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**RESTORATION PLANNING WORKING GROUP
EXXON VALDEZ OIL SPILL OFFICE
645 "G" STREET
ANCHORAGE, ALASKA 99501**

MEMORANDUM

TO: Peer Reviewers

FROM: John Strand *JS*

DATE: October 13, 1992

SUBJECT: Next Week's Meeting

I am very pleased that you have agreed to attend the Restoration Planning Review Meeting scheduled for October 19 - 21, 1992, in Anchorage. The RPWG believes it is essential that both our process as well as our product, in this case the proposed restoration options, be given a thorough review before the Draft Restoration Plan is assembled in late November.

To optimize our time together, I am enclosing a packet of information that hopefully you will have time to peruse before the meeting. This packet contains:

1. Draft Annotated Outline of Draft Restoration Plan - Working outline of the Draft Restoration Plan.
2. Creating Alternatives Using the Options Evaluation Database - This describes the process used to evaluate candidate restoration options and create the Options Evaluation Database.
3. Draft Summary Table of Injury - The Injury Summary was recently prepared by Bob Spies for inclusion in a section of the Draft Restoration Plan (see Annotated Outline) that lists resources and services that meet injury criteria.
4. Draft Evaluation Criteria - These criteria were developed to help determine which of the many restoration options are most appropriate and beneficial.
5. Draft Restoration Options (short forms) - Thirty-five candidate restoration options have been identified from suggestions made by the public and agency scientists.
6. Options Evaluation Database - The database evaluates how each option affects each injured resource or service. The database also is used to organize the options into alternatives.
7. Draft Alternative Themes - This paper provides a generalized description of four candidate alternatives that could be included in the Draft Restoration Plan.

	ALT #1	ALT #2	ALT #3	ALT #4
Alternative: Title	Natural Recovery (No Action) ¹	Natural Recovery with Protection	Active Restoration: Emphasis on Resource Restoration	Active Restoration: Emphasis on Resource Restoration and Human Use
Explanation	<ul style="list-style-type: none"> Assumes that natural resources and services will recover without human intervention. Nothing is done beyond pre-spill management activities. Monitoring 	<ul style="list-style-type: none"> Natural recovery Protection from further degradation to injured resources and services. Active restoration (including replacement) when an injured resource or service is not recovering. Monitoring. 	<ul style="list-style-type: none"> Over the life of the settlement, use all effective techniques to address the range of injured resources. Addresses services by addressing injuries to resources they are based upon. In light of limited funds, schedule options according to immediate needs and most effective techniques. Monitoring. 	<ul style="list-style-type: none"> Same as Alternative #3; uses effective techniques to accelerate resources' restoration but puts additional emphasis on those options that will ensure the continuity or enhancement of human use -- fishing, hunting, recreation, and subsistence -- that was interrupted by the spill. Monitoring.
Resources: <u>Manipulation & Replacement</u>	None	When a resource is not recovering.	Use all effective techniques scheduled according to immediate needs and effectiveness across all injured resources.	Same as #3 except, emphasize those techniques which contribute resources that are part of the human use of the spill area.
<u>Management of Human Use</u>	Normal agency management.	Management to protect injured resources. Management could entail some cost to human use.	Protective management applied where it significantly accelerates recovery of a resource.	Avoid protective management that causes significant cost to human use. Do so by substituting, if possible, manipulation or replacement options.
<u>Protection and Acquisition</u>	None	<p>Recommend that state and federal agencies use protective management until resources recover.</p> <p>Emphasis on acquiring private habitat to prevent further stresses and degradation to injured resources.</p>	Targeted habitat acquisition as needed to ensure protection of the injured resources as they recover.	Same as Alternative #3. For differences in acquisitions between Alternatives #3 and #4, see Services.

Alternatives (cont'd)	Alt #1	Alt #2	Alt #3	Alt #4
Services: <u>Manipulation & Human Use</u>	Normal agency management.	None; however, incidental benefit from protection options directed at resources.	Injuries to services are addressed by addressing the injuries to the resources they are based upon.	Those options which accelerate recovery of services.
<u>Protection & Acquisition</u>	None	None	None	Purchases to include public recreation sites and access.
Other Special Designations Etc	None	Use special designation(s) appropriate to increased protection.		

Note: Monitoring is done in all alternatives.

¹ There is some question whether or not Alternative #1, Natural Recovery, would qualify under NEPA as a "no action" alternative. For example, some money would be spent for monitoring. If this alternative is not the "no action" alternative, another "no action" alternative will be needed. RPWG hopes that such an alternative can be avoided, because Natural Recovery/No Monitoring is an unrealistic alternative. It would be a straw-man alternative that the agencies would be unwilling to stand behind.

Draft Alternative Themes Status Report for RT Review

INTRODUCTION.

RPWG was asked to provide a description of the alternatives in advance of actually constructing them for RT review. This brief paper provides general descriptions of draft alternatives. However, the RT should expect some changes as RPWG builds the alternatives for RT review. As the options are grouped, we will undoubtedly find that changes in the descriptions provided here would improve the alternatives.

As discussed in a previous RT meeting, an alternative is a list of restoration options and their implications (funding, timing, geographic scope, etc.). To make each group of options more understandable, each alternative is typically given a title, and a description of the essential elements of the alternative. This last part, the title and description, is described here. A more complete version of the draft alternatives (with options grouped by alternative) will be available in approximately two weeks. We expect more detailed review at that time.

CONCEPTS FOR BUILDING ALTERNATIVES.

Some concepts to keep in mind when reviewing descriptions of the alternatives:

- o We are aiming to have 3-5 alternatives (including a "no action" alternative).
- o Alternatives should cover the range of significant public and agency opinion.
- o We do not create straw-man alternatives (if the agencies are unwilling to implement an alternative, we should not present it to the public).

DRAFT ALTERNATIVE THEMES AND DESCRIPTIONS FOR RT REVIEW

Alternative #1: Natural Recovery (No Action)¹

This alternative assumes that natural resources and services will recover without human intervention. In this alternative, nothing, except monitoring, is done beyond pre-spill management activities.

Alternative #2: Natural Recovery with Protection

This alternative uses natural recovery as the primary tool to aid recovery. However, it also emphasizes protection of habitat and populations to prevent further degradation and stresses to injured resources and services. State and federal agencies apply management protection, and the trustees fund purchase of threatened habitat. These protection activities will provide a "breathing space" for injured resources to recover. In this alternative, the Trustees will fund active restoration (including replacement) when an injured resource or service is not recovering. Finally, this and all other alternatives include monitoring.

Alternative #3: Active Restoration: Emphasis on Resource Restoration

This alternative assumes that over the life of the settlement, the trustees will use all effective techniques to address the range of injured resources on an as-needed basis. However, in light of limited funds, (the final payment is not due until the year 2001), the trustees will schedule options according to immediate needs and most effective techniques. For example, priority will be given to the most effective techniques, and those which if not done soon will result in a lost opportunity (e.g., imminent threats, declining populations, etc.). This alternative addresses services by addressing injuries to the resources they are based upon. The alternative also includes monitoring.

Alternative #4: Active Restoration: Emphasis Resource Restoration and Human Use

This alternative is the same as Alternative #3. That is, it uses effective techniques to accelerate the restoration for resources but puts additional emphasis on those options that will ensure the continuity or enhancement of human use that was interrupted by the spill - fishing, hunting, recreation, and subsistence. It also includes monitoring.

¹ There is some question whether or not this alternative would qualify under NEPA as a "no action" alternative. For example, some money would be spent for monitoring. If this alternative is not the "no action" alternative, another "no action" alternative will be needed. RPWG hopes that a new alternative can be avoided, because Natural Recovery/No Monitoring is unrealistic. It would be a straw-man alternative that the agencies would be unwilling to stand behind.

QUESTIONS NOT ADDRESSED IN ALTERNATIVES

Some important questions are not packaged into alternatives because they apply to all alternatives. These include:

- o An endowment;
- o Level of monitoring;
- o Programmatic options such as public information, education, or law enforcement; and
- o A Science Center.

These questions could potentially apply to all alternatives, and it is confusing to place them into one alternative alone. The public should be questioned about these decisions at the same time that alternatives are presented.

Finally, it is appropriate to get additional detail from the public concerning habitat acquisition. This issue is one of the most important issues facing the Trustees, and it is important to get additional direction on the questions of "How much? Where? And Why?" RPWG, however, cannot generate these questions alone. The overlap with the Habitat Working Group is too great. We assume that much of the work will be completed by the Habitat Working Group.

DRAFT ALTERNATIVE THEMES

Aug. '92
from RPWG

DRAFT ANNOTATED OUTLINE

Draft Annotated Outline
DRAFT RESTORATION PLAN

10/9/92

- i. Cover Letter (front/back [Trustee signatures]) Editor (1 pg)
- ii. Acknowledgements (Planning Team) John
- iii. Table of Contents Editor
- iv. Executive Summary Editor/John/Bob L.

I. Introduction

A. Purpose of document

Presents the proposed action (see Restoration Framework, page 1) and explains the function of the Draft Restoration Plan as providing overall direction for the restoration process and guidance for implementation of annual work plans, including all anticipated annual and periodic activities. Explains the relationship among alternatives, options and restoration projects and types of actions to implement them. John/Bob L. (1 pg)

B. Background

Summarizes the history of the oil spill, including the cleanup; pre-settlement NRDA program; A summary of Trustee Activity since the settlement, including the role of the U.S. District Court of Alaska; criminal and civil settlements; and the EVOS trustee organization and administration. Presents the number and nature of the public's comments received on the Restoration Framework and how they were used. Ray/Veronica (5-10 pgs)

C. Spending guidelines for EVOS settlement

1. Civil settlement

Summarizes guidelines for spending civil settlement money. Includes a description of the decision-making process for expenditures. Chris (2 pgs)

2. Criminal settlements (state and federal)

Summarizes state and federal guidelines for spending criminal settlement money. Explains

relationship to civil settlement guidelines.
Chris (2 pgs)

D. Relationship to Draft Environmental Impact Statement

Following a brief outline of the NEPA process, the relationship of the Draft Environmental Impact Statement (DEIS) to the Draft Restoration Plan will be explained. Explains that the DEIS will be programmatic in nature and the impacts of the preferred restoration alternative will be presented and compared with those of all other restoration alternatives. Ray (1 pg)

X

II. Injured Resources and Services

A. Criteria for selecting injured resources and services

Injury criteria will be listed and briefly explained. Any changes from those in the Restoration Framework will be explained. Sandy (2-3 pgs)

B. How criteria are applied

The decision-making process for applying the injury criteria will be explained. Bob L./Sandy (2-3 pgs)

C. Conclusions: List of resources and services injured: tables/graphics of resources and services that meet the injury criteria

Presents summary of information on the range of injuries from the ecosystem level to individual resources and services as we now understand it. Injuries will be explained in terms of injured life history stages or user groups, the geography of the injury, and the status and prospects for natural recovery. Bob Spies/Veronica/Sandy/Bob L. (40-80 pgs)

III. Restoration Options

A. Explanation of restoration options

Briefly explains restoration options: their origins, the evolution of these public and professional ideas into options and the central importance of them to the plan. Karen (3 pgs)

B. Evaluate restoration options

1. Criteria for evaluating restoration options

Identifies and defines criteria that are used in evaluating and ranking candidate restoration options. Explains any changes from Restoration Framework. Karen (3 pgs)

2. How criteria are applied

Describes the process used in ranking options (as high, medium, or low) for each criteria. Includes a description of the process used to generate candidate restoration alternatives. Bob L. (3-5 pgs)

C. Evaluate habitat protection and acquisition options

Describes the evaluation process that will be used in identifying and prioritizing habitat for protection and acquisition, including how protection for services will be approached. Includes description of threshold criteria, habitat types, and the imminent threat analysis for determining whether accelerated protection is required due to immediate threats to restoration potential.

Description of other habitat acquisition issues including 1) land management: which agencies would manage the acquired land; how land management considerations (such as the need for survey, and locatable, contiguous blocks) influence purchases; 2) tools for land acquisition: describes the range of potential tools from development moratoriums to fee-simple purchase; 3) multi-species analysis: describes how the decision to purchase may depend on the benefits provided to more than one resource or service type. Bob L./Art/Veronica (10 pgs)

✱

IV. Restoration Plan Alternatives

Indicates that this section presents a range of restoration alternatives. It explains that while a preferred alternative is presented, clearly no final decision will be made as to the selection of a preferred alternative until the public has had opportunity to comment and the Trustees can take full consideration of the public's opinion. The reason for presenting a preferred alternative at this time is the Trustee's desire to indicate direction at this point in the process and to facilitate compliance with the National Environmental Policy Act of 1969, as amended, i.e., simultaneous publication of the Draft Environmental Impact Statement. Bob L./Sandy will write up-front (5 pgs)

A. Description of alternatives

3 - 5 Alternatives will be presented.

*

1. No action alternative (natural recovery)

Describes the scope and nature of the no action alternative. Explains reliance on natural processes and the limited activities that would occur. Distinguishes between these and the more active restoration options presented in other alternatives. Bob L./Carol/Karen/Veronica (? pgs)

2. Other alternative

Describes the scope and nature of one of the other alternatives (not including the preferred alternative). Presents a summary of the options included in the alternative and considers the following: responsiveness to recognized injuries and the proposed action, timing of implementation, geographic scope of application, and relative amounts of funding required for option categories presented in the alternative (e.g., management of human uses, habitat protection, etc.). Bob L./Carol/Karen/Veronica (? pgs)

3. Preferred alternative

Describes the scope and nature of the preferred alternative. Presents a summary of the options included and considers the following: responsiveness of the alternative to recognized injuries and the proposed action, timing of implementation, geographic scope of application, and relative amounts of funding required for option categories (e.g., management of human uses, habitat acquisition and protection, etc.). Bob L./Carol/Karen/Veronica (? pgs)

4. Other alternative

See annotation for V.A.2. Bob L./Carol/Karen/Veronica (? pgs)

B. Comparison of alternatives

Describes the significant differences between the alternatives so the public can readily see the choices presented. Sandy/Veronica (3-5 pgs)

V. Implementation Process for Life of the Settlement

- A. Development of annual budget and work plans (i.e., selection of projects/studies for a given year legal compliance etc...)

Describes the process and timeline the Trustee Council will follow in prioritizing annual research and restoration needs. Mark F. (3-5 pgs)

- B. Operations/Administration

How the Trustee Council, staff, etc. will operate the restoration program. This will include an organization chart/flow diagram of how restoration program will operate. Dave Gibbons (3-5 pgs)

- C. Funding mechanisms

1. Current mechanism

Describes the current funding mechanism (court registry account). Explains how the process functions and its effects on the nature, extent and future of the restoration program. Mark Brodersen (3-4 pgs)

2. Endowment

Describes the various approaches to endowments that could be suitable for the restoration program. Explains how endowments could function and affect the nature, extent and future of the restoration program. Mark Brodersen (3-4 pgs)

- D. Monitoring/Evaluation

Presents elements of an integrated, long-term monitoring program designed to follow the rate of recovery of injured resources and services and to evaluate the effectiveness of restoration activities. Also presents an evaluation process to determine if plans, projects and related activities have been implemented as designed. John/Mark F. (5-7 pgs)

- E. Public participation/Public education

Describes how the Trustee Council will continue to provide for meaningful public involvement over the life of the settlement. This will include information about the Public Advisory Group (i.e., the process used to establish it and any accomplishments to date) and all other efforts by Trustee Council staff to accomplish this goal.

Explains what actions the Trustee Council will take to provide for an appropriate level of public education about the restoration program. Although this is related to public participation efforts, it differs in that the Trustee Council will generate educational products relating to restoration. Educational efforts may, in part, take the form of annual work plan projects. **Peg/LJ Evans (10-15 pgs)**

F. Amendments to the final Restoration Plan

Describes the process for amending the final plan. **Mark F. (2 pgs)**

Appendices

A. Restoration options

Summarizes all options and suboptions. The descriptions will be more detailed than those in the Restoration Framework. **Various authors (70 pgs)**

B. Charter of the Public Advisory Group

Copy of the Public Advisory Group charter **Editor**

List of PAG principal interests **Editor**

List of current PAG members and their affiliation
Editor — get

C. List of other publications **Editor**

(i.e., 1990 Progress Report, etc...)

D. Court settlement documents **Editor**

E. Glossary **Editor/Chris**

Brochure

Annotation

The brochure summarizes the draft plan and includes the comment sheet for the plan. It is a stand-alone summary that can be distributed separately from the plan for those who are uninterested in reading the full document. **Bob L./Sandy/Editor/Illustrator (2-4 newspaper size pages)**

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PROCESS

CREATING ALTERNATIVES USING THE OPTIONS EVALUATION DATABASE

Description of RPWG's Process

The Basics: Three Questions. The draft restoration plan is built on the answers to three questions concerning each injured resource or service.

- Was it injured?
- Is it recovering?
- What are the possibilities for restoration?

The correct answers to these questions are the basics upon which we construct the restoration plan. The only reason why we do not do all useful restoration options is their combined cost is more than we have available. Thus, we have to make decisions. We construct alternatives -- groups of restoration options for public review -- in order to gather public preferences on the options, and to show the implications of choosing some projects over another.

Options: Groups of Restoration Projects. Rather than make decisions among hundreds (thousands?) of different restoration projects, RPWG grouped similar projects into categories of projects. For example, there are a variety of potential techniques to increase the breeding productivity of murres: decoys, sound recordings, and many physical nest site improvements, all of these are grouped into Option 16 "Increase productivity and success of murre colonies". We used the name Restoration Options for these categories. The options are categories of similar restoration projects. The grouping used the following approach:

1. Ask the public, agencies and resource or service experts what they can think of to do. (1990)
2. Group projects into similar categories: options. (1990)
3. Apply simple criteria to eliminate ineffective projects and groups of projects (ones which will not have significant effect on the resources or services, or which are not within the guidelines of the settlement.) (1991)
4. Ask the public and agencies to review our options. (Restoration Framework Vol I, 1992)
5. Modify options based on public review. (Summer 1992)

Why a database? Answer: Be Systematic. RPWG developed criteria to evaluate options for their effect on an injured resource or service (including some indirect effects such as benefit/cost, or negative impacts on other resources or services). These criteria are presented separately in this package. The criteria definitions were used to evaluate each relevant option for each injured resource or service. In this way, RPWG hoped to eliminate biases from the evaluation and create a systematic repeatable process for developing alternatives. The database evaluates how each option will affect each resource or service. The most important evaluations are: will the option help the rate or degree of recovery, prevent an additional stress from habitat degradation that will hurt the resource or service, enhance the resource or service. Others address technical feasibility, cost, adverse impacts, etc.

In completing the ratings RPWG considered the type of injury. For example, an injury to habitat is usually most effectively restored with an option that addresses habitat. Productivity problems such as non-breeding are not addressed by options that focus on protection only. The database also includes descriptive categories that identify if the focus of an option is manipulation, management of human uses, or protection as well as if it qualifies as direct restoration, replacement, acquisition of equivalent resources or enhancement as described in the settlement document.

The Next Step: Creating Alternatives. RPWG can use the database to organize the options into alternatives. By sorting the database using different perspectives on either the resource/services or on some combination of criteria we are able to identify which options would be included in a particular alternative. For example, what alternatives are available to address the most severely injured species that we know aren't recovering. Which of those are the most effective. The database can also be used to guide implementation of the options and will help RPWG create a coordinated restoration plan. ✕

This step is not yet complete. The purpose of next week's peer review is to look at the overall process to ensure that there are no serious errors, and to review the database evaluation to ensure that we evaluated the options correctly.

INDEX FOR OPTION SUMMARIES

<u>OPTION</u>	<u>PAGE</u>
1 Archaeological Resource Protection	1
2 Increase Fisheries Management.....	3
4 Establish or expand protective buffer zones to reduce disturbance for marine birds or mammals.....	5
8 Restrict or eliminate harvest of mammals and sea ducks.....	7
9 Minimize incidental take of marine birds by commercial fisheries.....	12
9b Duplicate of suboption 8b - Please ignore	
10 Preservation of archaeological sites and artifacts	17
11 Improve or supplement stream and lake habitats for spawning and rearing of wild salmonids.....	19
12 Creation of new recreation sites and facilities through replacement or construction.....	23
13 Eliminate sources of persistent contamination of prey and spawning substrates.....	28
14 Accelerate Recovery of Upper Intertidal Zone.....	30
15 Supplements to subtidal spawning substrates and egg transplants for Pacific herring.....	32
16 Increase productivity and success of murre colonies.....	34
17 Eliminate or reduce predators from areas important to nesting marine birds.....	38
18 Promote the recovery of injured wild salmon stocks by replacing harvest opportunities with alternative runs.....	42
19 Update and expand the State's Anadromous Waters Catalog....	49
27 Designate long-term Ecological Research Site(s).....	51
28 Purchase access to sport-fishing and recreation sites.....	53
34 Establish a marine environmental institute.....	58
35 Replacement of archaeological artifacts.....	60
40 Designate Protected Areas.....	62

SHORT FORMS

DRAFT

October 12, 1992

OPTION 1 Archaeology Resource Protection

SUMMARY

Beach clean up activities resulted in increased public knowledge of exact locations of archaeological sites throughout the oil spill area. Archaeological sites and artifacts affected by looting and vandalism, directly attributable to the oil spill, is occurring at an unprecedented level. The remoteness of most sites makes traditional enforcement of archaeological protection laws difficult. A site stewardship program could establish a core of local citizens to watch over threatened archaeological sites thereby providing a significant means of resource protection.

DESCRIPTION

Site stewardship is the recruitment, training, coordination, and maintenance of a corps of local interested citizens to watch over threatened archeological sites located within their home districts. Local citizens' groups and Native Corporations will be brought into the project as cooperators to facilitate communications and operations. The Trustee Council has already begun work on this sub-option by approving a project for a Site Stewardship program in February 1992. However, to yield any beneficial results the project must be carried out over several years.

Although the Trustee Council approved a project in February 1992, it will take until the summer of 1993 before people involved in the program will be in the field carrying out their duties.

MEANS AND POTENTIAL TO IMPROVE RECOVERY

Damage to archaeological sites and artifacts as a result of the Exxon-Valdez oil spill continues to occur as sites are looted and/or vandalized. In some locations, oil continues to seep into the sites themselves oiling artifacts and the surrounding strata. Inherently, archaeological sites and artifacts are not restorable. The site stewardship program seeks to stop the continuing damage to these resources from looting and vandalism by establishing a strong locally based deterrent to such activity.

Damage assessment studies indicate that looting and vandalism has occurred at 19 of 35 sites studied so far and that it is suspected to have occurred at an additional 16 sites. This suggests that 34 of 35 sites studied throughout the oil spill area have suffered losses from looting and vandalism. The use of local people, who volunteer their services, is believed to be a very practical method to accomplish the stated goals. It is expected to take several years to fully accomplish option goals.

INDIRECT EFFECTS

Socio-economic

People will see that the state and federal governments are dealing directly with the looting and vandalism problem associated with archaeological sites in the oil spill area. Further, they will learn that they can participate directly in restoration if they are interested in seeking out this opportunity. The site stewardship volunteers will become more knowledgeable of Alaska's past and are likely to share their experience and knowledge with others in their communities. Volunteers may receive small cash payments for expenditures associated with their volunteer duties. The addition of cash in small communities may benefit some local businesses.

Human health and safety

People participating in this program may be subject to risks associated with travel in boats and small aircraft.

OTHER INFORMATION

CITATIONS

* An Evaluation of Archaeological Injury Documentation Exxon-Valdez Oil Spill, M. Jespersen and K. Griffin, May 14, 1992, Alaska Office of History and Archaeology and the National Park Service

* Restoration Framework, Exxon-Valdez Oil Spill Trustees, April 1992.

* "Archaeological Resource Protection - 1992 Restoration Project Proposal, C. Holmes and S. Morton, Alaska Office of History and Archaeology and the National Park Service

* personal communication, Cordell Roy, 257-2526

* personal communication, Susan Morton, 257-2559

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stocks. If fisheries can be redirected through intensified management and selectively target only healthy stocks, injured stocks will have a better chance of recovery.

Reducing human use of injured stocks is an effective restoration option that can greatly facilitate natural recovery of injured populations and the fisheries dependent on them. When specific stocks have been identified and the health of these stocks determined, commercial, sport and subsistence fishing pressure will be directed away from injured stocks and toward healthy stocks or harvests will be temporarily closed. Management actions will attempt to minimize negative impacts on human uses.

INDIRECT EFFECTS

There could be socio-economic impacts to commercial, sport and subsistence fishermen if areas are closed to protect injured stocks or opened in locations not previously fished.

There could be adverse effects on rockfish populations depending on the methods used to gather baseline information and monitoring of restoration efforts. Non-destructive sampling methods should be used wherever possible.

DRAFT

October 9, 1992

OPTION 4: Through regulations, establish or expand protective buffer zones to reduce disturbance at marine mammal haul-out sites and rubbing beaches and at breeding colonies of marine birds.

INJURED RESOURCES AND SERVICES Common and thick-billed murres, sea otters, harbor seals and killer whales.

DESCRIPTION

Human disturbance can adversely affect the fitness and reproductive success of marine birds and mammals. Species that gather in large numbers and traditionally make use of small, discrete sites are especially vulnerable. Disturbance at these important habitats can result in increased mortality of offspring or reduced health of adults. Existing management capabilities at important habitat sites are not always adequate to provide the extra protection from disturbance that is needed to help injured species recover. This option considers establishing buffer zones as special designation areas around important marine bird and marine mammal habitats.

Buffer zones can vary considerably between specific sites and are designed to meet the needs of each location. Most existing buffer zones encircle areas used by the species for reproducing or for resting during periods of physiological stress (i.e. harbor seal haul-out sites during molting). Restrictions within buffer zones can range from limiting the speed of boat traffic within a couple hundred feet of a specific site for a short time each year, to prohibiting boat or air traffic within a half mile or mile of the location.

Implementation of this option is likely to take 2 to 3 years depending on the information that is available. The effects of disturbance on marine mammals and on murre breeding colonies have been documented outside of the oil spill area; however, the current level of disturbance at many of the important sites within the oil spill area have not been assessed. This information will be needed in order to determine if establishing buffer zones is necessary at any given location. It will also define what level of protection needs to be established to protect an area.

MEANS AND POTENTIAL TO IMPROVE RECOVERY

Human disturbance creates different problems for different species of marine birds and mammals. For common murres, loud noise can cause the adults to flush from the breeding ledges, kicking eggs off the cliffs and leaving eggs and young exposed to predators. The lower density and asynchronous nesting at the colonies within the oil-spill area already make the eggs and young more vulnerable

to predation than prior to the oil spill. Modifying boat traffic around these colonies may reduce additional disturbance factors.

Haul-out sites are especially important for harbor seals. Rocks, isolated beaches, protective cliffs and sand/mud bars are used for resting, pupping and nursing young. Pair-bonds between females and their new pups can be weakened when the females are disturbed from the haul-out site, this can lead to the abandonment and death of the pups. Pups are sometimes crushed when the adults are forced to stampede into the water. Harbor seals rely on haul-out sites for resting during the molt. Protective measures for harbor seals should extend from mid-May to September to cover pupping and molting periods.

The importance of haul-out sites for sea otters is less understood. It is believed that haul-out sites may be important for sea otters in northern climates because of the colder water temperatures. The importance of beach rubbing by killer whales is also poorly understood but it may be associated with removal of parasites, resting and socialization. For both of these species it is reasonable to assume that haul-out sites or rubbing beaches in some way help maintain the health of the animals and therefore affects their ability to reproduce. However, the irregular haul-out pattern of sea otters make chronic problems of human disturbance less likely than for harbor seals.

INDIRECT EFFECTS

Creating buffer zones would also provide protection for other non-target species which utilize the areas. Ultimately, the buffer zones would provide a long-term gain in wildlife viewing opportunities as the populations approach their pre-spill population levels.

The effects on human use of the area would depend on the level of restrictions needed to reduce disturbance. The less stringent regulations could require tour- or charter-boat companies to change their use patterns for part of the year, but would not prohibit access. The most restrictive buffer zones could prevent access to a favorite viewing or fishing location and should only be applied in critical situations.

RAFT

OPTION 8A Restrict or eliminate legal harvest of marine and terrestrial mammals and sea ducks.

INJURED RESOURCES AND SERVICES Sea Otter, Harbor Seal, Brown Bear, River Otter, and Harlequins and other seaducks.

SUMMARY

Brown bears forage seasonally in the intertidal and supratidal areas of the Alaska Peninsula and the Kodiak Archipelago. Preliminary analysis showed that some bears were exposed to petroleum hydrocarbons. A few river otter carcasses were found by oil spill clean-up workers and preliminary analysis indicate that petroleum hydrocarbons are being accumulated by this species. Harbor seals and sea otters were both substantially impacted by the oil spill. Studies indicate that sea otters continue to suffer long-term effects from exposure to petroleum hydrocarbons. Seaducks, especially Harlequin Duck, were substantially impacted by the oil spill. Surveys indicate harlequin population declines and a near total reproductive failure in oiled areas of Prince William Sound.

Suboption A discusses temporary restriction or closure of harvest of the injured species on the oil-spill area which would require recommendations from the Trustee Council to the Alaska Department of Fish and Game and the U.S. Fish and Wildlife Service to initiate changes in the sport and subsistence harvest regulations. Suboption B discusses an education program which would encourage voluntary reductions in subsistence harvest.

SUBOPTION A Temporarily restrict or close harvests of injured species in the oil-spill area.

TARGET RESOURCES AND SERVICES

Sea Otter, Harbor Seal, Brown Bear, River Otter, and Harlequins and other seaducks.

DESCRIPTION

Trustees would recommend that the Fish and Wildlife Service reduce subsistence harvest of marine mammals and harlequin ducks on Federal lands in the spill zone. Trustees would recommend that the Alaska State Board of Game reduce or close sport hunting of brown bear in the spill zone. Trustees would also recommend that sport and subsistence bag limits on harlequin duck be reduced, season closed entirely, or season limited to such time when migrants and wintering ducks are present in the spill zone. Trustees would recommend that trapping of river otters be adjusted to limit to subsistence use only, reduced bag limits for commercial trappers, or reduction and/or closure to both subsistence and commercial trappers.

Harvest regulations are created by the Alaska Department of Fish and Game, Board of Game. The Board meets twice a year, in the spring and in the fall. Proposals for regulation changes may be submitted to the Board for review during the bi-annual meetings. 60-day public notices are required for any proposed regulation changes. An "emergency order" is the quickest way to change a harvest regulation. Emergency orders can be issued by the Alaska Department of Fish and Game within 24-48 hours and are effective for 120 days.

MEANS AND POTENTIAL TO IMPROVE RECOVERY

Reduction in harvest of injured species would mean a greater opportunity for the spill zone populations to reproduce and increase their numbers by eliminating additional mortality.

Brown bears forage seasonally in the intertidal and supratidal areas of the Alaska Peninsula and the Kodiak Archipelago. Preliminary analysis showed that some bears were exposed to petroleum hydrocarbons. It is not known what impacts the oil spill will have on brown bear populations. If populations are substantially affected by exposure to petroleum hydrocarbons, then restrictions on sport harvest could potentially improve recovery by reducing or eliminating a source of mortality.

A few river otter carcasses were found by oil spill clean-up workers and preliminary analysis indicate that petroleum hydrocarbons are being accumulated by this species. Populations in western Prince William Sound were impacted by the oil spill but the extent of the impacts are not yet clear. River otters are trapped throughout western Prince William Sound. Restrictions on trapping could potentially improve recovery of the species by eliminating a source of mortality.

Harbor seals and sea otters were both substantially impacted by the oil spill. Studies indicate that sea otters continue to suffer long-term affects from exposure to petroleum hydrocarbons. Although these marine mammals are protected by the Marine Mammal Protection Act, an exemption for Alaska Natives allows take for subsistence. It is not known how much subsistence harvest of marine mammals occurs within Prince William Sound, but sea otters are harvested for subsistence purposes around Kodiak Island. The Marine Mammal Protection Act protects the harvest of marine mammals for subsistence purposes unless the harvest is accomplished in a wasteful manner, or unless the population is determined to be depleted. Although regional population levels for sea otters likely were affected as a result of the spill, a determination of depletion of the species or stock would be extremely difficult. Because of the provisions of the Act, stock depletion would likely be considered on a state-wide basis rather than a regional basis, making the impacts to the sea otters in the oil spill area relatively insignificant. However, harbor seal populations throughout the state are in a serious decline. Although determining the contribution of the oil spill to stock or

population depletion would not be possible, it may be that other factors would be considered in making the determination.

Seaducks, especially Harlequin Duck, were substantially impacted by the oil spill. Surveys indicate harlequin population declines and a near total reproductive failure in oiled areas of Prince William Sound. It is not known how many ducks are harvested by sport hunters in Prince William Sound because the harvest figure is reported for all of Southcentral Alaska. It is said that the harvest is small. However, a harvest in September would take almost exclusively resident birds because migrants have not yet arrived from breeding grounds further north. A delayed harvest in Prince William Sound could potentially improve recovery of the resident Harlequin Duck by eliminating a source of mortality during a time when only resident birds are present.

INDIRECT EFFECTS

Sport hunters would be indirectly impacted by closure or restriction of duck and bear hunting seasons in the oil spill zone. Subsistence users may be impacted if subsistence regulations close the season or implement a reduced harvest. However, if voluntary reduction in harvest is encouraged, should need prevail, subsistence users would not be barred from taking the resource. It is not known to what extent trapping occurs, or how many people would be affected should trapping of river otters be restricted.

OTHER INFORMATION

This option seeks both to restore injured species and the injured services which they provide, as described in the Memorandum of Agreement to the civil settlement. No permits should need to be obtained to implement any action in this suboption. These activities are generally categorically excluded from a detailed NEPA process.

Alaska Department of Fish and Game manages hunting/trapping levels of brown bears, river otters and harlequin ducks and monitors the harbor seal populations. NOAA/NMFS would be involved with marine based programs related to harbor seals. USFWS has management responsibilities for sea otters. The primary agencies with land management responsibilities within the oil-spill area include DNR, NPS, USFS, and USFWS.

CITATIONS

Information on harvest provided by Roy Nowlin, Cordova Area Biologist; 424-3215.

Information on harvest regulations provided by Jim Lieb, Dept. of Wildlife Conservation, 267-2261.

DRAFT

October 12, 1992

SUBOPTION 8B Encourage voluntary reductions of subsistence, commercial and sport harvest levels

TARGET RESOURCES AND SERVICES Sea otter, harbor seal, brown bear river otter and harlequin duck

DESCRIPTION

Many subsistence users within the spill area have voluntarily reduced their take of marine mammals in an effort to help the recovery of sea otters and harbor seals. Providing information on the status of the populations and on the value of the reduced take, may encourage more people to reduce their harvest levels until the populations can better sustain the additional loss. This suboption focuses primarily on subsistence users since pure education programs are less likely to succeed in influencing hunters and trappers. However, hunters and trappers could be better informed of legal restrictions which guide the harvest of brown bears, river otters and harlequin ducks in areas that have depleted populations and in nearby areas that could provide animals for natural recolonization.

Development of an education/interpretive plan should take about a year to complete but could vary depending on the type of media selected. Similar education-information programs implemented in other parts of the country and Canada, continue for several years. For the Exxon-Valdez oil spill area the program should continue until the subsistence users and researchers believe the targeted population could sustain an increased harvest.

MEANS AND POTENTIAL TO IMPROVE RECOVERY

Because of the requirements of the litigation process many subsistence users of the oil-spill area are unaware of the extent of the injuries on the species they hunt. Many of these users would be willing to change their use patterns if they were convinced of the need to reduce further impacts on specific resources. Providing information on especially sensitive areas would help users decide if their activities might slow the recovery of the harvested population. Likewise, it will be necessary to provide current information on the recovery of specific resources so that subsistence activities can return to their pre-spill status at the earliest date.

Subsistence use of sea otters is believed to be relatively low (less than 50?) in the oil spill area since these animals are rarely used for food. The subsistence harvest of harbor seals varies tremendously throughout the oil spill area. Tatitlek villagers may harvest several hundred seals for food each year

while other villages such as English Bay may harvest less than 20 per year (ADF&G Subsistence Division census data).

Subsistence use of harbor seals has decreased somewhat since the oil spill. This is believed to be partially due to concerns over the safety of the meat, as well as concern about the seal population.

INDIRECT EFFECTS

Indirect environmental effects could include a more rapid recovery of injured species (through lessened disturbance). Potentially, subsistence activity could shift to different species which would experience higher than normal harvest levels. Greater awareness of subsistence users of the health of the harvested population would help to ensure the long-term health of the population.

Indirect socio-economic effects would include a reduced opportunity for village residents to carry out a traditional activity. Although this impact would be voluntary and could be short termed, habits changed as a result of decreased subsistence activities could be long lasting. However, this program could lead to placing a higher value on these traditional activities that may translate into a greater significance for the users.

Providing updates on the recovery of species used for subsistence could ensure that people can return to the pre-spill subsistence harvests without concern about their impacts to the harvested population (i.e. once they know that the populations can sustain the traditional harvest).

Other indirect effects would include a long-term gain in viewing opportunities for tourists as the numbers of fish and wildlife approach their pre-spill population levels.

Effects on human health and safety could cause negative effects on some residents by causing a change in diet away from customary foods. This is more likely to be a problem for elderly residents.

OTHER INFORMATION

Subsistence use within the oil spill area is managed by the Federal government on Federal lands and the Alaska Department of Fish and Game on state and private lands. Subsistence regulations do not include designated harvest levels for sea otters and harbor seals in the oil-spill area. Changing the harvest levels for these species would require declaring the populations as "depleted" under the Marine Mammal Protection Act.

DRAFT

October 9, 1992

OPTION 9 Minimize incidental take of marine birds by commercial fisheries

INJURED RESOURCES AND SERVICES Marine birds including common murre, marbled murrelets and other marine birds

SUMMARY

Entanglement of marine birds in gillnets deployed in high seas and coastal fisheries in the North Pacific is a recognized conservation problem. Within and adjacent to the area affected by the Exxon Valdez oil spill, there are several coastal gillnet fisheries for salmon, including the Prince William Sound drift and setnet, Cook Inlet drift and setnet, and Kodiak setnet fisheries. Under this option, the extent of marine bird mortality in these fisheries would be examined. If this mortality is found to represent a significant source of mortality for marine bird populations in the spill area, an effort to develop new technologies or strategies for reducing encounters between marine birds and gillnets would be made.

DESCRIPTION

Mortality of marine birds in North Pacific high seas gillnet fisheries has been relatively well-studied through observer programs. Mortality of marine birds in coastal gillnet fisheries has been less well studied, and only a few studies of mortality in North Pacific coastal fisheries have been conducted.

Studies have documented mortality to common murre and marbled murrelets due to entanglement in gillnets particularly in California and British Columbia. Within Alaska, the only studies of marine bird entanglement and marine bird mortality in the Exxon Valdez spill area are those carried out for the National Marine Fisheries Service. The studied fisheries included the Prince William Sound drift and setnet fisheries and the Alaska Peninsula drift fishery. In both 1990 and 1991, observers found that only a small percentage of birds that came within 10 m of driftnets became entangled; almost no birds became entangled in setnets. The majority of birds that became entangled in driftnets, however, died. Murre and murrelets were the most frequently entangled and killed species. Extrapolating based on estimated fishing effort, it is estimated that over 460 common murre and about 300 marbled murrelets died due to entanglement in Prince William Sound driftnets in 1991.

The significance of this level of mortality to the common murre and marbled murrelet populations of Prince William Sound is unknown. Common murre and marbled murrelets, however, were two

marine bird species that the subject to injury from the Exxon Valdez oil spill.

To implement this option, a number of steps would have to be taken: (1) research and document the extent of marine bird mortality in coastal gillnet fisheries in the area affected by Exxon Valdez oil spill; (2) research new technologies or strategies for reducing encounters between marine birds and gillnets; and (3) incorporate relevant methodologies and strategies to reduce encounters between marine birds and gillnets into State of Alaska fishery management plans until populations recover.

MEANS AND POTENTIAL TO IMPROVE RECOVERY

This option could facilitate recovery of marine bird species whose populations were reduced by the Exxon Valdez oil spill by reducing a ongoing source of mortality and reducing the time needed for injured marine bird populations to return to pre-spill levels. However, determining the potential effect of this option on injured resources is difficult because the extent of marine bird mortality due to gillnet entanglement has not been determined.

This option is technically feasible. It generally follows the approach used in addressing other fishery-bycatch problems. This approach involves study of the problem followed by management actions aimed at reducing bycatch. In most cases, the action that has been taken is closure of the fishery, but technical solutions are also possible. A variety of techniques could be examined including: experiments with nets that are suspended one, two and three meters below the surface; removing the lower portion of the nets; temporary seasonal and area closures; and elimination of night fishing. In addition, a management plan directing fishing pressure away from injured marine bird habitats may be an effective restoration option.

Although this approach suggested here is technically feasible, the importance of political considerations must be recognized. No changes in fishing practices are possible until a significant problem has been demonstrated which raises the concern of the public and politicians. The observer program that has operated in the Prince William Sound gillnet fisheries during the past two years was mandated by Congress, which is a sign of the level of concern about the problem of marine mammal entanglement. Although Congress has shown some interest in the entanglement of marine birds in high seas fisheries, Congress has not, as yet, expressed significant interest in the mortality of marine birds in coastal fisheries. Without such high level political support for changes to reduce mortality of marine birds, the possibility of such changes is doubtful.

INDIRECT EFFECTS

The indirect effects of implementing this option could include:

- o changes in the efficiency of coastal gillnet fisheries;
- o closure of coastal gillnet fisheries;
- o reductions in economic viability of coastal gillnet fisheries, which could have economic and social effects on communities such as Cordova, Valdez, Homer, and Kodiak;
- o changes in the incidental bycatch of marine mammals.

October 9, 1992

SUBOPTION B ⁹ **Encourage voluntary reductions of subsistence, commercial and sport harvest levels**

TARGET RESOURCES AND SERVICES Sea otter, harbor seal, brown bear river otter and harlequin duck

DESCRIPTION

Many subsistence users within the spill area have voluntarily reduced their take of marine mammals in an effort to help the recovery of sea otters and harbor seals. Providing information on the status of the populations and on the value of the reduced take, may encourage more people to reduce their harvest levels until the populations can better sustain the additional loss. This suboption focuses primarily on subsistence users since pure education programs are less likely to succeed in influencing hunters and trappers. However, hunters and trappers could be better informed of legal restrictions which guide the harvest of brown bears, river otters and harlequin ducks in areas that have depleted populations and in nearby areas that could provide animals for natural recolonization.

Development of an education/interpretive plan should take about a year to complete but could vary depending on the type of media selected. Similar education-information programs implemented in other parts of the country and Canada, continue for several years. For the Exxon-Valdez oil spill area the program should continue until the subsistence users and researchers believe the targeted population could sustain an increased harvest.

MEANS AND POTENTIAL TO IMPROVE RECOVERY

Because of the requirements of the litigation process many subsistence users of the oil-spill area are unaware of the extent of the injuries on the species they hunt. Many of these users would be willing to change their use patterns if they were convinced of the need to reduce further impacts on specific resources. Providing information on especially sensitive areas would help users decide if their activities might slow the recovery of the harvested population. Likewise, it will be necessary to provide current information on the recovery of specific resources so that subsistence activities can return to their pre-spill status at the earliest date.

Subsistence use of sea otters is believed to be relatively low (less than 50?) in the oil spill area since these animals are rarely used for food. The subsistence harvest of harbor seals varies tremendously throughout the oil spill area. Tatitlek villagers may harvest several hundred seals for food each year

while other villages such as English Bay may harvest less than 20 per year (ADF&G Subsistence Division census data).

Subsistence use of harbor seals has decreased somewhat since the oil spill. This is believed to be partially due to concerns over the safety of the meat, as well as concern about the seal population.

INDIRECT EFFECTS

Indirect environmental effects could include a more rapid recovery of injured species (through lessened disturbance). Potentially, subsistence activity could shift to different species which would experience higher than normal harvest levels. Greater awareness of subsistence users of the health of the harvested population would help to ensure the long-term health of the population.

Indirect socio-economic effects would include a reduced opportunity for village residents to carry out a traditional activity. Although this impact would be voluntary and could be short termed, habits changed as a result of decreased subsistence activities could be long lasting. However, this program could lead to placing a higher value on these traditional activities that may translate into a greater significance for the users.

Providing updates on the recovery of species used for subsistence could ensure that people can return to the pre-spill subsistence harvests without concern about their impacts to the harvested population (i.e. once they know that the populations can sustain the traditional harvest).

Other indirect effects would include a long-term gain in viewing opportunities for tourists as the numbers of fish and wildlife approach their pre-spill population levels.

Effects on human health and safety could cause negative effects on some residents by causing a change in diet away from customary foods. This is more likely to be a problem for elderly residents.

OTHER INFORMATION

Subsistence use within the oil spill area is managed by the Federal government on Federal lands and the Alaska Department of Fish and Game on state and private lands. Subsistence regulations do not include designated harvest levels for sea otters and harbor seals in the oil-spill area. Changing the harvest levels for these species would require declaring the populations as "depleted" under the Marine Mammal Protection Act.

DRAFT

October 12, 1992

OPTION

#10 Preservation of archaeological sites and artifacts

INJURED RESOURCES AND SERVICES

Archaeological sites and artifacts

SUMMARY

Conservative estimates based on injury studies to date suggest that between 300 and 500 archeological sites located on State and Federal land within the Exxon Valdez oil spill pathway sustained at least some degree of injury from oiling, oil spill cleanup activities, or vandalism. Site-specific injury is documented in oil spill response records for a sample of 35 known sites. Types of injury range from the contamination of radiocarbon dating specimens to the illegal excavation of sites by looters. In a few cases, there is sufficient available information to determine if specific restoration measures are necessary to the continued preservation of the site values, and if so, which restorative activities are appropriate to the need. However, in many cases the injury data available from response records is not sufficiently detailed to reach an informed decision on treatment. If the Archeological Resource Protection ACT (ARPA) regulations are employed as a guide, individual, detailed assessments of injury are a first essential step in the restoration process. Once there is sufficient information, two basic categories of restorative treatment may be considered, physical repair or data recovery.

These two types of restorative treatment are not mutually exclusive and they are often employed in conjunction with each other. Physical repair includes such actions as restoring trampled protective vegetation at a site or filling in a looter's pothole. Data recovery is used to recover what bits of information can be salvaged from the area of an illegal excavation--in a sense, restoring to the public what information has been potentially lost by means of scientific investigations.

DESCRIPTION

The purpose of this option is two-fold, first, to conduct individual, site-specific restoration assessments at sites with documented injury, but where there is insufficient information upon which to determine appropriate treatment. Second, is to carry out the indicated restorative action--either physical repair and/or data recovery. The initial focus would include the 35 archeological sites for which there is clear evidence of injury. The results would include the prevention of further injury and professional documentation on the restorative actions taken.

Three years would be sufficient time to treat the 35 known sites with detailed injury information. Project length could be extended to address any additional injured sites that come to light in the next several years. An exact time span cannot be estimated at this time given the available information.

MEANS AND POTENTIAL TO IMPROVE RECOVERY

Since archaeology artifacts can not, in a biological sense recover from injury or looting, recovery will not be aided. However, this option has the potential to significantly reduce further degradation or decline of the resources and services associated with archaeological sites and artifacts.

INDIRECT EFFECTS

Socio-economic

People will see that the state and federal governments are dealing directly with the looting and vandalism problem associated with archaeologic sites in the oil spill area.

Archaeologists will spend considerable time, in the field to accomplish this work. With some certainty, they will spend funds in near by communities for needed supplies and services, thereby indirectly benefitting local economies in a modest way.

Human health and safety

People participating in this program may be subject to risks associated with travel in boats and small aircraft.

CITATIONS

- * Ted Birkedal, NPS, Chief of Cultural Resources 257-2657
- * "Site-Specific Archeological Restoration (Interagency)", June 1992, EVOS Trustee Council Restoration Ideas (1993)

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OPTION 11: Improve or supplement stream and lake habitats for spawning and rearing of wild salmonids.

INJURED RESOURCES AND SERVICES: Pink and sockeye salmon

SUMMARY

There are a variety of well-established techniques for improving or supplementing spawning and rearing habitats to restore and enhance the wild salmon populations. These include construction of spawning channels and fish passes, removal of barriers impeding access to spawning habitats, and addition of woody debris to provide cover and food for fish. A survey of the oil-spill impact area will be conducted to determine where mitigation will be required. This information will be used to scale the effort applied to improving or replacing spawning habitat.

Unlike pink and chum salmon which swim to sea in their first year, young sockeye salmon grow in lakes for 1-3 years before emigrating to sea. Appropriate restoration and enhancement techniques for sockeye salmon are determined by the amount of spawning and rearing habitat in the lake system. If possible, these two habitat characteristics should be balanced. In lake systems with inadequate spawning habitat, spawning channels or fish passes may be appropriate to increase the amount of available spawning habitat. In lake systems with damaged rearing habitat, chemical fertilizers may be added to temporarily supplement the nutrients needed to sustain the prey on which fry feed. Once the run is restored, the decomposition of salmon carcasses provides a natural source of nutrients to sustain the food chain.

SUBOPTION A Supplement fry production using such methods as egg boxes and net pens for fry rearing.

DESCRIPTION

This restoration technique includes construction of egg boxes adjacent to damaged wild stock spawning streams or nearby streams. Artificial spawning techniques will be used to fertilize eggs taken from wild salmon. Fertilized eggs will be placed in the egg boxes. Fry will outmigrate from the boxes on their own in the spring.

This restoration technique also includes rearing fry in net pens and releasing fry when conditions in the natural environment are favorable for survival. In addition, a representative group of fry may be coded-wire tagged to evaluate the success of the program and reduce exploitation of damaged stocks in the fishery. Recoveries of coded-wire tagged fish when they return as adults will provide the information fishery managers need to direct exploitation away from damaged stocks.

Time needed to implement Suboption A at five sites is six years:

Survey area to identify sites for egg boxes:

July 1993-August 1994.

Capture outmigrant fry and rear in net pens:

April 1993-June 1998.

Construct egg boxes and conduct first egg take:

June 1994-August 1994.

Conduct annual egg takes:

June 1995-August 1998.

Recovery monitoring: Begins June 1994.

Costs of implementing Suboption A at five sites is estimated at \$2.5M.

SUBOPTION B Improve access to spawning areas (e.g., fish passes, remove instream barriers).

DESCRIPTION

This restoration technique involves constructing fish passes to provide wild salmon access to spawning habitat to replace damaged habitat. A survey of potential fish pass sites will be conducted to determine the best sites for fish pass construction. The genetic stock affected and benefit-cost ratio will be the principal criteria used to evaluate potential fish pass sites. Access to unutilized spawning habitat can also be achieved by removing instream barriers such as log jams.

Time needed to implement Suboption B at five sites is five years:

Survey areas to location mitigation sites:

June 1993-October 1994.

Construct instream structures:

February 1995-October 1996.

Recovery monitoring: Begins June 1997.

Costs to implement Suboption B at five sites is estimated at \$1.3M.

SUBOPTION C Improve spawning and rearing habitat (e.g., create spawning channels, add woody debris, improve substrate, lake fertilization, reduce siltation rates).

DESCRIPTION

This restoration technique involves construction of spawning channels to create new spawning habitat to replace damaged habitat. A survey of the oil-spill impact area will be conducted to determine the most appropriate locations for spawning channels. Channels will be designed specifically for the cold climate in this

area to insure high egg-to-fry survival. Fertilization may be appropriate to restore sockeye salmon producing lakes that have been damaged by overescapement or over-exploitation. In systems damaged by overescapement, the resident zooplankton stocks that provide the food base for sockeye salmon fry have been reduced through over-grazing. In systems that have been damaged by over-exploitation, sockeye salmon fry may have been replaced in the lake ecosystem by competitor species or decreased nutrient input by salmon carcasses may have reduced lake productivity. In either case, addition of chemical fertilizers will restore the natural productivity of the lake ecosystem and its capacity to rear sockeye salmon fry.

Time to implement Suboption C on two drainages is seven years:

Apply fertilizer annually and monitor ecosystem effect:

June 1993-October 1998

Recovery monitoring: Begins June 1995

Costs of implementing Suboption C on two drainages is estimated at \$4.8M.

MEANS TO IMPROVE RECOVERY

The fry-to-adult survival of pink and sockeye fry reared under controlled conditions is double the natural survival rate. Marine survival is also much higher than under uncontrolled conditions. Wild pink salmon populations are expected to increase because of the greater spawning areas and increased spawning capacity following improvements. The egg-to-fry survival of salmon in spawning channels is 5 to 6 times greater than survival in unimproved streams. Lake fertilization will greatly improve over-winter survival and smolt-to-adult survival, because the fish are larger in the fall and at outmigration into the ocean. Increased stock productivity and adult returns will result from these restoration techniques.

Monitoring of recovery will be an important part of each of the above improvement efforts. Recovery monitoring, whether by natural means or through specific restoration actions, will generally depend on the severity of injury, the capacity of injured resources or services to recover, and the time necessary to establish a trend for recovery.

INDIRECT EFFECTS

Other species directly depend on salmon runs for their survival. Bears, otters and birds will benefit from this project because returns of wild stocks would be nearer normal levels

There will be socio-economic impacts to commercial, sport and subsistence users of all of these resources when certain areas are closed to protect injured stocks or opened in areas not previously fished when management plans for sockeye are developed and implemented (Option 2 and 3). The potential of such impacts will be discussed and evaluated in the Environmental Impact Statement to be prepared by the Trustees.

Human health and safety issues will increase when population baseline acquisition activities begin. Field activities will increase from their present level and continue until the populations recovery to pre-spill levels. Field investigators will be required to work on the water, travel to and from remote work sites by boat, helicopter or float plane. These risks, however, are considered to be minimal.

Other fisheries resources such as cutthroat trout, Dolly Varden, and coho salmon will benefit from these actions.

OPTION 12: Creation of new recreation sites and facilities through replacement or construction

INJURED RESOURCES AND SERVICES: Recreation

SUMMARY

The area impacted by the Exxon Valdez Oil Spill contains an assemblage of private, State of Alaska and federal lands that provide recreational services to the public. The public lands include the Chugach National Forest, National Monuments, National Parks, National Wildlife Refuges, and several Alaska State Parks. These lands are in Prince William Sound, on the Kenai Peninsula, Alaska Peninsula and Kodiak Island. A full range of private and commercial backcountry oriented recreation activity occurs in these areas, supported by facilities like mooring buoys, boat ramps, recreational-user cabins, camping sites and trails.

Developed commercial recreation sites do not exist. This service is provided by communities within the spill area such as Cordova, Whittier, Seward, and Kodiak. Commercial services include fly-in and boat-in related activities, as well as cruise lines.

Suboptions A and B are consistent with the terms of the settlement aimed at restoring natural resources and replacing or enhancing services within the spill area.

SUBOPTION A: Construct or rehabilitate backcountry structures and services to enhance user experiences

DESCRIPTION:

As was evidenced during the evaluation of injury to resources and services on federal and state lands, recreation services within the National Forest System, the National Park System and the National Wildlife Refuge System, and the Alaska State Marine Park system were impacted by the EVOS. There is a management concern that actual recreation visitor use of lands and facilities declined after the spill and throughout intensive cleanup efforts. Visitors may perceive their destinations differently after the spill and may have changed use patterns.

It is important for both Federal and State agencies, and concerned citizens to have information on the type and degree of injury suffered by individual units, as well as effects perceptions of injury may be having (have had) on users of recreation units and sites within the oiled area. The full impact to recreation activities and opportunities needs to be determined by the management agencies and damage assessment personnel. Dissemination of injury information to affected parties would be a subsequent step. The following four steps would provide the information and focus for backcountry use restoration and enhancement:

1. Additional Injury Assessment

2. Information resources with photos and synopses of oil spill related impacts
3. Recreation opportunity guide
4. New sites and activities to enhance recreation

To focus this information and develop a responsive restoration plan these general processes are appropriate. As an interagency activity, with public participation; a. define the types and location of facilities and sites within the oil spill area, b. establish priorities for implementation of facility and site development plans, c. complete necessary permit and environmental compliance, and d. implement.

Development of an education/recreation opportunity guide should take about one year. Interagency activities may take longer.

Construction activities normally take 3 to 4 years from concept and design to a completed structure. Continuity of funding is required during this period to complete a facility in an efficient, cost-effective manner.

MEANS AND POTENTIAL TO IMPROVE RECOVERY

Management and development enhancing the visitors' backcountry experience is the focus of this restoration activity. Recovery will be effected by the development of resources equivalent to those injured in the spill. User information and site development will enhance pre-spill recreation opportunities. Providing backcountry opportunities which develop the vision of a pristine water and land environment will take time.

Visitors are attracted to areas when facilities are available for their use and enjoyment. Managers can better attend to the needs and demands of visitors when they have some control over their activities and the locations of those activities. New and/or rehabilitated sites and facilities can provide managers a focus for implementation of their information and education programs.

INDIRECT EFFECTS

Environmental: It is perceived that the activities associated with site enhancement and rehabilitation will potentially add to the injury, or the perception of injury, that already occurred in the area. It is also an expressed concern that better sites and facilities will draw more people into the area, localizing their impacts, possibly distracting from the perceived pristine nature of the area.

Socio-economic: Managers will provide a socially valuable service through backcountry site and facility enhancement and information management. It is certain that the development activity, whether it be rehabilitation, enhancement or replacement of sites and facilities, will increase the economic activity within the spill area.

Human health and safety: Restored, rehabilitated, enhanced and newly constructed sites and areas would focus human activity. This would focus agency management. Appropriate visitor information services at these sites and areas provides recreationists with information and services needed to enjoy the surroundings in a safe and environmentally sound manner.

OTHER INFORMATION

Both Federal and State managers have long-term plans for management and enhancement of resources within their jurisdiction. The oil spill event changed types of projects needed and the priorities for their implementation. All site reconstruction and enhancement as well as information development and distribution will necessarily fit into management plans for National Parks and Monuments, Wildlife Refuges, National Forests and State Parks. Projects which will respond to restoration needs, but are outside currently approved plans, and which are a high priority for the manager would likely be adopted and implemented through agency plan amendment procedures.

* * *

SUBOPTION 12B: Construction of commercial recreation facilities

DESCRIPTION

FEDERAL: Permitting opportunities exist for the development of commercial recreation sites and facilities within the oil spill area. Typical development such as lodges, fuel depots, and multi-unit campgrounds are not present on public land, but can be developed by entrepreneurs under permit from federal agencies. These facilities would enhance existing recreation opportunities. Current recreation management activities of the federal agencies within Prince William Sound and along the Kenai and Alaskan Peninsulas would change commensurate with the type, location and number of commercial sites permitted and constructed.

STATE: Several units of the ALaska State Marine Park system in Western Prince William Sound were directly impacted by the Oil Spill. These recreation sites offer opportunities for development of large scale and commercial facilities. Plannign efforts would determine the utility of these opportunities.

It is important for both the Federal and State agencies to have information on the type and degree of injury suffered by individual units, as well as effects perceptions of injury may be having (have had) on users of

recreation units and sites within the oiled area. Using this information and the desires of potential commercial operators, recreation activities, opportunities and development needs will be determined.

Additionally commercial sites would provide an information outlet. Appropriately focused information sources could provide a significant service to all types of recreationists. The sites would also be used for interpretive opportunities.

Site development would follow planning procedures similar to those for dispersed backcountry site with greater attention given to social and environmental impacts of implementation. Commercial site development would take 1 to 2 years for an in-depth assessment of environmental impacts. Design, development and construction takes 2 to 4 years. Staged construction lengthens the time sites are disturbed.

MEANS AND POTENTIAL TO IMPROVE RECOVERY

User information and facility development will enhance pre-spill recreation opportunities. Commercial recreation opportunities would be expanded over what they were pre-spill. Information enhancement will be effected by distribution within the damaged area for a hands-on and look-see assessment by the individual persons. Providing facilities and education on environmental awareness will enhance both the manager's capabilities and public knowledge for a common goal of sustained, sensitive, high-quality interaction with the environment.

As described above all activities under this option may be implemented under existing laws and regulations. Management decisions will be needed to implement actions. These actions on federal land will need an environmental analysis and appropriate documentation. Permits of various kinds from both federal and state agencies may be required for any singular or group of activities.

Both Federal and State managers have long-term plans for management and enhancement of resources within their jurisdiction. The oil spill event changed types of projects needed and the priorities for their implementation. All site reconstruction and enhancement as well as information development and distribution will necessarily fit into management plans for National Parks and Monuments, Wildlife Refuges, National Forests and State Parks. Projects which will respond to restoration needs, but are outside currently approved plans, and which are a high priority for the manager, would likely be adopted and implemented through agency plan amendment procedures.

Development of planned facilities and sites is feasible. Scale and timing of development could greatly effect cost factors. Compliance with environmental laws and regulations on large-scale projects would insure public participation in evaluation processes and decisions.

Visitors are attracted to areas when facilities are available for their use and enjoyment. Managers can better attend to the needs and demands of visitors when they have some control over their activities and the locations of those activities. New and/or rehabilitated sites and facilities provides the manager focus for implementation of their education programs. Commercial operations provide entrepreneurs with business opportunities.

INDIRECT EFFECTS

Environmental: It is perceived that the activities associated with site enhancement and rehabilitation will potentially add to the injury, or the perception of injury, that already occurred in the area. It is also an expressed concern that better sites and facilities will draw more people into the area, further distracting from its perceived pristine nature. Large-scale construction and long-term occupancy of areas poses some risk to the environment, particularly in the immediate proximity of the development.

Socio-economic: Managers will provide a socially valuable service through site and facility enhancement and information management. Commercially developed sites provide the "base of operations" for those traveling into undeveloped country. Commercial site such as lodges can provide destination services in an otherwise primitive environment.

The variety of users now in the oil spill area demand different services. In the long run well placed developed sites may be of benefit to most users. It is certain that the development activity, whether it be rehabilitation, enhancement or replacement of sites and facilities, will increase the economic activity within the spill area.

Human health and safety: Newly constructed sites and recreation areas would focus human activity. This focus would be managed by the agencies who would likely have more presence in the areas affected by the site work. Managed sites and maintained facilities are actively sought by visitors. Appropriate visitor information services at these sites and areas provides recreationists with information and services needed to enjoy the surroundings in a safe and environmentally sound manner.

Monitoring of public and agency impressions and use statistics for any individual as well as the cumulative developments will be necessary to evaluate the success of development.

OTHER INFORMATION

Large-scale commercial development on public land in the spill area is a new venture. Environmental consequences on these actions would have to be determined, sometimes at great effort and expense. The economic benefits to developers is unknown. Environmentally concerned people are doubtful such development is appropriate in harsh environment of the spill area.

October 6, 1992

OPTION 13 Eliminate Sources of Persistent Contamination of Prey and Spawning Substrates.

INJURED RESOURCES AND SERVICES

Coastal habitat, blue mussels, harlequin ducks, sea otters, black oystercatchers, river otters, fish and subsistence.

SUMMARY

The spring, 1992 survey of beaches in the affected area confirmed the presence of contamination on numerous beaches. The majority of this persistent oil is located under the surface, rocky armor or beneath mussel beds. Persistent oil adjacent to mussel beds or anadromous streams represents a potential threat to living resources that utilize them as food or habitat. Chemical analyses of mussel tissue and sediments from contaminated mussel beds revealed very high levels of petroleum contamination.

DESCRIPTION

The objective of this option to determine the geographic extent of persistent oil in and adjacent to oiled mussel beds and anadromous streams in Prince William Sound. The study will also determine the concentration of oil remaining in mussels, the underlying organic mat and substrate. This study will determine and implement, if necessary, the most effective and least intrusive method of cleaning oiled mussel beds and areas of contamination adjacent to anadromous streams. This study will also provide chemical data to assess the possible linkages of oiled mussel beds to harlequin ducks, black oystercatchers, juvenile sea otters, juvenile and adult river otters, and other organisms.

MEANS AND POTENTIAL TO IMPROVE RECOVERY

By exposing buried oil to the air, residual oil also will be eliminated through weathering and microbial degradation. Stripping or tilling of contaminated mussel beds will increase flushing of residual oil. Consequently, less oil will be available for bioaccumulation by mussels and other invertebrates. Less oil also will be available as contaminated prey for predator species such as harlequin duck, black oystercatcher, sea otter and river otter.

INDIRECT EFFECTS

Although there will likely be no adverse socio-economic and human health and safety effects associated with treating the mussel beds, there will be some environmental cost. There will probably be a minimal direct loss of mussels and associated invertebrates and algae. This loss needs to be weighed against the benefit of accelerating the rate at which contamination is eliminated from this habitat, and the benefit of decreasing the probability that potentially harmful petroleum hydrocarbon residues will be passed up the food chain.

OTHER INFORMATION

This option includes a monitoring component designed to assess the efficacy of stripping on elimination of oil from mussel beds. Both the fate of oil in mussels and in the substrate and the effects of oil on growth and reproduction of mussels will be followed at oiled and unoiled-control study sites.

CITATIONS

Exxon Valdez Oil Spill Trustees 1992. Exxon Valdez Oil Spill Restoration. Volume II. 1992 Draft Work Plan. Exxon Valdez Oil Spill Trustee Council, Anchorage, Alaska.

DRAFT

October 6, 1992

OPTION 14 Accelerate Recovery of Upper Intertidal Zone

INJURED RESOURCES AND SERVICES Upper intertidal community of algae and invertebrates (upper *Fucus* zone).

SUMMARY

Much of the upper intertidal zone within the oil spill area was heavily oiled and subjected to intense clean-up. This zone is dominated by the brown alga, *Fucus gardneri* (popweed), which has been slow to recover. Moreover, many of the other life forms that use the upper intertidal zone are dependent upon *Fucus* for both cover and food. The scientific literature documents that *Fucus* is slow to recover and that its recovery affects the recovery of the rest of the intertidal community. It is the objective of this restoration option to accelerate the recovery of this important habitat.

DESCRIPTION

It will be the objective of this option to test approaches of accelerating the rate of recovery of *Fucus* assemblages. These include: 1) Installation of trickle irrigation system to enhance moisture retention, 2) Use of biodegradable materials, e.g., burlap, placed to provide additional substrate for germling attachment and cover, and 3) transplants of adult plants attached to small rocks and cobble. The proposed feasibility study will include an analysis of cost versus benefit.

Two additional field seasons will be required to test the feasibility of these techniques. Assuming proven feasibility, implementation of one or more of these restoration approaches at appropriate beaches will occur over three additional field seasons. Monitoring will be continued over the entire five year period, but will likely be reduced in frequency thereafter.

MEANS TO IMPROVE RECOVERY

In 1990, research was initiated aimed at developing a better understanding of the underlying mechanisms limiting *Fucus* populations. These studies included an evaluation of important abiotic and biotic factors (texture of substrate, canopy shading and presence/absence of local adults, etc.) affecting recruitment of this alga. Monitoring its recovery in relation to the quantity of residual oil in the upper intertidal zone also was undertaken. Additionally, preliminary experiments were conducted on the feasibility of using transplants to accelerate recovery.

If a new *Fucus* canopy can be established, other seaweeds, invertebrates and even terrestrial animals will be afforded a suitable habitat and/or source of food. It also has been observed that new *Fucus* plants are more likely to recruit in rock cracks, other rough surfaces and not on tar or bare rock; and the presence of adult *Fucus* enhanced local recruitment. Restoration approaches based on these research results could significantly increase the rate of *Fucus* recovery.

INDIRECT EFFECTS

Construction will be kept to a minimum, and research (habitat manipulation) will not further degrade the integrity of the intertidal ecosystem. Where possible, monitoring will be conducted using non-destructive and the least intrusive methods available.

CITATIONS

De Vogelaere, A. P. and M. S. Foster. 1990. Status Report: *Fucus* Restoration Project. University of Alaska, Fairbanks Contract No. 53-0109-9-00276 Mod #4. Moss Landing Marine Laboratories, Moss Landing, CA.

Houghton, J. P., D. C. Lees, H. Teas, III., H. L. Cumberland, S. Landino, and T. A. Ebert. 1991. Evaluation of the Condition of Intertidal and Shallow Subtidal Biota in Prince William Sound following the Exxon Valdez Oil Spill and Subsequent Shoreline Treatment. NOAA WASC Contract Nos. 50ABNC-0-00121 and 50ABNC-0-00122. NOAA, Hazardous Materials Response Branch, Seattle, WA.

Others

DRAFT

OPTION 15: Supplements to subtidal spawning substrates and egg transplants for Pacific herring.

INJURED RESOURCES AND SERVICES Pacific herring.

DESCRIPTION

Herring eggs, larvae and spawning substrates were adversely impacted by the oil spill and subsequent cleanup. Direct effects on eggs and larvae were observed in 1989 but to a lesser extent in 1990. No direct effects were observable in 1991. Indirect effects on substrates including marine plants were observed in 1989 and 1990. The potential effects of the oil spill on year-class strength, however, will not be known until 1993, when fish exposed to oil in 1989 as eggs or larvae will first spawn.

It will be the objective of this option to test the feasibility of increasing herring spawning by employing both natural (macroalgae) and artificial substrates and by transplanting dislodged-stranded eggs to underutilized areas.

A possible study location for this feasibility study is the northern and western portions of Montague Island. Hair kelps and other species of red kelps will be collected from areas on southern Montague Island and anchored in nearshore experimental (oiled) and control areas prior to herring spawning. Also, artificial substrates consisting of plastic and wood lath will be fabricated and anchored in study areas. After spawning, experimental and control sites will be monitored every 4-5 days until most of the eggs have hatched to measure egg survival and hatching success. After hatching, larval trawls will be used to measure larval densities.

In a related approach and after storm events, eggs dislodged and deposited on the beach will be carefully collected and transported by skiff to offshore incubation facilities. The incubators will be sampled periodically to measure egg survival and percent hatch.

The timeframe for the field portion of this study is April to mid-May. Data analyses will be completed during the following winter. The decision to implement this approach on a wider scale will be made following interpretation of the data.

MEANS TO IMPROVE RECOVERY

Supplementing herring spawning substrate to enhance even local herring stocks is unproven in North America. In the Soviet Union, fish culturists have successfully employed both artificial and natural substrates in an effort to enhance local stocks of herring. Intuitively, where substrate is limiting, an increase in substrate should result in an increase in egg survival and hatching success, assuming that the number of spawners also is not limiting.

Canadian biologists also have transplanted dislodged-stranded eggs to underutilized areas where successful hatching was observed.

INDIRECT EFFECTS

Although there will be no adverse socio-economic and human health and safety effects associated with the collection of macroalgae for eventual transplant, there will be some minimal biological cost. There will probably be some direct loss of individual macroalgae, especially those that are cut or broken from their holdfast. There also could be a small economic loss to commercial or subsistence fishers if there is a need to close the fishery in an area to support this study. These potential losses need to be weighed against the potential benefits of accelerating recovery of local herring stocks. Such costs and benefits will be addressed in future project-level environmental assessments and environmental impact statements.

OTHER INFORMATION

There is some information to suggest that herring egg survival and hatching varies with the type of kelp substrate used for spawning and with the number of egg layers deposited. Generally kelp species with large interstitial spaces (hair and fern kelps) provide better oxygen exchange and spacing among eggs, which enhances hatching success. Also, as the number of egg layers deposited increase, fertilization rate, egg survival and hatching success decrease. Therefore, increasing spawning substrate in an area where substrate is limiting should decrease egg density per unit area and enhance survival.

DRAFT

October 12, 1992

OPTION 16 Increase productivity and success of murre colonies

APPROACH CATEGORY Manipulation of Resources

INJURED RESOURCES AND SERVICES Common murres

SUMMARY

Numerically, common murres suffered the greatest direct mortality from the oil spill of any bird species. Based on restoration work with related species and an understanding of murre behavior, there are several techniques that hold some promise of increasing murre productivity. Methods that could be considered include enhancing social stimuli (e.g., use of decoys and recorded calls - See Suboption A) to encourage nesting activity, and improving the physical characteristics of nest sites (e.g., adding sills to ledges Suboption B) to increase productivity. These techniques are experimental and possibly intrusive, but if effective, have the potential to reduce the recovery time of murres nesting in colonies in such places as the Barren Islands. Careful monitoring of experimental and control sites is necessary to determine the effectiveness of these direct restoration techniques. Without intervention, the time to recovery is now estimated to be in the decades.

SUBOPTION A Test the feasibility of enhancing murre productivity through increased social stimuli.

TARGET RESOURCES AND SERVICES Common murres

DESCRIPTION

Design and implement a feasibility study which experiments with techniques which could increase murre productivity by enhancing social stimuli. Common murres have a synchronized breeding strategy which helps reduce predation pressure. This synchronization was disrupted by the oil-spill and some populations have not resumed normal breeding patterns. The lack of synchrony could be a function of either the reduced numbers of birds, or the age and experience of the remaining birds. Enhancing social stimuli, such as using decoys and recorded calls to give the illusion of typical breeding densities may encourage a return to normal breeding patterns. These techniques have been successfully used on a variety of seabirds, including Alcids. Japan is currently using murre decoys in an attempt to attract common murres to a new colony site; the results of this study are not yet available.

While it is technically feasible to use decoys and recordings to attract murres to colonies, it is unknown whether the technique would influence the breeding synchrony of the injured populations.

This option would first be implemented as a feasibility study. A management plan would be written to implement this option on a larger scale if the feasibility study is successful.

Any work which involves on-site manipulation of murre nesting habitat, must be accomplished before the birds arrive at the colony. Arrival dates vary somewhat between colonies, but most birds arrive from mid-April to late May.

MEANS AND POTENTIAL TO IMPROVE RECOVERY

Nesting density is known to be an important factor in influencing breeding success at murre colonies (Birkhead 1977). Murres have their highest breeding success when they nest in high densities (greater than 10 birds/meter²). The dense congregation of birds allows for protection from avian predators and is believed to help synchronize egg laying so that hatching and fledging occur simultaneously. Vocalizations are also believed to provide breeding stimulus. Synchronization is important because it allows for predator swamping and group defense of eggs and chicks. Studies have shown that chicks left alone on a ledge with their parents were 100 times more likely to be depredated than chicks fledging together.

If successful, decoys and recordings will make the birds believe they are in a healthy, productive colony. Wooden eggs would provide a visual stimulus for laying.

NRDA studies from 1991 have shown that murre colonies at the Chiswell Islands, Barren Islands and Paule Bay had not yet resumed synchronized breeding and had poor reproductive success (nearly complete failure). These colonies lost up to 70 percent of their breeding population during the oil spill. Murres are not expected to have recovery rates of more than 10 percent per year once they have started normal breeding behavior, and the predicted recovery time for populations injured by the Exxon Valdez Oil Spill is expected to exceed 70 years.

On site manipulation may allow the populations to resume normal breeding patterns more rapidly, and may reduce predation of the existing breeding birds. Prebreeding murres often visit colonies other than their natal colony to investigate nesting space. Using playback recordings of murres at a large colony, may attract prospecting murres to the depleted colonies and reduce the recovery time of the population.

INDIRECT EFFECTS

Potential Negative Effects: The following concerns have been expressed by seabird biologists. Because murres have very strong site tenacity, placing decoys on ledges may displace a pair from their preferred nesting site. The decoys may create gaps between

birds on a breeding ledge which could be used by predators. Depending on where decoys are placed (on ledges vs on the water) they may send "mixed signals" to the birds. Mirrors may cause the birds to behave aggressively towards their own image, or may cause the birds to fly into the cliff. The recordings may contain alarm calls which could further disrupt the breeding birds.

SUBOPTION B Test the feasibility of improving the physical characteristics of nest sites to increase murre productivity

DESCRIPTION

Develop and implement a feasibility study to improve the physical characteristics of the nesting ledges to increase murre productivity. These techniques are largely experimental. Several ideas have been proposed by experts (Roby, 1991). These ideas included: provide breeding ledges with sills, add partitions and/or roofs on nesting ledges, blanket-off or cover portions of breeding cliffs, enlarge nesting ledges on cliff faces and clear debris etc...from otherwise suitable nesting sites. An implementation plan will be developed to expand this work if the feasibility study is successful.

Any work which involves on-site manipulation of murre nesting habitat, must be accomplished when the birds are away from the colony. Arrival dates vary somewhat between colonies, but most birds arrive from mid-April to late May, and the birds leave the colony by early September (this may be delayed at the injured colonies due to a 30-45 day delay in breeding).

MEANS AND POTENTIAL TO IMPROVE RECOVERY

Common and thick-billed murres lay their eggs on the bare surface of cliff ledges. Eggs are often lost when the adults are disturbed from the ledges and knock the eggs off of the cliffs. Sometimes the ledges are sloped outward which places the eggs in very precarious positions. Providing sills to the ledges could prevent or reduce this additional loss.

The natural recovery rate for common and thick-billed murres is believed to be less than 10 percent per year for a healthy colony (Nur and Ainley 1992). Many of the young are lost to predation or accidents before they leave the colony. Eggs are knocked off or roll off of ledges when the adults are disturbed. Predators such as gulls, eagles and ravens are especially effective when the density of nesting birds is low (Birkhead 1977). Constructing partitions or creating roofs over nesting ledges may reduce predator access to the breeding birds. Techniques which reduce the loss of eggs from falling off of the ledges, or reduce the ability of predators to take eggs and chicks, will increase the productivity of a colony and thereby increase the rate of recovery.

INDIRECT EFFECTS

Potential Negative Effects: Several types of modifications to nesting ledges have been proposed. Modifications such as attaching sills to the ledges are less likely to create disturbance than larger modifications such as creating partitions on the ledges. Any action which may prevent a pair of murres from returning to their traditional nesting ledge may prevent the pair from breeding successfully.

CITATIONS

Birkhead, T.R. 1977. The effect of habitat and density on breeding success in the common guillemot (*Uria aalge*). *J. Animal Ecology*. 46:751-764.

Nur, N. and D.G. Ainley. 1992. Comprehensive review and critical synthesis of the literature on recovery of marine bird populations from environmental perturbations. Unpublished Final Report to the Restoration Planning Work Group. (Contract COOP-91-039).

Roby, Daniel D. Memorandum to Restoration Planning Work Group. 17 December 1991. "Annotated list of restoration options for common murres in the aftermath of the Exxon Valdez Spill". RPWG files.

Tuck, L. M. 1960. The murres. Canadian Wildlife Series:1. Queen's Printer, Ottawa.

DRAFT

October 12, 1992

Author: Gorbics/Klinge

OPTION 17: Eliminate introduced foxes and rodents from islands important to nesting marine birds

INJURED RESOURCES AND SERVICES Marine birds

SUMMARY

Fox and certain rodents are not indigenous to many of the islands of the Aleutian chain and Gulf of Alaska. Fox were introduced on more than 400 islands to be raised and trapped for their furs. Introduced fox reduced and even eliminated populations of surface, burrow and in some cases cliff-nesting birds in a matter of years. Birds were also harmed by incidental introductions of rodents, many of which were released to the islands to provide food for the fox. Programs to eradicate red and arctic ("blue") fox on islands in the western Gulf of Alaska and in the Aleutians where such fox are not indigenous, and the islands were important to nesting alcids (murres, puffins, auklets, murrelets), storm-petrels, gulls and terns, and waterfowl such as eiders and Canada geese have been successful in the past and would increase Alaska's population of marine birds.

DESCRIPTION

The goal of this option would be to remove introduced fox from islands along the Alaska Peninsula and the Aleutians. Several steps would need to be taken to accomplish this: (1) identify and prioritize target islands, (2) work with the Environmental Protection Agency and Department of Agriculture to secure registration for toxicants, and (3) remove fox from up to 4 islands per year for a total of approximately 20 islands.

It would take over 5 years to complete the project. Additional time may be required to obtain toxin registration.

MEANS AND POTENTIAL TO IMPROVE RECOVERY

On some small islands, spectacular increases in breeding birds have been documented after the disappearance or removal of fox. Their removal allows a variety of native birds, including seabirds and waterfowl, to reinhabit these islands. Fox are voracious predators of chicks and eggs and climb among the nesting birds to feed. Their removal will allow the productivity of these islands to increase with increased survival of chicks and eggs.

The adverse impacts of fox appeared as early as 1811, only about 20 years after arctic fox were introduced. Birds were also harmed by incidental introductions of rodents, many of which were released to the islands to provide food for the fox.

The best means of eliminating fox from islands, toxicants or poison, was essentially banned in 1972 (Federal Environmental

Pesticide Control Act). A special exemption by the Environmental Protection Agency for restoration of Aleutian Canada Geese allowed the use of certain toxicants in 1986. However, with the increase in the Aleutian Canada Geese populations, permission to use the toxicants has now been withdrawn, precluding further use for fox eradication until new registration is obtained.

Since toxicants became highly restricted in 1972, additional attempts to remove foxes from islands within the Alaska Maritime National Wildlife Refuge relied principally on traps. Eliminating the last few trap-shy fox is exceedingly difficult, if not impossible, therefore, trapping is a viable eradication method only on small and moderate-sized islands.

Shooting fox, particularly where concentrated around seabird colonies, is locally fruitful, but nowhere has this technique been successful in eliminating all individuals from an island.

An experiment using five vasectomized male and five female red fox was initiated in 1983 on a small island in the eastern Aleutians. The larger and more aggressive red fox will outcompete the arctic fox by usurping dens and other limited resources. Once the arctic fox are gone, the red fox population dies out since no young are being produced. It appears that this may be successful on at least small islands.

Various combinations of eradication techniques are best suited to different islands, depending on size, topography, presence of non-target species, and other factors. Toxicants cannot be used until they are re-registered for fox eradication due to the Exxon Valdez oil spill. Multiple years of treatment must be considered for larger islands. Continued surveillance for several years will be necessary to ascertain the absence of fox on larger islands.

INDIRECT EFFECTS

With poisons and traps, some danger to non-target species also exists. River otters, common ravens (Corvus corax) and ground squirrels are among the most commonly trapped and poisoned non-target animals on islands off the Alaska Peninsula.

Although in 1924 there were 33 fox farming permits in the Chugach National Forest, and some natives still trapped on a few islands as late as 1947, additional demand for farming is unlikely. Government policy changed from facilitation of fox farming as one of the purposes of the Aleutian Islands Reservation to active eradication of fox to protect and restore birds, beginning with Amchitka Island in 1949. Fox farming is no longer profitable throughout the spill area and further along the Aleutian Islands, therefore, it is unlikely that there would be adverse economic effects as a result of removal of fox.

SUBOPTION 17b Reducing predators at depleted marine bird nesting areas.

INJURED RESOURCES OR SERVICES Common and thick-billed murres, Pigeon guillemot

DESCRIPTION

Determine the extent of predation at injured murre colonies, or on coastlines with nesting pigeon guillemots, and implement a predator control program. Predation can have a significant affect on the productivity of seabirds. Eagles, gulls are known predators of murres and other seabirds. If other activities to help the recovery of bird populations in the oil spill area are being negated by the effects of predation a program to reduce predators could be implemented. Mammals such as foxes and mink have been known to prey on murres and guillemots, however they are not known to be present at the injured murre colonies. Option 17a discusses a fox removal program on the Aleutian Islands.

Reducing predators at murre colonies is feasible, but would be difficult to implement for long term effects. Eagle predation could be reduced by providing young eagles to the eagle reintroduction program in the lower 48 states. However, reducing predation during the early stages of recovery may be crucial in helping the populations rebound. Reducing predation for nesting pigeon guillemots would be more difficult due to the dispersed nest locations. Initial predation studies would need to be completed to determine the feasibility of benefiting guillemots through predator removal. At least one season of intensive research is needed to determine if this program can be justified.

MEANS AND POTENTIAL TO IMPROVE RECOVERY

Glaucous-winged gulls and northern ravens are effective predators on murre colonies in the oil spill area. Murre eggs and chicks are especially vulnerable when the colony density is reduced or when nesting is not synchronized. These are both problems at colonies injured by the oil-spill. Gulls are believed to be a major source of egg mortality at some colonies, sometimes accounting for 40% of the egg loss (Roby 1991). Reducing gull populations at murre colonies could increase the productivity. Because the gulls reproduce much more quickly than common murres, a temporary population reduction would not threaten the gull population.

Bald eagles also prey on murre colonies. Not only do they take adult and juvenile murres. They also cause the adult murres to panic off of the nesting ledges causing eggs to be knocked off, or exposing the eggs and young to other avian predators (Roby 1991).

Murres rely on high nesting densities for protection against predators and possibly for synchronizing their breeding. Any activity which reduces predation or accidental loss of chicks and eggs would increase the rate of recovery.

INDIRECT EFFECTS

Other seabirds would benefit from the removal of avian predators.

Bald eagles reproduction in the oil-spill area is believed to have returned to pre-spill levels so the population would not be affected by removing juvenile eagles from murre colonies.

Secondary effects from removing gulls or mammalian predators near seabird nesting areas would depend on the technique used to eliminate the predators. Species specific techniques would have little impacts on non-target species, however, broader techniques such as poisoning could injure other species. A predator reduction program which creates long-term effects on endemic predator populations would not be implemented.

CITATIONS

Roby, Daniel D. Memorandum to Restoration Planning Work Group. 17 December 1991. "Annotated list of restoration options for common murres in the aftermath of the Exxon Valdez Spill". RPWG files.

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9 Oct 92

OPTION 18: Promote the recovery of injured wild salmon stocks by replacing harvest opportunities with alternative salmon runs.

APPROACH CATEGORY: Manipulation of Resources

INJURED RESOURCES AND SERVICES: Pink and sockeye salmon; associated commercial, sport, and subsistence fisheries

PROPOSED ACTION

Establish new salmon runs to provide alternative opportunities for commercial, sport, and subsistence fishing to relieve harvest pressure on injured stocks of pink and sockeye salmon.

SUMMARY

There is a variety of well-established techniques for transplanting fish into new locations to create or establish new fish stocks. These new stocks could provide alternative fishing opportunities that could relieve or remove fishing pressure from injured pink and sockeye salmon stocks. Techniques that might be applied include establishing new hatchery runs and creating new "wild" runs by transplanting hatchery-reared fish to vacant habitat and using eggs from suitable wild stock fish to initiate runs in vacant habitat. (Habitat might be vacant owing to stream blockages or depleted fish stocks.) These techniques may be used alone or in conjunction with others, such as lake fertilization, barrier removal, or creation of new habitat (e.g. spawning channels; see Options 11&15). In most areas, most available habitat is already occupied, so this option would usually have to be applied in conjunction with other options that create new habitat. While hatchery stocks may be convenient to use, it is important to use stocks that are genetically well suited to the particular site or need. There are also fish health considerations. Consequently, ADF&G standards and requirements for genetic and disease screening and brood stock selection must be followed before new runs are established. Regional Planning Team members must also agree with any proposed actions to establish new fish runs.

SUBOPTION 18A

Establish additional hatchery salmon runs.

DESCRIPTION

Rearing of juvenile fish under controlled conditions and releasing them at optimal times can:

- stock fry, pre-smolts, and smolts to establish new hatchery runs that will provide alternative opportunities instead of injured wild stocks;
- increase fry survival in the marine environment;
- increase number of returning spawners;
- mitigate for reduced runs of pink, chum, and sockeye salmon expected over the next several years;
- minimize further injury to other stocks;
- facilitate recovery of wild stocks to pre-spill conditions.

This suboption would aim to establish runs that can be fished distinctly, spatially and/or temporally, from wild runs.

MEANS AND POTENTIAL TO IMPROVE RECOVERY

The aim of this suboption is to remove or reduce fishing mortality from injured stocks of salmon by creating alternative fish stocks and redirecting fishing pressure to them. This reduction in mortality will allow larger numbers of fish from injured stocks to return to their natal streams to spawn. This suboption would require a redirection of fishing effort (Option 2) to the new alternative salmon runs to be most effective. In addition, this option would allow for the maintenance of fishing services even while restricting fishing on injured stocks.

The effectiveness of projects carried out under this suboption will depend on the characteristics of particular injured stocks, such as species, numbers, run timing, availability of suitable alternate stocks, etc. The tools provided here may be critically important in some cases.

Hatchery fish have been used to provide greatly increased commercial harvests in Alaska. To the extent that the fish produced for harvest under this suboption exceed the numbers that would have been provided by uninjured wild stocks, this suboption will enhance commercial fisheries. They may also enhance sport and subsistence fisheries. However, the aim of this suboption is to provide alternatives only until the injured stocks have recovered to pre-spill conditions.

INDIRECT EFFECTS

Salmon are of key importance to the ecosystem and to certain species in particular. Bears, otters, and certain bird and fish species will benefit when wild stocks return to pre-spill levels.

There will be socio-economic impacts to commercial, sport, and subsistence users when areas may have to be closed to protect injured stocks, while other areas are opened to redirect effort to fish provided under this suboption.

OTHER INFORMATION

There are important considerations regarding the genetics and possible pathology of fish used in introductions. Because of the availability of nearby salmon runs, these concerns should be minimal. All introductions and transfers will have to conform with Alaska Department of Fish and Game policies on Fish Genetics and Fish Pathology and will require the concurrence of the Regional Planning Team.

SUBOPTION 18B

Transplant hatchery-reared salmon to vacant areas.

DESCRIPTION

Vacant habitat may result from improvement of presently unsuitable habitat (see Options 11&15) or from the extinction of stocks for whatever reason. In some cases, additional habitat can be made available by removing obstructions to fish passage, some of which resulted from the 1964 earthquake. This suboption would provide for the rapid occupation of vacant areas. It is intended that once runs are established, they will sustain themselves. This suboption would aim to establish runs that can be fished distinctly, spatially and/or temporally, from wild runs.

MEANS AND POTENTIAL TO IMPROVE RECOVERY

The aim of this suboption is to remove or reduce fishing mortality from injured stocks of salmon by creating alternative fish stocks and redirecting fishing pressure to them. This reduction in mortality will allow larger numbers of fish from injured stocks to return to their natal streams to spawn. This suboption would require a redirection of fishing effort (Option 2) to the new alternative salmon runs to be most effective. In addition, this option would allow for the maintenance of fishing services even while restricting fishing on injured stocks.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

The effectiveness of projects carried out under this suboption will depend on the characteristics of particular injured stocks, such as species, numbers, run timing, availability of suitable alternate stocks, etc. The tools provided here may be critically important in some cases.

To the extent that the fish produced for commercial harvest under this suboption exceed the numbers that would have been provided by uninjured wild stocks, this suboption will enhance commercial fisheries. If the new stocks persist after injured stocks recover, they should provide enhanced fishing opportunities.

INDIRECT EFFECTS

Salmon are of key importance to the ecosystem and to certain species in particular. Bears, otters, and certain bird and fish species will benefit when wild stocks return to pre-spill levels. Newly established runs should have a similar effect. It is expected that the runs established under this option will be permanent.

There will be socio-economic impacts to commercial, sport, and subsistence users when areas may have to be closed to protect injured stocks, while other areas are opened to redirect effort to fish provided under this suboption.

OTHER INFORMATION

There are important considerations regarding the genetics and possible pathology of fish used in introductions. Because of the availability of nearby salmon runs, these concerns should be minimal. All introductions and transfers will have to conform with Alaska Department of Fish and Game policies on Fish Genetics and Fish Pathology and will require the concurrence of the Regional Planning Team.

9 Oct 92

SUBOPTION 18C Transplant wild salmon eggs to vacant areas.

DESCRIPTION

Vacant habitat may result from improvement of presently unsuitable habitat (see Options 11 & 15) or from the extinction of stocks for whatever reason. In some cases, additional habitat can be made available by removing obstructions to fish passage, some of which resulted from the 1964 earthquake. This suboption would provide for the occupation of vacant areas, aided by the transplantation of wild eggs. It is intended that once runs are established, they will sustain themselves. This option would aim to establish runs that can be fished distinctly, spatially and/or temporally, from wild runs.

MEANS AND POTENTIAL TO IMPROVE RECOVERY

The aim of this suboption is to remove or reduce fishing mortality from injured stocks of salmon by creating alternative fish stocks and redirecting fishing pressure to them. This reduction in mortality will allow larger numbers of fish from injured stocks to return to their natal streams to spawn. This suboption would require a redirection of fishing effort (Option 2) to the new alternative salmon runs to be most effective. In addition, this option would allow for the maintenance of fishing services even while restricting fishing on injured stocks.

The effectiveness of projects carried out under this suboption will depend on the characteristics of particular injured stocks, such as species, numbers, run timing, availability of suitable alternate stocks, etc. The tools provided may be critically important in some cases.

To the extent that the fish produced for commercial harvest under this suboption exceed the numbers that would have been provided by uninjured wild stocks, this suboption will enhance commercial fisheries. They may also enhance sport and subsistence fisheries. If the new stocks persist after injured stocks recover, they should provide enhanced fishing opportunities.

INDIRECT EFFECTS

Salmon are of key importance to the ecosystem and to certain species in particular. Bears, otters, and certain bird and fish species will benefit when wild stocks return to pre-spill levels. Newly established runs should have a similar effect. It is expected that the runs established under this option will be permanent.

There will be socio-economic impacts to commercial, sport, and subsistence users when areas may have to be closed to protect injured stocks, while other areas are opened to redirect effort to fish provided under this suboption.

OTHER INFORMATION

There are important considerations regarding the genetics and possible pathology of fish used in introductions. Because of the availability of nearby salmon runs, these concerns should be minimal. All introductions and transfers will have to conform with Alaska Department of Fish and Game policies on Fish Genetics and Fish Pathology and will require the concurrence of the Regional Planning Team.

DRAFT

October 9, 1992

Author: Chris Swenson

OPTION Option 19: Update and Expand the State's Anadromous Waters Catalog and Atlas

INJURED RESOURCES AND SERVICES Numerous anadromous streams were affected by the spill and cleanup. Injuries have been documented in anadromous fish, including salmon, cutthroat trout and Dolly Varden. These species contribute to important commercial, sport and subsistence fisheries, which were also impacted by the spill.

SUMMARY

This option pertains to updating the state's Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes and its associated atlas. Updating these documents through additional stream surveys would increase protection of injured anadromous species, their habitat, species that feed on them, and the services they provide. Anadromous streams listed in the catalog are automatically afforded legal protection under Alaska Department of Fish and Game (ADF&G) statutes and, on state and private lands, the State Forest Practices Act. In addition, the information acquired during stream surveys will be necessary for the Trustees' evaluation of management, protection and acquisition options for restoring anadromous fish and their habitats. While many of the anadromous streams in the spill area are listed in the catalog, the list is not complete. Many new streams were noted during the spill response but incompletely surveyed, others have never been surveyed, and many surveys need to be updated. Total costs and time requirements for this option depend on the geographical extent of the stream surveys, which cannot be determined at this point.

Implementation of this option involves the following steps:

- 1) Identify and prioritize public and private lands where an imminent threat or high potential for habitat degradation exists.
- 2) Determine areas within the threatened lands defined in step # 1 where anadromous fish data is incomplete or lacking.
- 3) Survey streams and collect data on species presence and upper extent of stream use.
- 4) Enter data into the anadromous waters catalog and atlas.
- 5) Continue ongoing enforcement and permitting activities.

MEANS AND POTENTIAL TO IMPROVE RECOVERY

Listing anadromous streams in the state catalog will facilitate

55 natural recovery of injured resources and services by providing
56 protection against human activities stressful to already damaged
57 species and habitats. Streams listed in the catalog are protected
58 by state statutes and permit requirements not applicable to
59 unlisted streams. State statutes regulate all instream
60 disturbances and activities in the anadromous waters and require
61 that ADF&G be informed of and issue permits for all such
62 activities. The State Forest Practices Act requires that logging
63 operations leave 100 foot riparian buffer zones around anadromous
64 streams on state lands and up to 66 foot buffers on private lands.
65 The implementation of this option could prevent future habitat
66 degradation and potentially improve natural recovery rates.

67
68 Existing regulatory authorities provide a general level of
69 protection for wildlife, water quality and water use, but do not
70 generally provide as much protection to anadromous fish, their
71 spawning and rearing areas, or adjacent riparian habitat as the
72 ADF&G statutes and the State Forest Practices Act. Application of
73 these regulatory tools is the most effective option for protecting
74 unsurveyed anadromous streams.

75
76 There are several streams within the spill area which have not been
77 surveyed for anadromous fish or were surveyed several years ago and
78 need to be updated. Recreational and commercial uses in these
79 areas, such as logging and mining, are ongoing and present
80 potential threats to anadromous species and their habitats.
81 Regulation of these activities, via inclusion of anadromous streams
82 in the state catalog, could provide the protection necessary to
83 facilitate the natural recovery of injured resources and services.
84 In addition, species dependent on anadromous fish, such as bald
85 eagles, harlequin ducks and marine mammals would benefit from
86 healthy fish populations and stream habitat.

87 88 **INDIRECT EFFECTS**

89
90 1) Species not targeted for restoration efforts could benefit
91 from enhanced habitat protection.

92
93 2) Healthier ecosystems resulting from enhanced resource
94 protection could provide socioeconomic benefits by attracting
95 tourists, providing increased harvest and recreational
96 opportunities and improving the quality of life.

97
98 3) Enhanced habitat protection could have negative economic
99 impacts due to increased regulatory restrictions on certain
100 recreational activities and development projects involving
101 anadromous waters.

DRAFT

October 12, 1992

Author: John Strand

OPTION 27 - Designate Long-Term Ecological Research Site(s).

INJURED RESOURCES AND SERVICES Marine, intertidal and adjacent uplands habitats and the biological communities supported by these habitats.

DESCRIPTION

It is the objective of this option to obtain continuing support through the NSF for one or more LTERs. LTER(s) would be established in habitats important to the recovery of species injured during the EVOS. With NSF support, protected research and monitoring sites at oiled, oiled-treated, oiled-untreated and unoiled (control) locations within the spill zone could be established to follow and better understand recovery of injured resources. LTER support also would allow for the establishment of baseline environmental conditions to use as reference standards when assessing damages from future disturbances. Support from NSF could provide for continued research and monitoring beyond the 10-year life of the settlement.

Because NSF is a granting agency and is not concerned with land ownership, site operation or management per se, the land where an LTER will be established must already be owned and protected by the State of Alaska or the Federal Government; or if in private hands, the private landowner must be willing to sign an agreement assuring long-term protection. Fee title acquisition with protection and protection without fee title of lands suitable for establishing an LTER are described in Options 23 and 25.

Although somewhat dependent upon the site, a successful proposal could take up to a year to write. This assumes that sufficient data are available to prepare the proposal. Otherwise, even a cursory site characterization will add one to three years to the process. NSF's panel review will take one year from the time a call for proposals is issued.

Grants from NSF average \$350K per year but may be as much as \$525K per year over a five year period.

The cost to develop a sufficiently large database to attract NSF-LTER support is not easily estimated, and it will most certainly vary with site location. While most LTERs were operated as research sites prior to designation and had developed large databases which helped justify their designation, a few LTERs were approved with little or no supporting data. A notable example is the Arctic Tundra LTER Site in the Brooks Range, Alaska, which was established in 1975. Long-term aquatic research began in 1975, and terrestrial ecologists began working there in 1976.

Even if new data on a candidate site is not required, there is still a cost associated with preparing a proposal to NSF in support of LTER support. Conservatively, this effort will cost \$50K.

MEANS TO IMPROVE RECOVERY

Obtaining NSF support for one or more LTER sites could improve or enhance recovery of injured resources. LTER support can facilitate monitoring to assess both the rate of natural recovery and the efficacy of restoration. Monitoring can identify where additional restoration may be appropriate, and determine when injury has been delayed. LTER support could also facilitate determining how and to what degree important physical, chemical and biological environmental factors affect recovery. Finally, LTER support will allow for the establishment of an environmental baseline. This baseline with the addition of manipulative research can be used to evaluate the effects of future disturbance; and as well, improve our ability to manage affected resources and services over the long-term.

INDIRECT EFFECTS

There need be no significant adverse environmental, socio-economic, and human health and safety effects associated with the designation of a research site that will receive LTER support; however, the potential for adverse effects as well as beneficial effects are the subject of NEPA review conducted at the program-level by the Trustees, and at the site specific-level by the agency establishing the site. By the nature of the Trustees' program, every effort is extended to protect the environment. Construction will be kept to a minimum and research (even manipulation) will not impact the representative ecological character and integrity of the site.

OTHER INFORMATION None.

October 11, 1992 (Bob Loeffler)

OPTION 28a Purchase access to sport-fishing and recreation areas.

INJURED SERVICE: The spill decreased the amount and quality of sport-fishing and all varieties of recreation use such as beachcombing, site-seeing, camping, and hiking.

SUMMARY. Many valuable sport-fishing sites and recreation areas are privately owned, mostly by Native Corporations. Private ownership prevents legal use by the public. (Many areas are used in trespass). Providing for legal public use -- whether it is to fish in the stream, camp, hike, beachcomb, or have access to public land blocked by private ownership - would increase the quality of public use and provide alternative sites for those damaged by the spill. In addition, acquiring access can redirect public use to specific areas and decrease the human pressure on areas and resources still recovering from the oil spill.

Agencies can purchase a variety of access rights. They can buy a site, or purchase only an easement. An easements would entitle the public to only specific rights. These could include all or some of the rights to walk, stop to fish, camp, or other use. In some cases the public management of the acquired rights could be specified in the purchase agreement, in others cases, it would be decided using the planning and management processes of the managing agency.

Where there is private ownership, it is the uplands above mean high tide that are privately owned, the tidelands and the lands beneath streams are publicly owned. In a few cases where permits, leases or other devices extend private rights to the tidelands or stream bottom without providing for public access, but these cases are rare. In the vast majority of cases, the land below mean high tide line on the ocean, and ordinary high water mark on streams is owned by the public.

MEANS AND POTENTIAL TO IMPROVE RECOVERY. This option is potentially valuable wherever significant private land exists: in Prince William Sound, Kenai Fiords, Cook Inlet, and Kodiak. There is little private land in Katmai National Park and south along Shelikof Straights. In addition, the option is most valuable where significant public use overlaps private ownership: most frequently in Prince William Sound, Cook Inlet, and on Kodiak and nearby islands.

The cost of this option is impossible to estimate. Cost vary dramatically depending on the size of the area purchased, and its value. Costs can also include staff time to negotiate purchase, survey fees (which can proportionally expensive on small, remote sites), title searches, assessment, and legal fees. A site can be acquired free (if the owner donates access rights), or it can be extremely expensive. Public agencies will use this option only to acquire rights from a willing seller. They will not condemn land or otherwise force an unwilling owner to sell.

In rare cases, negotiation and purchase can occur in a few months from when a site is identified, more frequently it requires years, sometimes many years.

Sites to be acquired can be identified from existing nominations, new public nominations, proposals from landowners, or knowledge of agency personnel.

INDIRECT EFFECTS. In some cases the main cost is the purchase and associated costs. In others, it is the on-going management cost. Once acquired, managing the land (or access rights) will become the job of one of the state or federal agencies such as the US Forest Service, or the Alaska Department of Natural Resources. Managing the land with significant public use can sometimes be expensive: it may require picking up trash, preventing erosion, accepting liability, etc.

Other indirect benefits of this option include reducing trespass, relieving pressure on available public sites (including those recovering from the spill), and increasing recreation and sport-fishing opportunities which are a form of economic development.

October 11, 1992 (Bob Loeffler)

OPTION 28c Purchase access to sport-fishing and recreation areas: "17(b)" easements.

INJURED SERVICE: The spill decreased the amount and quality of sport-fishing and all varieties of recreation use such as beachcombing, site-seeing, camping, and hiking.

SUMMARY. Section 17(b) of the Alaska Native Claims Settlement Act (ANCSA) provides for public access to Native Corporation land at periodic distances along waterways.

The state and federal government locate easements in the normal course of their work, and the Alaska DNR publishes atlases locating easements. This option would accelerate that work. That is, the 2-person staff in the Department of Natural Resource's is responsible for this program throughout Alaska. This option would provide funding to allow the department to concentrate effort on the spill area: to locate easements and publish atlases within two years of funding, rather than many years from now as might be the case under normal agency practices.

Section 17(b)(1) of ANCSA directs the government to "identify public easements across lands selected by Village Corporations and the Regional Corporations and at period points along the courses of major waterways which are reasonable necessary to guarantee international treaty obligations, a full right of public use and access for recreation, hunting, transportation, utilities, docks, and other public uses..."

Easements are identified and included in documents conveying land to the Native Corporations. In Prince William Sound some conveyance documents provided for negotiated identification of easements after conveyance. The Bureau of Land Management coordinates identification of 17(b) easements for the federal government and records them in the conveyance documents. The Alaska Department of Natural Resources coordinates easement identification for the state.

These easements are limited in size. Camping easements are usually only a few acres. Access easements are generally narrow.

The Department of Natural Resources publishes 1:63,360-scale atlas (1 inch = 1 mile) showing the location of easements including 17(b) easements. None are currently published for the spill area.

MEANS AND POTENTIAL TO IMPROVE RECOVERY. Many valuable sport-fishing sites and recreation areas are privately owned, mostly by Native Corporations. Private ownership prevents legal use by the public. (Many areas are used in trespass). Providing for legal public use -- whether it is to fish in the stream, camp, hike, beachcomb, or have access to public land blocked by private ownership -- would increase the quality of public use and provide alternative sites for those damaged by the spill. In addition, acquiring access can redirect public use to specific areas and decrease the human pressure on areas and resources still recovering from the oil spill.

This option is available where land is being conveyed to Native Corporations: Prince William Sound, Kenai Fiords, Cook Inlet and Kodiak. There is no corporate ownership on the west side of Shelikof Straits in Katmai National Park or further south.

The direct cost of this option is at most a few hundred thousand dollars for the entire spill area, spread over approximately two years. Only government agencies have the right to assert location of easements; thus, that part of this option is an agency task. Publishing the atlases could be completed by agencies or private firms. (It is usually done by the state).

INDIRECT EFFECTS. The cost discussed above includes only the agency cost of locating easements and publishing their location. There is also the on-going cost of managing the easements. Once acquired, managing the land (or access rights) will become the job of one of the state or federal agencies such as the US Forest Service, or Alaska Department of Natural Resources. Managing the land with significant public use can sometimes be expensive: it may require picking up trash, preventing erosion, accepting liability, etc.

Other indirect benefits of this option include reducing trespass, relieving pressure on available public sites (including those recovering from the spill), and increasing recreation and sport-fishing opportunities which are a form of economic development.

This option does not acquire sites as large or as usable as does option 18a.

DRAFT

October 11, 1992 (Bob Loeffler)

OPTION: 33b: Education: visitor's center, interpretive and education facilities

INJURED RESOURCE OR SERVICE. This option is a replacement for some of the human effects of the spill in general.

SUMMARY. This option proposes that the Trustees fund construction and operation of a large visitor-center somewhere in the affected area. Possible locations include Cordova, Valdez, Anchorage, Seward, Homer, or Kodiak.

Residents and visitors alike seek information about the oil spill and the status of recovery. By developing informational and educational products, and locating a visitor center dedicated to that information, the Trustees can help the public become better informed about this significant event in Alaska's history. Through information, people can understand what happened, and how they can participate in the efforts to speed recovery of injured resources.

This option assumes that the visitor center would be located in a town, or in some area designated for this use. It does not assess the land-use effects of locating the center.

MEANS AND POTENTIAL TO IMPROVE RECOVERY. A visitor's center and its staff would design and develop information available from the damage assessment and restoration process to inform the public about the spill, and about how they can help injured resources recover from the spill and from the clean-up. Specifically, the information would explain the history of the spill, changes to the ecosystem, status of recovery, and how people can lessen any harmful effects they create when using the spill area. Information from the visitor's center could also be available to other visitor's centers, government agencies, organizations in the spill area, and school curricula.

This option would require significant funds (HOW MUCH?) to build, and a targeted endowment (HOW MUCH?) to provide for on-going operation.

INDIRECT EFFECTS. The main effect of this option is public education. However, it could also provide economic development benefits associated with an important tourist and visitor attraction.

DRAFT

October 7, 1992

OPTION 34 Establish a Marine Environmental Institute

INJURED RESOURCES AND SERVICES

All

SUMMARY

The proposed action is to establish a new marine environmental institute within the oil spill affected area in order to both study the marine environment and provide public education. The institute would also serve to coordinate recovery monitoring, basic and applied research and environmental education programs dealing with the effects of the spill. Public exhibits and marine aquaria will be an integral part of the institute. These will provide both support for the research scientists and as well as living examples of Alaskan marine habitats, plants animals and seabirds .

DESCRIPTION

Aside from the lingering effects of the spill, the natural environment within Prince William Sound and the adjacent Gulf of Alaska is relatively unaffected by human impact. Consequently, the area represents a perfect location for the establishment of a research/teaching facility for both basic marine research and for spill recovery monitoring. The intertidal habitats and nearshore waters of southcentral Alaska contain highly diverse invertebrate and finfish communities as well as diverse and abundant populations of seabirds and marine mammals. Moreover, the economically important tourist, commercial and sport fishing industries are dependent upon an understanding of nearshore marine systems.

Research in the institute would focus on the ecology of nearshore Alaskan marine habitats; the biology of Alaskan sea life, marine mammals and seabirds and the monitoring of the effects of the Exxon Valdez oil spill on the marine environment. Research efforts and support would be coordinated with the University of Alaska's Institute of Marine Science. Environmental education programs would have the same goal. The public education effort would be facilitated by the live exhibits of both animals and habitats that are created and used by the scientists for their research. Field trips, for the public, would be conducted by institute staff. These field trips would visit nearby marine habitats that would be readily accessible by small boat or on foot. The environmental education program would be coordinated with that of the Alaska public school system and University of Alaska.

A major resource management effort would be based at the Institute. The goal of this program would be to develop baseline information on both species and habitat diversity within the oil spill affected area. The program would identify the animals and plants that utilize this area as habitat and then map those habitats on a Geographic Information System [GIS]. These kinds of information were sorely lacking at the time of the spill. If made available, as a result of this program, these data would provide invaluable assistance to oil spill response planners and for future damage assessment and restoration efforts in the event of another spill.

A key element of the proposed institute is the relationship between the public exhibits and the needs of the research scientists. These exhibits, especially the aquaria, would allow the public to closely observe marine creatures and habitats that they otherwise would probably never see. These same facilities would serve as holding and observation tanks for researchers. This arrangement has worked quite well in other parts of the country. Examples are the Rosenstiel School of Marine and Atmospheric Sciences [University of Miami] and the Miami Seaquarium; and the Monterey Aquarium and the Monterey Marine Lab [Stanford University].

The institute should be located in an area that provides quick, easy and ice-free boat access to the oil spill affected area. The site should lie immediately adjacent to a source of pollution-free sea water that is not subject to wide fluctuations in salinity or temperature. The site should be connected by paved road to the state road system in order to accommodate both the public and institute staff. A nearby airport with regularly scheduled flights to and from Anchorage is desirable. Reliable electrical power and telecommunications would also be necessary. The time frame for implementation of this option would include: site selection, planning and design, construction, and staffing time.

MEANS AND POTENTIAL TO IMPROVE RECOVERY

The institute would provide support and coordination for direct restoration projects, feasibility studies and monitoring of injured resources and services. Environmental education programs developed and implemented by the institute would help to minimize additional impacts on injured resources and services. Living exhibits would introduce the public to animals and habitats injured by the spill and facilitate an understanding of their life histories and sensitivities to human disturbance.

OTHER INFORMATION

The institute's research, monitoring and education programs would be coordinated with those of the University of Alaska's Institute of Marine Science and the Alaska public school system. Research would also be coordinated with the Prince William Sound Science Center and resource agencies. Monitoring programs funded by the Trustees and those supported by the Prince William Sound Regional Citizens Advisory Council will also be coordinated with that of the institute.

INDIRECT EFFECTS

The institute would have a significant socio-economic impact upon the local community and region. The institute would probably attract numerous tourists, Alaska residents and school children with consequent impacts on the local economy and the regional road system. Staff would require housing as well as urban infrastructure support.

DRAFT

October 12, 1992

OPTION 35 Replacement of archaeological artifacts

INJURED RESOURCES AND SERVICES

Archaeological sites and artifacts

SUMMARY

Conservative estimates based on injury studies to date suggest that between 300 and 500 archeological sites located on State and Federal land within the Exxon Valdez oil spill (EVOS) pathway sustained at least some degree of injury from oiling, oil spill cleanup activities, or vandalism. Site-specific injury is documented in oil spill response records for a sample of 35 known sites. This option seeks to replace and/or recover those artifacts that have been lost and place them in or return them to public ownership for appropriate public display and for scientific uses.

DESCRIPTION

This option would identify institutions (non-Alaskan) and individuals with archaeological artifacts from the oil spill region who would be willing to sell some or all of their artifacts to the Exxon-Valdez oil spill Trustees (member agencies). In turn, the Trustees would transfer acquired artifacts to appropriate public institutions within the oil spill area for public display (i.e. museums) and appropriate scientific uses and study.

Steps to implement this option include: Identify owners of artifacts; prepare list of artifacts available for sale; determine public value of list items (non-monetary value) and prioritize list for public acquisition; acquire artifacts within spending limits; identify appropriate public institutions in the oil spill area for housing and public display of artifacts acquired; transfer artifacts to institutions in oil spill area.

It is estimated that preparation of a list of owners, prioritization of, and actual acquisition would take a period of two years.

MEANS AND POTENTIAL TO IMPROVE RECOVERY

This option will not improve recovery. It will return artifacts to appropriate public agencies and institutions in the oil spill area as a replacement for those artifacts lost.

INDIRECT EFFECTS

Socio-economic

People will see that the state and federal governments are dealing

directly with the lost archaeologic artifacts in the oil spill area by replacing them through acquisitions.

CITATIONS

none

SUBOPTION

35 (b) Investigate incidents of looting and vandalism and strive to regain possession of publicly owned artifacts

DESCRIPTION

This suboption would establish agency and possibly inter-agency teams of law enforcement officers and archaeologists who would investigate cases of looting and vandalism. These teams would operate in the EVOS spill area and strive to recover artifacts taken from the area. Recovered artifacts would be returned to the appropriate public land managing agency, or other public institutions for scientific and public uses.

Approximately three years would be required to establish agency teams, investigate all know incidents of looting and vandalism and take appropriate actions to regain possession of publicly owned artifacts.

MEANS AND POTENTIAL TO IMPROVE RECOVERY

This option will not improve recovery. It will return illegally obtained artifacts to appropriate public agencies and institutions.

INDIRECT EFFECTS

Socio-economic

People will see that the state and federal governments are dealing directly with the looting and vandalism problem associated with archaeologic sites in the oil spill area.

d:sandy\opt#35.sum

October 13, 1992

OPTION 40 Designate Protected Areas

INJURED RESOURCES AND SERVICES This option targets nearshore, coastal and upland habitats supporting injured resources and services. Injured species include seabirds, waterfowl, marine mammals, salmon, trout, herring, rockfish, invertebrates, seagrasses and intertidal algae. Injured services include commercial, subsistence and sport harvests; and aesthetic and recreational uses, such as camping, fishing, birdwatching and kayaking.

SUMMARY

Marine and intertidal areas, and uplands in public ownership can be placed into special state or federal land designations which provide increased levels of regulatory protection. An important feature of special designations is that they can provide a regulatory basis for managing an area on an ecosystem level, with the primary objective of restoring spill injuries. Special designations are appropriate when they provide a beneficial level of protection for multiple recovering resources and services or valuable restoration monitoring opportunities that is not provided by existing regulations. Special designations may not be appropriate when they do not meet the above criteria or place significant restrictions on services injured by the spill.

Different designations place varying amounts of emphasis on providing resource protection, opportunities for public uses, and scientific research. Appropriate designations can be determined by examining: 1) which injured resources and services and research opportunities are supported by an area; 2) what type of additional regulatory protection, if any, is required to continue recovery; and 3) existing and planned human uses of the area. Designations under consideration include: Alaska State Parks, Alaska Department of Fish and Game special areas, National Marine Sanctuaries, Estuarine Research Reserves, U.S. Forest Service Research Natural Areas, National Recreation Areas, and Federal Wilderness areas.

OPTION EVALUATION DATABASE

MEMORANDUM

State of Alaska DEPARTMENT OF FISH & GAME

TO: RPWG

DATE: October 2, 1992

FILE NO.:

TELEPHONE NO.: 278-8012

SUBJECT: Second Draft of
Option Evaluation
Database

69
FROM: Chris Swenson

The attached package contains the second draft of the Option Evaluation Database. Please note that the database has not yet undergone peer review and may well change again.

This package includes the following:

1. Copy of the Option Rating Sheet
2. List of Option Names and Numbers
3. Description of the Columns and Values Used in the Database
4. Option Evaluation Database Sorted by Option (without footnotes)
5. Option Evaluation Database Sorted by Resource or Service (without footnotes)
6. Second Draft of Option Evaluation Database with a complete set of footnotes for each option

RESOURCE OR SERVICE:

OPTIONS RATING

DATE:

CRITERIA												
1A. Potential to improve the rate or degree of recovery												
1B. Potential to prevent further degradation or decline												
2. Technical feasibility												
3. Degree to which proposed action benefits more than one resource or service												
4. Degree to which proposed action enhances the resource or service												
5. Potential for NO additional injury to: a. other target or nontarget <u>resources</u> b. other target or nontarget <u>services</u>												
6. Potential effects of the action on human health and safety												
7. The relationship of the expected costs of the proposed action to the expected benefits												
8. Will the restoration opportunity be lost if implementation is delayed? (Y/N)												
9. Public Comments												

COMMENTS:

Code	Name of Option
1.0	Archeological site stewardship program
2.0	Increase fish and shellfish management
2.1	Increase fish/shellfish management: species already with plans
2.2	Increase fish/shellfish management: for species without plans
4.0	Reduce disturbance at marine bird colonies and mammal haulout
7.0	Increased agency field presence
8.0	Restrict/eliminate legal harvest: mammals and sea ducks
8.1	temporarily restrict/close harvest
8.2	educate public to voluntarily restrict harvest (sport, subsist.)
9.0	Minimize incidental take of marine birds by commercial fisheries
10.0	Preserve archaeological sites/artifacts
11.0	Improve freshwater wild salmon spawning/rearing habitats
11.1	Supplement fry production (salmon)
11.2	Improve access to spawning areas (salmon)
11.3	Improve spawning and rearing habitat (salmon)
12.0	New recreation facilities
12.1	New backcountry recreation facilities
12.2	New commercial, (lodge, fuel facilities) recreation facilities
13.0	Eliminate oil from mussel beds
14.0	Accelerate recovery of upper intertidal zone
15.0	Supplement or clean marine spawning substrates
15.1	Supplement intertidal substrates for herring
15.2	Clean intertidal salmon spawning substrates
16.0	Restore murre productivity
16.1	Enhance social stimuli (Common murre)
16.2	Improve physical characteristics of nest sites (Common murre)
17.0	Predator control to benefit marine birds
17.1	Eliminate introduced foxes (for nesting marine birds)
17.2	Reduce predator access to seabird colonies
18.0	Replace fisheries opportunities by alternative salmon runs
18.1	Establish additional hatchery (salmon) runs
18.2	Transplant (salmon) hatchery-reared fish to depleted areas
18.3	Wild egg take to establish new runs (salmon)
19.0	Update and expand Alaska's Anadromous Fish Stream Catalog
26.0	Amend Forest Practices Act
27.0	Designate long-term Ecological Research Sites
28.0	Acquire access for sport-fishing and recreation

Code	Name of Option
28.1	Purchase access (title or rights)
28.2	Negotiate access without purchase
28.3	Assert "17b" easements
30.0	Test subsistence foods for hydrocarbon contamination
33.0	Public information and education program
33.1	Education programs, information, and products
33.2	Education: visitor center, interpretive and educational facilities
34.0	Marine environmental institute
34.1	New marine environmental institute
34.2	Enhance an existing marine environmental institute
35.0	Acquire archaeologic artifacts from outside the spill area
37.0	Purchase private lands (fee title or less than fee title)
40.0	Special Designations

DESCRIPTION OF THE COLUMNS AND VALUES

<u>COLUMN NAME</u>	<u>DESCRIPTION</u>	<u>CHOICES TO USE</u>
Resource_or_Svc	Name of the Resource or Service	Use <u>exact</u> name (no plurals, no extra spaces; capitals don't matter). Example: "Bald eagle"
Restoratn_Option	Option number.	Example: "13" or "8.1"

Criteria:

Criteria_#1a	Criteria 1a	H, M, L, N/A, or Unk
Crit_#1b	Criteria 1b	H, M, L, N/A, or Unk
Crit_#2	Criteria 2	H, M, or Unp
Crit_#3	Criteria 3	H, M, or L
Crit_#4	Criteria 4	H, M, L, N/A, or Unk
Crit_#5a	Criteria 5a	H, M, or L
Crit_#5b	Criteria 5b	H, M, or L
Crit_#6	Criteria 6	H (there are no M's or L's)_
Crit_#7	Criteria 7	H, M, or L
Crit_#8	Criteria 8	Yes, or No

Footnotes:

Option Note	Footnote for the entire option	Select by typing in exact footnote; use "contains" & key word.
Note_#1a	Footnote for Crit 1a	Same as above.
Note_#1b	Footnote for Crit 1b	Same as above.
...
Note_#8	Footnote for Crit 8	Same as above.

Settlement Characteristic:

Direct_Restoration	Is it direct restoration?	"Y" for Yes; "N" for no.
Replacement	Is it replacement?	"Y" for Yes; "N" for no.
Acq_of_Equivalent	Is it acquisition of equivalent resc?	"Y" for Yes; "N" for no.
Enhancement	Is it enhancement?	"Y" for Yes; "N" for no.

Which Framework Alternative?

Fram_Alt	Which framework alternative category?	MR = Manipulation of Resc MH = Mgmt of Human Use PR = Protection
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Which Specie Group?

Specie_Group	Specie group (for resources) or Svc?	Bird, land mammal, sea mammal, fish, primary producer, or service (type in exactly).
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The Options Evaluation Database
Sorted by OPTION
October 1, 1992

The short form (without footnotes)

Evaluation of Options by Resource: DRAFT for RPWG Review

Resource or Service	Option	Criteria										FrWork Alter- native	Settlement Char			
		1a	1b	2	3	4	5a	5b	6	7	8		DR	Rep	AofE	Enh
Archaeology	1.0 Archeological site stewardship program	N/A	H	M	M	L	H	H	H	H	Yes	MH	Y	N	N	N
Cutthroat trout	2.1 Increase fish/shellfish management: species already with plans	M	M	H	L	L	H	M	H	M	Yes	MH	Y	N	N	Y
Dolly varden trout	2.1 Increase fish/shellfish management: species already with plans	M	M	H	L	L	H	M	H	M	Yes	MH	Y	N	N	Y
Herring	2.1 Increase fish/shellfish management: species already with plans	Unk	Unk	H	L	M	H	M	H	L	No	MH	Y	N	N	Y
Pink salmon	2.1 Increase fish/shellfish management: species already with plans	H	H	M	H	L	H	M	H	M	Yes	MH	Y	N	N	Y
Sockeye salmon	2.1 Increase fish/shellfish management: species already with plans	H	H	M	H	L	H	H	H	H	Yes	MH	Y	N	N	Y
Rockfish	2.2 Increase fish/shellfish management: for species without plans	Unk	Unk	H	M	L	H	M	H	Unk	Yes	MH	Y	N	N	Y
Common murre	4.0 Reduce disturbance at marine bird colonies and mammal haulout	M	M	H	M	L	H	M	H	H	Yes	MH	Y	Y	N	N
Harbor seal	4.0 Reduce disturbance at marine bird colonies and mammal haulout	H	H	H	L	L	H	M	H	H	Yes	MH	Y	Y	N	N
Killer whale	4.0 Reduce disturbance at marine bird colonies and mammal haulout	N/A	M	M	M	L	H	M	H	M	No	MH	Y	Y	N	N
Sea otter	4.0 Reduce disturbance at marine bird colonies and mammal haulout	L	L	M	L	L	H	M	H	L	No	MH	Y	Y	N	N
Brown bear	8.1 temporarily restrict/close harvest	L	M	H	L	M	H	M	H	M	No	MH	Y	N	N	Y
Harbor seal	8.1 temporarily restrict/close harvest	H	H	H	M	L	H	L	H	M	No	MH	Y	N	N	Y
Harlequin duck	8.1 temporarily restrict/close harvest	M	M	H	L	L	H	M	H	M	Yes	MH	Y	N	N	Y
River otter	8.1 temporarily restrict/close harvest	L	L	H	L	L	H	M	H	H	No	MH	Y	N	N	Y
Sea otter	8.1 temporarily restrict/close harvest	L	L	M	L	L	H	L	H	L	No	MH	Y	N	N	Y
Harbor seal	8.2 educate public to voluntarily restrict harvest (sport, subsist.)	H	H	M	L	L	H	M	H	M	Yes	MH	Y	N	N	Y
Harlequin duck	8.2 educate public to voluntarily restrict harvest (sport, subsist.)	L	L	M	L	L	H	M	H	L	Yes	MH	Y	N	N	Y
Sea otter	8.2 educate public to voluntarily restrict harvest (sport, subsist.)	L	L	M	L	L	H	M	H	M	No	MH	Y	N	N	Y
Marbled murrelet	9.0 Minimize incidental take of marine birds by commercial fisherie	L	L	M	M	L	H	L	H	L	No	MH	Y	N	N	Y
Archaeology	10.0 Preserve archaeological sites/artifacts	N/A	M	H	L	L	H	H	H	M	Yes	MR	Y	Y	N	N
Cutthroat trout	11.0 Improve freshwater wild salmon spawning/rearing habitats	M	N/A	H	M	M	H	H	H	M	No	MR	Y	Y	Y	Y
Dolly varden trout	11.0 Improve freshwater wild salmon spawning/rearing habitats	M	N/A	H	M	M	H	H	H	M	No	MR	Y	Y	Y	Y
Pink salmon	11.0 Improve freshwater wild salmon spawning/rearing habitats	H	H	H	H	H	H	H	H	M	Yes	MR	Y	Y	Y	Y
Sockeye salmon	11.0 Improve freshwater wild salmon spawning/rearing habitats	H	H	H	H	M	H	H	H	H	Yes	MR	Y	Y	Y	Y
Recreation: backcountry developed	12.1 New backcountry recreation facilities	N/A	N/A	H	M	M	M	L	H	H	No	MH	N	Y	Y	Y
Recreation: backcountry developed	12.2 New commercial, (lodge, fuel facilities) recreation facilities	N/A	N/A	H	M	H	L	H	H	M	No	MH	N	N	Y	Y
Black oystercatcher	13.0 Eliminate oil from mussel beds	M	M	Unp	H	L	M	H	H	M	No	MR	Y	N	N	N
Brown bear	13.0 Eliminate oil from mussel beds	L	L	H	H	L	M	H	H	L	No	MR	Y	N	N	N
Coastal habitat: intertidal	13.0 Eliminate oil from mussel beds	M	N/A	H	H	L	M	H	H	M	Yes	MR	Y	N	N	N
Harlequin duck	13.0 Eliminate oil from mussel beds	H	H	H	H	L	M	H	H	M	Yes	MR	Y	N	N	N
River otter	13.0 Eliminate oil from mussel beds	H	H	H	H	L	M	H	H	M	Yes	MR	Y	N	N	N
Sea otter	13.0 Eliminate oil from mussel beds	H	H	H	H	L	M	H	H	H	Yes	MR	Y	N	N	N

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Evaluation of Options by Resource: DRAFT for RPWG Review

Resource or Service	Option	Criteria										FrWork Alter- native	Settlement Char			
		1a	1b	2	3	4	5a	5b	6	7	8		DR	Rep	AofE	Enh
Black oystercatcher	14.0 Accelerate recovery of upper intertidal zone	M	M	Unp	H	L	M	H	H	M	No	MR	Y	N	N	N
Coastal habitat: intertidal	14.0 Accelerate recovery of upper intertidal zone	M	N/A	Unp	H	L	M	H	H	M	No	MR	Y	N	N	N
Cutthroat trout	14.0 Accelerate recovery of upper intertidal zone	H	N/A	Unp	H	L	H	H	H	M	No	MR	Y	N	N	N
Dolly varden trout	14.0 Accelerate recovery of upper intertidal zone	H	N/A	Unp	H	L	H	H	H	M	No	MR	Y	N	N	N
River otter	14.0 Accelerate recovery of upper intertidal zone	Unk	Unk	Unp	H	L	H	H	H	Unk	Yes	MR	Y	N	N	N
Herring	15.1 Supplement intertidal substrates for herring	Unk	Unk	M	H	M	H	H	H	M	No	MR	Y	Y	N	Y
Coastal habitat: intertidal	15.2 Clean intertidal salmon spawning substrates	L	N/A	H	H	L	H	H	H	L	No	MR	Y	N	N	N
Pink salmon	15.2 Clean intertidal salmon spawning substrates	L	L	M	H	L	M	H	H	L	Yes	MR	Y	N	N	N
Common murre	16.1 Enhance social stimuli (Common murre)	M	M	M	L	L	M	H	H	H	Yes	MR	Y	N	N	N
Common murre	16.2 Improve physical characteristics of nest sites (Common murre)	M	M	Unp	L	L	M	H	H	M	Yes	MR	Y	N	N	N
Common Murre	17.1 Eliminate introduced foxes (for nesting marine birds)	H	N/A	H	H	N/A	H	H	H	H	No	MR	N	Y	Y	N
Marbled murrelet	17.1 Eliminate introduced foxes (for nesting marine birds)	H	N/A	H	H	N/A	H	H	H	H	No	MR	N	Y	Y	N
Pigeon guillemot	17.1 Eliminate introduced foxes (for nesting marine birds)	H	N/A	H	H	N/A	H	H	H	H	No	MR	N	Y	Y	N
Common murre	17.2 Reduce predator access to seabird colonies	Unk	L	M	M	L	M	H	H	M	No	MR	Y	N	N	Y
Pigeon guillemot	17.2 Reduce predator access to seabird colonies	M	M	M	L	M	H	H	H	M	No	MR	Y	N	N	Y
Pink salmon	18.1 Establish additional hatchery (salmon) runs	L	L	H	H	H	L	L	H	L	No	MR	Y	Y	N	Y
Sockeye salmon	18.1 Establish additional hatchery (salmon) runs	M	M	H	H	M	M	H	H	M	No	MR	Y	Y	N	Y
Pink salmon	18.2 Transplant (salmon) hatchery-reared fish to depleted areas	L	L	H	H	H	L	L	H	L	No	MR	Y	Y	N	Y
Sockeye salmon	18.2 Transplant (salmon) hatchery-reared fish to depleted areas	H	L	H	H	L	H	H	H	M	Yes	MR	Y	Y	N	Y
Pink salmon	18.3 Wild egg take to establish new runs (salmon)	M	M	H	H	H	L	H	H	M	No	MR	Y	Y	N	Y
Sockeye salmon	18.3 Wild egg take to establish new runs (salmon)	M	M	H	H	M	M	H	H	M	No	MR	Y	Y	N	Y
Cutthroat trout	19.0 Update and expand Alaska's Anadromous Fish Stream Catalog	L	M	H	H	L	H	H	H	M	No	PR	Y	N	N	N
Dolly varden trout	19.0 Update and expand Alaska's Anadromous Fish Stream Catalog	L	M	H	H	L	H	H	H	M	No	PR	Y	N	N	N
Pink salmon	19.0 Update and expand Alaska's Anadromous Fish Stream Catalog	L	M	H	H	L	H	H	H	M	No	PR	Y	N	N	N
Sockeye salmon	19.0 Update and expand Alaska's Anadromous Fish Stream Catalog	L	M	H	H	L	H	H	H	M	No	PR	Y	N	N	N
Cutthroat trout	26.0 Amend Forest Practices Act	L	L	H	H	L	H	L	H	L	No	PR	Y	N	N	N
Dolly varden trout	26.0 Amend Forest Practices Act	L	L	H	H	L	H	L	H	L	No	PR	Y	N	N	N
Pink salmon	26.0 Amend Forest Practices Act	L	L	H	H	L	H	L	H	L	No	PR	Y	N	N	N
Sockeye salmon	26.0 Amend Forest Practices Act	L	L	H	H	L	H	L	H	L	No	PR	Y	N	N	N
Recreation: backcountry developed	28.0 Acquire access for sport-fishing and recreation	M	H	H	M	M	M	H	H	M	No	MH	N	Y	Y	Y
Subsistence	30.0 Test subsistence foods for hydrocarbon contamination	M	N/A	H	L	L	H	H	H	H	No	MH	Y	N	N	N

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Resource or Service	Option	Criteria										FrWork Alter- native	Settlement Char			
		1a	1b	2	3	4	5a	5b	6	7	8		DR	Rep	AofE	Enh
Recreation: concentrated	33.2 Education: visitor center, interpretive and educational facilities	N/A	N/A	H	L	N/A	H	H	H	M	No	MH	N	N	Y	N
Recreation: concentrated	34.0 Marine environmental institute	N/A	N/A	H	M	N/A	H	H	H	M	No	MH	N	N	Y	N
Archaeology	35.0 Acquire archaeological artifacts from outside the spill area	N/A	N/A	H	L	N/A	M	H	H	L	No	MR	N	Y	N	N
Bald eagle	37.0 Purchase private lands (fee title or less than fee title)	M	H	H	M	L	H	M	H	M	No	PR	Y	Y	Y	N
Black oystercatcher	37.0 Purchase private lands (fee title or less than fee title)	M	M	M	H	L	H	M	H	L	No	PR	Y	Y	Y	N
Brown bear	37.0 Purchase private lands (fee title or less than fee title)	N/A	H	H	H	L	H	H	H	M	No	PR	Y	Y	Y	N
Common murre	37.0 Purchase private lands (fee title or less than fee title)	M	M	M	M	L	H	H	H	L	No	PR	Y	Y	Y	N
Cutthroat trout	37.0 Purchase private lands (fee title or less than fee title)	N/A	M	H	H	L	H	M	H	L	No	PR	Y	Y	Y	N
Dolly varden trout	37.0 Purchase private lands (fee title or less than fee title)	N/A	M	H	H	L	H	M	H	L	No	PR	Y	Y	Y	N
Harlequin duck	37.0 Purchase private lands (fee title or less than fee title)	M	H	H	H	L	H	M	H	L	No	PR	Y	Y	Y	N
Marbled murrelet	37.0 Purchase private lands (fee title or less than fee title)	M	M	H	H	L	H	L	H	L	No	PR	Y	Y	Y	N
Pigeon guillemot	37.0 Purchase private lands (fee title or less than fee title)	L	M	M	H	L	H	M	H	L	No	PR	Y	Y	Y	N
Pink salmon	37.0 Purchase private lands (fee title or less than fee title)	L	M	H	H	L	H	M	H	M	No	PR	Y	Y	Y	N
Recreation: backcountry developed	37.0 Purchase private lands (fee title or less than fee title)	N/A	H	H	H	H	H	L	H	M	No	PR	Y	Y	Y	Y
Recreation: undeveloped	37.0 Purchase private lands (fee title or less than fee title)	N/A	H	H	H	H	H	L	H	M	No	PR	Y	Y	Y	Y
River otter	37.0 Purchase private lands (fee title or less than fee title)	N/A	M	H	H	L	H	M	H	M	No	PR	Y	Y	Y	N
Sockeye salmon	37.0 Purchase private lands (fee title or less than fee title)	N/A	M	H	H	L	H	M	H	M	No	PR	Y	Y	Y	N
Wilderness/intrinsic values	37.0 Purchase private lands (fee title or less than fee title)	H	H	H	H	N/A	H	L	H	M	No	PR	Y	Y	N	N
Bald eagle	40.0 Special Designations	M	M	H	M	L	H	M	H	M	No	PR	Y	Y	N	N
Black oystercatcher	40.0 Special Designations	M	M	M	H	L	H	M	H	M	No	PR	Y	Y	N	N
Brown bear	40.0 Special Designations	N/A	L	M	H	L	H	M	H	M	No	PR	Y	Y	N	N
Coastal habitat: intertidal	40.0 Special Designations	L	L	H	H	L	H	L	H	M	No					
Common murre	40.0 Special Designations	M	M	H	M	L	H	M	H	H	No	PR	Y	Y	N	Y
Cutthroat trout	40.0 Special Designations	N/A	M	H	H	L	H	M	H	M	No	PR	Y	Y	N	N
Dolly varden trout	40.0 Special Designations	N/A	M	H	H	L	H	M	H	M	No	PR	Y	Y	N	N
Harbor seal	40.0 Special Designations	H	H	H	H	L	H	M	H	H	Yes	PR	Y	Y	N	N
Harlequin duck	40.0 Special Designations	M	M	H	H	L	H	M	H	M	No	PR	Y	Y	N	N
Herring	40.0 Special Designations	N/A	Unk	H	H	L	H	L	H	M	No	PR	Y	Y	N	N
Killer whale	40.0 Special Designations	N/A	M	M	M	L	H	M	H	M	No	PR	Y	Y	N	N
Marbled murrelet	40.0 Special Designations	M	M	H	H	L	H	L	H	L	No	PR	Y	Y	N	N
Pigeon guillemot	40.0 Special Designations	L	M	M	H	L	H	M	H	M	No	PR	Y	Y	N	N
Pink salmon	40.0 Special Designations	L	L	H	H	L	H	M	H	M	No	PR	Y	Y	N	N
Recreation: backcountry developed	40.0 Special Designations	N/A	H	H	H	L	H	L	H	M	No	PR	Y	Y	Y	Y
Recreation: undeveloped	40.0 Special Designations	N/A	H	H	H	L	H	L	H	M	No	PR	Y	Y	Y	Y
River otter	40.0 Special Designations	N/A	L	H	H	L	H	M	H	M	No	PR	Y	Y	N	N
Sea otter	40.0 Special Designations	L	L	M	H	L	H	M	H	M	No	PR	Y	Y	N	N
Sockeye salmon	40.0 Special Designations	N/A	L	H	H	L	H	M	H	M	No	PR	Y	Y	N	N
Wilderness/intrinsic values	40.0 Special Designations	H	H	H	H	N/A	H	L	H	M	No	PR	Y	Y	N	N

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Sorted by RESOURCE OR SERVICE
October 1, 1992**

The short form (without footnotes)

Evaluation of Options, order by RESOURCES/SERVICE: DRAFT for RPWG Review

Option	Resource or Service	Criteria											FrWork Alter- native	Settlement Char			
		1a	1b	2	3	4	5a	5b	6	7	8		DR	Rep	AofE	Enh	
1.0 Archeological site stewardship program	Archaeology	N/A	H	M	M	L	H	H	H	H	Yes	MH	Y	N	N	N	
10.0 Preserve archaeological sites/artifacts	Archaeology	N/A	M	H	L	L	H	H	H	M	Yes	MR	Y	Y	N	N	
35.0 Acquire archaeological artifacts from outside the spill area	Archaeology	N/A	N/A	H	L	N/A	M	H	H	L	No	MR	N	Y	N	N	
37.0 Purchase private lands (fee title or less than fee title)	Bald eagle	M	H	H	M	L	H	M	H	M	No	PR	Y	Y	Y	N	
40.0 Special Designations	Bald eagle	M	M	H	M	L	H	M	H	M	No	PR	Y	Y	N	N	
13.0 Eliminate oil from mussel beds	Black oystercatcher	M	M	Unp	H	L	M	H	H	M	No	MR	Y	N	N	N	
14.0 Accelerate recovery of upper intertidal zone	Black oystercatcher	M	M	Unp	H	L	M	H	H	M	No	MR	Y	N	N	N	
37.0 Purchase private lands (fee title or less than fee title)	Black oystercatcher	M	M	M	H	L	H	M	H	L	No	PR	Y	Y	Y	N	
40.0 Special Designations	Black oystercatcher	M	M	M	H	L	H	M	H	M	No	PR	Y	Y	N	N	
8.1 temporarily restrict/close harvest	Brown bear	L	M	H	L	M	H	M	H	M	No	MH	Y	N	N	Y	
13.0 Eliminate oil from mussel beds	Brown bear	L	L	H	H	L	M	H	H	L	No	MR	Y	N	N	N	
37.0 Purchase private lands (fee title or less than fee title)	Brown bear	N/A	H	H	H	L	H	L	H	M	No	PR	Y	Y	Y	N	
40.0 Special Designations	Brown bear	N/A	L	M	H	L	H	M	H	M	No	PR	Y	Y	N	N	
13.0 Eliminate oil from mussel beds	Coastal habitat: intertidal	M	N/A	H	H	L	M	H	H	M	Yes	MR	Y	N	N	N	
14.0 Accelerate recovery of upper intertidal zone	Coastal habitat: intertidal	M	N/A	Unp	H	L	M	H	H	M	No	MR	Y	N	N	N	
15.2 Clean intertidal salmon spawning substrates	Coastal habitat: intertidal	L	N/A	H	H	L	H	H	H	L	No	MR	Y	N	N	N	
40.0 Special Designations	Coastal habitat: intertidal	L	L	H	H	L	H	L	H	M	No						
4.0 Reduce disturbance at marine bird colonies and mammal haulout	Common murre	M	M	H	M	L	H	M	H	H	Yes	MH	Y	Y	N	N	
16.1 Enhance social stimuli (Common murre)	Common murre	M	M	M	L	L	M	H	H	H	Yes	MR	Y	N	N	N	
16.2 Improve physical characteristics of nest sites (Common murre)	Common murre	M	M	Unp	L	L	M	H	H	M	Yes	MR	Y	N	N	N	
17.1 Eliminate introduced foxes (for nesting marine birds)	Common Murre	H	N/A	H	H	N/A	H	H	H	H	No	MR	N	Y	Y	N	
17.2 Reduce predator access to seabird colonies	Common murre	Unk	L	M	M	L	M	H	H	M	No	MR	Y	N	N	Y	
37.0 Purchase private lands (fee title or less than fee title)	Common murre	M	M	H	M	L	H	H	H	L	No	PR	Y	Y	Y	N	
40.0 Special Designations	Common murre	M	M	H	M	L	H	M	H	H	No	PR	Y	Y	N	Y	
2.1 Increase fish/shellfish management: species already with plans	Cutthroat trout	M	M	H	L	L	H	M	H	M	Yes	MH	Y	N	N	Y	
11.0 Improve freshwater wild salmon spawning/rearing habitats	Cutthroat trout	M	N/A	H	M	M	H	H	H	M	No	MR	Y	Y	Y	Y	
14.0 Accelerate recovery of upper intertidal zone	Cutthroat trout	H	N/A	Unp	H	L	H	H	H	M	No	MR	Y	N	N	N	
19.0 Update and expand Alaska's Anadromous Fish Stream Catalog	Cutthroat trout	L	M	H	H	L	H	H	H	M	No	PR	Y	N	N	N	
26.0 Amend Forest Practices Act	Cutthroat trout	L	L	H	H	L	H	L	H	L	No	PR	Y	N	N	N	
37.0 Purchase private lands (fee title or less than fee title)	Cutthroat trout	N/A	M	H	H	L	H	M	H	L	No	PR	Y	Y	Y	N	
40.0 Special Designations	Cutthroat trout	N/A	M	H	H	L	H	M	H	M	No	PR	Y	Y	N	N	
2.1 Increase fish/shellfish management: species already with plans	Dolly varden trout	M	M	H	L	L	H	M	H	M	Yes	MH	Y	N	N	Y	
11.0 Improve freshwater wild salmon spawning/rearing habitats	Dolly varden trout	M	N/A	H	M	M	H	H	H	M	No	MR	Y	Y	Y	Y	
14.0 Accelerate recovery of upper intertidal zone	Dolly varden trout	H	N/A	Unp	H	L	H	H	H	M	No	MR	Y	N	N	N	
19.0 Update and expand Alaska's Anadromous Fish Stream Catalog	Dolly varden trout	L	M	H	H	L	H	H	H	M	No	PR	Y	N	N	N	
26.0 Amend Forest Practices Act	Dolly varden trout	L	L	H	H	L	H	L	H	L	No	PR	Y	N	N	N	
37.0 Purchase private lands (fee title or less than fee title)	Dolly varden trout	N/A	M	H	H	L	H	M	H	L	No	PR	Y	Y	Y	N	

Criteria Summary. 1a: Potential to improve the rate or degree of recovery. 1b: Potential to prevent further degradation or decline. 2: Technical feasibility
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Evaluation of Options, order by RESOURCES/SERVICE: DRAFT for RPWG Review

Option	Resource or Service	Criteria										FrWork Alter- native PR	Settlement Char			
		1a	1b	2	3	4	5a	5b	6	7	8		DR	Rep	AofE	Enh
40.0 Special Designations	Dolly varden trout	N/A	M	H	H	L	H	M	H	M	No	PR	Y	Y	N	N
4.0 Reduce disturbance at marine bird colonies and mammal haulout	Harbor seal	H	H	H	L	L	H	M	H	H	Yes	MH	Y	Y	N	N
8.1 temporarily restrict/close harvest	Harbor seal	H	H	H	M	L	H	L	H	M	No	MH	Y	N	N	Y
8.2 educate public to voluntarily restrict harvest (sport, subsist.)	Harbor seal	H	H	M	L	L	H	M	H	M	Yes	MH	Y	N	N	Y
40.0 Special Designations	Harbor seal	H	H	H	H	L	H	M	H	H	Yes	PR	Y	Y	N	N
8.1 temporarily restrict/close harvest	Harlequin duck	M	M	H	L	L	H	M	H	M	Yes	MH	Y	N	N	Y
8.2 educate public to voluntarily restrict harvest (sport, subsist.)	Harlequin duck	L	L	M	L	L	H	M	H	L	Yes	MH	Y	N	N	Y
13.0 Eliminate oil from mussel beds	Harlequin duck	H	H	H	H	L	M	H	H	M	Yes	MR	Y	N	N	N
37.0 Purchase private lands (fee title or less than fee title)	Harlequin duck	M	H	H	H	L	H	M	H	L	No	PR	Y	Y	Y	N
40.0 Special Designations	Harlequin duck	M	M	H	H	L	H	M	H	M	No	PR	Y	Y	N	N
2.1 Increase fish/shellfish management: species already with plans	Herring	Unk	Unk	H	L	M	H	M	H	L	No	MH	Y	N	N	Y
15.1 Supplement intertidal substrates for herring	Herring	Unk	Unk	M	H	M	H	H	H	M	No	MR	Y	Y	N	Y
40.0 Special Designations	Herring	N/A	Unk	H	H	L	H	L	H	M	No	PR	Y	Y	N	N
4.0 Reduce disturbance at marine bird colonies and mammal haulout	Killer whale	N/A	M	M	M	L	H	M	H	M	No	MH	Y	Y	N	N
40.0 Special Designations	Killer whale	N/A	M	M	M	L	H	M	H	M	No	PR	Y	Y	N	N
9.0 Minimize incidental take of marine birds by commercial fisherie	Marbled murrelet	L	L	M	M	L	H	L	H	L	No	MH	Y	N	N	Y
17.1 Eliminate introduced foxes (for nesting marine birds)	Marbled murrelet	H	N/A	H	H	N/A	H	H	H	H	No	MR	N	Y	Y	N
37.0 Purchase private lands (fee title or less than fee title)	Marbled murrelet	M	M	H	H	L	H	L	H	L	No	PR	Y	Y	Y	N
40.0 Special Designations	Marbled murrelet	M	M	H	H	L	H	L	H	L	No	PR	Y	Y	N	N
17.1 Eliminate introduced foxes (for nesting marine birds)	Pigeon guillemot	H	N/A	H	H	N/A	H	H	H	H	No	MR	N	Y	Y	N
17.2 Reduce predator access to seabird colonies	Pigeon guillemot	M	M	M	L	M	H	H	H	M	No	MR	Y	N	N	Y
37.0 Purchase private lands (fee title or less than fee title)	Pigeon guillemot	L	M	M	H	L	H	M	H	L	No	PR	Y	Y	Y	N
40.0 Special Designations	Pigeon guillemot	L	M	M	H	L	H	M	H	M	No	PR	Y	Y	N	N
2.1 Increase fish/shellfish management: species already with plans	Pink salmon	H	H	M	H	L	H	M	H	M	Yes	MH	Y	N	N	Y
11.0 Improve freshwater wild salmon spawning/rearing habitats	Pink salmon	H	H	H	H	H	H	H	H	M	Yes	MR	Y	Y	Y	Y
15.2 Clean intertidal salmon spawning substrates	Pink salmon	L	L	M	H	L	M	H	H	L	Yes	MR	Y	N	N	N
18.1 Establish additional hatchery (salmon) runs	Pink salmon	L	L	H	H	H	L	L	H	L	No	MR	Y	Y	N	Y
18.2 Transplant (salmon) hatchery-reared fish to depleted areas	Pink salmon	L	L	H	H	H	L	L	H	L	No	MR	Y	Y	N	Y
18.3 Wild egg take to establish new runs (salmon)	Pink salmon	M	M	H	H	H	L	H	H	M	No	MR	Y	Y	N	Y
19.0 Update and expand Alaska's Anadromous Fish Stream Catalog	Pink salmon	L	M	H	H	L	H	H	H	M	No	PR	Y	N	N	N
26.0 Amend Forest Practices Act	Pink salmon	L	L	H	H	L	H	L	H	L	No	PR	Y	N	N	N
37.0 Purchase private lands (fee title or less than fee title)	Pink salmon	L	M	H	H	L	H	M	H	M	No	PR	Y	Y	Y	N
40.0 Special Designations	Pink salmon	L	L	H	H	L	H	M	H	M	No	PR	Y	Y	N	N
12.1 New backcountry recreation facilities	Recreation: backcountry developed	N/A	N/A	H	M	M	M	L	H	M	No	MH	N	Y	Y	Y
12.2 New commercial, (lodge, fuel facilities) recreation facilities	Recreation: backcountry developed	N/A	N/A	H	M	H	L	H	H	M	No	MH	N	N	Y	Y
28.0 Acquire access for sport-fishing and recreation	Recreation: backcountry developed	M	H	H	M	M	M	H	H	M	No	MH	N	Y	Y	Y
37.0 Purchase private lands (fee title or less than fee title)	Recreation: backcountry developed	N/A	H	H	H	H	N	L	H	M	No	PR	Y	Y	Y	Y

Criteria Summary. 1a: Potential to improve the rate or degree of recovery. 1b: Potential to prevent further degradation or decline. 2: Technical feasibility
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Option	Resource or Service	Criteria											FrWork Alter- native PR	Settlement Char			
		1a	1b	2	3	4	5a	5b	6	7	8		DR	Rep	AofE	Enh	
40.0 Special Designations	Recreation: backcountry developed	N/A	H	H	H	L	H	L	H	M	No		Y	Y	Y	Y	
33.2 Education: visitor center, interpretive and educational facilities	Recreation: concentrated	N/A	N/A	H	L	N/A	H	H	H	M	No	MH	N	N	Y	N	
34.0 Marine environmental institute	Recreation: concentrated	N/A	N/A	H	M	N/A	H	H	H	M	No	MH	N	N	Y	N	
37.0 Purchase private lands (fee title or less than fee title)	Recreation: undeveloped	N/A	H	H	H	H	H	L	H	M	No	PR	Y	Y	Y	Y	
40.0 Special Designations	Recreation: undeveloped	N/A	H	H	H	L	H	L	H	M	No	PR	Y	Y	Y	Y	
8.1 temporarily restrict/close harvest	River otter	L	L	H	L	L	H	M	H	H	No	MH	Y	N	N	Y	
13.0 Eliminate oil from mussel beds	River otter	H	H	H	H	L	M	H	H	M	Yes	MR	Y	N	N	N	
14.0 Accelerate recovery of upper intertidal zone	River otter	Unk	Unk	Unp	H	L	H	H	H	Unk	Yes	MR	Y	N	N	N	
37.0 Purchase private lands (fee title or less than fee title)	River otter	N/A	M	H	H	L	H	M	H	M	No	PR	Y	Y	Y	N	
40.0 Special Designations	River otter	N/A	L	H	H	L	H	M	H	M	No	PR	Y	Y	N	N	
2.2 Increase fish/shellfish management: for species without plans	Rockfish	Unk	Unk	H	M	L	H	M	H	Unk	Yes	MH	Y	N	N	Y	
4.0 Reduce disturbance at marine bird colonies and mammal haulout	Sea otter	L	L	M	L	L	H	M	H	L	No	MH	Y	Y	N	N	
8.1 temporarily restrict/close harvest	Sea otter	L	L	M	L	L	H	L	H	L	No	MH	Y	N	N	Y	
8.2 educate public to voluntarily restrict harvest (sport, subsist.)	Sea otter	L	L	M	L	L	H	M	H	M	No	MH	Y	N	N	Y	
13.0 Eliminate oil from mussel beds	Sea otter	H	H	H	H	L	M	H	H	H	Yes	MR	Y	N	N	N	
40.0 Special Designations	Sea otter	L	L	M	H	L	H	M	H	M	No	PR	Y	Y	N	N	
2.1 Increase fish/shellfish management: species already with plans	Sockeye salmon	H	H	M	H	L	H	H	H	H	Yes	MH	Y	N	N	Y	
11.0 Improve freshwater wild salmon spawning/rearing habitats	Sockeye salmon	H	H	H	H	M	H	H	H	H	Yes	MR	Y	Y	Y	Y	
18.1 Establish additional hatchery (salmon) runs	Sockeye salmon	M	M	H	H	M	M	H	H	M	No	MR	Y	Y	N	Y	
18.2 Transplant (salmon) hatchery-reared fish to depleted areas	Sockeye salmon	H	L	H	H	L	H	H	H	M	Yes	MR	Y	Y	N	Y	
18.3 Wild egg take to establish new runs (salmon)	Sockeye salmon	M	M	H	H	M	M	H	H	M	No	MR	Y	Y	N	Y	
19.0 Update and expand Alaska's Anadromous Fish Stream Catalog	Sockeye salmon	L	M	H	H	L	H	H	H	M	No	PR	Y	N	N	N	
26.0 Amend Forest Practices Act	Sockeye salmon	L	L	H	H	L	H	L	H	L	No	PR	Y	N	N	N	
37.0 Purchase private lands (fee title or less than fee title)	Sockeye salmon	N/A	M	H	H	L	H	M	H	M	No	PR	Y	Y	Y	N	
40.0 Special Designations	Sockeye salmon	N/A	L	H	H	L	H	M	H	M	No	PR	Y	Y	N	N	
30.0 Test subsistence foods for hydrocarbon contamination	Subsistence	H	N/A	H	L	L	H	H	H	H	No	MH	Y	N	N	N	
37.0 Purchase private lands (fee title or less than fee title)	Wilderness/intrinsic values	H	H	H	H	N/A	H	L	H	M	No	PR	Y	Y	N	N	
40.0 Special Designations	Wilderness/intrinsic values	H	H	H	H	N/A	H	L	H	M	No	PR	Y	Y	N	N	

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Coastal Hab

NRDA

EXXON VALDEZ OIL SPILL PROJECT DESCRIPTION

Project Number:

Project Source:

Project Title: SUBTIDAL MONITORING: Recovery of sediments, eelgrass communities, and fish in the shallow subtidal environment.

Project Category: Restoration monitoring

Project Type: Sediments, Eelgrass beds, fish

Lead Agency: NOAA, NMFS

Cooperating Agencies: ADFG/UAF

Project Term: Start Date: 1 Jan 1993 Finish Date: 1 May 1995

INTRODUCTION:

A. Background on the Resource/Service:

This project will monitor the recovery of subtidal sediments, eelgrass communities, rockfish, and bottom fish from SHALLOW subtidal areas of Prince William Sound. An important component of this study is tracking the loss of oil from the environment and from organisms in the spill area.

Hydrocarbons were found in the shallow sub-tidal sediments and in species (Rockfish, Flounders) associated with the shallow bottom sediments. Investigators attempting to restore or monitor recovery of populations of shallow sub-tidal organisms following the EXXON VALDEZ oil spill will want to know what concentrations of petroleum hydrocarbons are present in sediments, AND if they continue to contaminate the organisms, and have sub-lethal impacts.

We anticipate that complete recovery to background levels of hydrocarbons in subtidal sediments in the Sound is likely to take several years.

B. Summary of Injury:

Subtidal sediments have been found to be contaminated by oil at no fewer than 15 sites within Prince William Sound by June 1990. Hydrocarbon contamination of sediments had reached a depth of 20 m at at least 8 sites. Evidence of hydrocarbon movement down-slope into sub-tidal sediments was detected by 1991; further oil movement to deeper depths is suspected (from weathering, cleaning), but is unknown.

Dead Rockfish were found after the spill. Species exposure in rockfish and flounders (contaminated bile) was documented between 89-91, but not since. Eelgrass beds in oiled areas were impacted by the spill.

Persistence of hydrocarbons and their impacts on associated species were not examined in 1992, and current status of recovery is unknown.

C. Location: All locations of the study will be in PWS (except for potential control sites outside the PWS if needed). All projects within the study will sample oiled sites sampled in previous years, and all projects will sample the same oiled sites. Five oiled and five control sites will be studied intensely by all component agencies of the project.

Oiled sites: Herring Bay, Northwest Bay, Sleepy Bay, Snug Harbor, and Bay of Isles. Control sites: Drier Bay, Lower Herring Bay, Moose Lips Bay, Olsen Bay, and Zaikof Bay. All sites were sampled repeatedly under the NRDA program. Sites will be sampled in June/July 1993 and 1994.

WHAT:

A. Goal: Monitor recovery of sediments, eelgrass beds, and shallow fish species in the subtidal environment.

B. Objectives:

1. (NMFS- O'Clair) Determine Hydrocarbons concentration and composition in sub-tidal sediments in PWS by GC-MS (6 depths; 10 sites).

Determine hydrocarbon hydrocarbon movement down-slope in three oiled bays (150 samples per bay, all from 0-20 meters) by fast screening UV-Fluorescence procedures.

2. (ADFG/UAF, Jewett) Determine impacts and recovery of shallow eelgrass communities in western PWS that were impacted by the spill.

3. (ADFG- McCarron; NMFS- Collier) Determine changes in exposure of fishes to hydrocarbons by monitoring bile, MFO activity and histopathological lesions in Rockfish and near-shore bottom fish.

WHY:

A. Benefit to Injured Resources/Services:

This project will determine the recovery of oiled sediments, if any, and the movement of sub-tidal oil, if any. The other projects will determine if contamination continues in species, and if symptoms of contamination or impacts continue.

Management of species and habitats may be influenced by the

level of recovery (e.g. no contamination or other symptoms would permit higher rates of harvest for target species and habitats). Rates of recovery of habitat and specie are needed to protect the habitat and species. It is important to follow oil exposure with some measures until the environment fully recovers. This is the only sub-tidal monitoring study.

HOW:

All of these projects and sites were sampled and analyzed by the cooperating agencies between 1989-91. None of these projects were implemented in 1992. All of these projects will use methods compatible with the methods of 1989-91, to insure temporal comparability of the results. All of these projects will be limited to about 10 sites within PWS, and will permit a spatial comparability.

Specific methods vary considerably between projects, as do the specific objectives. Sediments will be collected primarily by divers (some with grabs), and will be analyzed by GC-MS, and all will be screened using the UV-Fluorescent procedures for sediments from the mussel bed study. Details for the methods for monitoring biological impacts/contamination will be given in detailed study plans and will follow the methods used in previous years.

Chain of custody procedures will be followed after collection of all samples.

Coordination with Other Efforts: This project will coordinate closely with each other- to insure similar sampling times and sites between studies and years. ALSO, this project will coordinate with the mussel bed project, and from the shoreline evaluations, particularly for the intense sub-tidal sampling at 3 oiled bays.

ENVIRONMENTAL COMPLIANCE:

It is not anticipated that this study will have a significant effect on the environment and an Environmental Impact Statement or Environmental Assessment will not be necessary.

WHEN: All field work will be conducted in June/July 1993 and 1994. Interim progress report will be due 1 DEC 1993 and 1994; Final reports for projects with one field season due 1 May 94; projects with two field seasons will be due 1 May 1995.

BUDGET SUMMARY

(NOTE: All projects are self contained. They include analytical costs, vessel-field logistics, University overhead, and final analyses/interpretation/write up)

	Jan 93-Sep 93	Oct 93-Sep 94	Oct 94-Sep 95
1. NMFS- O'Clair	292 K	350 K	124 K
2. ADFG/UAF Jewett	230 K	265 K	75 K
3. ADFG- McCarron	126 K	--	--
4. NMFS- Collier	190 K	230 K	140 K
	-----	-----	-----
totals	838 K	845 K	339 K

Note: with summer field season occurring in the fourth quarter of the FY, much of the sample analyses falls into the following first two quarters of the next FY.

SEE ATTACHED FOR MORE DETAILS.

EXXON VALDEZ TRUSTEE COUNCIL

Project Description: *SubTidal Monitoring -
Part 1. NMFS - Oclair, Sediment Hydrocarbons*

Budget Category	Proposed 1-Jan-93 30-Sep-93			FY 94	FY 95	FY 96	FY 97	Sum FY 98 & Beyond
Personnel	92			118	52			
Travel	10			10	5			
Contractual *	160			210	65			
Commodities	20			10	2			
Equipment	10			2	0			
Capital Outlay				0	0			
Sub-total	\$292	\$0.0		\$350	\$124	\$0.0	\$0.0	\$0.0
General Administration								
Project Total		\$0.0		\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Full-time Equivalents (FTE)								

Budget Year Proposed Personnel:

Position	Months Budgeted	Cost	Comment
<p>* Contractual Includes Vessel costs in 93 & 94, UV screenings in 93 & 94, costs GC's for field yr 93 in 93 & 94, Costs for GC's for field yr 94 in 94 & 95.</p>			

17-Jul-92

1993

page of

Project Number:
Project Title:
Agency:

FORM 2A
PROJECT
DETAIL

Project Description: *SubTidal Monitoring*

Part II. ADFG/UAF - Jewett. Eelgrass communities

Budget Category	Proposed 1-Jan-93 30-Sep-93			FY 94	FY 95	FY 96	FY 97	Sum FY 98 & Beyond
Personnel	\$ 134K							
Travel	5							
Contractual *	76							
Commodities	10							
Equipment	5							
Capital Outlay								
Sub-total	\$ 230K			\$265K	\$75K	\$0.0	\$0.0	\$0.0
General Administration				\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Project Total	\$0.0			\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Full-time Equivalents (FTE)								

Budget Year Proposed Personnel:

Position	Months Budgeted	Cost	Comment
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* includes vessel, univ overhead, ~~travel~~ + 1 contract

17-Jul-92

1993

page of

Project Number:

Project Title:

Agency:

FORM 2A
PROJECT
DETAIL

Project Description:

*SubTidal Monitoring**Part III - ADFG - McCarron. Rock Fish Monitoring*

Budget Category	Proposed 1-Jan-93 30-Sep-93			FY 94	FY 95	FY 96	FY 97	Sum FY 98 & Beyond
Personnel	34.5			0	0	0	0	0
Travel	1.9							
Contractual *	83.6							
Commodities	6.5							
Equipment	0							
Capital Outlay	0							
Sub-total	\$126.5			\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
General Administration								
Project Total	\$0.0			\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Full-time Equivalents (FTE)								

Budget Year Proposed Personnel:

Position	Months Budgeted	Cost	Comment
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* *Contracts includes Vessel logistics, & sample analyses*

17-Jul-92

1993

page of

Project Number:

Project Title:

Agency:

 FORM 2A
PROJECT
DETAIL

Project Description: *SubTidal Monitoring*

Part IV. NMFS-Collier. subTidal Fish Monitoring.

Budget Category	Proposed 1-Jan-93 30-Sep-93			FY 94	FY 95	FY 96	FY 97	Sum FY 98 & Beyond
Personnel	125K			156	\$115	0		
Travel	7			7	4			
Contractual *	25			25	0			
Commodities	33			42	21			
Equipment	0			0	0			
Capital Outlay	0			0	0			
Sub-total	\$190 \$0.0			\$230 \$0.0	\$140 \$0.0	\$0.0	\$0.0	\$0.0
General Administration								
Project Total	\$0.0			\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Full-time Equivalents (FTE)								

Budget Year Proposed Personnel:

Position	Months Budgeted	Cost	Comment
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** Contract includes Vessel costs*

17-Jul-92

1993

page of

Project Number:
Project Title:
Agency:

FORM 2A
PROJECT
DETAIL

*RPWG
file*

**RESTORATION TEAM AND RESTORATION PLANNING WORK GROUP
AUGUST 26, 1992
9:30 A.M.**

Attendees:

Dave Gibbons
Mark Fraker
Pam Bergmann
Henry Gerke
Marty Rutherford
Mark Brodersen
Ken Rice
Ray Thompson
Bob Loeffler
Karen Klinge
Tim Steele
Jerome Montague
Byron Morris
John Strand
Jim Slocomb
Art Weiner

The following handouts were provided:

Agenda
Issue Statements
Pamela Bergmann 8/25 Memo
RPWG 8/21 Memo Regarding Response to Restoration Team Comments
Mike Barton 8/24 Memo
Draft Evaluation Criteria
Draft Alternative Themes, Status Report for RT Review

The following agenda items were discussed:

MEETING EXPECTATIONS - Strand

John stated that this meeting will also include topics originally scheduled for the 19th. There are four major items for discussion: issue statements, annotated outline, draft evaluation criteria and rating categories and draft themes. RPWG has some expectations for these deliverables and would like to reach closure on them. With respect to the outline, RPWG would like to come away with some clearer guidance from the RT. John asked if there were any additions from the Restoration Team to the agenda. Jerome asked if there is a new RPWG schedule. John stated the most up-to-date internal RPWG timeline should be August 12th. It reflects formation of alternatives and review of options but did not deal with any delay in the overall schedule. RPWG's intention is still to deliver in November all that was promised.

ISSUE STATEMENTS - Strand

Ray will answer any substantive questions on the issue statements. RPWG has not received any additional comments on the issue statements; therefore, John concluded, barring any further guidance from the Restoration Team, the issues in the last version will be included in a package to the Trustee Council. Ray stated the last changes were not substantive. Mark asked when the version that will be presented to the Trustee Council will be available for Restoration Team review. John stated that this version has been distributed. Mark asked what would be proposed as an introduction to the package for the Trustee Council. John stated that guidance is needed on what will go to the Trustee Council. Karen stated that Sandy suggested that a memo go to the Trustee Council requesting sign off. Mark asked if the whole package will go to the Trustee Council by the 8th of September and Dave stated it will. John stated RPWG will have some things to go out in this package. The next meeting with the RT will be on the 3rd.

Jerome had a question on issue statement #10. Ken concurred and stated he would question whether the Restoration Plan will resolve the question of opportunities for people outside the agencies to compete for funds. Ken stated he is skeptical if the plan needs to do that. Tim suggested that the plan will address this via a policy statement. Ken questioned if the plan is the place to resolve this kind of issue. Marty stated if this is not included how will the public have input to the Trustee Council, and she doesn't think this question has been broached in a straight-forward fashion. Ken stated he is reluctant to move off of this issue immediately. Karen stated that the public comments reflect a desire for an opportunity for the private sector to be involved. Henry stated it would affect the options of how your money would be allocated. An administrative decision has to be made and so stated in the plan. Marty stated that the public might react differently if they knew how funds would be dispersed. Tim stated that the plan is the place for policy decisions or statements, and managing of the funds is dealt with in the financial procedures. Henry stated if you have an option, how you budget your money determines what options are open to you. Budget is an implementation criteria. Bob stated that different options have different implications for what parts go to the public sector. John stated that these issue statements are built from public comments which suggested there is a need to be more competitive and not just support the agencies. Dave suggested revising #10 to reflect how will the plan be structured to provide equal opportunity for qualified parties (Trustee parties and outside) to compete. Mark suggested changing #10 to how will restoration funds be managed. Marty stated that there might not always be equal opportunity to compete so she would agree with Mark's suggestion. Pam suggested taking "equal" out of this statement. Mark stated he wants to know how the funds will be managed. Henry stated you have to tell how the funds will be managed, but how they will be implemented is

totally different. Marty stated there are several questions: how funds will be managed and what are the criteria for the Trustees to decide if bidding will be competitive? The statement was revised to "how will restoration funds be managed". John asked for any other suggested revisions. Ken asked if #4 is a subset of #11. Marty stated it is a subset in terms of how the habitat protection work group has considered it. Ray stated #4 has stood the test and has stayed the same since the start of this process. #11 is a combination of two other statements. Marty stated that #11 should stand. Byron stated waters are not covered in #11. Ray stated there were a number of comments on special management areas as well as protection; therefore, separate issue statements were developed. Tim stated that he would not like for #4 to get lost in #11. Dave suggested the following combination of #4 and #11: How will habitat protection mechanisms such as special management designations, land acquisition, and others, for public and private lands and waters be integrated into an overall restoration program. Henry questioned issue statement #5.

Ray stated the public expressed interest in having information on a regular basis. Henry stated the issue is dissemination and not on the information itself. This issue raises the specter that some information is being hidden. How and where the dissemination will occur is a national issue and not just a state or local. Ken stated it is important to know what information is valuable to the public; otherwise, overload will occur if all information is sent out. Pam suggested changing #5 to "what and how should information be disseminated". Jerome suggested changing #5 to "what information should be distributed to the public and how should it be disseminated," and this version was agreed upon.

Henry asked where does the aspect of monitoring come in. Dave stated it fits into #1 and #3. Ken stated the Restoration Plan should provide some direction as to an overall restoration strategy. Dave stated the issue statements are identified as part of the package going to the Trustee Council. Mark suggested deleting "long-term" from #3 and this revision was accepted. Pam suggested titling this product "Issue Statements for the Draft Restoration Plan," and John stated that this revision will be made. Henry suggested adding "oversight" to #3. John stated that oversight ensures that what you designed into the plan was implemented. Ray stated there is a real concern about adding too many staff from the public comments and he sees oversight as associated with agencies. Ken stated that oversight has too many connotations and should be left out.

REVIEW OF REVISED ANNOTATED OUTLINE FOR RESTORATION PLAN - Strand

John prepared a memo to the Restoration Team on 8/21 addressing specific Restoration Team comments. John stated that the rationale for why some things were not changed was also addressed. Capital letters represent additions. Lines represent deletions. Nine out

of the 11 suggestions were heeded. The most significant comments dealt with how RPWG would present the information on alternatives. John stated RPWG needs some clear guidance on how to present the preferred alternative in the Restoration Plan. The draft plan presents alternatives more completely and provides some opportunity for the public to help decide the preferred alternative which would then be reflected in the final plan. John wants some discussion as to which way to go. Dave asked if preferred alternative will be included in a suite or will the preferred alternative stand alone. Bob stated NEPA requires that they be parallel alternatives. Henry disagreed because if the two documents are sent out as combined, you have to identify your proposed action. Ken stated the plan gives the reasonable alternatives. The preferred alternative will come out after the Trustee Council has looked at each one in equal detail. Byron stated this heads in the direction of writing four different restoration alternatives. Ken stated that we are talking about the draft plan and if alternative ways are developed for restoring the oil spill area, they should be displayed equally giving the decisionmakers and public a variety of ways for achieving that end. Ken stated there will be some overlap between the plan and the EIS. Bob stated that what we do is the most efficient way to get to your goal with one set of actions that will do. It has been his experience that the more public distrust you have, the more problems you have. If you put all the alternatives out, the process goes quicker. Four alternatives will be put out. The question is whether the preferred alternative will be in a separate chapter from all the others. Ken stated the draft plan and draft EIS should be stand alone documents; however, there will be some duplication. Dave stated a comparison of the contents of the DEIS and draft Restoration Plan to determine differences would be interesting. Byron stated he doesn't want to lay out four equal alternatives without stating the preferred alternative. Dave stated that appears what RPWG is proposing to do. Bob stated to get informed public comment, you give a range of informed choices. The objective is to make it easy for the public to read, see what we are doing and see what other choices were not made that could be recommended. Henry raised the issue of the level of specificity. John stated you can't get too specific as to geography or sites of restoration because the data doesn't allow you to do that. Ken stated the plan will take a suite of options and put some emphasis on those with different alternatives. Mark Fraker stated that one way to think of this is we are providing a tool box. John suggested Henry and Pam review the full notebook of RPWG restoration options.

Break at 10:55.

John again requested that RPWG would like some clear indication on how to proceed and asked if this is an issue that needs to be resolved with the Trustee Council? Pam stated Interior feels that as long as the draft Restoration Plan identifies the preferred alternative and includes the other alternatives as well, they will

go along with the group. John asked if Byron is comfortable with that. Byron stated that it is a matter of packaging. Bob stated there will be a better picture when it is written up. John stated RPWG can take this guidance and run with it. Henry stated DOI wanted clarification of where the criteria would be applied. John stated there are two separate sets of criteria: criteria for evaluation of restoration options and criteria for screening habitat protection and acquisition projects. Karen perceived DOI's concern being resolved by a letter describing the process, which does not presently come across in the outline. Henry stated the process has not been laid out sufficiently. Pam does not want to buy off on a process that may have been applied to the wrong thing. Karen suggested a presentation be made of the process. John asked what more DOI would like to see in the annotated outline showing that the process is appropriate. Pam stated a detailed attachment might be more appropriate. John stated he is open to adding more words to the goals and objectives; however, Bob stated he would prefer a separate attachment rather than wordsmithing the outline. Mark suggested getting in the habit of using "types of action" rather than just "action". John stated the 1990 Progress Report started with a whole list of restoration ideas, and the criteria were applied to get down to the options contained in the Restoration Framework. John stated the attachment will be prepared for Restoration Team review. Marty asked if RPWG has enough time to get this done. John stated he will caucus with RPWG to see what can be done within a week. John stated the information is there but he needs to talk with RPWG. There is a clear indication that some additional information on process needs to be provided. Ken questioned if a list of Public Advisory Group members needs to be provided. Marty stated that the principal interests would be more appropriate. Mark further suggested providing where principal interests can be contacted. Mark Fraker suggested it might be appropriate to note who the current PAG member is for each principal interest. Byron questioned the way that habitat protection and acquisition is presented in Section IVB. Bob stated that because habitat protection and acquisition will receive such scrutiny, it was presented this way to simplify things for the public. Byron stated IVB says what the criteria are and IVC says how the criteria are applied. RPWG needs to review this some more to work out clarification.

Meeting adjourned for lunch until 1:00.

REVIEW OF DRAFT EVALUATION CRITERIA AND RATING CATEGORIES - Klinge

This item is another holdover from the 18th meeting. Karen presented RPWG's view of the criteria used to evaluate options and how to go about building ratings categories to go along with the criteria. Karen distributed copies of draft evaluation criteria for rating restoration options for their effect on each resource and service. The handout discusses each criteria and its definition. An overhead presentation was also given. Jerome questioned how a land purchase would be addressed. Karen stated that land acquisition was included under the first criteria where you can't promote recovery but can stop further degradation. Pam suggested that further degradation or decline could be set up as a separate criteria. Karen stated that we could do this; however, the group followed the precedent set by the Framework Document. Bob stated that the footnote allows this to apply to all rating categories. Mark Fraker suggested expanding the footnote. Karen suggested expanding the definition of our rating system. Ken asked if RPWG is proposing comparing the options against each other or against themselves. Karen stated this process consists of ranking or rating the options. Mark asked why we are doing this if we aren't ranking one option against the other. Bob stated this will provide a list in prioritized order. Jerome stated that his understanding of the answer to his question is no change.

Ken suggested changing the rating categories under technical feasibility as follows: high-works consistently, medium-mixed results, low-least results. Pam agreed with Ken's suggestions. Karen stated that Ken's suggestions soften the definition up. The agreed upon definition for high is as follows: There is documented evidence that the option has consistently worked when applied to this resource or service. The agreed upon definition for medium is as follows: There is documented evidence that the option has the potential to restore a similar resource or service or has worked with mixed results when applied to the proposed resource. Bob stated the low rating should be used intelligently. Byron stated there is a big difference between unknown and unproven. Mark is disturbed with the low category. If you have an option that is unproven, you should do a technical feasibility test. Pam stated you are measuring the level of certainty. John stated some level of gradation has to be built in to sort. Bob suggested adding to the low definition that if an option is rated low, it will probably require a feasibility study. Ken stated that implementation should be looked at on a year-by-year basis. Henry questioned where is the quantification using high, medium and low. Bob stated documentation provides objectivity. Karen stated that each RPWG member's expertise is relied upon heavily. Mark is concerned that innovative techniques will have a much more difficult time than the old tried and true practices. Karen stated these criteria are used for evaluating the options that will form the alternatives. Bob stated if low does not give the true meaning, maybe low should be changed to unknown. Pam suggested that this may be problematic and

should be put through the process to see what happens, and we should keep high, medium and low. John stated that even yes or no could be used. Pam stated this should be caveated so that it does not preclude technical feasibility tests as suggested by Mark. Pam suggested adding unknown to the low category. Bob suggested changing the low category to unproven. Mark stated that if the public's proposals fall into the low category, it sends a bad message rather than if an unproven category is used. Marty asked if Mark's concern was a wordsmithing issue. Pam again recommended moving on and paying attention to the technical feasibility later. RPWG will also discuss the category definitions under "degree to which proposed action benefits more than one resource or service". Karen stated the "measurement of results" criteria is new and was added to determine if what we have done can be quantified. Mark asked if the results are measurable, are we willing to spend the money to do it. Henry stated the first three criteria were being used in a two-stage process and then #4 is being evaluated on a one-stage process. Art stated to fund on an annual basis, you must have a measurable perimeter. Bob stated that this has to be applied to single projects and gave several examples. Pam stated she doesn't think we lose anything by dropping this criteria from the list because it is confusing. Marty is bothered by the transition from single projects to a suite of projects and asked for clarification.

Pam asked what is the difference between #1 and #4. Mark Fraker stated one is how well you can measure and the other is whether you can attribute changes. Art stated it is hard to measure the effects of an education program. John stated that criteria #4, measurement of results, will be deleted. Karen stated criteria #5 is applied separately to resources and services. Bob stated you answer the question separately for harm to people or species. Mark suggested rewording this explanation of separate application for presentation to the Trustee Council. Henry stated that this only reflects the negative impacts. Ken suggested using net environmental benefits. Henry stated it is hard to manage any resource without impacting another resource. Additional injuries are injuries beyond what conditions would be like pre-spill. Karen stated that the aspect of safety concerns of people implementing the option was added to criteria #6. Marty stated that this should not be applicable to agency people implementing the options. Ken stated the concern should be for the general public. John stated that the "persons implementing the option" will be deleted. Karen stated #7 considers indirect costs and benefits.

Marty was concerned about public agreement of high, low and medium. Bob stated that this category only tries to isolate things which are outstanding in cost. People should be able to agree on the extremes. Pam strongly recommended running these criteria by the attorneys and asking if they are adequate if we are involved in a lawsuit. Bob stated statutory tests should be applied to the alternatives. Marty's concerns with running this by attorneys is

the timing and also a non-consensus opinion is worthless. Karen explained the tracking criteria which uses yes, no or unknown for rating categories. Ken questioned how #1 is different from #8. The difference is baseline. Byron stated that #8 should be made a true criteria using high, medium and low. Pam suggested developing a high, medium, and low ranking for #8. Criteria #8 will be a category similar to #1 and will not be a tracking criteria. Criteria #9 addresses adverse impacts by waiting. Byron suggested adding purchase habitat in #9 and it was agreed upon. Criteria #10 records public comment. This criteria will be left in. Karen explained the eight categories for sorting. Pam asked why not stick to the five actions in the settlement and also suggested that the definitions be restated. Dave suggested deleting habitat acquisition. Marty suggested adding rehabilitation as a subset of direct restoration. Karen stated these are not exclusive categories. Marty stated that RPWG can spend a little more time on this and move on. Karen explained the three other criteria from the Restoration Framework which were not used. Dave asked why cost effectiveness was not used. Karen stated it was based on input from economists and that it overlaps #3. Jerome stated he has no problems with the three that were deleted.

RPWG will reconvene at 4:00 to complete the last agenda item.

REVIEW OF DRAFT THEMES FOR ALTERNATIVES - Loeffler

RPWG reconvened with the Restoration Team; however, Barbara was completing another task for Dave Gibbons and did not attend to take notes. Bob provided a copy of the handout from his presentation on draft alternative themes.

**RESTORATION PLANNING WORK GROUP
AUGUST 27 - SEPTEMBER 8, 1992**

Attendees:

Cathy Berg
Karen Klinge
John Strand
Art Weiner
Ray Thompson
Bob Loeffler
Carol Gorbics
Chris Swenson
Mark Fraker

The following items were distributed:

Curt McVee 8/26 memo to Mike Barton
Revised Evaluation Form

The following items were discussed:

Tomorrow RPWG will divide the work for the deliverables to the Restoration Team. Bob will be the point of contact in John's absence. Henry Gerke called and wants to talk with RPWG. John and Carol will meet with Henry and Doug Muetter to go over the process that RPWG will use to develop restoration alternatives. John and Carol will also respond to questions on the annotated outline to the Draft Restoration Plan.

EIS

Art stated that we need some direction from the Restoration Team as to where RPWG's schedule stands now with respect to the EIS contract. John stated this will become clearer after the teleconference on Monday, August 31.

EVALUATION EXERCISE

Ray and Chris will go through and review the public comment for each resource and service at the end of this process. Girke provided a definition for criteria #5, which John forwarded to Karen for review. RPWG continued with the evaluation exercise.

The following evaluation forms were modified per direction received from the Restoration Team on 8/26.

RESOURCE OR SERVICE: Pigeon Guillemots
Option 4 - (does not apply; nest too sparsely; no rating)

1. Potential to improve the rate or degree of recovery
- 1b. Potential to protect the area from further degradation
2. Technical feasibility
3. Degree to which proposed action benefits more than one resource or service
4. Enhancement
5. Potential for NO additional injury to:
 - other target or nontarget resources
 - other target or nontarget services
6. Potential effects of the action on human health and safety
7. The relationship of the expected costs of the proposed action to the expected benefits
8. Will the restoration opportunity be lost if implementation of the option is delayed
9. Public comments

RESOURCE OR SERVICE: Pigeon Guillemot
Options 20,22,36 (special designation)

1. Potential to improve the rate or degree of recovery
Low;
- 1b. Potential to protect the area from further degradation
Medium; moderate effect over a moderate portion
2. Technical feasibility
Medium;
3. Degree to which proposed action benefits more than one resource or service
High;
4. Enhancement
Low;
5. Potential for NO additional injury to:
 - other target or nontarget resources
High;
 - other target or nontarget services
Medium; would not do special designation on upland sites; would be near-shore coastal
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action to the expected benefits
Medium; less than outstanding benefits at a moderate cost
8. Will the restoration opportunity be lost if implementation of the option is delayed
No;
9. Public comments
Will be rated later

RESOURCE OR SERVICE: Pigeon Guillemot
Option 17B (reducing predator access) (expanded to include Pigeon Guillemot)

1. Potential to improve the rate or degree of recovery
Medium; if it works
- 1b. Potential to protect the area from further degradation
No rating; not applicable
2. Technical feasibility
Medium;
3. Degree to which proposed action benefits more than one resource or service
Low;
4. Enhancement
Medium;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
High;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action to the expected benefits
Medium;
8. Will the restoration opportunity be lost if implementation of the option is delayed
No;
9. Public comments
Will rate later

RESOURCE OR SERVICE: Pigeon Guillemot
Options 37,38 (acquisition and protection of private lands)

1. Potential to improve the rate or degree of recovery
Low;
- 1b. Potential to protect the area from further degradation
Medium; given the dispersed nature of the bird
2. Technical feasibility
Medium;
3. Degree to which proposed action benefits more than one resource or service
High;
4. Enhancement
Low;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
Medium;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action to the expected benefits
Low; high costs

8. Will the restoration opportunity be lost if implementation of the option is delayed

No;

9. Public comments

Will be rated later

RESOURCE OR SERVICE: Black oystercatcher
Option 13 (oiled mussel beds)

1. Potential to improve the rate or degree of recovery

Medium;

1b. Potential to protect the area from further degradation

Not applicable;

2. Technical feasibility

Unproven; Low;

3. Degree to which proposed action benefits more than one resource or service

High;

4. Enhancement

Low;

5. Potential for NO additional injury to:

-other target or nontarget resources

Medium; some short-term impact associated with cleaning

-other target or nontarget services

High;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of the option is delayed

No;

9. Public comments

Will rate later

RESOURCE OR SERVICE: Black Oystercatcher
Option 14 (restore fucus)
(same as 13 above)

1. Potential to improve the rate or degree of recovery

Medium;

1b. Potential to protect the area from further degradation

Not applicable;

2. Technical feasibility

Low/unknown;

3. Degree to which proposed action benefits more than one resource or service

High;

4. Enhancement

Low;

5. Potential for NO additional injury to:
-other target or nontarget resources

Medium;

-other target or nontarget services

High;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of the option is delayed

No;

9. Public comments

Will rate later

RESOURCE OR SERVICE: Black Oystercatcher

Option 20, 22, 26

1. Potential to improve the rate or degree of recovery

Medium; by reducing disturbance, rate or degree of recovery would be improved

- 1b. Potential to protect area from further degradation

Medium;

2. Technical feasibility

Medium;

3. Degree to which proposed action benefits more than one resource or service

High;

4. Enhancement

Low;

5. Potential for NO additional injury to:
-other target or nontarget resources

High;

-other target or nontarget services

Medium;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of the option is delayed

No;

9. Public comments

Will rate later

RESOURCE OR SERVICE: Black Oystercatcher

Options 37,38 (protection from private owners)

1. Potential to improve the rate or degree of recovery
Medium;
- 1b. Potential to protect the area from further degradation
Medium;
2. Technical feasibility
Medium;
3. Degree to which proposed action benefits more than one
resource or service
High;
4. Enhancement
Low;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
Medium;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action
to the expected benefits
Low;
8. Will the restoration opportunity be lost if implementation of
the option is delayed
No;
9. Public comments
Will be rated later

RESOURCE OR SERVICE: Harlequin Ducks
Option 8A

1. Potential to improve the rate or degree of recovery
Medium; hunting presence is low, but it could still have a moderate
effect
- 1b. Potential to protect the area from further degradation
Medium;
2. Technical feasibility
High;
3. Degree to which proposed action benefits more than one
resource or service
Low;
4. Enhancement
Low;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
Medium;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action
to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of the option is delayed

Yes;

9. Public comments

Will rate later

RESOURCE OR SERVICE: Harlequin Ducks

Option 8B (education)

1. Potential to improve the rate or degree of recovery

Medium;

1b. Potential to protect the area from further degradation

Medium;

2. Technical feasibility

Medium;

3. Degree to which proposed action benefits more than one resource or service

Low;

4. Enhancement

Low;

5. Potential for NO additional injury to:

-other target or nontarget resources

High;

-other target or nontarget services

Medium;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Low;

8. Will the restoration opportunity be lost if implementation of the option is delayed

Yes;

9. Public comments

Will be rated later

RESOURCE OR SERVICE: Harlequin Ducks

Option 13 (mussel beds)

1. Potential to improve the rate or degree of recovery

Medium; linkage is still being proven

1b. Potential to protect the area from further degradation

Not applicable;

2. Technical feasibility

Low/unknown;

3. Degree to which proposed action benefits more than one resource or service

High;

4. Enhancement

Low;

5. Potential for NO additional injury to:
-other target or nontarget resources

Medium;

-other target or nontarget services

High;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action
to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of
the option is delayed

Yes; species are declining

9. Public comments

Will rate later

RESOURCE OR SERVICE: Harlequin Duck

Options 20, 22, 26 (special designation areas)

1. Potential to improve the rate or degree of recovery

Medium; based on the assumption that disturbance is a factor

- 1b. Potential to protect area from further degradation

Medium;

2. Technical feasibility

High;

3. Degree to which proposed action benefits more than one
resource or service

High;

4. Enhancement

Low;

5. Potential for NO additional injury to:
-other target or nontarget resources

High;

-other target or nontarget services

Medium; impacts to logging through expanded buffer zones should be
minimal; there is also limited development planned in the EVOS area

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action
to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of
the option is delayed

No; there is not an urgency on public lands

9. Public comments

Will be rated later

RESOURCE OR SERVICE: Harlequin Duck

Option 26 (forest practices act)

1. Potential to improve the rate or degree of recovery
Medium;
- 1b. Potential to protect the area from further degradation
High;
2. Technical feasibility
High; the actual technical feasibility of doing it is poor because of the politics
3. Degree to which proposed action benefits more than one resource or service
High;
4. Enhancement
Low;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
Low;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action to the expected benefits
Medium; high cost and high benefits
8. Will the restoration opportunity be lost if implementation of the option is delayed
No; could be done any time
9. Public comments
Will be rated later

RESOURCE OR SERVICE: Harlequin Ducks
Option 37, 38 (protection on private lands)

1. Potential to improve the rate or degree of recovery
Medium;
- 1b. Potential to protect the area from further degradation
High; could be pretty wide spread and significant
2. Technical feasibility
High;
3. Degree to which proposed action benefits more than one resource or service
High;
4. Enhancement
Low;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
Medium;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action to the expected benefits

Medium; high cost and high benefit

8. Will the restoration opportunity be lost if implementation of the option is delayed

Yes; especially in the spill zone

9. Public comments

Will be rated later

RESOURCE OR SERVICE: Bald Eagles

Options 20,22,36 (more protection to buffer zones)

1. Potential to improve the rate or degree of recovery

Medium;

1b. Potential to protect the area from further degradation

Medium;

2. Technical feasibility

High;

3. Degree to which proposed action benefits more than one resource or service

Medium; most imagined protection strategies would be focused on single species; some larger designations could encompass strips of the coastal area, which would benefit more than one

4. Enhancement

Low;

5. Potential for NO additional injury to:

-other target or nontarget resources

High;

-other target or nontarget services

Medium;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium; moderate costs

8. Will the restoration opportunity be lost if implementation of the option is delayed

No;

9. Public comments

Will be rated later

RESOURCE OR SERVICE: Bald Eagles

Option 26 (buffer strips)

1. Potential to improve the rate or degree of recovery

Medium;

1b. Potential to protect the area from further degradation

Medium;

2. Technical feasibility

High;

3. Degree to which proposed action benefits more than one resource or service

High;

4. Enhancement

Low;

5. Potential for NO additional injury to:
-other target or nontarget resources

High;

-other target or nontarget services

Low; long-term impact

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action
to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of
the option is delayed

No;

9. Public comments

Will be rated later

RESOURCE OR SERVICE: Bald Eagles

Option 37, 38 (private lands)

1. Potential to improve the rate or degree of recovery

Medium;

1b. Potential to protect the area from further degradation

High;

2. Technical feasibility

High;

3. Degree to which proposed action benefits more than one
resource or service

Medium; most often it will focus just on bald eagles

4. Enhancement

Low;

5. Potential for NO additional injury to:
-other target or nontarget resources

High;

-other target or nontarget services

Medium;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action
to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of
the option is delayed

No;

9. Public comments

Will be rated later

RESOURCE OR SERVICE: Brown Bears

Option 8

1. Potential to improve the rate or degree of recovery
Low;
- 1b. Potential to protect the area from further degradation
Medium;
2. Technical feasibility
High;
3. Degree to which proposed action benefits more than one
resource or service
Low;
4. Enhancement
Medium;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
Medium; short term
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action
to the expected benefits
Medium;
8. Will the restoration opportunity be lost if implementation of
the option is delayed
No;
9. Public comments

Will be rated later

RESOURCE OR SERVICE: Harbor Seals
Option 4

1. Potential to improve the rate or degree of recovery
High;
- 1b. Potential to protect the area from further degradation
Not applicable;
2. Technical feasibility
High;
3. Degree to which proposed action benefits more than one
resource or service
Low; (ask Mark about haulout)
4. Enhancement
Low;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
Medium; depends on the level of restrictions
6. Potential effects of the action on human health and safety
High;

7. The relationship of the expected costs of the proposed action to the expected benefits

High;

8. Will the restoration opportunity be lost if implementation of the option is delayed

Yes; harbor seals are declining

9. Public comments

Will rate later

RESOURCE OR SERVICE: Harbor Seals

Option 8b

1. Potential to improve the rate or degree of recovery

High;

1b. Potential to protect the area from further degradation

High;

2. Technical feasibility

Medium;

3. Degree to which proposed action benefits more than one resource or service

Low;

4. Enhancement

Low;

5. Potential for NO additional injury to:

-other target or nontarget resources

High;

-other target or nontarget services

Medium;

6. Potential effects of the action on human health and safety

Medium;

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium; high costs with high benefits

8. Will the restoration opportunity be lost if implementation of the option is delayed

Yes;

9. Public comments

Will rate later

RESOURCE OR SERVICE: Harbor Seals

Options 20, 22, 36

1. Potential to improve the rate or degree of recovery

High; has great potential to reduce disturbance

1b. Potential to protect the area from further degradation

High;

2. Technical feasibility

High;

3. Degree to which proposed action benefits more than one resource or service

High;
4. Enhancement
Low;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
Medium;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action
to the expected benefits
High;
8. Will the restoration opportunity be lost if implementation of
the option is delayed
Yes;
9. Public comments
Will rate later

RESOURCE OR SERVICE: Cutthroat Trout
Option 2a

1. Potential to improve the rate or degree of recovery
Medium; great ability for improvement for small streams
1b. Potential to protect the area from further degradation
Medium; ability to prevent
2. Technical feasibility
High; something already in place, is there enough data to
3. Degree to which proposed action benefits more than one
resource or service
Low;
4. Enhancement
Low; temperature preference
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
Medium;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action
to the expected benefits
Medium;
8. Will the restoration opportunity be lost if implementation of
the option is delayed
Yes;
9. Public comments
Will rate later

RESOURCE OR SERVICE: Cutthroat Trout

Options 11a, b, c,

1. Potential to improve the rate or degree of recovery
Medium; problem is near shore and focuses on fresh water
- 1b. Potential to protect the area from further degradation
Not applicable;
2. Technical feasibility
High; all techniques will improve all salmonids
3. Degree to which proposed action benefits more than one resource or service
Medium;
4. Enhancement
Medium;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
High;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action to the expected benefits
Medium;
8. Will the restoration opportunity be lost if implementation of the option is delayed
No;
9. Public comments
Will rate later

RESOURCE OR SERVICE: Cutthroat Trout
Option 14

1. Potential to improve the rate or degree of recovery
High; we are assuming a positive link between Fucus and the prey for cutthroat trout
- 1b. Potential to protect the area from further degradation
Not applicable;
2. Technical feasibility
Yes;
3. Degree to which proposed action benefits more than one resource or service
High;
4. Enhancement
Low;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
High;
6. Potential effects of the action on human health and safety
High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of the option is delayed

No;

9. Public comments

Will rate later

RESOURCE OR SERVICE: Cutthroat Trout

Option 19

1. Potential to improve the rate or degree of recovery

Low;

1b. Potential to protect the area from further degradation

Medium;

2. Technical feasibility

High;

3. Degree to which proposed action benefits more than one resource or service

High;

4. Enhancement

Low;

5. Potential for NO additional injury to:

-other target or nontarget resources

High;

-other target or nontarget services

High;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of the option is delayed

No;

9. Public comments

Will rate later

RESOURCE OR SERVICE: Cutthroat Trout

Options 20, 22, 36, 6

1. Potential to improve the rate or degree of recovery

Low;

1b. Potential to protect the area from further degradation

Low;

2. Technical feasibility

High;

3. Degree to which proposed action benefits more than one resource or service

High;
4. Enhancement
Low;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
Medium;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action
to the expected benefits
Medium;
8. Will the restoration opportunity be lost if implementation of
the option is delayed
Medium;
9. Public comments
Will rate later

RESOURCE OR SERVICE: Cutthroat Trout
Option 26

1. Potential to improve the rate or degree of recovery
Low;
1b. Potential to protect the area from further degradation
Low;
2. Technical feasibility
High;
3. Degree to which proposed action benefits more than one
resource or service
High;
4. Enhancement
Low;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
Low;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action
to the expected benefits
Low;
8. Will the restoration opportunity be lost if implementation of
the option is delayed
No;
9. Public comments
Will rate later

RESOURCE OR SERVICE: Cutthroat Trout

Option 37, 38

1. Potential to improve the rate or degree of recovery
Low;
- 1b. Potential to protect the area from further degradation
Low;
2. Technical feasibility
High;
3. Degree to which proposed action benefits more than one resource or service
High;
4. Enhancement
Low;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
Medium;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action to the expected benefits
Low;
8. Will the restoration opportunity be lost if implementation of the option is delayed
No;
9. Public comments
Will rate later

Note: Dolly Varden are rated the same as Cutthroat Trout

RESOURCE OR SERVICE: Sockeye Salmon
Option 2a

1. Potential to improve the rate or degree of recovery
High; stock separation, intensify management
- 1b. Potential to protect the area from further degradation
High;
2. Technical feasibility
Medium; stock separation
3. Degree to which proposed action benefits more than one resource or service
High;
4. Enhancement
Low;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services;
High; increase knowledge and management

6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action to the expected benefits
High;
8. Will the restoration opportunity be lost if implementation of the option is delayed
Yes;
9. Public comments
Will rate later

RESOURCE OR SERVICE: Sockeye Salmon
Option 11a, b, c

1. Potential to improve the rate or degree of recovery
High;
- 1b. Potential to protect area from further degradation
High;
2. Technical feasibility
High;
3. Degree to which proposed action benefits more than one resource or service
High;
4. Enhancement
Medium;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
High;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action to the expected benefits
High;
8. Will the restoration opportunity be lost if implementation of the option is delayed
Yes;
9. Public comments
Will rate later

RESOURCE OR SERVICE: Sockeye Salmon
Option 18a

1. Potential to improve the rate or degree of recovery
Medium;
- 1b. Potential to protect the area from further degradation
N/A
2. Technical feasibility
High;

3. Degree to which proposed action benefits more than one resource or service

High;

4. Enhancement

Medium;

5. Potential for NO additional injury to:
-other target or nontarget resources

Medium;

-other target or nontarget services;

High; assuming land use impacts are taken into account

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

High;

8. Will the restoration opportunity be lost if implementation of the option is delayed

No;

9. Public comments

Will rate later

RESOURCE OR SERVICE: Sockeye Salmon

Option 18b

1. Potential to improve the rate or degree of recovery

High;

1b. Potential to protect the area from further degradation

High;

2. Technical feasibility

High;

3. Degree to which proposed action benefits more than one resource or service

High;

4. Enhancement

Low;

5. Potential for NO additional injury to:
-other target or nontarget resources

High;

-other target or nontarget services

High;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of the option is delayed

Yes;

9. Public comments

Will rate later

RESOURCE OR SERVICE: Sockeye Salmon
Option 18c

1. Potential to improve the rate or degree of recovery
Medium;
- 1b. Potential to protect the area from further degradation
N/A
2. Technical feasibility
High;
3. Degree to which proposed action benefits more than one
resource or service
High;
4. Enhancement
Medium;
5. Potential for NO additional injury to:
-other target or nontarget resources
Medium; assuming that land use impacts are taken care of in
permitting process
-other target or nontarget services
High;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action
to the expected benefits
Medium;
8. Will the restoration opportunity be lost if implementation of
the option is delayed
No;
9. Public comments
Will rate later

RESOURCE OR SERVICE: Sockeye Salmon
Option 19

1. Potential to improve the rate or degree of recovery
Low;
- 1b. Potential to protect the area from further degradation
Medium;
2. Technical feasibility
High;
3. Degree to which proposed action benefits more than one
resource or service
High;
4. Enhancement
Low;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
High;
6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of the option is delayed

No;

9. Public comments

Will rate later.

RESOURCE OR SERVICE: Sockeye Salmon

Options 20, 22, 36, 6

1. Potential to improve the rate or degree of recovery

Low;

- 1b. Potential to protect the area from further degradation

Low;

2. Technical feasibility

High;

3. Degree to which proposed action benefits more than one resource or service

High;

4. Enhancement

Low;

5. Potential for NO additional injury to:

-other target or nontarget resources

High;

-other target or nontarget services

Medium;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of the option is delayed

No;

9. Public comments

Will rate later

RESOURCE OR SERVICE:

Option 26

1. Potential to improve the rate or degree of recovery

Low;

- 1b. Potential to protect the area from further degradation

Low;

2. Technical feasibility

High;

3. Degree to which proposed action benefits more than one resource or service

High;

4. Enhancement

Low;

5. Potential for NO additional injury to:
-other target or nontarget resources

High;

-other target or nontarget services

Low;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Low;

8. Will the restoration opportunity be lost if implementation of the option is delayed

No;

9. Public comments

Will rate later

RESOURCE OR SERVICE: Sockeye Salmon

Option 37, 38

1. Potential to improve the rate or degree of recovery

Medium;

1b. Potential to protect the area from further degradation

Medium;

2. Technical feasibility

High;

3. Degree to which proposed action benefits more than one resource or service

High;

4. Enhancement

Low;

5. Potential for NO additional injury to:
-other target or nontarget resources

High;

-other target or nontarget services

Medium;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of the option is delayed

No; unless there is imminent threat

9. Public comments

Will rate later

RESOURCE OR SERVICE: Recreation, concentrated development (visitor center, highway access - need a better name)
Option 33b

1. Potential to improve the rate or degree of recovery
N/A
- 1b. Potential to protect the area from further degradation
N/A
2. Technical feasibility
High;
3. Degree to which proposed action benefits more than one resource or service
Low;
4. Enhancement
N/A
5. Potential for NO additional injury to:
-other target or nontarget resources
High; highway, in town, or elsewhere already designated for this use
-other target or nontarget services
High;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action to the expected benefits
High;
8. Will the restoration opportunity be lost if implementation of the option is delayed
No;
9. Public comments
Will rate later

Note: This is replacement, effectiveness of replacement using criteria in 1A - unsure if it needs rating as effectiveness of replacement, however, we feel a lot of people could get value out of it

RESOURCE OR SERVICE: Back Country - developed
Option 6,20,22,36

1. Potential to improve the rate or degree of recovery
N/A
- 1b. Potential to protect the area from further degradation
N/A
2. Technical feasibility
High;
3. Degree to which proposed action benefits more than one resource or service
High;
4. Enhancement
High;
5. Potential for NO additional injury to:

-other target or nontarget resources
 High;
 -other target or nontarget services
 Low;
 6. Potential effects of the action on human health and safety
 Medium;
 7. The relationship of the expected costs of the proposed action to the expected benefits
 Medium;
 8. Will the restoration opportunity be lost if implementation of the option is delayed
 No; unless imminent threat
 9. Public comments
 Will rate later

RESOURCE OR SERVICE: Back Country Developed
 Option 12a and b

1. Potential to improve the rate or degree of recovery
 N/A
 1b. Potential to prevent further degradation
 Low; can prevent resource damage
 2. Technical feasibility
 High;
 3. Degree to which proposed action benefits more than one resource or service
 Medium;
 4. Enhancement
 Medium;
 5. Potential for NO additional injury to:
 -other target or nontarget resources
 Medium;
 -other target or nontarget services
 Low;
 6. Potential effects of the action on human health and safety
 High;
 7. The relationship of the expected costs of the proposed action to the expected benefits
 Medium;
 8. Will the restoration opportunity be lost if implementation of the option is delayed
 No;
 9. Public comments
 Will rate later

RESOURCE OR SERVICE: Back Country - developed
 Option 12c

1. Potential to improve the rate or degree of recovery
 N/A;
 1b. Potential to protect the area from further degradation
 N/A;

2. Technical feasibility
High;
3. Degree to which proposed action benefits more than one resource or service
Medium;
4. Enhancement
High;
5. Potential for NO additional injury to:
-other target or nontarget resources
Low; long-term impacts, but they may not be severe
-other target or nontarget services
High;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action to the expected benefits
Medium;
8. Will the restoration opportunity be lost if implementation of the option is delayed
No;
9. Public comments
Will rate later

RESOURCE OR SERVICE: Back Country Developed
Option 28

1. Potential to improve the rate or degree of recovery
Medium;
- 1b. Potential to prevent further degradation
High;
2. Technical feasibility
High;
3. Degree to which proposed action benefits more than one resource or service
Medium;
4. Enhancement
Medium;
5. Potential for NO additional injury to:
-other target or nontarget resources
Medium;
-other target or nontarget services
High;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action to the expected benefits
Medium;
8. Will the restoration opportunity be lost if implementation of the option is delayed
No;
9. Public comments

Will rate later

RESOURCE OR SERVICE: Back Country Developed
Option 37,38

1. Potential to improve the rate or degree of recovery
N/A;
- 1b. Potential to prevent further degradation
High;
2. Technical feasibility
High;
3. Degree to which proposed action benefits more than one
resource or service
High;
4. Enhancement
High;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
Low;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action
to the expected benefits
Medium;
8. Will the restoration opportunity be lost if implementation of
the option is delayed
No; unless imminent threat
9. Public comments
Will rate later

9/2/92

RESOURCE OR SERVICE: Archaeology
Option 1

1. Potential to improve the rate or degree of recovery
N/A
- 1b. Potential to protect the area from further degradation
High;
2. Technical feasibility
Medium;
3. Degree to which proposed action benefits more than one
resource or service
Low; may benefit social wellbeing to people in rural communities
4. Enhancement
Low; increases the knowledge base
5. Potential for NO additional injury to:

-other target or nontarget resources
 High;
 -other target or nontarget services
 High;
 6. Potential effects of the action on human health and safety
 High;
 7. The relationship of the expected costs of the proposed action to the expected benefits
 High;
 8. Will the restoration opportunity be lost if implementation of the option is delayed
 Yes;
 9. Public comments
 Will rate later

RESOURCE OR SERVICE: Preservation of Archaeological Sites
 Option 10

1. Potential to improve the rate or degree of recovery
 N/A
 1b. Potential to protect area from further degradation
 Medium;
 2. Technical feasibility
 High;
 3. Degree to which proposed action benefits more than one resource or service
 Low; may provide social benefits to local communities
 4. Enhancement
 Low; may benefit local communities with local volunteers and increase knowledge of local archaeological history
 5. Potential for NO additional injury to:
 -other target or nontarget resources
 High;
 -other target or nontarget services
 High;
 6. Potential effects of the action on human health and safety
 High;
 7. The relationship of the expected costs of the proposed action to the expected benefits
 Medium;
 8. Will the restoration opportunity be lost if implementation of the option is delayed
 Yes; when critical sites are identified, the option needs to be scheduled quickly until then no
 9. Public comments
 Will rate later

RESOURCE OR SERVICE: Archaeology replacement
 Option 35

1. Potential to improve the rate or degree of recovery
N/A
- 1b. Potential to protect the area from further degradation
N/A; this is a replacement project
2. Technical feasibility
High;
3. Degree to which proposed action benefits more than one resource or service
Low;
4. Enhancement
Low;
5. Potential for NO additional injury to:
-other target or nontarget resources
Medium; if done correctly and not offering to purchase, there should be no problem
-other target or nontarget services
High;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action to the expected benefits
Low;
8. Will the restoration opportunity be lost if implementation of the option is delayed
No;
9. Public comments
Will rate later

RESOURCE OR SERVICE: Brown Bears
Options 20,22,36

1. Potential to improve the rate or degree of recovery
Low;
- 1b. Potential to protect the area from further degradation
Low;
2. Technical feasibility
Medium;
3. Degree to which proposed action benefits more than one resource or service
Medium; broad scale application of more sensitive management through existing agency authorities
4. Enhancement
Low;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
Medium;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action

to the expected benefits

Low;

8. Will the restoration opportunity be lost if implementation of the option is delayed

No;

9. Public comments

Will rate later

RESOURCE OR SERVICE: Brown Bears

Option 13

1. Potential to improve the rate or degree of recovery

Unknown;

1b. Potential to protect the area from further degradation

Unknown; extent of injury is unknown, therefore, unsure if it is causing injury

2. Technical feasibility

High;

3. Degree to which proposed action benefits more than one resource or service

High;

4. Enhancement

Low;

5. Potential for NO additional injury to:

-other target or nontarget resources

Medium;

-other target or nontarget services

High;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Unknown;

8. Will the restoration opportunity be lost if implementation of the option is delayed

No;

9. Public comments

Will rate later

RESOURCE OR SERVICE: Brown Bears

Options 37, 38

1. Potential to improve the rate or degree of recovery

N/A

1b. Potential to protect the area from further degradation

High; would have to be applied on a broad scale basis which covers concentration sites used by bears

2. Technical feasibility

High;

3. Degree to which proposed action benefits more than one

resource or service

High;

4. Enhancement

Low;

5. Potential for NO additional injury to:
-other target or nontarget resources

High;

-other target or nontarget services

Low;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action
to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of
the option is delayed

No; if imminent threat to critical habitat, it would be important
to implement quickly, but on a broad scale application, it is low

9. Public comments

Will rate later

RESOURCE OR SERVICE: Killer Whales

Option 4

1. Potential to improve the rate or degree of recovery

N/A; if there is current disturbance at a rubbing beach that is
preventing their use, then this should be rated

1b. Potential to protect the area from further degradation

Medium; this assumes the potential for increased disturbance

2. Technical feasibility

Medium;

3. Degree to which proposed action benefits more than one
resource or service

Medium;

4. Enhancement

Low;

5. Potential for NO additional injury to:
-other target or nontarget resources

High;

-other target or nontarget services

Medium;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action
to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of
the option is delayed

No;

9. Public comments

Will rate later

RESOURCE OR SERVICE: Killer Whales
Options 20, 22

1. Potential to improve the rate or degree of recovery
N/A; if there is current disturbance at a rubbing beach that is preventing their use, then this should be rated
- 1b. Degradation
Medium;
2. Technical feasibility
Medium;
3. Degree to which proposed action benefits more than one resource or service
Medium;
4. Measurement of results
Low;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
Medium;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action to the expected benefits
Medium;
8. Will the restoration opportunity be lost if implementation of the option is delayed
No;
9. Public comments
Will rate later

RESOURCE OR SERVICE: River Otter
Option 8A

1. Potential to improve the rate or degree of recovery
High;
- 1b. Potential to protect the area from further degradation
High;
2. Technical feasibility
High;
3. Degree to which proposed action benefits more than one resource or service
Low;
4. Enhancement
Medium;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
Medium; may cause significant loss to some individuals
6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

High;

8. Will the restoration opportunity be lost if implementation of the option is delayed

Yes;

9. Public comments

Will rate later

RESOURCE OR SERVICE: River Otter

Option 13a

1. Potential to improve the rate or degree of recovery

High; equal Sea Otter

- 1b. Potential to protect from further degradation

High;

2. Technical feasibility

High;

3. Degree to which proposed action benefits more than one resource or service

High;

4. Enhancement

Low;

5. Potential for NO additional injury to:

-other target or nontarget resources

Medium;

-other target or nontarget services

High;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of the option is delayed

Yes;

9. Public comments

Will rate later

RESOURCE OR SERVICE: River Otter

Option 14

1. Potential to improve the rate or degree of recovery

Unknown; we need to determine frequency of foraging (contact PI)

- 1b. Potential to protect the area from further degradation

Unknown; same as above

2. Technical feasibility

Yes;

3. Degree to which proposed action benefits more than one

resource or service

High;

4. Enhancement

Low;

5. Potential for NO additional injury to:
-other target or nontarget resources

High;

-other target or nontarget services

High;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action
to the expected benefits

Unknown; need to contact PI

8. Will the restoration opportunity be lost if implementation of
the option is delayed

Yes;

9. Public comments

Will rate later

RESOURCE OR SERVICE: River Otter - Special Designations
Option 20, 22, 6

1. Potential to improve the rate or degree of recovery

N/A

1b. Potential to protect area from further degradation

Low;

2. Technical feasibility

High;

3. Degree to which proposed action benefits more than one
resource or service

High;

4. Enhancement

Low;

5. Potential for NO additional injury to:
-other target or nontarget resources

High;

-other target or nontarget services

Medium

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action
to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of
the option is delayed

No;

9. Public comments

Will rate later

RESOURCE OR SERVICE: River Otter
Option 37, 38

1. Potential to improve the rate or degree of recovery
N/A
- 1b. Degradation
Medium;
2. Technical feasibility
High;
3. Degree to which proposed action benefits more than one resource or service
High;
4. Enhancement
Low;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
Medium;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action to the expected benefits
Medium;
8. Will the restoration opportunity be lost if implementation of the option is delayed
No;
9. Public comments
Will rate later

RESOURCE OR SERVICE: Harbor Seal
Option 8A - Marine Mammal Protection Act

1. Potential to improve the rate or degree of recovery
High;
- 1b. Potential to prevent further degradation
High;
2. Technical feasibility
High;
3. Degree to which proposed action benefits more than one resource or service
Medium;
4. Enhancement
Low;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
Low;
6. Potential effects of the action on human health and safety
Medium;

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of the option is delayed

No; other opportunities; a voluntary program would be just as effective

9. Public comments

Will rate later

Note: There were no notes for this period.

RESOURCE OR SERVICE: Intertidal
Option 13

1. Potential to improve the rate or degree of recovery

Medium; high potential when focused on mussel beds but lower when focused on mussels in general. We assume cleaning mussel beds would provide a great improvement for a small area.

- 1b. Potential to protect the area from further degradation

Not applicable; they are stable and not getting worse

2. Technical feasibility

High; in reference to mussel beds

3. Degree to which proposed action benefits more than one resource or service

High;

4. Enhancement

Low; not an enhancement

5. Potential for NO additional injury to:

-other target or nontarget resources

Medium;

-other target or nontarget services

High;

6. Potential effects of the action on human health and safety

High; disregarding workers

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium; this would be low if the insomniac mussels have a substantial amount of oil

8. Will the restoration opportunity be lost if implementation of the option is delayed

Yes;

9. Public comments

Will review later

RESOURCE OR SERVICE: Intertidal
Option 14

1. Potential to improve the rate or degree of recovery

Medium; if it works, it will help that discrete area

1b. Potential to protect the area from further degradation

Not applicable;

2. Technical feasibility

Unproven;

3. Degree to which proposed action benefits more than one resource or service

High;

4. Enhancement

Low;

5. Potential for NO additional injury to:

-other target or nontarget resources

High;

-other target or nontarget services

High;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium; high cost and high benefits

8. Will the restoration opportunity be lost if implementation of the option is delayed

No;

9. Public comments

Will rate later

RESOURCE OR SERVICE: Intertidal
Option 15B

1. Potential to improve the rate or degree of recovery

Low; small improvement over a small area

1b. Potential to protect the area from further degradation

Not applicable;

2. Technical feasibility

High;

3. Degree to which proposed action benefits more than one resource or service

High;

4. Enhancement

Low;

5. Potential for NO additional injury to:

-other target or nontarget resources

High; in general there is not enough oil trapped in those at-risk areas; limited number of potential cleanup sights; in a few areas may be useful

-other target or nontarget services

High;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Low; (may want to revisit after reviewing the write up)

8. Will the restoration opportunity be lost if implementation of the option is delayed

No;

9. Public comments

Will rate later

Note: There are no known options for taking care of subtidal species. Herring substrates will be dealt with for Herring.

RESOURCE OR SERVICE: Wilderness

Option 37,38

1. Potential to improve the rate or degree of recovery

High;

1B. Potential to protect the area from further degradation

High;

2. Technical feasibility

High;

3. Degree to which proposed action benefits more than one resource or service

High;

4. Enhancement

High;

5. Potential for NO additional injury to:

-other target or nontarget resources

High;

-other target or nontarget services

Low;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of the option is delayed

No; only if imminent threat

9. Public comments

Will rate later

RESOURCE OR SERVICE: Recreation

Option 12C (backcountry commercial facilities)

Note: We assume that this is done in an area already designated for its use and could be private or public land currently undeveloped.

1. Potential to improve the rate or degree of recovery

Not applicable; what we are dealing with for recreation is a replacement for recreation uses lost but right now we don't have

injury. There is a continuing injury to perception.

1B. Degradation

Not applicable;

2. Technical feasibility

High;

3. Degree to which proposed action benefits more than one resource or service

Medium;

4. Enhancement

High;

5. Potential for NO additional injury to:

-other target or nontarget resources

Low; long-term impacts which may not be severe if properly managed (e.g., disturbance to marine mammals through increased vessel traffic)

-other target or nontarget services

High, we are not evaluating land use impacts because the land is already designed for that use.

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of the option is delayed

No;

9. Public comments

Will rate later

RESOURCE OR SERVICE: Recreation

Option 28

1. Potential to improve the rate or degree of recovery

Medium;

1B. Potential to protect the area from further degradation

High;

2. Technical feasibility

High;

3. Degree to which proposed action benefits more than one resource or service

Medium;

4. Enhancement

Medium; provides access beyond what we have now

5. Potential for NO additional injury to:

-other target or nontarget resources

Medium;

-other target or nontarget services

High;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of the option is delayed

No; unless imminent threat

9. Public comments

Will rate later

RESOURCE OR SERVICE: Recreation

Option 37,38

1. Potential to improve the rate or degree of recovery

N/A;

1B. Degradation

High;

2. Technical feasibility

High;

3. Degree to which proposed action benefits more than one resource or service

High;

4. Enhancement

High;

5. Potential for NO additional injury to:

-other target or nontarget resources

High;

-other target or nontarget services

Low;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of the option is delayed

No; unless imminent threat

9. Public comments

RESOURCE OR SERVICE: Nondeveloped Recreation

Note: Ratings are the same as Wilderness Values

1. Potential to improve the rate or degree of recovery

1b. Potential to protect the area from further degradation

2. Technical feasibility

3. Degree to which proposed action benefits more than one resource or service

4. Enhancement

5. Potential for NO additional injury to:

-other target or nontarget resources

-other target or nontarget services

6. Potential effects of the action on human health and safety

7. The relationship of the expected costs of the proposed action

- to the expected benefits
- 8. Will the restoration opportunity be lost if implementation of the option is delayed
- 9. Public comments

RESOURCE OR SERVICE: Special Designation
Options 20,22,6,36

- 1. Potential to improve the rate or degree of recovery
N/A
- 1B. Potential to protect the area from further degradation
High;
- 2. Technical feasibility
High;
- 3. Degree to which proposed action benefits more than one resource or service
High;
- 4. Enhancement
Low;
- 5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
Low;
- 6. Potential effects of the action on human health and safety
High;
- 7. The relationship of the expected costs of the proposed action to the expected benefits
Medium; because of indirect costs
- 8. Will the restoration opportunity be lost if implementation of the option is delayed
No; unless imminent threat
- 9. Public comments
Will rate later

RESOURCE OR SERVICE: Special Designation
37,38

- 1. Potential to improve the rate or degree of recovery
N/A
- 1b. Potential to protect the area from further degradation
High;
- 2. Technical feasibility
High;
- 3. Degree to which proposed action benefits more than one resource or service
High;
- 4. Enhancement
High;
- 5. Potential for NO additional injury to:

-other target or nontarget resources
 High;
 -other target or nontarget services
 Low;
 6. Potential effects of the action on human health and safety
 High;
 7. The relationship of the expected costs of the proposed action to the expected benefits
 Medium;
 8. Will the restoration opportunity be lost if implementation of the option is delayed
 No;
 9. Public comments
 Will rate later

The following resources and services will be considered under education:

Marine Mammals
 -Harbor Seals
 -Other
 Birds
 -Common Murres
 Fish
 -Cutthroat Trout
 -Sockeye Salmon
 Archaeology
 Public Awareness

RESOURCE OR SERVICE: Harbor Seals
 Programmatic Options: Education

1. Potential to improve the rate or degree of recovery
 Medium;
 1B. Potential to protect the area from further degradation
 Medium;
 2. Technical feasibility
 High;
 3. Degree to which proposed action benefits more than one resource or service
 Medium;
 4. Enhancement
 Low;
 5. Potential for NO additional injury to:
 -other target or nontarget resources
 High;
 -other target or nontarget services
 Medium; some affect for tour boats
 6. Potential effects of the action on human health and safety
 High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of the option is delayed

Yes; there is a decline in population

9. Public comments

Will rate later

RESOURCE OR SERVICE: Other

Programmatic Option: Education

1. Potential to improve the rate or degree of recovery

Medium;

- 1B. Potential to protect the area from further degradation

Low;

2. Technical feasibility

High;

3. Degree to which proposed action benefits more than one resource or service

Medium;

4. Enhancement

Low;

5. Potential for NO additional injury to:

-other target or nontarget resources

High;

-other target or nontarget services

Medium;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of the option is delayed

No;

9. Public comments

RESOURCE OR SERVICE: Common Murre

Programmatic Option: Education

1. Potential to improve the rate or degree of recovery

Medium;

- 1B. Potential to protect the area from further degradation

Medium;

2. Technical feasibility

High;

3. Degree to which proposed action benefits more than one resource or service

Low;

4. Enhancement

Low;

5. Potential for NO additional injury to:

-other target or nontarget resources

High;

-other target or nontarget services

Medium;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of the option is delayed

Yes;

9. Public comments

Will rate later

RESOURCE OR SERVICE: Sport Fish (Cutthroat and Sockeye)

Programmatic Option: Education

1. Potential to improve the rate or degree of recovery

Medium;

1b. Potential to protect the area from further degradation

Medium;

2. Technical feasibility

Medium;

3. Degree to which proposed action benefits more than one resource or service

Medium;

4. Enhancement

Medium;

5. Potential for NO additional injury to:

-other target or nontarget resources

High;

-other target or nontarget services

High;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of the option is delayed

No; given the other management tools

9. Public comments

RESOURCE OR SERVICE: Archaeology

Programmatic Option: Education

1. Potential to improve the rate or degree of recovery
N/A
- 1b. Potential to protect area from further degradation
High;
2. Technical feasibility
Medium;
3. Degree to which proposed action benefits more than one resource or service
Low;
4. Enhancement
Low;
5. Potential for NO additional injury to:
-other target or nontarget resources
High; any education program must be done very careful so that a black market is not promoted
-other target or nontarget services
High;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action to the expected benefits
Medium;
8. Will the restoration opportunity be lost if implementation of the option is delayed
Yes;
9. Public comments

RESOURCE OR SERVICE: Public Awareness
Programmatic Option: Education

1. Potential to improve the rate or degree of recovery
High;
- 1b. Potential to protect the area from further degradation
High;
2. Technical feasibility
High;
3. Degree to which proposed action benefits more than one resource or service
High;
4. Enhancement
High;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
High;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action to the expected benefits
Medium;

8. Will the restoration opportunity be lost if implementation of the option is delayed

No;

9. Public comments

Will rate later

Meeting adjourned at 3:15. The only category remaining is law enforcement. Meeting will begin on 9/3 at 8:30.

Programmatic Option: Field Presence

Option 7 (Management of Human Uses)

Note: The criteria will be applied when alternatives are developed.

1. Potential to improve the rate or degree of recovery
- 1b. Potential to protect the area from further degradation
2. Technical feasibility
3. Degree to which proposed action benefits more than one resource or service
4. Enhancement
5. Potential for NO additional injury to:
 - other target or nontarget resources
 - other target or nontarget services
6. Potential effects of the action on human health and safety
7. The relationship of the expected costs of the proposed action to the expected benefits
8. Will the restoration opportunity be lost if implementation of the option is delayed
9. Public comments

RESOURCE OR SERVICE: Herring
Option 2A - Increase Management

1. Potential to improve the rate or degree of recovery
Unknown; population level injury is equivocal
- 1B. Potential to protect the area from further degradation
Unknown;
2. Technical feasibility
High;
3. Degree to which proposed action benefits more than one resource or service
Low;
4. Enhancement
Medium; depends upon the specific management action
5. Potential for NO additional injury to:
 - other target or nontarget resources
High;
 - other target or nontarget services
Medium; depends upon the specific management action

6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action to the expected benefits
Low; high cost; benefits are unknown and current understanding is they would not be outstanding
8. Will the restoration opportunity be lost if implementation of the option is delayed
No;
9. Public comments
Will rate later

RESOURCE OR SERVICE: Herring

Option 15A

Note: Based on what the option is perceived to be and not the write-up

1. Potential to improve the rate or degree of recovery
Unknown; population level injury is equivocal
1b. Potential to protect the area from further degradation
Unknown;
2. Technical feasibility
Medium;
3. Degree to which proposed action benefits more than one resource or service
High;
4. Enhancement
Medium;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
High;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action to the expected benefits
Medium; benefits are unknown but indications are less than outstanding
8. Will the restoration opportunity be lost if implementation of the option is delayed
No;
9. Public comments

RESOURCE OR SERVICE: Herring

Option 6,22,20,36

Note: Bob felt designating special areas has no effect on this particular resource.

1. Potential to improve the rate or degree of recovery

Not applicable; population level injury is equivocal

1B. Potential to protect the area from further degradation

Unknown;

2. Technical feasibility

High;

3. Degree to which proposed action benefits more than one resource or service

High;

4. Enhancement

Low;

5. Potential for NO additional injury to:

-other target or nontarget resources

High;

-other target or nontarget services

Low;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of the option is delayed

No;

9. Public comments

Will rate later

Meeting adjourned at 10:15 and will reconvene 9/8 at 1:15.

The evaluation exercise continued on 9/9. Joe Sullivan attended to provide input on fish.

RESOURCE OR SERVICE: Pink Salmon

Option 2A (intensify management)

Joe - Pink salmon tend to stray and have been managed by considering them individual stocks. There was debate over the injury to pink. There is injury at the egg fry level. The difficulty was whether they have compensatory mechanisms at different levels to recover. Management for pink salmon is very difficult but is more developed with less controversy and consequences than some other options.

1. Potential to improve the rate or degree of recovery

High;

1b. Potential to prevent further degradation

High;

2. Technical feasibility

Medium;

3. Degree to which proposed action benefits more than one resource or service

High; pinks feed a lot of other animals

4. Enhancement

Low; there are some political difficulties

5. Potential for NO additional injury to:
-other target or nontarget resources

High;

-other target or nontarget services

Medium; short-term effect on commercial fishing; short-term effect for long-term gain

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium; depends on pink salmon prices

8. Will the restoration opportunity be lost if implementation of the option is delayed

Yes; this is time critical due to time gaps. It will determine if it is too late

9. Public comments

Will rate later

RESOURCE OR SERVICE: Pink Salmon

Option 11 a,b,c

Joe - Supplementing fry production will help a particular stream without messing up the gene pool.

1. Potential to improve the rate or degree of recovery

High; for the important streams

1b. Potential to prevent further degradation

High;

2. Technical feasibility

High; there are so many options that one of them would be

3. Degree to which proposed action benefits more than one resource or service

High;

4. Enhancement

High;

5. Potential for NO additional injury to:

-other target or nontarget resources

High; depends on the management technique; assumes you are taking it to pre-spill

-other target or nontarget services

High;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium; high benefits with lower costs in some cases

8. Will the restoration opportunity be lost if implementation of the option is delayed

Yes; there would be problems with genetic mixing

9. Public comments
Will rate later

RESOURCE OR SERVICE: Pink Salmon
15b (cleaning intertidal spawning substrates)

1. Potential to improve the rate or degree of recovery
Low; may be worthwhile in a couple of locations
- 1b. Potential to prevent further degradation
Low;
2. Technical feasibility
Medium; mixed results
3. Degree to which proposed action benefits more than one resource or service
High;
4. Enhancement
Low; can't clean past pre-spill
5. Potential for NO additional injury to:
-other target or nontarget resources
Medium; done on a limited scale
-other target or nontarget services
High;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action to the expected benefits
Low;
8. Will the restoration opportunity be lost if implementation of the option is delayed
Yes; opportunity could be lost
9. Public comments

RESOURCE OR SERVICE: Pink Salmon
Option 18 a & b

1. Potential to improve the rate or degree of recovery
Low;
- 1b. Potential to prevent further degradation
Low;
2. Technical feasibility
High;
3. Degree to which proposed action benefits more than one resource or service
High; pumping out a lot of fish could help many things
4. Enhancement
High;
5. Potential for NO additional injury to:
-other target or nontarget resources
Low; potential to hurt target fish
-other target or nontarget services
Low; it has potential to hurt wild runs and thus hurts the service

that wild fish provide by being wild

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Low;

8. Will the restoration opportunity be lost if implementation of the option is delayed

No;

9. Public comments

RESOURCE OR SERVICE: Pink Salmon

Option 18c

1. Potential to improve the rate or degree of recovery

Medium;

1b. Potential to prevent further degradation

Medium;

2. Technical feasibility

High;

3. Degree to which proposed action benefits more than one resource or service

High;

4. Enhancement

High;

5. Potential for NO additional injury to:

-other target or nontarget resources

Low;

-other target or nontarget services

High;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of the option is delayed

No; can be done later

9. Public comments

RESOURCE OR SERVICE: Rockfish

Option 2b

Joe - Most of this species are long-lived. They are live bearers. The population size is unknown. Rockfish are very territorial. The only adult fish found dead after the spill were rockfish. The direct toxic effects on their population are unknown. This is a desirable commercial species.

1. Potential to improve the rate or degree of recovery

Unknown; the degree of impact from the spill is unknown

1b. Potential to prevent further degradation

Unknown;

2. Technical feasibility

High;

3. Degree to which proposed action benefits more than one resource or service

Medium;

4. Enhancement

Low;

5. Potential for NO additional injury to:

-other target or nontarget resources

High;

-other target or nontarget services

Medium; service of commercial rockfish was at a low level pre-spill

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Unknown;

8. Will the restoration opportunity be lost if implementation of the option is delayed

Yes; there is the potential to lose rockfish and we should find out;

9. Public comments

Will rate later

The following were rated again because they were done early on in the evaluation process:

RESOURCE OR SERVICE: Sea Otter

Option 4

1. Potential to improve the rate or degree of recovery

Low; so dispersed

1b. Potential to prevent further degradation

Low;

2. Technical feasibility

Medium; because of the dispersed nature and importance of haulouts, implementation would be very difficult. Population level effects are problematic;

3. Degree to which proposed action benefits more than one resource or service

Low;

4. Enhancement

Low;

5. Potential for NO additional injury to:

-other target or nontarget resources

High;

-other target or nontarget services

Medium;

6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action to the expected benefits
Low;
8. Will the restoration opportunity be lost if implementation of the option is delayed
No;
9. Public comments
Will rate later

RESOURCE OR SERVICE: Sea Otter

Option 8a

Note: We are unsure if regulations in MMPA would allow this. We do not know if sea otters would apply as depleted under the MMPA. At present, we could not implement this option unless the population was determined to be depleted by the definition of the MMPA.

1. Potential to improve the rate or degree of recovery
Low; small improvement in a small area
- 1b. Potential to prevent further degradation
Low;
2. Technical feasibility
Medium;
3. Degree to which proposed action benefits more than one resource or service
Low;
4. Enhancement
Low;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
Low;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action to the expected benefits
Low;
8. Will the restoration opportunity be lost if implementation of the option is delayed
No;
9. Public comments
Will rate later

RESOURCE OR SERVICE: Sea Otter

Option 8b

1. Potential to improve the rate or degree of recovery
Low;

- 1b. Potential to prevent further degradation
Low;
2. Technical feasibility
Medium;
3. Degree to which proposed action benefits more than one resource or service
Low;
4. Enhancement
Low
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
Medium;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action to the expected benefits
Medium;
8. Will the restoration opportunity be lost if implementation of the option is delayed
No;
9. Public comments
Will rate later

RESOURCE OR SERVICE: Sea Otter
Option 13

1. Potential to improve the rate or degree of recovery
High; the linkage is unproven; therefore, this rating is speculative
1b. Potential to prevent further degradation
High; See Bob or Karen's insomniac mussel footnote
2. Technical feasibility
3. Degree to which proposed action benefits more than one resource or service
High;
4. Enhancement
Low;
5. Potential for NO additional injury to:
-other target or nontarget resources
Medium
-other target or nontarget services
High;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action to the expected benefits
High;
8. Will the restoration opportunity be lost if implementation of the option is delayed

Yes; if pup mortality continues to be high and the population is declining

9. Public comments

Will rate later

RESOURCE OR SERVICE: Sea Otter

Option 20,22,36

1. Potential to improve the rate or degree of recovery

Low;

1b. Potential to prevent further degradation

Low;

2. Technical feasibility

Medium;

3. Degree to which proposed action benefits more than one resource or service

Low;

4. Enhancement

Low;

5. Potential for NO additional injury to:

-other target or nontarget resources

High;

-other target or nontarget services

Medium;

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Medium;

8. Will the restoration opportunity be lost if implementation of the option is delayed

No;

9. Public comments

Will rate later

RESOURCE OR SERVICE: Marbled Murrelets

Option 9

1. Potential to improve the rate or degree of recovery

Low; lacking data on the amount of incidental take

1b. Potential to prevent further degradation

Low; same as above

2. Technical feasibility

Medium;

3. Degree to which proposed action benefits more than one resource or service

Medium;

4. Enhancement

Low;

5. Potential for NO additional injury to:

-other target or nontarget resources
High;
-other target or nontarget services
Low; if we eliminate night time fishing; techniques to reduce mortality may have an adverse affect on commercial fishing fleets.
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action to the expected benefits
Low;
8. Will the restoration opportunity be lost if implementation of the option is delayed
No;
9. Public comments
Will rate later

RESOURCE OR SERVICE: Sea Birds - replacement
Option 17a

1. Potential to improve the rate or degree of recovery
High;
1b. Potential to prevent further degradation
Not applicable;
2. Technical feasibility
High;
3. Degree to which proposed action benefits more than one resource or service
High;
4. Enhancement
Not applicable;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
High;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action to the expected benefits
High;
8. Will the restoration opportunity be lost if implementation of the option is delayed
No;
9. Public comments
Will rate later

RESOURCE OR SERVICE: Marbled Murrelet
Option 37

1. Potential to improve the rate or degree of recovery

Medium; it is unknown to what degree the nesting habitat would be affected

1b. Potential to prevent further degradation

Medium;

2. Technical feasibility

High;

3. Degree to which proposed action benefits more than one resource or service

High;

4. Enhancement

Low;

5. Potential for NO additional injury to:

-other target or nontarget resources

High;

-other target or nontarget services

Low; any habitat-affected use

6. Potential effects of the action on human health and safety

High;

7. The relationship of the expected costs of the proposed action to the expected benefits

Low; high cost not balanced by outstanding benefits

8. Will the restoration opportunity be lost if implementation of the option is delayed

No; unless imminent threat

9. Public comments

Will rate later

RESOURCE OR SERVICE: Marbled Murrelet

Options 20,22,36

Note: Rated the same as above

1. Potential to improve the rate or degree of recovery

1b. Potential to prevent further degradation

2. Technical feasibility

3. Degree to which proposed action benefits more than one resource or service

4. Enhancement

5. Potential for NO additional injury to:

-other target or nontarget resources

-other target or nontarget services

6. Potential effects of the action on human health and safety

7. The relationship of the expected costs of the proposed action to the expected benefits

8. Will the restoration opportunity be lost if implementation of the option is delayed
9. Public comments

RESOURCE OR SERVICE: Pink Salmon
Option 19

1. Potential to improve the rate or degree of recovery
Low;
- 1b. Potential to prevent further degradation
Medium;
2. Technical feasibility
High;
3. Degree to which proposed action benefits more than one resource or service
High;
4. Enhancement
Low;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
High;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action to the expected benefits
Medium;
8. Will the restoration opportunity be lost if implementation of the option is delayed
No;
9. Public comments

RESOURCE OR SERVICE: Pink Salmon
Option 6,20,22,36 (upland and spawning stream protection)

1. Potential to improve the rate or degree of recovery
Low;
- 1b. Potential to prevent further degradation
Low;
2. Technical feasibility
High;
3. Degree to which proposed action benefits more than one resource or service
High;
4. Enhancement
Low;
5. Potential for NO additional injury to:

-other target or nontarget resources
 High;
 -other target or nontarget services
 Medium;
 6. Potential effects of the action on human health and safety
 High;
 7. The relationship of the expected costs of the proposed action to the expected benefits
 Medium;
 8. Will the restoration opportunity be lost if implementation of the option is delayed
 No;
 9. Public comments

RESOURCE OR SERVICE: Pink Salmon
 Option 26

1. Potential to improve the rate or degree of recovery
 Low; could potentially increase the buffer and identification of anadromous streams
 1b. Potential to prevent further degradation
 Low;
 2. Technical feasibility
 High;
 3. Degree to which proposed action benefits more than one resource or service
 High;
 4. Enhancement
 Low;
 5. Potential for NO additional injury to:
 -other target or nontarget resources
 High;
 -other target or nontarget services
 Low;
 6. Potential effects of the action on human health and safety
 High;
 7. The relationship of the expected costs of the proposed action to the expected benefits
 Low; high cost including all indirect effects
 8. Will the restoration opportunity be lost if implementation of the option is delayed
 No;
 9. Public comments
 Will rate later

RESOURCE OR SERVICE: Pink Salmon
 Option 37,38

1. Potential to improve the rate or degree of recovery
 Low;

- 1b. Potential to prevent further degradation
Medium;
2. Technical feasibility
High;
3. Degree to which proposed action benefits more than one
resource or service
High;
4. Enhancement
Low;
5. Potential for NO additional injury to:
-other target or nontarget resources
High;
-other target or nontarget services
Medium;
6. Potential effects of the action on human health and safety
High;
7. The relationship of the expected costs of the proposed action
to the expected benefits
Medium;
8. Will the restoration opportunity be lost if implementation of
the option is delayed
No; unless imminent threat
9. Public comments
Will rate later

Evaluation exercise concluded at 3:30.

**RESTORATION PLANNING WORK GROUP
SEPTEMBER 17, 1992
10:00 A.M.**

Attendees:

Bob Loeffler
Mark Fraker
Karen Klinge
John Strand
Sandy Rabinowitch
Ray Thompson
Chris Swenson
Art Weiner
Carol Gorbics

The following items were distributed:

September 11, 1992 Memo Re: First Draft: Evaluation Database
General Comments on Options Evaluation Database
List of Option Names and Numbers
Option Evaluation Database
Comment Sheet for RPWG Meeting

Evaluation Database

Bob led the discussion of the general comments on the options evaluation database. His expectation is that there will be some agreement on the ratings at the end of the day. Carol stated that we were not always consistent with why N/A was used. It was decided to review all N/A ratings for consistency.

Carol stated that it is necessary to have the criteria in front of you when rating, because the rating could not be done intuitively. Bob stated this is not a stand alone review document but would require either a verbal or written explanation. Carol suggested writing up the criteria explanation. Bob stated an injury summary will have to be written. Karen suggested having a one liner in the database which will trigger the group's memory of why a rating was assigned. Carol suggested expanding the footnote section for the one liner. Karen suggested each member keep track of his species and write the footnote. The resource or service was assigned as follows:

Archaeology - Sandy
Bald Eagles - Carol
Black Oystercatcher - Karen
Brown Bear - Sandy
Coastal Habitat - Art
Common Murre - Carol
Cutthroat Trout - John
Dolly Varden - John

Harbor Seal - Mark
Harlequin Duck - Mark
Herring - John
Killer Whale - Karen
Marbled Murrelet - Karen
Pigeon Guillemot - Carol
Pink Salmon - Chris
Recreation (3) - Ray
River Otter - Mark
Rock Fish - Chris
Sea Otter - Carol
Sockeye Salmon - Chris
Wilderness - Sandy

FOOTNOTES FOR N/A

Black Oystercatcher - continuing injury possibly associated with contaminated food

Coastal Habitat - it is assumed that the status of the mussel beds is either stable or not applicable.

Cutthroat Trout - the option focuses on restoration. It is assumed that the status of the population is recovering.

Dolly Varden - (same as Cutthroat Trout)

Harbor Seals - the definition focuses on restoration and not degradation or decline.

Harlequin Ducks - 13.0 is changed to High. Potential for linkage is high.

Herring - there is no ongoing disturbance; not applicable if there is no ongoing disturbance.

Killer Whale - at this time, there is no disturbance.

Marbled Murrelet - this is replacement (should be duplicated for all marine birds).

Pigeon Guillemot - could improve and help recovery but predation is not increasing; predation is not a factor created by the oil spill; focus on restoration and not degradation or decline.

Recreation (backcountry developed) - this is replacement; replacing use with a different use location site. Carol stated that 12.1 (1b) is not applicable. Chris expressed concern regarding the recreation rating because it does not reflect clearly the injury. Sandy agreed there is a need for further clarification. 40.0 (1b) should be rated High.

Recreation (concentrated) - acquisition of equivalent resource.

River Otter - no ongoing disturbance.

Sockeye Salmon - not applicable unless there is an ongoing disturbance.

General Comments

Murres - Karen agreed with Bob's comments that Murres - 16.1 and 16.2 should be High.

Bob agreed with Karen's comments to duplicate 17.1 (Marbled Murrelet) under Common Murres and Pigeon Guillemots.

Karen agreed with Chris that opening legislation to amendment in any political context can lead to mixed results. Karen stated that if we do this it might not be consistent. Bob stated that our science should not be modified on the basis of what the legislature could do.

Sea Otters should be High for Criteria 3 in Option 40.

Carol questioned why variable ratings were used.

Carol suggested communicating with the Habitat Protection Group regarding the significant overlap between the work being done by their group and RPWG. Bob stated that he will talk with Marty regarding this. Sandy stated there is a need to articulate in writing who is doing what so there are clear expectations. Karen stated that it seems the Habitat Work Group is working more on how do you do it and less on what are you doing it for.

COMMENT SHEET

Archaeology (1.0-1b) - The group disagreed with Art. You are trying to put people closer to the problem but you are not trying to target everything. High potential for preventing degradation of sites. (leave High). (35-4) - This is a replacement option (change to N/A).

Bald Eagle (26) - Should not be rated with the Forest Practices Act. If you could change FPA, then you would benefit. The group agreed to change this to N/A.

Black Oystercatcher (13.0-2) - add that if disaggregated mussels are the source of the problem, then it would be rated differently. (37)(40) - delete "prevented" from 5b.

Brown Bears (13.0-1a&b) - Karen stated these should be evaluated based on what we expect it to be. Bob stated that Low is the best you can do. There is debate over whether bears are injured. If

bears are injured, it comes from injury to the intertidal area. Bob agreed to add Karen's footnote: Linkage is unknown but if positive, the potential to improve recovery is low because of large home ranges of bears and dispersal of mussels. Therefore, small improvement for small portion. 1a and 1b are changed to Low.

Coastal Habitat (40) - This should be rated and will cover the ability of special designations to minimize disturbance in the intertidal area such as subsistence use and sport fishing. This was rated as follows:

- 1a. Potential to improve the rate or degree of recovery
Low; the level of activity is small relative to the injured area
- 1b. Potential to protect the area from further degradation.
Low
- 2. Technical feasibility
High
- 3. Degree to which proposed action benefits more than one resource or service
High; by definition
- 4. Degree to which proposed action enhances the resource or service
Low
- 5a. Potential for no additional injury to:
-other target or non-target resources
High
- 5b. -other target or non-target services
Low
- 6. Potential effects of the proposed action on human health and safety
High
- 7. Relationship of the expected costs of the proposed action to the expected benefits
Medium
- 8. Will the restoration opportunity be lost if implementation is delayed
No

Murres - (9.0) - This should be rated. (16-1a&b) - Carol felt this was not likely to affect a significant portion of the population. It was agreed to rate this medium. (17.2-1a) - Carol suggested changing the footnote to: predator control may help synchronizing. Art suggested stalling this until peer review of 1a. (17.2-2) - Bob suggested changing this footnote. Karen stated it should remain Medium and eliminate the footnote. (40-1a&b) - Carol suggested this should be Medium because the disturbance of the Murres decreases productivity; the group concurred. Murre (37-1b) - Art stated that the purchase of privately owned colonies outside of the oil-affected area could prevent further decline in species numbers. 1a&b are Medium. The footnote should be rewritten to change the Gull Rock statement.

Cutthroat Trout (14.0-1a) - Karen stated we assume there is a positive link between Fucus and Cutthroat Trout prey and cover. Fixing Fucus will help. 1a is Medium. (Everything for Cutthroat Trout should be duplicated for Dolly Varden).

Dolly Varden (37)(40)-1a&b) - Ray questioned why this was rated Low. Art states that this option is to prevent exacerbation of the injury.

Harbor Seals (8.1) - Karen's footnote was added: Concept is to declare population depleted under MMPA.

Harlequin Duck (8.2) - Bob stated education to stop hunting is an odd option and perhaps should be rated only for subsistence. Karen questioned the footnote for special designation. Bob stated that it needs to be reworded.

Herring (2.1-4) - Bob questioned how management could be High on enhancement and why not for other fish species. He stated he is now satisfied with the way it is.

Killer Whale (40-4) - Art questioned whether there are any known rubbing beaches. John stated there are known rubbing beaches within PWS.

Marbled Murrelet (17.1-5a) - Carol suggested deleting the footnote as it was not what she intended. Carol suggested adding the following footnote: Foxes were introduced for the fur-farming industry and are continuing to decimate bird populations. (9.0) Carol suggested deleting "this is a feasibility study option." It is a feasibility option and so much more.

Pink Salmon (2.1-1a&b) - Art stated population level injury has not been documented. Karen stated that this was rated assuming there is injury. (17.1-5b) - Bob questioned if this rating is consistent with our philosophy. Bob suggested adding the footnote to revisit after injury summary is done. Art stated that Spies stated there is not a population level injury. Art suggested leaving the question of rating open until peer review. Carol stated that she wants in writing for documentation purposes the basis for Spies' statement. Bob stated if there is population injury, this will be High and if not, it will be Low.

River Otter - Art stated the population level injury has not been documented. (8.1-1a&b) should be Low. (14-2) - Yes is changed to Unproven. (8.1) - Karen suggested adding that we assume trapping restrictions would be short term. (8.1-4) - Bob questioned how managing them can be enhancement. It was changed to Low.

Rockfish (2.2-8) - John suggested changing the footnote to: Suspect that Rockfish population will not continue to tolerate current level of exploitation.

Sea Otters (8.2-1a&b) - Carol suggested changing this to Unknown. Karen agreed that Unknown may be accurate because we are not sure what the subsistence level is. This is something that could be changed through education. Karen suggested adding the following footnote: May need to be upgraded if subsistence harvest is higher.

Sockeye Salmon (18.1-3) - The footnote is deleted. (18.2-1a) - John questioned how this approach could be more successful than 18.1. He doesn't see the difference in terms of what you can gain. 18.2-1a&b are changed to Medium. Cutthroat Trout should be changed to Medium also. One option is the ability to restore a stream and the other is the entire population. (37-1a) - John questioned what basis the decision was made to rate this Medium. Karen stated the problem is upland habitat. For Cutthroat Trout and Dolly Varden, injury is related to intertidal status. Purchasing upland will not improve recovery. For sockeye salmon, the injury is tied to overescapement. It is more related to where the injury occurs. The injury for Cutthroat Trout occurs during time spent in marine waters. (37-1a) is not applicable unless there is ongoing disturbance. The same would apply for Dolly Varden.

Sockeye (11-1a) - John stated there appears to be a problem of consistency with Dolly Varden and Cutthroat Trout. John suggested adding the following footnote: The basis of the injury is the lack of proper rearing habitat for the Sockeye. (18.2-5a) - Art stated there is a potential impact of hatchery fish on wild stocks. Bob suggested adding the following footnote: Assume that the initial stock was from that depleted area.

Wilderness (37)(40)-1a) - Art stated that the perception of pristine wilderness is forever and irretrievably lost for the oil - affected area. Karen suggested adding that this is a replacement option. Bob stated this is a definition problem. Karen stated that 1a is probably not applicable. The injury to perception can't be repaired beyond pre-spill.

ASSIGNMENTS

The footnotes should be written and given to Bob by Tuesday. Karen and Carol will deal with Murres (9). The ratings will be turned in along with the notes. RPWG needs to discuss how the public comments database will be used. Ray stated RPWG needs to discuss whether a comment reflects a wide opinion of the general public's perception. Ward will give an overview of the computer system. Art stated that several members will need time to review the three RFP's. Bob stated the public should be kept informed of the monitoring plan to assess the amount of money to be spent on monitoring.

RPWG will reconvene on 9/18 at 9:30. Meeting adjourned at 4:25.

**RESTORATION PLANNING WORK GROUP
SEPTEMBER 18, 1992
10:00 A.M.**

Attendees:

Bob Loeffler
Mark Fraker
Karen Klinge
John Strand
Sandy Rabinowitch
Ray Thompson
Chris Swenson
Art Weiner
Carol Gorbics

The following items were distributed:

Request for Proposals - Technical Writer/Editor
Database Printout (Public Comment)

The following agenda items were discussed:

Public Comment

Ray discussed the process for including the public comments into the evaluation database. A fairly simplistic version of the comments was used. NC means no significant comments or no comments. The initial list of 30 issues with all the comments that were not taken forward were reviewed to develop the rating scale. The comments are very general; some come directly from the issues document and some are paraphrased. Art questioned if the comments from the supplement were included. Ray stated they were not included in this round. These comments only relate to the options. Art stated that some of these comments are substantial and should be factored in some way. Ray stated for this exercise we just need a general sense of whether there is interest in pursuing these options. Art was concerned that these comments don't get lost because of the level of effort involved and should be part of the package of public comments. Ray stated these comments would help in the development of alternatives and how an option might be used. Art stated these comments should be acknowledged. In the subsequent analysis of alternatives, these comments will be included. Bob stated that this is relative to numbers of comments, and it should be noted if it is less than 2 or greater than 10. Art stated that RPWG had a discussion on whether a comment represents one person or an organization and it was decided to identify the issues qualitatively and not quantitatively. Ray did not take out the specifics of each comment numerically. Karen questioned how this information will be used and wondered if there were enough comments to make a valid contribution. Ray stated the value comes from what the comment is. Bob asked if the comments give guidance.

Ray stated we may want to pull the specifics out of the comments. Karen stated that when writing alternatives, we could refer to comments either positive or negative, indicating mixed comments. Art questioned who is reviewing comments as they come in now. Bob stated that this becomes part of the general influence base, and it may not be necessary to develop a formal process. John stated that this information will be captured in a chapter in the Restoration Plan and possibly in the option summary. Ray stated that Pam Miller's comments were very thorough. Art disagreed with Bob's approach because the settlement specifically addresses meaningful public comment. Bob stated that the way you address the public is in the product. If you create an internal paper trail the public never sees, the public will not care. Art stated that the comments should be analyzed. Ray stated that people are generally focusing on a variety of different things and the character of the comments is not changing very much. Ray stated that a good idea of the public's concerns were documented during the scoping process. Ray will discuss with LJ if anything is being done with comments from the Trustee Council meetings. Art stated that some effort must be made to make the public comments more meaningful. Karen suggested this analysis is possibly something for the Public Participation Work Group. Art will speak with Marty regarding the possibility of their group extracting the public comments. Karen suggested a column in the database which shows the sorts. Bob stated that the database should remain as an internal document. Bob suggested noting the number of comments in another column. Art stated this goes back to if a comment represents one person or a group. Art questioned how the numbers will be used. Bob stated that numbers indicate how strongly a comment was supported. John stated we need to add to the database if there are any comments on universal options such as monitoring, education and endowment. Bob requested fleshing out 34.1 for the suggested sites for new marine environmental institute. Ray stated that if comments were not fairly blatant, he did not put words in their mouth. "G" or "I" will be used to denote group or individual comments.

DATABASE REVIEW

Ward will give RPWG an overview of the database functions later today.

SCHEDULING

John suggested that RPWG could possibly meet on Monday to discuss scheduling.

WRITER/EDITOR

The Resource Review Board will meet on the 28th. John provided copies of the RFP. John will obtain the number of responses to the RFP from Terri Bristow.

ASSIGNMENTS

The options were assigned as follows:

Sandy	1.0 Archeological site stewardship program
Chris/John	2.0 Increase fish and shellfish management
	2.1 Increase fish and shellfish management; species already with plans
	2.2 Increase fish and shellfish management; plans for species without them
Karen	4.0 Reduce disturbance at marine bird colonies and mammal haulout
Ray	7.0 Increased agency field presence
Carol/Karen	8.0 Restrict/eliminate legal harvest: mammals and sea ducks
	8.1 Temporarily restrict/close harvest
	8.2 Educate public to voluntarily restrict harvest (sport, subsistence)
Carol	9.0 Minimize incidental take of marine birds by commercial fisheries
Sandy	10.0 Preserve archaeological sites/artifacts
Chris/John	11.0 Improve freshwater wild salmon spawning/rearing habitats
	11.1 Supplement fry production (salmon)
	11.2 Improve access to spawning areas (salmon)
	11.3 Improve spawning and rearing habitat (salmon)
Bob	12.0 New recreation facilities
	12.1 New backcountry recreation facilities
	12.3 New commercial, (lodge) recreation facilities
Art/John	13.0 Eliminate oil from mussel beds
	14.0 Accelerate recovery of upper intertidal zone
John	15.0 Supplement or clean marine spawning substrates
	15.1 Supplement intertidal substrates for herring
	15.2 Clean intertidal salmon spawning substrates
Karen	16.0 Restore murre productivity
	16.1 Enhance social stimuli (common murre)
	16.2 Improve physical characteristics of nest sites (common murre)
Carol/Karen	17.0 Predator control to benefit marine birds
	17.1 Eliminate introduced foxes (for nesting marine birds)
	17.2 Reduce predator access to seabird colonies
Chris/John	18.0 Replace fisheries opportunities by alternative salmon runs
	18.1 Establish additional hatchery (salmon) runs
	18.2 Transplant (salmon) hatchery-reared fish to depleted areas
	18.3 Wild egg take to establish new runs (salmon)
Chris	19.0 Update and expand Alaska's anadromous Fish Stream Catalog
	26.0 Amend Forest Practices Act
John	27.0 Designate long-term Ecological Research Sites

Bob	28.0 Acquire access for sport-fishing and recreation
	28.1 Purchase access (title or rights)
	28.2 Negotiate access without purchase
	28.3 Negotiate "17b" easements
Karen	30.0 Test subsistence foods for hydrocarbon contamination
	33.0 Public information and education program
	33.1 Education programs, information, and products
Ray/Sandy	33.2 Education: interpretive and educational facilities
Art	34.0 Marine environmental institute
	34.1 New marine environmental institute
	34.2 Enhance an existing marine environmental institute
Sandy	35.0 Acquire archaeological artifacts from outside the spill area
Art	37.0 Purchase private lands (fee title or less than fee title)
Sandy/Chris	40.0 Special Designations

RESTORATION PLANNING WORK GROUP
OCTOBER 1, 1992
10:00 a.m.

ATTENDEES:

Bob Loeffler
Carol Gorbics
Mark Fraker
Karen Klinge
Chris Swenson
Veronica Gilbert
Art Weiner
Ray Thompson

RECEIVED 10:06 6-22

The following handouts were provided:

Bob Spies Draft Injury Summary

RPWG Members

Art introduced Veronica Gilbert who will represent DNR on RPWG. She has regional planning experience and brings a wealth of knowledge of Alaska to this process. Art will still be around to provide science commentary.

SCHEDULE

We will go over everyone's computer runs to see what people have thought about in creating alternatives. Art asked if Spies' injury summary will be discussed now that we have the list. Carol stated that the list is considered to be a draft and Spies has requested comments. Art stated we should take a good hard look at the list and let it influence decisionmaking. Art further stated he had problems with working in areas that have not been recognized as injured and felt it was redundant to work on something that will fall by the wayside.

Bob stated that other RPWG members will review the database and work on sorts. Karen gave an overview of the sorting process for developing alternatives. Spies' table can be used to verify the certainty of injury. Karen stated that using double searches would help to prioritize. Multi sorts from the database may be necessary to compare levels of information. Karen stated she always assumes there is some prioritization, such as we are going to suggest that options be done first or if there is a matter of money. Bob stated that he did his sorts in a similar way. Karen stated that for starters you should run it for what you think would be useful to call up. Bob stated he kept in mind providing a range of choices for the public when doing his sorts. Art stated that we should also write down the justification rules or bias of what went into the sorts. Art and Chris talked with the legal team with respect

to whether some options are direct restoration or enhancement. Art stated it is very important to categorize things for the public. Sandy stated what is important is what the public cares about. Art stated we should be prepared to defend why we call something direct restoration. Karen stated that when there are problems or questions, they can be posed to the peer reviewers. This will eliminate the need for further group review of the evaluation criteria. Veronica requested clarification on the various work products on the table. Bob stated that updated versions will be provided to her. Karen stated that prioritization will become clear in the justification rules. Art suggested that a one-on-one demonstration of sorts be given to members who have not done them by those who have. Sandy suggested keeping a list of sorts that have been done and looking at the results. Karen preferred not to do this because there would be a greater range of ideas if each person did a separate sort without any input. Carol stated that she agreed with Karen from a creativity stand point.

DRAFT SUMMARY OF INJURY

Bob stated that someone, John, should be designated to compile the comments to the draft summary of injury and discuss them with Spies. Art stated that if there is disagreement, the source should be cited, such as PI comments. Bob stated that his comments will probably relate to missing information and not science. Bob further stated the draft injury summary does not deal much with recovery, and Spies should elaborate more on this. Art stated that Bob's questions probably won't be answered until the reports come in from the PI's. Carol stated that these reports probably won't be available to the public until February. Mark questioned the numbers used for finds and stated there needs to be some wording that doesn't obscure the fact that some species don't lend themselves to study. Data is often too hard to collect to find answers; therefore, Mark questioned if this is an accurate representation of the information. Veronica stated that in reviewing the information, there were questions of injury or probability of injury and whether species lend themselves to any type of manipulation. Sandy stated he doesn't feel all the framework criteria are addressed in the draft summary of injury and they should be. Sandy further stated there are more columns to add to the summary, such as lack of productivity. Art questioned who will be the final decisionmaker on the summary of injury. Sandy stated that you either meet the criteria or you don't. Carol stated that the Trustee Council is the final decisionmaker. Art stated we have to decide who we will listen to. Bob stated that this is an interactive process. Carol stated there is a very clear chain of command, and Spies is an advisor to the Restoration Team. Art stated that the summary of injury is fundamental to a lot of the work RPWG is doing. Carol stated that once the Trustee Council adopts Spies' recommendation, that will be the final decision. Art stated that Spies is the only independent authority in this process. Karen stated that we would use the most current informa-

tion we have. We are up against a deadline because the draft injury summary was received so late. Carol stated that critical review is not inappropriate. Sandy envisioned taking the recommendations of RPWG to the Restoration Team. Bob stated his comments will include things that were missed in the summary and communication problems. Sandy stated that this only shows injury to the resources and it should be explicit that the summary does not include injury to services. Bob stated that it should also address species which were not included. Sandy stated that Spies' list should include the resources from the framework because things have been dropped out in the past which are no longer germane to the process and preparation for a lawsuit. Bob requested that all comments be forwarded to John by next Wednesday for compilation. Karen stated that she spoke with Spies for more specific information, such as population level injury to pink salmon. She also discussed pigeon guillemot injuries with Spies, who stated he would keep it in but would not address it with the same priority. Karen also discussed other species which were not part of the NRDA process but were possibly injured. Spies felt this could be addressed through a habitat or ecosystem approach. Art stated we need to come to closure with Spies on the injury summary before meeting with the peer reviewers because the differences of opinion should be on the table.

SORTS

The sorts will be discussed on Tuesday and should be forwarded to Bob by late Monday. Karen stated that the sorting rules and criteria will be more important than the output. Chris suggested if anyone has ideas for sorting services, they could be circulated among the group.

Meeting adjourned at 11:30.

management actions. Chris stated special designation parallels the habitat protection process. Marty suggested using "agency management actions recommendations" to capture special designation. Mark stated that special designation is a subset of conceivable actions. Pam stated this issue should be put on hold and other comments reviewed. The RT agreed to defer this issue. Dave stated that headings for sections would be helpful. Byron stated there were blank boxes under commercial fishing and sea otters. Mark suggested adding "none identified yet". Bob stated on page 19 it would be noted those things for which nothing can be done. Sockeye was not included. Bob will check this out. Dave stated it is extremely suspect that it is absent. Bob stated that the table on page 27 has not been finalized and requires more discussion. Dave stated Option 44 should be taken out. Pam stated the table needs to be made consistent. Dave stated on page 32 under murre some change needs to be made to make it more descriptive. Dave asked if under salmon does "run" mean per stream and felt it needs clarification for the public.

Jerome raised a question of the accuracy of sockeye information. Bob stated that RPWG cannot arbitrarily change what the peer reviewers said. Ken reiterated that the main direction to RPWG is to make the information consistent. Mark suggested solving the special designation issue by renaming it. Chris suggested adding an old option "review existing management actions". Mark stated you don't want to have two separate options. Chris stated with a broader title, people might think there is overlap. Mark suggested letting RPWG deal with this renaming issue.

RPWG will come back with:

injury table (assuming there is concurrence with Spies)
other tables (alternatives) with enough text to explain tables
(Monday to RT)

Pam asked how comments will be dealt with. Dave stated that could be facilitated possibly through a teleconference at 3:00 on Monday. Comments are to be forwarded to Dave by 12:00.

John asked if alternative themes (one page) can be given to the PAG. Dave stated "yes".

Dave summarized the distribution of work products as follows:

services table only to TC
alternative themes summary sheet to the TC, public
resources injury table (to be determined Monday), possibly to TC
budget table and pie charts to the TC, public
rest of the alternatives package to the TC only

Meeting adjourned at 12:45.

Mark stated he felt the numbers above were too low. Byron agreed with Mark. Bob suggested indicating in the text that we expect to have high numbers for the next two years. The numbers for restoration are a ten-year average. Mark stated he is also uncomfortable with the numbers for peer review and the Chief Scientist going down. Dave stated alternatives 3 and 4 should not be above 6%. The RT disagreed and voted to increase alternatives 3 and 4 to 7%.

Jerome diagramed the following pie chart information:

ALTERNATIVES	3	4	5
Administration	6(8)	7(9)	7(10)
Monitoring	8	10	12
Other Restoration	14(7)	22(10)	36(22)
Hab. Protection	72(62)	61(57)	45(42)
Reserve	15	14	14

Note: The number in parenthesis represents a range.

Dave stated that because all restoration options cannot be identified, reserve should be used for the unknowns which come up. The RT agreed that any double counting from monitoring should go into other restoration.

John stated he, Carol and Chris will meet with Spies tonight to reconcile the injury table. Bob stated that a footnote will be added if a population level effect is possible. Dave stated the key is to match the text and table. Pam stated it is a policy decision on how to handle something when there is disagreement on population level effect. Bob stated on page 5 of the table, some chronic effects will be noted as "possibly". Bob stated that enough text will be included to understand what the tables mean. A new pie chart will be made to reflect any changes.

Mark stated contingency planning needs to drop out of the table because it is a normal agency function. Dave agreed. Mark also stated that spill prevention needs to be pulled out and possibly added to chapter 6. Bob stated that a decision needs to be made on spill prevention and whether it is covered under the settlement (civil or criminal). Dave stated the Trustees need to resolve this issue. Pam suggested that legal guidance is needed. Bob stated that spill prevention/response technology should have an appropriate location in the plan and stated that there will be a placeholder inserted into the text until this issue is resolved.

Mark stated that "special designation" is not appropriate to be singled out as a restoration option; however, it is one aspect of normal management activities. Making special designation a restoration option would be giving it too much credit. Mark stated we are charged with gathering the information necessary to justify

RESTORATION PLANNING WORK GROUP/RESTORATION TEAM
FEBRUARY 5, 1993
10:00 A.M.

ATTENDEES

Dave Gibbons
Marty Rutherford
Mark Brodersen
Ray Thompson
Bob Loeffler
Chris Swenson
John Strand
Veronica Gilbert
Karen Klinge
Pam Bergmann
Jerome Montague

The following items were distributed:

Memo from Pam Bergmann to Dave Gibbons dated 2/4/93
End of Trustee Symposium Response Statement

BUDGET

Dave proposed 4% for Administrative cost for alternative #2. Marty stated a footnote is needed stating that some costs, such as evaluations, are carried within the habitat protection fund. Ken stated this should be added as part of the text. Pam stated that you should include that this is averaged over a ten-year period. Dave stated the cost for habitat protection is built into the habitat protection line.

The administrative cost proposal was modified and agreed upon as follows:

Alt. #1 - 1%
Alt. #2 - 4%
Alt. #3 - 6%
Alt. #4 - 7%
Alt. #5 - 7%

Dave made the following suggestions for reductions in cost:

Admin. Director (1.2 to 1.3) (minus OSPIC and four staff)
Finance Committee - keep
Restoration Team - keep (somewhat uncomfortable)
PAG - reduce to \$200,000 (.2)
Peer Review - reduce to \$200,000 (.2)
1994 Work Plan - should be easier - \$300,000 (6%)

to resources recovered and not yet recovered. Alternative 2 was changed to habitat protection. Bob stated there are things for which there are no effective actions. Ken asked what is meant by protect or increase existing uses through habitat protection. Bob stated it is the extent to which you would like to provide opportunities and access for human use to the resources and services. Pam stated that she agreed with Byron that "public uses" captures this.

Marty stated that all alternatives, except natural recovery, assume injury to services. Mark suggested changing "injury" to resources addressed. All injured services are addressed in all alternatives. Mark suggested changing status of recovery to status of resource recovery. Marty asked what is baseline. Ken stated it is where a resource would be had there been no oil spill.

Mark suggested the following changes to the variable headings:

resources addressed
status of resource recovery
effectiveness
service actions implemented

Veronica stated that lots of people do not want "accessibility" to imply roads. The category, opportunities for human use, was developed because of this. Marty asked how RPWG felt about "types of service actions implemented". Pam stated the problem is in characterizing what you are trying to show. Veronica stated ordinary people don't necessarily understand the clear distinction between resources and services.

Carol suggested the following changes to the variables:

under injury, adding services to all alternatives
effectiveness of restoration actions for resources and services
strategies for public uses

Carol's suggestions were agreed to.

RPWG's portion of the meeting adjourned at 5:25 p.m.

areas. "Tenacious" was removed. Mark stated you should delete "wilderness" because you are begging for trouble. Intrinsic value captures this service. Dave stated he would take out "intrinsic" and leave "wilderness". Mark stated that the concept of lost use has to be captured. It is a service provided by the resource. Wilderness will be legislated wilderness. Mark suggested lumping intrinsic values and lost use together. It was decided to leave it to RPWG's discretion of whether to separate intrinsic values and lost use.

Dave stated that since closure could not be reached on services, discussion of the table would be discontinued.

Jerome raised the issue of trapping. Pam stated that if you are going to pull these out, then why not hiking and kayaking. Pam suggested under recreation, the user groups need to be defined.

Dave stated that the Restoration Plan is already too complex for the public to understand. Dave proposed that the services table not be included in the package to the TC and the alternatives be reviewed tomorrow.

Break at 4:05.

Dave suggested forwarding the services table to the TC with the note that it is a working draft not for public review. Pam did not agree with giving them something that is not finished. Mark suggested stamping draft on the table and forwarding it to the TC. Ken asked what is Pam's fear in forwarding it to the TC. Pam stated because it doesn't just go to the TC, and it is not ready to go to the public. Dave stated in the past the TC has received draft working documents which did not go to the public. Sandy stated that pretty much what the table says has already been given to the public. Mark stated that we are close on the total content but disagreement lies in splitting various parts. The concern is over presentation. Veronica suggested the RT assign one liaison member to review the information in an effort to work together jointly and funnel concerns. Dave stated the liaison might not represent the group. Ken stated that if the guidance received by the RT cannot be done or is not sufficient, RPWG should come back to the RT.

It was decided to include the services table as a working draft to the TC only. Pam asked what are the action items to keep working on this. Dave asked how soon could RPWG have the table incorporating trapping, intrinsic values and lost use. The RT will receive a copy next week.

SUMMARY OF RESTORATION PLAN ALTERNATIVES

Bob gave an overhead presentation on the table, Summary of Restoration Plan Alternatives. All stages of recovery was changed

Pacific Herring - No change.

Rockfish - The number will be put in the comments.

Sockeye Salmon - Pam stated she would like to show that the effects looked at are not due to direct oiling. The effects on the population are unknown. Current population status is "continuing decline". Mark suggested adding "initial" oil spill mortality.

Crabs - Jerome suggested adding there was insufficient data to determine injury.

Intertidal - Pam stated there needs to be a reference to hot water washing. Intertidal organisms were affected by oil spill cleanup, particularly high pressure washing (e.g., *Fucus*).

Subtidal Communities - Delete "see comments". Byron stated we need to address the physical resources, such as air, water and sediment. Dave stated these will be addressed under another category along with archaeology. Carol stated a footnote will be added to "see text". Byron also stated that archaeological resources are a resource and not a service.

Archaeology - There are 24 known sites. Other sites may be determined later. Sandy stated the injury is a description.

Pam suggested having the table peer reviewed. Sandy suggested faxing the table and text to peer reviewers. Dave stated this should be run by Spies.

Subsistence - Jim Fall will review this data. Pam stated that DOI's attorney recommended Chenega Bay's legal people also review this. Dave stated Maria will be asked about the review.

Recreation/Tourism - There is limited data. Ken questioned if RPWG can separate tourism and recreation. Veronica stated it can be done and asked if the split is whether the individuals make money or not. Jerome stated that separating them would be too complicated and unnecessary. Sandy stated that you will take a pretty thin pile of data and make it thinner. Ken stated he would charge RPWG with determining whether the data allows for separating tourism and recreation.

Sport/Commercial Fishing - Byron stated that recreational fishing should be included under recreation. Pam stated that everything recreational should be under recreation because we should be using logic. Veronica stated we are analyzing how things were affected and not how business went down. Associations of people who do these types of things were contacted. Byron stated that the problem is not a labeling issue but substance.

Wilderness/Intrinsic Values - Ken suggested adding wilderness study

may not be in the text. Dave asked if pre-spill numbers would be included. Ken stated if RPWG can do it, the numbers should be put in. Byron stated he would prefer to leave this information in the text because it would be too difficult to convey it in the table.

Humpback Whales - No change.

Killer Whales - Byron stated 13 whales died. Mark suggested adding a footnote: the 13 whales are from AB pod only. Byron stated the second sentence is not accurate. He further stated that sublethal and chronic effects should be changed to "yes" and recovering population status is "unknown". Pam disagreed with the text which stated there is no evidence that deaths were linked to contact with oil and stated you should be consistent among categories. Mark suggested including "possibly" to oil spill mortality. Chris stated that the original intent of "possibly" was to indicate disagreement and not lack of data. Pam asked if there were peer reviewers who believed the injury was oil-spill related. Jerome stated "yes". Pam asked what to do with editorial changes and suggested the table be reviewed for consistency. John requested that the comments be more explicit than just question marks and arrows. Byron stated that several adult males have collapsed dorsal fins, and social disruption of family units was observed.

Sea Lions - No change.

Sea Otters - Carcasses of prime age animals were found on beaches in 1989, 1990 and 1991. Carol will defer to Spies on whether it should be "yes" or "possibly". Evidence could be defined in the footnote.

Black Bear - Jerome stated no field studies were completed but they were attempted.

Bald Eagles - Non-measured declines are not included. Pam suggested the footnote could capture what the criteria is. Ken stated there are a lot of footnotes, and it could possibly be added to the comments.

Black-legged Kittiwakes - No comments.

Marbled Murrelets - No change.

Other Seabirds - Carol would like to check with Bob on the number.

Stellar Sea Lions - The spelling "stellar" should be checked.

Cutthroat Trout - Decline in population is "unknown". "See comments" is redundant.

Dolly Varden - "See comments" is redundant.

Varden. Pam stated she spent a lot of time going through the tables and hopes the comments will improve the overall product. Jerome stated he doesn't feel it is appropriate for Spies to have the final say on the table. Marty stated that Spies has to be the arbitrator on the injury status. Jerome stated he feels the RT has the expertise to do this. Mark stated that to put down that there is disagreement is intellectually honest. Marty stated the difference of opinion is between peer reviewers and the Chief Scientist. Dave proposed reviewing process type items and submitting other comments to Bob. Marty stated that some agencies are commenting again and again. Pam stated that the RT failed to meet directly with Bob. Dave stated the presentation shouldn't go to Spies but the content should. Carol suggested taking comments to the subgroup with Spies and making a list of unresolved issues. The RT can then go through the unresolved issues. Veronica suggested going over the bald eagle issue.

Mark stated that the RT needs to make a recommendation to the TC regarding a policy decision on what to do when there is disagreement. Ken stated the policy decision is made in the choice of alternatives by the Trustee Council. Karen re-emphasized that if information comes back that changes the injury status, we can deal with it later if the level shows no documented population effect. Mark stated that for species where there is disagreement on sublethal effects, we should take a more liberal viewpoint. The question comes down to professionals who are giving us advice on population effects to resources and services. Mark suggested you treat it as though it had population level effects. Mark stated where there is disagreement the two choices are 1) do you treat the resource or species as sublethal only or 2) as a population level effect.

Jerome stated we should hear what Spies and the other peer reviewers have to say. Marty stated she doesn't think that is the RT's role to be the arbitrator of the science. Dave stated that the verbiage in the injury assessment table seems appropriate. There is a purpose to the wording difference. Jerome stated that he would change cutthroat to unknown. Pam agreed with Carol's suggestion for the RT to get comments to a RPWG subgroup for review with Spies.

Veronica stated that if we give the TC any of the plan's key elements, we need to know which species sustained population level injury or sublethal injury. Marty suggested going species by species to determine any problems. The RT agreed.

Harbor Seals - Dave stated that Kathy Frost said there was no continuing injury. Evidence of continuing sublethal effect should be changed to "no". The number killed was also higher (345). Pam stated in column one it would be helpful to have some population estimates and this information could be pulled from the text. Jerome stated that in many cases the information is available but

RESTORATION PLANNING WORK GROUP/RESTORATION TEAM
FEBRUARY 4, 1993
1:00 P.M.

Attendees

Marty Rutherford
Sharon Saari
Jerome Montague
Byron Morris
Pam Bergmann
Karen Klinge
John Strand
Veronica Gilbert
Ray Thompson
Chris Swenson
Bob Loeffler
Mark Brodersen
Ken Rice
Sandy Rabinowitch
Carol Gorbics
Dave Gibbons
Art Weiner (in Marty's absence)

INJURY ASSESSMENT STUDIES TABLE

Marty stated that she thought the RT would make the call on format presentation and Spies would make the call on injury status. Pam stated she went through the revised tables and made comments based on her review. It is important that Spies feels comfortable and buy off on the changes. Carol stated that RPWG met with Spies and came up with the table. Three RT members gave comments to RPWG which were incorporated. The next step is to go back to Spies. Marty stated she is uncomfortable with this incorporation. Pam reviewed her notes from the December meeting and read aloud the action items involving the table. The RT was going to work with Bob to resolve conflicts to the table. Mark read his notes which stated: RT to review injury summary and give preliminary comments to Dave by January 5. Marty stated that she is uncomfortable that the comments have already been incorporated. Mark stated that we need to move on from here and review the table. Pam stated she has come up with more specific comments on the table which need to be discussed. Marty asked what kind of comments they were. Pam stated that some of the things involved logic. The description in the text does not match the information in the table. The footnote says population may have been declining and text says there were population declines. There appears to be logic gaps in some information. Footnote D wasn't clear. The "see comments" section does not answer questions. There is a logic problem with killer whales.

Jerome had some significant changes on pink salmon and Dolly

represents an important policy decision. Bob stated his RT member felt the uncommitted balance in alternative #5 should go to 30%. Bob stated he felt endowment would be a separate funding question.

WORDING CHANGES

The RT suggested developing other language which conveys what is really meant: effectiveness (all effective actions, only highly effective actions) and all stages of recovery, (resources recovered and resources not yet recovered). Alternative 5 was changed to take all effective actions.

Chris suggested under the injury variable including something about key habitats reflecting that we are not solely targeting injured species. Carol suggested including this when effectiveness is rewritten. Veronica recommended that Chris work with someone from HPWG to make sure they have looked at and understood the implications. Chris stated that Art suggested an additional variable. RPWG agreed to bring up this issue to the RT. Karen stated we don't want to lose the distinction between alternatives we have now for habitat protection. Chris suggested having a draft variable and volunteered to develop language.

Bob suggested taking spill prevention out of the table and putting it in Chapter 6. Veronica stated that more work needs to be done on it rather than just relegating it to a chapter.

Meeting adjourned at 12:15.

is now available. Karen stated there are at least 100 sea birds which would benefit. RPWG concurred there will be no new variable and the old variable will be changed to effectiveness.

The variable was rated as follows on the alternative table:

- 1 - n/a
- 2 - all
- 3 - most effective
- 4 - most effective
- 5 - all

Veronica questioned whether this is the best time in the history of Alaska to eliminate foxes. Veronica also recommended the following changes: leave 17.2 alone and suggested using the language: removal of introduced species. Also, before a decision is made on the method, the Trustee Council should evaluate techniques. This would remove the burden from the Restoration Plan and put it with the work plan.

Break at 11:00.

Chris stated there is a protocol which must be followed for introducing options.

ALTERNATIVE #2

Bob stated he found 22 projects which could be considered protection such as Options #30 and 4. Veronica stated her RT member prefers that this alternative include habitat protection only. We have to read the plan by how some third party might read and interpret it. Veronica stated that Marty felt the TC might push for 4 alternatives rather than 5. If one must be dropped out, it could be #1, which could be used as background and include a research foundation. Veronica stated the EIS group would have to deal with the ramifications of this because for NEPA purposes, the research foundation would not be included. Bob stated he sees two problems with the research foundation: 1) there is a proposal for a research foundation already and 2) this would be confusing. Sandy suggested having a second recommendation of which alternative could be dropped. Ray stated his concern is the parallel between the EIS and Restoration Plan because you would have to change the description of the existing alternatives. Karen stated she envisions having a baseline information chapter with current status. Carol suggested stating that the alternatives should not be reduced to 4; however, if a backup is necessary, #1 could be dropped.

BUDGET

Bob stated that the RT wanted habitat protection to be 80% in alternative 2. Karen stated the balance captures all those options which we don't know about yet. Bob stated that the balance

concurred. The table and chapter title will be changed as well. Karen stated the actual artifacts are the resource; how you use them is a service. Carol suggested identifying archaeology as a cultural resource. Bob suggested Carol and Veronica come up with a solution to this in a sub-committee. Carol suggested using sub-tables to address archaeology and RPWG concurred.

Carol, Chris, John and Bob Spies will form a subgroup, possibly on Sunday, to discuss comments one by one and identify comments which could be easily incorporated.

Veronica stated that the summary of services does not seem necessary. Sandy stated there is value in having a table. Bob, Sandy and Pam will meet to discuss comments.

Chris stated he wants to indicate on the injury table that there is some disagreement on population level effects. Karen stated that we need to make clear that the status changes are based on current information. Bob suggested indicating this in the comments section. Carol suggested using a footnote: although the species has not had a population level injury, there is still debate within the scientific community regarding the implication of the results. This is something which has to be decided by the Trustees. A subgroup could work out the language of the footnote. Chris stated we must differentiate this from other statements about injury. Carol stated there is a conflict which needs to be worked out between Fish and Game and the Chief Scientist regarding population level effects.

Bald Eagle - No measured decline in population. Current population status would be no change. Bob stated this section must be better explained.

REPLACEMENT/ACQUISITION

Carol came up with another variable for opportunities for replacing injured population/species with different populations and/or species. Long recovery time species include common murre, pigeon guillemot, Kenai River sockeye smolts, Harlequin duck and marbled murrelets. The concept includes resources inside and outside the spill area. Degree of effectiveness is dependent upon whether the 1) species is the same or different; if different, which species are functional equivalents, 2) number of individuals benefitted, 3) status of equivalent 4) does it address something that has a long recovery time, limited restoration options, and seriousness of injury. Veronica raised the issue that no settlement characteristics should be deleted and feels more work is needed on protection issues. Veronica asked what are the birds we are trying to increase. Carol stated they are: common murre, pigeon guillemots, alcids, auklets and other sea birds. Veronica stated she has strong feelings about using sea birds as the link and feels we need to explore this issue more. Carol stated this information

*Simon
Your copy
CP*

RESTORATION PLANNING WORK GROUP
FEBRUARY 4, 1993
9:30 A.M.

Attendees:

Veronica Gilbert
Chris Swenson
John Strand
Karen Klinge
Carol Gorbics
Sandy Rabinowitch
Ray Thompson
Bob Loeffler

The following items were distributed:

Budget for Administrative Costs
Alternative Allocation Table
Administrative Budget Table

AGENDA ITEMS

- Replacement/Acquisition
 - How to Deal in Alternatives
- Injury Table (Arch)
- Geo Table/Spill Area Map
- New Options
- Ecosystem Stuff in Alternatives
- Alt. #2; logical break and Alt. #1
- Spill Prevention
- Special Designations
- Budget
 - Alt. #5
 - Admin.
- Explain Inf. - Adj.
- Wording Changes/Table

INJURY TABLE

Veronica stated archaeology is a human resource but not a service. Sandy stated that archaeology could be split in half as a resource and a service by definition. Veronica stated it is inconsistent to have archaeology under services. Bob suggested putting archaeology under resources. Veronica stated this is a presentation matter. Carol asked what do we gain by making this change and is this an important distinction which will change the content or implementation of the Restoration Plan. Veronica stated services is the service derived from the resources injured by the spill. Archaeology is its own resource. Veronica suggested labeling everything under services as "Archaeology and Services" and RPWG

**RESTORATION PLANNING WORK GROUP
OCTOBER 30, 1992
8:45 A.M.**

ATTENDEES

Carol Gorbics
Veronica Gilbert
Bob Loeffler
Karen Klinge
Sandy Rabinowitch
John Strand
Ray Thompson
Chris Swenson

The following items were distributed:

Draft Alternative Themes - 10/30/92
October 29, 1992 Memo to RT regarding Draft Alternative Themes

DRAFT ALTERNATIVE THEMES

John asked for comments regarding the draft alternative themes table prepared by Veronica. Bob suggested bolding the key points. Karen suggested changing variable 2 under alternative 4 to known because of parallel construction between three and four. Veronica stated she was trying to make alternative 4 looser. Carol suggested using known but not recovered. Carol suggested adding known under injury to all the alternatives. RPWG felt "undocumented" captures this thought. Carol suggested that rate of recovery should be a variable. John stated that while this is a variable, it is an uncertain one. Bob stated that this table will change when money is added; therefore, it is not necessary to spend a lot of time perfecting the table. Veronica suggested using "most effective" rather than "best" technique. Sandy questioned why alternative 5 is limited to within EVOS, and stated you can allow for a larger universe with lesser actions. Veronica stated it is good to add some constraints for more control; however, there will be a lot of discussion. This will prompt questions on how the EVOS area will be defined. John suggested that members of RPWG could work on defining this area and bring it back for group review.

COVER LETTER

John asked for comments on the cover letter to be attached to the draft alternative themes. Carol suggested that the questions should be more explicitly listed. Karen disagreed with having "minimize cost" included because it is misleading that some studies will be frugal. Bob added that we are being cost effective but not necessarily minimizing cost. Sandy questioned the connotations of using "objectives". Veronica suggested adding "the alternatives

are constructed using the following variables." Carol suggested using other variables that were thought of. Bob stated this is included under other ways. Carol suggested changes to the objectives as follows:

- d. beneficial social benefits
- e. geographic distribution throughout the spill area

Carol stated that geographic distribution on its own is not an objective. Carol also suggested using topics rather than objectives. John stated he sees geographic distribution as an objective and specifics can be dealt with in the annual work plan. Carol suggested adding benefits to ecosystem effects. John stated that you are attempting to benefit all components of the ecosystem. Bob suggested changing "various allocation mixes" to "explicitly set funding percentages." Veronica suggested "various expenditure allocations." John suggested "set funding by categories". Veronica disagreed, and John suggested "allocate funding by categories." RPWG agreed. Veronica suggested adding nature and certainty of injury. Sandy stated that protection and manipulation are not in the settlement but in the framework. RPWG agreed to use the terms in the settlement. B was changed to allocate funding by geographic areas. C was changed to funding for at least one project for each injured resource or service. Bob suggested ending the memo with we need concurrence that we are using the correct variables, and these kinds of themes provide a reasonable range of alternatives.

Karen suggested adding on page 2 "more flexibility on the options that could be implemented." Veronica stated alternatives 3 and 4 are similar in that they address injury at a population level. Alternatives 5 and 6 address all injury. Bob suggested all comments be forwarded to Veronica and John rather than having a group discussion.

EIS SCOPING MEETING

Veronica suggested having a RPWG member attend the EIS Scoping Meeting for the first hour. Bob spoke with Ken to determine the amount of time someone from RPWG would be required to attend. Ken requested someone be there in shifts for the entire time and also suggested that they could bring a computer down and work during this time.

SCHEDULE FOR EIS SCOPING MEETING

12-1	Sandy
1-2	Carol
2-3	Chris
3-4	John
4-5	Karen
5-6	Ray

6-7 Veronica
7-8 Mark
8-9

LIMITATIONS ON OPTIONS

Veronica stated that Marty asked her to address the issue of limitations on options, and she has drafted a memo. Marty feels the options are arbitrarily limited in a few arenas. Attorney General Charlie Cole will release a memo in about a week regarding the state's position on what kinds of options are allowable. Veronica stated there may be some uneasiness with some of the limitations RPWG has set on some of the options. Carol stated that RPWG never intentionally limited the scope of options but there were so few options out there. Sandy stated this brings up what do we know about injury. Veronica stated that some options are excluded because of a weak link to injury; however, subsistence issues are not addressed because of third party suits. Carol stated her sense is that if it wasn't explicitly listed, it wasn't done. Veronica stated there needs to be a policy call as to why certain options are not explicitly addressed. Bob stated RPWG will revisit this issue after the Restoration Team meeting.

COMMENTS ON THE FRAMEWORK SUPPLEMENT

Veronica prepared a memo to Chuck Gilbert regarding the comments to the Restoration Framework Supplement which provides a clear statement that the Habitat Protection process will be subject to the Restoration Plan. Another point addressed was the concurrent approach versus the hierarchical approach. Veronica also stated that the suite of alternatives has not been agreed upon; consequently, RPWG requested that both approaches are considered.

INJURY SUMMARY

Carol made revisions to the injury table. Carol further stated that "yes" and "no" as defined do not work and suggested just using "yes" and "no" with no definition. There are some inferences that we have to live with. Bob stated that "unknown" should mean unknown. Previously it was defined as "not studied." Bob suggested having "NS" for not studied. Bob also suggested sending a copy of the table to Spies as soon as possible. Carol stated that she would rather wait until Tuesday to send Spies a filled in injury table which will make him respond to what RPWG's considerations were. Sandy stated that the value of sending this to Spies immediately would be getting some input on the form. John stated that he told Spies that RPWG is changing the form and will be forwarding a copy for his review. John also stated he would rather fill in the table and send it to him on Tuesday. Bob suggested changing "fully recovered" to "recovered." Carol stated that in the public document there will need to be some better footnotes. The information for the table should be forwarded to Carol by

Monday. John suggested preparing a cover letter to go with the table to Spies explaining RPWG's position.

INTERVIEW QUESTIONS

The peer reviewers suggested using a key informant interview process. The memo outlines the process. The process is to replace the information in Appendix A and 2C (injury summary). It is in response to the peer review comments that the categories for services were too broad. Bob stated that the key informant interview process would not try to define injury quantitatively. Also we would want the user groups' evaluations of options. This incidental objective is a useful way to make contact with user groups. Veronica stated that this process has generated a high level of response. Veronica also stated that budgets need to be looked at in terms of methodology and progression. Veronica suggested going to the villages to discuss subsistence. John asked if we know enough about subsistence to do this. John has the results of some NRDA studies, which dealt with the measurement of hydrocarbon contaminants in food stuff. John stated this information probably may not be enough. Sandy stated a decision could be made later on the adequacy of subsistence information. Veronica stated that this would also require literature searches. Sandy questioned if RPWG can get this done. Veronica stated that in the past, the problems were in documenting injury. The user groups could help to identify continuing problems. John asked when would RPWG do the work. Veronica stated that recreation could be done next week through the workshops. Bob stated that this process has to be done before the PAG meeting in December.

Veronica suggested the following steps:

- Literature search to see what has been done
- GIS search
- Determine the interest groups
- Figure out the questions to ask
- If RPWG agrees, schedule peer review of the methodology

John asked if the RT should be appraised if this interview process. Bob stated that Mark thought it was a good idea and suggested writing a memo to Sandor appraising him of what is being done. Veronica, Bob, and John will develop methodology which focuses on recreation and subsistence. Veronica asked if John or Sandy could discuss the nature of injury to subsistence and what the options were targeted to address. Sandy stated he could provide the latest proposal for a subsistence study and also suggested looking at the Chenega agreement. Veronica suggested pulling the information together. John volunteered to work on the review of the subsistence information. Veronica suggested that Mark Fraker could lead up the effort for identifying commercial fishing user groups. John suggested that the key questions we want answered should be laid out. Bob stated the problems need to be defined by area and user

groups of commercial and sport fishing. John will discuss this with Mark and Chris on Tuesday. Bob and Veronica will focus on recreation. John and Sandy will focus on subsistence. Carol suggested that injury to sport fishing should not be limited to the Kenai River.

SCHEDULE

The next RPWG meeting is scheduled for Tuesday at 10:00 and Wednesday will be a work day with members attending the EIS Scoping Meeting on shifts. Karen suggested having a meeting with Sharon Saari on Wednesday. Veronica stated that RPWG needs to discuss the alternatives with the EIS group. Ray stated that Sharon will probably be in high gear on Wednesday and unable to meet. John stated that RPWG will schedule a time to meet with Sharon, possibly during lunch.

DETAILED OUTLINE

John stated that a subgroup of RPWG (Sandy, John and Carol) could make a first cut of the outline and bring it back to the group. This will be forwarded to Barbara by Monday to be combined. Karen stated that her and Ray's outline are on the network.

WRITER/EDITOR

Bob introduced Steven Levi, the writer/editor, to RPWG. John stated that RPWG will provide some good material for him to work with. Steven stated that he will be available on Monday.

RPWG meeting adjourned.

RECEIVED NOV 23 1992

RESTORATION PLANNING WORK GROUP
October 28, 1992
10:45 a.m.

ATTENDEES

Chris Swenson
Carol Gorbics
Karen Klinge
Sandy Rabinowitch (a.m. only)
John Strand
Bob Loeffler
Veronica Gilbert
Art Weiner

The following items were distributed:

Memo from Doug Mutter, dated October 22, 1992
Memo from John Strand re: Draft Alternative Themes

STATUS OF DETAILED SECTION OUTLINES

John asked the status of the section outlines. He has been working on monitoring and evaluation. Karen asked if this would be given to the RT on Friday. John stated "no" but they are to be submitted to him by Friday to reconcile any glitches before group review. Sandy stated that DOI has expressed a high degree of interest. John asked if all members had received a copy of the DOI outline. The level of detail required and how closely RPWG should comply with the DOI outline will be discussed with Dave. Carol suggested adding to the plan "the following things will not be included in the Restoration Plan but will be included in the EIS document." Barbara will collect the detailed input to the outline and a small group will meet to review the detailed outline. Sandy suggested that everyone give Barbara a disk so that the outline can be combined into one document.

ROLE OF PPWG

Veronica stated that Marty asked if RPWG expects the Public Participation Work Group to coordinate presentations at the public meetings. Marty would prefer not to do this. If she does have to do this, she would like a lot of lead time. Karen felt that this is PPWG's role. Carol stated that we could commit to having a couple of RPWG members attend. Bob suggested that LJ and Peg work on the public meeting plan. Veronica stated that by the end of January a public meeting schedule should be prepared.

CONSULTANTS

Randall Luthi is involved in writing regs for the Oil Spill Act of 1990 and in developing a restoration guidance manual pursuant to

implementing the Oil Spill Act. Randall asked that RPWG try to accommodate the consultants, Ken Finkelstein and Debbie French. They will be utilizing OSPIC today and will attend the PAG meeting tomorrow. John will meet with them on Friday one on one to answer specific questions. Sandy, Karen and Carol volunteered to assist with the consultants. Barbara will prepare a sign-up sheet for scheduling the times to meet with the consultants.

Chuck Gilbert is revising ugly book and asked for any RPWG comments for rewrites by Friday. Veronica requested that any comments be forwarded to her by the end of tomorrow

PAG MEETING

John asked if everyone received a schedule for the PAG meeting. RPWG is scheduled for 2:45. Karen stated that Marty stated she would be willing to give RPWG more time. Doug Mutter stated that RPWG would be allotted more time on December 2, which is the 2nd PAG meeting date. RPWG will have up to an hour at that time.

John talked with Bob regarding what RPWG might present to the PAG. Bob laid out some elements for presentation. John will begin by explaining RPWG's purpose and the specifics of where we are now. RPWG may need one designee to the PAG. Bob recommended that this be Sandy. Sandy asked what this would entail. John stated his view is the designee would attend meetings and be the first line of interface to bring back specific requests and coordinate any requests from our group to them. Sandy agreed to be the designee. John felt that other RPWG members could attend as their schedules allow. John will make some general comments and introduce the person who will be the liaison (Sandy). Bob stated that he would do the portions of the briefing he has written. Sandy suggested going over what we want to get across to the PAG. Veronica asked if the December 15th date for providing the key elements to the PAG will be advanced to the December 2nd date of their 2nd meeting. Veronica also asked if the 2nd could be used as an opportunity to present some of the elements. Bob stated that what we want to give the PAG is actually not alternatives but to separate the fact finding portion of what was injured by the spill, is it recovering, what are the options and how are we dealing with them. This should be given to the PAG unencumbered by other information. Bob stated that the workshops will be useful for separation. Carol stated we need to get a good straw man of the alternatives. Veronica recommended that if the RT submits comments by November 30th, then something could be presented to the PAG on the 2nd. Bob stated that the priority is the fact finding before the conclusions. The other elements are necessary to understand the alternatives. Sandy stated that we need to do a good job so that we don't leap to any conclusions. Bob agreed with Veronica that it would have more of an impact if the information is personally presented to the PAG to provide an opportunity to ask questions. RPWG agreed to make a presentation of some of the elements on December 2. Sandy

suggested a mini presentation could be done in some of the PAG members' areas. Bob explained his portion of the PAG presentation for tomorrow and suggested inviting the PAG members to the next peer review session. The PAG should be involved more in the fact finding. John stated that we will be asking for comments reflective of their interests and asked if that is consistent with the charter under which the PAG operates. Sandy added that RPWG thinks the PAG can help in the draft plan by working on a one-to-one level. Bob stated the second level is joint fact finding with non PAG groups; however, this should not be presented to the PAG. Sandy viewed this as a threat to the PAG members. Bob stated it could be done in a non-threatening manner.

Sandy asked what handouts will be distributed to the PAG tomorrow and suggested adding a copy of the annotated outline to the PAG notebooks. John provided a copy to Cherri for inclusion in the PAG notebooks.

The December 2nd PAG meeting will be an opportunity to give the PAG the key elements.

ROUTINE RPWG MEETINGS

John stated that RPWG needs to come to consensus on whether PAG members may attend routine RPWG meetings. Bob stated that Mark Brodersen stated that PAG members can be restricted from attending RPWG meetings. Sandy suggested that PAG members could be told to contact Barbara to schedule a time to come and observe RPWG's process. Bob stated that according to Charlie Cole, all meetings are closed. Bob is comfortable with the position that RPWG meetings are not advertised but they are always open.

INJURY SUMMARY

Karen had to leave at 11:30 but stated that she has some comments on injury, relating to the categories. John suggested this could be dealt with in a smaller group. Karen briefed Carol on her comments regarding injury for presentation in her absence. Carol stated that the substance comments and the blanks should be set aside for later discussion. Carol also suggested going over the format. Spies' injury table was reviewed in conjunction with the Restoration Framework. The injury summary was reviewed to determine what was missed. Cathy Berg took everything from Spies' table and attempted to assign a spot in her table. Carol referred to pink book and the complete list of species studied. The next step would be the whole universe of things which could be studied, which would relate back to public comment. John suggested this could be addressed in Carol's chapter. Veronica asked if direct mortality or population decline would be looked at. Carol stated population decline could define significance. Bob stated that knowing how many were killed is useful information. Carol stated that we don't have that number for most species, but where we have

this information it could be put in the comments section. Karen wanted population decline to define if an injury happened at some point or is continuing to decline. Bob stated it is useful to separate injury from recovery. Direct mortality is whether something was found dead. Carol stated she is trying to steer away from too much complexity in the tables. Everything cannot be captured in the table but in the text. John stated he would like some number on direct mortality. Sandy suggested an estimate could be used.

Lunch break.

RPWG reconvened at 1:30.

During lunch, Carol and Chris tried to capture in a chart the concept of injury and where we are now. Initial mortality was included under injury. Bob asked if you can have direct mortality without a measurable effect on the population. Carol answered "yes".

Resource	Description of Injury			Status of Recovery			Geo Extent of Injury	Comments
	Initial Mortality	Pop. Decline Post 1989	Sublethal Chronic Effects or Exposure	Pop. Status	Sublethal Chronic Effects or Exposure	Dep. on Degraded Habitat		
Marbled Murrelet ¹	yes	yes	yes	c.d.	n.d.	n.d.		
Pigeon Guillemot ¹	yes 1500-3000 (est.)	yes	n.d.	unk.	n.d.	n.d.		
Pink Salmon ¹	n.d.	n.d.	yes	unk.	yes	yes		

¹Population may have been declining prior to the spill

n.d. - not detected but studied

no - studied, no likely injury

yes - studied, significant evidence of injury

unknown - not studied

Bob made the following suggestions to the table:

- use 11 point type
- use subheadings
- footnotes on every page
- if possible, don't use abbreviations

Carol will work on a draft and get back to the group on Tuesday. Karen suggested giving a copy to Spies also for comments.

Veronica stated that the HPWG discussed the summary of injury and stated possible Carol's table could serve that group also. John envisions writing a cover memo to Spies detailing what was done in the table. Art asked how much information will be in the narrative section describing injury. Carol stated "lots". Art stated there is a lot of complex information behind the tables. Veronica suggested presenting this as an outline of the injury narratives that Spies will do, and RPWG should agree on what kind of information is useful and what are the key points that need to be extracted. Carol stated that Spies captured those points. John stated that substantively RPWG agrees with Spies. The original intent was to have a table that summarizes everything. The table is a stand-alone product. Veronica stated that the table may not be terribly useful for laymen. Bob raised the issue that habitat degradation may be misinterpreted by the public. Art stated that it will be important from the habitat protection point of view for the public to understand habitat types, and defining habitat types and sites will need to go somewhere in the document. Art also stated that the assumption he would make, if he were the public, would be the extent of injury is equal across the board. If the public doesn't read the narratives, they can make a lot of incorrect assumptions. Bob raised the issue that Spies will not fill out services. Sandy has been assigned to fill out the table on services. Carol stated Sandy thinks that services should have the status of injury changed to the three bullets from the Restoration Framework document. Carol requested comments on the table by c.o.b. Monday. Art questioned if wilderness and intrinsic values have been discussed. Bob stated "yes". Sandy will be writing this.

DRAFT SKETCH ALTERNATIVES

Veronica prepared a package detailing how to present the six draft alternative themes to the Restoration Team. We are in an awkward position because we are unsure what the database will do for us. Karen stated she had some comments on wording. Karen tried to think of different approaches to developing the alternatives. She would take something similar to alternatives 5 and 6 and keep the expanded list of injuries in the pot. There is the risk of getting complicated if we restrict the target injury. Decisions have to be made on replacement options or equivalent resources. Karen used alternative 6 with a conservative view. You emphasize those things that have a greater certainty of injury. The database is sorted

for what things apply and the component funding determined. You don't drop out things with less certainty of injury. Alternative 8 is much more relaxed and is based on how effective the projects might be. Veronica stated she thought about Karen's concerns and went back to the outline on page 2 of the cover memo. Options are not mentioned at this stage. Veronica does not feel comfortable with this because the database has not been revamped yet. Carol stated the options would give a range. Veronica stated she understood this would be done generally by theme. The distinction is that this would be a basis for structuring alternatives. Karen stated that she thought about the alternatives in this respect because she didn't want to eliminate a lot of the Trustee's flexibility in doing things. Veronica stated that at this stage we need to address some of the basic cuts. Veronica stated there are two questions: 1) what do we want these to look like and 2) what do we need from the Restoration Team. John stated that we need some consensus from the RT on what the differences between the alternatives would be. Carol questioned if we have moved forward with the present themes. Veronica asked what she would like to see added. Carol stated that adding the options would show that some progress was made. Veronica stated if we could all agree on the list of resources that were injured at a population level, that might be something that helps. Karen agreed with Carol and felt the alternatives were too general and stated the assumptions are not targeted in the right direction. Carol stated the adequacy of natural recovery does not change from one species to another, and you should talk about rate or speed. Veronica stated that she has no problem dropping the assumptions. Carol stated she felt the assumption regarding impact of other activities was good. Karen stated you don't make arbitrary decisions about allocations until some of your options are brought out. Veronica suggested using a method of allocating funds across the board to see if there are substantial differences. If you look at the notion of cost and then look at the alternatives, you minimize cost by looking at the most effective things at the lowest cost. Bob recommended capturing the following ideas: 1) an option is not always an option 2) what are the oil spill boundaries. John stated that a decision needs to be made on what the alternatives are. Veronica stated in terms of whether things will be done outside or inside the affected area, she is confused on whether it is presumed or by definition. Is this done in advance as a constraint of the options you set? John stated we have to decide this to come up with some recommendations to the RT. Karen suggested using the term geographic constraints to cover this issue. Karen suggested using her ideas for alternatives 4,5, and 6 with type focuses. Chris suggested deleting framework alternatives and protection from the table. Replacement could be added to 4,5, and 6. Karen stated that protection is usually direct restoration. Veronica stated the language may include land outside EVOS, but won't necessarily. Karen stated the difference between 3 and 4 is you are opening up your options by adding those moderately affected. The choice is doing enhancement inside the EVOS area (2,3,5) or outside.

Alternatives 4 and 6 are inside and outside. Chris asked if alternative 2 is considered a conservative protection option. Karen stated the premise is to provide protection so that natural recovery can proceed at the most rapid rate. John suggested changing the term "active restoration" to "progressive restoration." Veronica suggested asking the editor for words which capture the meaning. Chris questioned if sublethal affects are included under the variable for Alternative 2, and stated it should be included. Karen suggested making this more explicit in 3 and 4 by adding "limited to resources injured at a population level." John suggested changing alternative 5's title to expanded and RPWG agreed. John asked if it is anyone's sense that the RT is looking for a pie chart. Karen stated that at some time in the future they will want to see one. The final question to address is budget constraints or allocation. Karen stated her reaction is 2,5 and 6 would have variation in allocation, and 3 and 4 would not because of the focus on certainty of injury. John asked if it is possible to capture this. His view is we should have a couple of conventions for how we deal with that. Karen stated monitoring should show up in all of these. Veronica suggested having a footnote that all alternatives include monitoring. Veronica also suggested that budget constraints could be added as a fifth variable. Karen stated that emphasis would be on those species which suffered the most severe injury. It is not necessary to make an explicit exclusion for things which don't fit. John asked if we could add some rationale to take to the RT that addresses cost allocation for each alternative. Bob stated he is not sure you make the allocation and force the alternative to fit. John suggested taking a couple of examples or conventions to the RT for dealing with costs associated with each alternative. John stated he is afraid to ask them anything without giving them something. Bob suggested doing an arbitrary allocation of cost by framework characteristics. Karen suggested putting the criteria into words because all the RT may not know what the criteria means. Veronica will redo the table. John will make some points of clarification to the cover letter. Karen asked if it would helpful to describe the differences between 3 and 4. Veronica stated that she had done this originally but she is concerned about introducing lots of verbiage in the table; however, this could be expanded in the cover letter. Karen asked if it is stressed in the memo that the database has been modified. Veronica stated that she mentioned this.

The remainder of RPWG's agenda will be completed Friday morning at 8:30. Meeting adjourned at 4:40.

June 17, 1992

Author: Ray Thompson

OPTION 12: Creation of New Recreation Facilities through replacement or construction

APPROACH CATEGORY: Manipulation of Resources

INJURED RESOURCES AND SERVICES: Recreation

SUMMARY

The area impacted by the Exxon Valdez Oil Spill contains an assemblage of private, State of Alaska and federal lands that provide recreational services to the public. The public lands include the Chugach National Forest, several Alaska State Parks, National Monuments, National Parks, and National Wildlife Refuges. These include management units in Prince William Sound, on the Kenai Peninsula, Alaska Peninsula and Kodiak Island. A full range of private and commercial recreation activity occurs in these areas, supported by facilities like mooring buoys, boat ramps, recreational-user cabins, camping sites and trails.

SUB-OPTION A: Replace and/or rehabilitate existing structures and services to enhance user experiences

TARGET RESOURCES AND SERVICES:

Recreation, visual resources, cultural resources, information services and interpretation services

DESCRIPTION

~~FEDERAL: Several federal land managers were impacted by the EVOS. This was evidenced during the evaluation of injury to resources and services on federal lands. These lands are administered within the National Forest System, the National Park System and the National Wildlife Refuge System. Actual recreation visitor use of lands and facilities declined to different degrees dependent upon the local affect of oil on the services provided by the three federal agencies. It is apparent that some direct and some subtle effect was noted on the following units.~~

Within the National Forest System the existing recreation use patterns, scenery and cultural resources were changed or impaired through oiling. Chugach National Forest use statistics for cabins in Prince William Sound indicate less occupancy immediately following the spill. Oiling and cleanup efforts have changed visual perspectives and peoples' perceptions of the Sound. The Spill has not only damaged cultural resources but cleanup has imparted knowledge to many people which has caused increased visitation and looting of cultural resource sites. The ability to manage by making more information available to users and interpreting it has not kept pace with the recreational and other use of these sites

The National Park Service manages several units within the spill area. Kenai Fjords N.P. had damaged resources from oiled beaches. This and cleanup efforts changed visitor use patterns. Similarly injured but to differing degrees or are carrying perception of injury were Lake Clark National Park and Preserve, Katmai National Park and Preserve, and Aniakchak National Monument and Preserve.

The Fish and Wildlife Service manages several National Wildlife Refuges in the Oil Spill area. Although some distance from Prince William Sound, oiling did occur within the jurisdiction of the Alaska Peninsula NWR and the Kodiak NWR. Recreational aspects of visitor use changed during the spill and cleanup projects afterward.

STATE: Alaska has several areas designated for various purposes but which attract recreationists. State Historic Sites, Marine Parks, Recreation Areas and Recreation Sites each provides the visitor with unique opportunities to enjoy Alaskan outdoors. Many of these sites were directly impacted by the Oil Spill. Others were not accessible for a time during spill cleanup. Without efforts to interpret injury for the interested public it may be difficult to attract visitors. Visitors may perceive their destinations differently after the spill and may change use patterns. Several units of concern are Marine Parks in Western Prince William Sound.

IMPLEMENTATION ACTIONS

It is important for both the Federal and State agencies to have information on the type and degree of injury suffered by individual units as well as effects perceptions of injury may be having (have had) on users of recreation units and sites within the oiled area. The full impact to recreation activities and opportunities needs to be determined by the management agencies and damage assessment personnel.

Information on injury and the utility of sites for recreation activities needs to be developed and distributed to vendors. These vendors, including information offices of the agencies, would distribute the facts about oil spill related injury and how that injury may or may not affect user activities. Brochures, posters and pamphlets with photos and synopses of oil spill related impacts could provide this service. Design and development of remote sites which could expedite the dissemination of information would be a concurrent step.

Engage in meetings with recreational clubs and organizations to provide information. Develop and promote recreation opportunity guide within each agency, or as a partnership effort develop regional guides, i.e., Prince William Sound Recreation Opportunity Guide, or others. Meetings and contact with the user public would indicate the need for on-ground sites and facilities. A recreation guide would direct people to the developed facilities.

Need
to add
rec.
to
education
options

Covered
in education
options

Video tapes on the evolution of the oil spill and related injuries within recreation areas, which provide focus for learning more about the actual effects would combine recreational opportunities with learning experiences. Remodeled facilities may be needed to use these tapes efficiently and effectively.

Identify facilities and sites damaged, destroyed or rendered unusable by the oil spill or cleanup.

Identify new sites needed to enhance recreation activities

As an interagency activity, with public participation, define the needed facilities and sites within the oil spill area and establish priorities for implementation of facility and site development plans.

TIME NEEDED TO IMPLEMENT

Development of an education/recreation opportunity guide should take about one year. Interagency activities may take longer.

Construction activities normally take 3 to 4 years from concept and design to a completed structure. Continuity of funding is required during this period to complete a facility in an efficient, cost-effective manner.

MEANS TO IMPROVE RECOVERY

A description of injury to recreation activities provides the basis upon which managers can build programs and facilities to enhance visitors' understanding of oil spill impacts. A successful approach for information dissemination is to do it on-site. This will require additional facilities and people as well as the information. This will enhance recovery of damages to recreation by providing information in a setting within the damaged area for a hands-on and look-see assessment by the individual persons. The provision of facilities and education on environmental awareness will enhance both the manager's capabilities and public knowledge for a common goal of sustained, sensitive, high-quality interaction with the environment.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

All activities under this option may be implemented under existing laws and regulations. Management decisions will be needed to implement actions. These actions on federal land will need an environmental analysis and appropriate documentation. Permits of various kinds from both federal and state agencies may be required for any singular or group of activities. (see 12/03/90 Memorandum from Les Gara, State of Alaska, Assistant Attorney General, to Stan Senner, Restoration Project Manager)

This memo outlines a variety of State and Federal permits and processes necessary for project implementation.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Both Federal and State managers have long-term plans for management and enhancement of resources within their jurisdiction. The oil spill event changed types of projects needed and the priorities for their implementation. All reconstruction and site enhancement will necessarily fit into development plans for National Parks and Monuments, Wildlife Refuges, National Forests and State Parks. Projects which will respond to restoration needs, but are outside currently approved plans, and which are a high priority for the manager would likely be adopted and implemented through agency plan amendment procedures.

TECHNICAL FEASIBILITY

Development of planned facilities and sites is feasible.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

The use of restoration emphasis to provide for enhanced recreation experiences is a valuable service to visitors of both federal and state lands within the spill area. Information developed by the various agencies and organizations concerned with oil spill impacts will have the greatest influence on visitor behavior, attitudes and perceptions when it is presented on-site. Visitors are attracted to areas when facilities are available for their use and enjoyment. Managers can better attend to the needs and demands of visitors when they have some control over their activities and the locations of those activities. Control of activities and dissemination of accurate and timely information is one of the best tools available to recreation and visitation managers. New and/or rehabilitated sites and facilities provides the manager focus for implementation of their education programs.

It is necessary to implement this activity concurrent with the beginnings of the restoration program. What is being done, its success and failures, timing and schedules are all important to the visitor and recreationist. Even with plans for reconstruction and/or rehabilitation of damaged sites and facilities in the making, it will take 1 to 2 years to complete an on-ground project.

INDIRECT EFFECTS

Environmental: It is perceived that the activities associated with site enhancement and rehabilitation will potentially add to the injury that already occurred in the area; cultural resources being a primary concern. It is also an expressed concern that better sites and facilities will draw more people into the area, further distracting from its 'pristine' nature.

Conversely the impacts of many people are more or less localized. This localization provides an opportunity for the manager to focus on the developed sites. This focus resulting in a better informed and more conscientious recreationist, who, in turn, makes less impact as an individual. Managed opportunities will, over time, result in long-term sustainable resource uses.

Socio-economic: Drawing on the above it is expected that managers will provide a socially valuable service through site and facility enhancement. Agencies will also provide opportunities for less developed recreation. The variety of users now in the oil spill area demand different services, but in the long run well placed developed sites may be of benefit to most users. It is certain that the development activity, whether it be rehabilitation, enhancement or construction will increase the economic activity within the spill area. This would come directly from the work associated with these processes and potential fees for user services, or indirectly from marine and air operations which would take visitors to the sites.

Human health and safety: Restored, rehabilitated, enhanced and newly constructed sites and areas would focus human activity. This focus would be managed by the agencies who would likely have more presence in the areas affected by the site work. This would have a direct affect on the visitors' perception of their immediate health and safety. Managed sites and maintained facilities are actively sought by visitors. Appropriate visitor information services at these sites and areas provides recreationists with information and services needed to enjoy the surroundings in a safe and environmentally sound manner.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

The value of facilities is for the focusing of information dissemination in an atmosphere that allows facilitation and coordination but doesn't distract from the message being given. With this in mind it is reasonable to consider development of facilities when it is expeditious for the presentation and understanding of information related to the area environment and its management. Options which consider the Management of Human Uses are more or less linked to the development of facilities. The development of other types of facilities requires coordination of the agencies, corporations and individuals which might be considering such

development. This certainly relates to any options in which development or intensive management of sites or areas is contemplated.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Other options which may have concurrent or similar activities are: 1B, 4C, 7B, 33B & C, 34A & B.

LEGAL CONSIDERATIONS

This sub-option is consistent with the terms of the settlement aimed at restoring natural resources and services within the spill area.

Agencies with management and/or regulatory responsibilities are primarily the land-based agencies which are DNR, NPS, USFS and USFWS. All agencies may be involved in the development of this option. Other than the above the ADF&G, NOAA and NMFS would be included in planning and management of the sites and areas to complete, at least the information portion of management, if not part of the planning and siting activities.

Permits required include those necessary for construction as regulated by the state, borough or municipality as well as the agency upon which the facility or site development may be located. This would primarily include the land-based agencies named above.

All developments upon federally managed lands or water would require compliance with NEPA. Public participation in the consideration of effects of a development proposal and its alternatives, and of any decision made on the proposal is required.

No new or additional legislative or regulatory actions are contemplated.

MEANS TO EVALUATE SUCCESS

Monitoring of public and agency impressions and use statistics for any individual as well as the cumulative developments will be necessary to evaluate the success of development. The attitude of individuals toward injured resources and services may be sampled for information on programs and facilities. When people have become sensitive and considerate of injured resources and services and modified their behavior within the spill area so as to preclude further injury through their presence, then restoration through development of facilities and areas, may be called successful.

REPRESENTATIVE COSTS

[e.g., planning/legal, capital, real estate and development rights, operating/management, etc.]

Typical costs for developments such as camping sites with interpretive facilities and manned interpretation and education facilities are being developed.

ADDITIONAL INFORMATION NEEDED

DRAFT

June 27, 1992

Author: John Strand/Art Weiner

OPTION 13 - Eliminate Sources of Persistent Contamination of Prey and Spawning Substrates.

SUMMARY

The spring, 1992 joint survey [FINSAP] of beaches in the EVOS-affected area confirmed the presence of contamination on numerous beaches. The majority of this persistent oil is located beneath the surface armor or beneath mussel beds. Persistent oil adjacent to mussel beds or anadromous streams represents a potential threat to living resources that utilize them as food or habitat. Chemical analyses of mussel tissue and sediments from contaminated mussel beds revealed very high levels of petroleum contamination.

APPROACH CATEGORY

Manipulation of Resources.

INJURED RESOURCES AND SERVICES

Coastal habitat, blue mussels, harlequin ducks, sea otters, black oystercatchers, river otters, fish and subsistence.

DESCRIPTION

The objective of this option to determine the geographic extent of persistent oil in and adjacent to oiled mussel beds and anadromous streams in Prince William Sound. The study will also determine the concentration of oil remaining in mussels, the underlying organic mat and substrate. This study will determine and implement, if necessary, the most effective and least intrusive method of cleaning oiled mussel beds and areas of contamination adjacent to anadromous streams. Proposed treatment should accelerate weathering and biodegradation and have a minimum adverse impact upon living resources. This study will also provide chemical data to assess the possible linkages of oiled mussel beds to harlequin ducks, black oystercatchers, juvenile sea otters, juvenile and adult river otters, and other organisms.

IMPLEMENTATION ACTIONS

1) Samples of mussels, byssal substrates and sediments will be collected from sites in Prince William Sound wherein persistent oil was found during 1992 surveys. Samples will first be screened by ultraviolet analyses to determine geographic extent and relative intensities of contamination. Selected byssal mat substrate samples as well as selected mussel and sediment samples will then be analyzed by gas chromatography/mass spectrometry to determine absolute and relative concentrations

of contamination.

2) Treatment techniques designed to accelerate weathering and microbial degradation will be implemented at selected sites with high concentrations of persistent oil. These sites will be sampled periodically and chemical analyses conducted to evaluate the efficacy of treatment techniques. Treated areas will also be monitored for erosion as well as for recruitment of mussels and other invertebrates.

TIME NEEDED TO IMPLEMENT

Much of the sampling to determine the geographic extent of persistent oil within the spill zone will be done in 1992, however, it is not likely that chemical analyses (UV screening) of these samples will be available for interpretation until Spring 1993. Detailed chemical analyses (GC/MS) will not be available until Spring 1994. Results of studies to determine elimination of petroleum hydrocarbons from mussel beds (based on UV screening) where contaminated mussels and underlying substrates were stripped away also will not be available until Spring 1993.

MEANS TO IMPROVE RECOVERY

Stripping or tilling of contaminated mussel beds will increase flushing of residual oil. By exposing buried oil to the air, residual oil also will be eliminated through weathering and microbial degradation. Consequently, less oil will be available for bioaccumulation by mussels and other invertebrates. Less oil also will be available as contaminated prey for predator species such as harlequin duck, black oystercatcher, sea otter and river otter.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

A measure of protection and management is afforded by the Coastal Zone Management Act of 1972 (Section 315, Public Law 92-583, as amended; 86 Stat. 1280 [U.S.C. 1461]) and the Alaska Coastal Management Act and Alaska Coastal Management Act Regulations (AS 46.40, 6 AAC 80 and 85).

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Knowledge of the levels of residual petroleum hydrocarbon contamination in intertidal habitats will be used to regulate subsistence gathering of mussels, clams and other shellfish.

Knowledge also gained by testing the feasibility of eliminating residual oil in mussel beds by stripping will be useful in making future decisions on whether or not it will be beneficial to physically or chemically (includes bioremediation) clean mussel beds and other biologically important habitats.

TECHNICAL FEASIBILITY

Although methods are available to monitor the fate of petroleum hydrocarbons in sediments and biological components of intertidal habitats, the potential efficacy of stripping mussel beds to accelerate elimination of residual oil has not been tested.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

Stripping of contaminated mussel beds should increase natural flushing of the beds within the stripped area. It is not known whether adjacent, contaminated areas will be affected. It should also increase weathering and microbial degradation of buried oil. As a result of this process, less oil should be available for bioaccumulation and transport up the food chain.

INDIRECT EFFECTS

Although there will likely be no adverse socio-economic and human health and safety effects associated with treating the mussel beds, there will be some environmental cost. There will probably be some direct loss of mussels and associated invertebrates and algae. This loss needs to be weighed against the benefit of accelerating the rate at which contamination is eliminated from this habitat, and the benefit of decreasing the probability that potentially harmful petroleum hydrocarbon residues will be passed up the food chain. The potential for such costs and benefits will be addressed in future project level environmental assessments or environmental impact statements.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

While this restoration option could be construed as a "response" activity, the U.S. Coast Guard and the Alaska State Department of Environmental Conservation ended clean-up of oiled shorelines in Spring, 1992. This is the only restoration option that considers additional clean-up, although Option 30 calls for the development of a testing program to test for the presence of petroleum hydrocarbon residues in subsistence foods including mussels and clams.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

There are no other options that propose direct restoration (manipulation) of intertidal sediments and mussel beds, although

Option 14 also proposes to accelerate recovery of the intertidal zone. Option 14, however, focuses on accelerating recovery of the intertidal alga, *Fucus gardneri*. One proposed method to accelerate recovery of the *Fucus* community is through use of a trickle irrigation system which may or may not accelerate flushing of the intertidal zone.

LEGAL CONSIDERATIONS

The State of Alaska Department of Natural Resources has regulatory authority for all tidelands. The State of Alaska Department of Fish & Game manages fish and wildlife including nongame species. Both agencies require and issue permits in the intertidal zone. Other permits may be required by the U.S. Forest Service, National Park Service or the Alaska State Parks System, dependent upon the site(s) of the proposed feasibility studies.

MEANS TO EVALUATE SUCCESS

This option includes a monitoring component designed to assess the efficacy of stripping on elimination of oil from mussel beds. Both the fate of oil in mussels and in the substrate and the effects of oil on growth and reproduction of mussels will be followed at oiled and unoled-control study sites.

REPRESENTATIVE COSTS

As shown in TABLE 1, expected costs for Year 1 will be \$582.00K. This amount will support the feasibility study and is based on costs presented in the Exxon Valdez Oil Spill 1992 Draft Work Plan (Exxon Valdez Oil Spill Trustees 1992). Costs for a second year assume that seven sites (5 sites in PWS, 2 sites elsewhere) will be revisited and mussel beds stripped. These costs are based on conversations with Jeep Rice of the Auke Bay Fisheries Lab.

ADDITIONAL INFORMATION NEEDED

None.

CITATIONS

Exxon Valdez Oil Spill Trustees 1992. Exxon Valdez Oil Spill Restoration. Volume II. 1992 Draft Work Plan. Exxon Valdez Oil Spill Trustee Council, Anchorage, Alaska.

TABLE 1. Projected costs of Implementing Option 13.

<u>ITEM</u>	<u>\$K</u>	<u>BASIS</u>
<u>Year 1 - Feasibility Study</u>		
Salaries		
Project Leader	29.00	5 man months over 1 year.
Other Scientist	45.00	10 man months over 1 year.
Technician	80.00	24 man months over 1 year.
Clerical Support	10.00	3.5 man months over 1 year.
Travel and Per Diem	35.00	Airfare to and from Juneau to Valdez for field team of months; team of 2 for 2 months.
		3, per diem for 2 per diem for second field
Boat Charter	25.00	For 2 month field season.
Helicopter Charter	50.00	For 2 month field season.
Equipment/Supplies	18.00	Sampling gear.
Chemical Analyses	280.00	Includes 450-550 UV and 275 GC/MS analyses, QA, maintenance,
		supplies, interpretation ⁽¹⁾ . instrument
Peer Review	4.00	One week.
Publication	6.00	Report duplication, graphics support, editing, mailing.
		page charges (journal),
<hr/>		
Sub-Total	\$582.00	

⁽¹⁾ Detailed chemical analyses may not be complete until spring 1993.

Table 1. (continued)

<u>ITEM</u>	<u>\$4K</u>	<u>BASIS</u>
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Year 2 - Implementation of Stripping

Salaries

Project Leader	6.00	1 man month over 1 year.
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Other Scientist	10.00	2 man month over 1 year.
-----------------	-------	--------------------------

Technician	14.00	4 man months over 1 year.
------------	-------	---------------------------

Clerical Support	3.00	1 man month over 1 year.
------------------	------	--------------------------

Travel and Per Diem Valdez and return for diem for second field	7.50	Airfare from Juneau to field team of 3-includes per diem for 10 days, per team of 2 for 5 days (two trips over 1 year).
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Helicopter Charter trips.	22.50	For three 5-day field trips.
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Equipment/Supplies	5.00	Sampling gear.
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Chemical Analyses many as 25 GC/MS analyses instrument interpretation.	30.00	Provide for 50 UV and as including QA, maintenance, supplies and
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Peer review	4.00	One week.
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Publication graphics support, (journal), mailing.	6.00	Report duplication, editing, page charges
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Subtotal \$107.50

Total \$689.50

June 23, 1992

Author: Chris Swenson

Updated

OPTION **Option 24: Acquire Inholdings Within Parks and Refuges**

APPROACH CATEGORY **Habitat Protection and Acquisition**

INJURED RESOURCES AND SERVICES Inholdings in existing state and federal protected lands include coastal, upland and marine areas which support any given combination of the resources and services injured by the spill.

SUMMARY State and federal lands under special protective status (e.g., parks, refuges, etc.) exist within the spill area and support several injured species and resources. Private inholdings within these conservation units are often not subject to the regulations which govern the management of these units. This situation makes it difficult for land management agencies to consistently regulate land uses and public activities. Two suboptions exist which could potentially solve this problem. First, inholdings containing key habitat types could be purchased and added to protected areas. Alternatively, there are several other protection options, such as conservation easements, which would leave the land in private ownership and provide varying levels of protection.

SUBOPTION A **Acquisition of Fee Title to Inholdings**

TARGET RESOURCES AND SERVICES This suboption potentially targets three groupings of resources and services:

1) oiled inholdings supporting resources and services directly injured by the spill

2) unoiled inholdings supporting resources and services directly injured by the spill (e.g., an unoiled coastal area which provides crucial habitat for a species of marine bird injured by the spill)

3) unoiled inholdings supporting resources and services equivalent to those injured by the spill

DESCRIPTION The federal or state government could acquire fee title to privately owned inholdings within lands managed by the Alaska Departments of Natural Resources and Fish and Game; the National Park Service; the Forest Service; or the Fish and Wildlife Service. The land would be managed by the appropriate agency to preserve and enhance injured resources and services.

IMPLEMENTATION ACTIONS Prior to implementing this option, the Trustee Council will have to select and rank candidate lands for purchase where there are willing sellers. Implementation of Trustee Council decisions will occur in three steps:

54 1) The appropriate agency will prepare a preliminary project
55 proposal and go through a NEPA compliance process, which would
56 probably entail preparation of an EA.
57

58 2) The appropriate agency will go through the multiple steps
59 necessary to purchase or reconvey land to public ownership.
60

61 3) The appropriate agency will carry out management
62 responsibilities and monitoring.
63

64 **TIME NEEDED TO IMPLEMENT** The time needed to implement this option
65 ranges from 6 months to several years. Variables include:
66

67 Time to negotiate with landowner

68 Time for federal or state land acquisition process

69 If an EA or EIS is required

70 Time to write/amend management plan
71

72 **MEANS TO IMPROVE RECOVERY** Public ownership and enhanced protection
73 of oiled lands will facilitate natural recovery by restricting
74 activities stressful to already damaged populations and habitats.
75 In the case of unoiled areas which support resources and services
76 equivalent to those damaged by the spill, the implementation of
77 this suboption would guard against future habitat degradation and
78 could enhance the services provided.
79

80 **PROTECTION AND MANAGEMENT UNDER EXISTING LAWS** Existing regulatory
81 authorities applicable on private lands within state and federal
82 conservation units potentially include:
83

84 Endangered Species Act of 1973 (16 USC 1531)

85 Marine Mammal Protection Act of 1972 (16 USC 1361 et seq.)

86 Migratory Bird Treaty Act of 1918 (16 USC 703-712)

87 Bald Eagle Protection Act of 1940 (16 USC 668)

88 Alaska Forest Practices Act of 1990 (AS 47.17) and regulations
89 (11 AAC 95)

90 Alaska Coastal Management Act of 1977 (AS 46.40)

91 Coastal resource district management plans (6 AAC 80 & 85)

92 ADF&G Anadromous Fish and Fishway Acts (AS 16.05.840 & 870)

93 Clean Water Act of 1977 (33 USC 1251 & 1344)

94 National Historic Preservation Act of 1966 (16 USC 470 et
95 seq.)

96 Section 22(g) of Alaska Native Claim Settlement Act of 1971

97 State and local zoning regulations
98

99 These regulations can provide high levels of protection in certain
100 cases, but do not provide a regulatory basis for managing an area
101 on an ecosystem level with the primary objective of restoring spill
102 injuries. The highest level of protection for recovering species
103 and habitats would be attained by placing public lands into special
104 protective status (e.g., refuge, park, sanctuary) with specific
105 intent language contained within the enabling statute. These types
106 of areas can be managed for a specific purpose, and the management
107 policies are enforceable.

Public lands which are not given any special protective status are often required by law to be left open to certain types of development (e.g., mining, logging, oil and gas production) which may not be consistent with restoration objectives. Non-protected lands are generally covered by some sort of resource agency management plan, but the administering agency generally cannot provide strong protection to lands which have not been classified into a protective status.

RELATIONSHIP WITH EXISTING/PLANNED USES OR MANAGEMENT Government acquisition and management of land could result in increased regulation of public uses, e.g. development projects, certain recreational and harvest activities, vehicle access, etc.

TECHNICAL FEASIBILITY This suboption is technically feasible. Natural resource agencies routinely and successfully utilize land acquisition and protection as a management tool to protect and enhance both damaged and healthy ecosystems. The state and federal land management agencies all have sections which deal specifically with land acquisition.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE Many state and federal protected lands in the spill area have private inholdings which support significant resources and services. Certain recreational and commercial activities on these lands conflicts with habitat requirements of injured species. In most cases, the resource agencies cannot directly control activities on these areas which may be harmful to injured species and habitats.

Acquisition and increased protection of these areas would ensure that restoration objectives would receive management priority. Acquisition could also enhance injured services by providing increased tourism, recreational opportunities and harvest levels. The acquisition process could take from 6 months to several years to complete.

INDIRECT EFFECTS Indirect effects could include the following:

- 1) Species not targeted for restoration efforts could benefit from enhanced habitat protection.
- 2) Healthier ecosystems resulting from enhanced protection could provide socioeconomic benefits by attracting tourists, providing increased harvest and recreational opportunities and improving the quality of life.
- 3) Enhanced habitat protection could have negative economic impacts due to increased regulatory restrictions on harvest levels, certain types of recreational uses and development projects.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIVITIES This suboption could potentially overlap with options 21, 23, 25, 26 and

162 29, which deal with acquisition of tidelands, marine bird habitat,
163 bird nesting areas, anadromous stream buffers and upland forests.
164 Inholdings can potentially include some or all of these areas.
165

166 **OTHER OPTIONS THAT COULD ACHIEVE THIS OBJECTIVE** This option
167 provides a high level of protection for inholdings. However, there
168 may be cases where the same objectives can be achieved by Suboption
169 B of option 24 (below), which would enhance habitat protection
170 through a variety of non-purchase alternatives. In addition,
171 options 21, 23, 25, 26 and 29 could achieve the same objectives if,
172 once these areas were acquired, they were given a level of
173 regulatory protection comparable to national wildlife refuge
174 status. There is, therefore, a strong potential for a single
175 acquisition to achieve multiple restoration objectives.
176

177 **LEGAL CONSIDERATIONS**

178
179 1) Consistency with settlement: Acquisition of land,
180 including acquisition of equivalent resources, is consistent
181 with the terms of the settlement.
182

183 2) Agencies with management/regulatory responsibilities:
184 Existing agency responsibilities do not conflict with the
185 implementation of this suboption. Agencies with management
186 responsibility for areas with inholdings potentially include
187 the Alaska Departments of Natural Resources and Fish and Game;
188 The National Park Service; the Fish and Wildlife Service;
189 and the Forest Service.
190

191 3) Permits required: No permits are required.
192

193 4) NEPA compliance: Land acquisitions generally go through
194 the NEPA process, although small additions to existing
195 conservation units may not have to.
196

197 5) Requirements for new legislative/regulatory actions: None
198 is required for purchasing inholdings.
199

200 6) Other: Complicating factors could include legal conflicts
201 over ownership of avulsed lands and the state challenges to
202 federal claims of ownership of Alaskan tidelands and submerged
203 lands.
204

205 7) ANILCA: With certain restrictions, ANILCA authorizes NPS
206 and FWS to purchase inholdings from willing sellers. With
207 minor exceptions, these agencies are not authorized to
208 purchase outside the boundaries of existing conservation
209 units. The USFS is also generally restricted to purchasing
210 inholdings. However, the boundaries of the Alaska National
211 Maritime Wildlife Refuge are loosely defined and include
212 coastal areas, islets and spires along much of the Alaskan
213 coast. Therefore, many privately owned coastal lands could
214 qualify as inholdings.
215

216 **MEANS TO EVALUATE SUCCESS** The appropriate agency will monitor
217 how effectively their management program has prevented activities
218 harmful to injured resources and services and the degree to which
219 the option has enhanced compatible public uses.
220

221 **REPRESENTATIVE COSTS**

222
223 Federal/state land acquisition process -

224
225 NEPA compliance process (EA/EIS) -

226
227 Fair market value for land - varies w. quality and size of parcel
228 OR

229 Land exchange process/reconveyance

230
231 Costs for maintaining agency management and monitoring of areas -

232
233 TOTAL COST: Variable

234
235 **ADDITIONAL INFORMATION NEEDED**

236
237 Input is needed from the Trustee Council on specific inholdings
238 eligible for acquisition and subsequent status. This must be based
239 on specified habitat types and conditions required for restoration
240 of injured species.
241

242 **CITATIONS**

243
244 Kim Sundberg, ADF&G, pers. comm.
245 Al Carson, ADF&G, pers. comm.
246 Bill Mattice, FWS Realty, pers. comm.
247 John Martin, FWS ANMWR Mgr., pers. comm.
248 Chuck Gilbert, NPS, pers. comm.
249 Robin Willis, ADF&G, pers. comm.
250 Steve Planchon, TNC, pers. comm.
251 TNC report
252 Jones and Stokes report
253 Restoration Framework document

SUBOPTION B Enhance protection of inholdings without acquisition of fee title

TARGET RESOURCES AND SERVICES This suboption potentially targets three groupings of resources and services:

1) oiled inholdings supporting resources and services directly injured by the spill

2) unoiled inholdings supporting resources and services directly injured by the spill (e.g., an unoiled coastal area which provides crucial habitat for a species of marine bird injured by the spill)

3) unoiled inholdings supporting resources and services equivalent to those injured by the spill

DESCRIPTION State and/or federal governments can enhance protection of key habitats through means other than acquisition of fee title. Land management agencies which could potentially become involved include the Alaska Departments of Natural Resources and Fish and Game; The Forest Service; the Fish and Wildlife Service and the National Park Service. A complete description of the protection options available to these agencies is beyond the scope of this document, but they could include the following: landowner contact and education; voluntary agreements with landowners; rights of first refusal; lease, license and cooperative management agreements; deed restrictions; and conservation easements or partial interests. For example, it is possible for an agency to purchase timber or mineral rights and still leave title to the land in private ownership.

In addition, modifying local coastal district management plans, described in option 22, could provide additional protection and would not require any fee title purchases. Implementing the most effective protection option will require considerable planning and negotiation with the landowner.

IMPLEMENTATION ACTIONS Prior to implementing this option, the Trustee Council will have to select and rank candidate lands for protection, and decide on the appropriate level of protection. Implementation of Trustee Council decisions will occur in a maximum of three steps:

1) The appropriate agency will contact the landowner and negotiate terms of non-purchase protection option.

2) The appropriate agency may go through a NEPA process, possibly generating an EA.

3) The appropriate agency will carry out monitoring and any additional management responsibilities.

TIME NEEDED TO IMPLEMENT The time needed to implement this

suboption may be less than for Suboption A but could extend up to several years. Variables include:

Negotiations with landowners

Time needed for EA (if applicable)

Process for purchasing less than fee simple title (if applicable)

Process for executing administrative actions (if applicable)

MEANS TO IMPROVE RECOVERY Enhanced protection of inholdings will facilitate natural recovery by restricting activities stressful to already damaged populations and habitats. In the case of unoiled areas which support resources and services equivalent to those damaged by the spill, the implementation of this suboption would guard against future habitat degradation and could enhance the services provided.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS Existing regulatory authorities applicable on private lands within state and federal conservation units potentially include:

Endangered Species Act of 1973 (16 USC 1531)

Marine Mammal Protection Act of 1972 (16 USC 1361 et seq.)

Migratory Bird Treaty Act of 1918 (16 USC 703-712)

Bald Eagle Protection Act of 1940 (16 USC 668)

Alaska Forest Practices Act of 1990 (AS 47.17) and draft regulations (11 AAC 95)

Alaska Coastal Management Act of 1977 (AS 46.40)

Coastal resource district management plans (6 AAC 80 & 85)

ADF&G Anadromous Fish and Fishway Acts (AS 16.05.840 & 870)

Clean Water Act of 1977 (33 USC 1251 & 1344)

National Historic Preservation Act of 1966 (16 USC 470 et seq.)

Section 22(g) of Alaska Native Claims Settlement Act of 1972

State and local zoning regulations

While these authorities can provide high levels of protection in some cases, they do not provide a regulatory basis for managing an area on an ecosystem level with the primary objective of restoring injured resources and services. Coastal district management plans can be amended to designate areas which are to be managed for specific purposes, but this management authority only has force on private lands when the landowner requires permits for activities on their land. In the absence of sufficiently specific and enforceable regulations, the best restoration option is to negotiate legally binding agreements with landowners which leave the land in private ownership but guarantee that no activities harmful to injured resources and services will be allowed.

RELATIONSHIP WITH EXISTING/PLANNED USES OR MANAGEMENT Enhanced protection and management of coastal habitats could result in increased restrictions on public uses, e.g. development projects, certain recreational and harvest activities, vehicle access, etc.

TECHNICAL FEASIBILITY This suboption is technically feasible.

362 Natural resource agencies and private conservation organizations
363 routinely and successfully utilize land protection strategies as
364 management tools to protect and enhance both damaged and healthy
365 ecosystems. For example, the Nature Conservancy recently
366 negotiated a cooperative management agreement in the Mad River
367 Slough and Dunes area of California, involving private landowners
368 and the federal Bureau of Land Management. Each group retained
369 ownership of their lands, but has entered into a mutual agreement
370 to increase protection of natural resources. The agreement also
371 allows for public access and compatible recreational uses.

372
373 **POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE**

374 Many state and federal conservation units in the spill area have
375 private inholdings which support significant resources and
376 services. Certain recreational and commercial activities on these
377 lands conflict with habitat requirements of injured species. In
378 most cases, the resource agencies cannot directly control
379 activities on these areas which may be harmful to injured species
380 and habitats.

381 Increased protection of these areas would ensure that restoration
382 objectives would receive management priority. It could also
383 enhance the services offered by these areas by providing increased
384 viewing opportunities and tourism. This suboption could take
385 anywhere from a few months to several years to complete.

386
387 **INDIRECT EFFECTS** Indirect effects could include the following:

- 388
389 1) Species not targeted for restoration efforts could benefit
390 from enhanced habitat protection.
391
392 2) Healthier ecosystems resulting from enhanced protection
393 could provide socioeconomic benefits by attracting tourists,
394 providing increased recreational and harvest opportunities and
395 improving the quality of life.
396
397 3) Enhanced habitat protection could have negative economic
398 impacts due to increased restrictions on harvest levels,
399 certain types of recreational activities and development
400 projects.
401
402

403 **RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIVITIES** This
404 suboption could potentially overlap with options 21, 23, 25, 26 and
405 29, which deal with acquisition of tidelands, marine bird habitat,
406 bird nesting areas, anadromous stream buffers and upland forests.
407 Inholdings can potentially include some or all of these areas.
408

409 **OTHER OPTIONS THAT COULD ACHIEVE THIS OBJECTIVE** Suboption A of
410 Option 24 (above) could achieve the same objectives. In addition,
411 options 21, 23, 25, 26 and 29 could achieve the same objectives if,
412 once these areas were acquired, they were provided with sufficient
413 levels of protection. There is, therefore, a strong potential for
414 a single acquisition to achieve multiple restoration objectives.
415

416 **LEGAL CONSIDERATIONS**

417
418 1) Consistency with settlement: Acquisition of less than fee
419 simple rights to land, including acquisition of rights to
420 equivalent resources, is consistent with the terms of the
421 settlement.

422
423 2) Agencies with management/regulatory responsibilities:
424 Existing agency responsibilities do not conflict with the
425 implementation of this suboption. Agencies with primary land
426 management responsibilities include the Alaska Departments of
427 Natural Resources and Fish and Game; The National Park
428 Service; the Fish and Wildlife Service; and the Forest
429 Service.

430
431 3) Permits required: No permits are required.

432
433 4) NEPA compliance: Since title to the land would be
434 retained by private parties, it is unlikely that an EIS would
435 have to be prepared, although an EA may be necessary.

436
437 5) Requirements for new legislative/regulatory actions: None

438
439 6) Other: Complicating factors could include legal conflicts
440 over ownership of avulsed lands and the state challenges to
441 federal claims of ownership of Alaskan tidelands and submerged
442 lands.

443
444 **MEANS TO EVALUATE SUCCESS** The appropriate resource management
445 agency will monitor how effectively this suboption has prevented
446 activities harmful to target resources and services and the degree
447 to which the option has enhanced compatible public uses.

448
449 **REPRESENTATIVE COSTS**

450
451 Costs of preparing EA (if necessary) -

452
453 Costs of negotiating agreements with landowners -

454
455 Costs of acquiring less than fee simple rights to land (if
456 applicable) -

457
458 Costs for monitoring - \$12,000/yr (based on inspection &
459 permitting costs for ADF&G special areas)

460
461 **TOTAL COST:** Variable

462
463 **ADDITIONAL INFORMATION NEEDED**

464
465 Input is needed from the Trustee Council on specific inholdings
466 eligible for protection, as well as the appropriate level of
467 protection. This must be based on specified habitat types and
468 conditions required for restoration of injured species.

470 CITATIONS
471
472 Kim Sundberg, ADF&G, pers. comm.
473 Steve Planchon, TNC, pers. comm.
474 TNC report
475 Jones and Stokes report
476 Restoration Framework document

June 23, 1992

Author: Chris Swenson

Updated

OPTION Option 25: Acquire Upland Forests and Watersheds

APPROACH CATEGORY Habitat Protection and Acquisition

INJURED RESOURCES AND SERVICES Upland forest resources and services injured by the spill include: harlequin ducks; marbled murrelets; river otters; anadromous fish; bald eagles; recreational uses; sport, commercial and subsistence harvest; and intrinsic values.

SUMMARY Increased protection of uplands could preserve and enhance injured and/or equivalent resources and services. Most uplands are in public ownership, but some are held by private parties or municipalities and have high fish and wildlife and public use values. Forested areas provide habitat for all the species listed above and support multiple human uses. In some cases, ongoing or imminent activities on private lands pose a threat of habitat disturbance which could retard recovery from spill injuries.

Restoration could be accomplished by acquiring fee title to the land and then placing it into special protective status. Activities detrimental to the natural recovery process could then be effectively regulated. In addition, public access and uses compatible with resource restoration objectives could also be enhanced. Alternatively, there are non-purchase protection options that do not require acquisition of fee title but still provide protection to injured resources and services through legally binding, voluntary agreements with private landowners.

SUBOPTION A Acquisition of fee title to privately owned uplands

TARGET RESOURCES AND SERVICES This suboption potentially targets two groupings of resources and services:

1) forested uplands and watersheds supporting resources and services directly injured by the spill

2) forested uplands and watersheds supporting resources and services equivalent to those injured by the spill

DESCRIPTION State and/or federal governments could acquire fee title to privately owned uplands. These lands would then be managed to preserve and enhance injured resources and services. These management objectives can be achieved by: a) legislative designation of the uplands as a protected area, e.g. a refuge or critical habitat area; or b) administrative actions such as amending resource agency area management plans or coastal district management plans. Also, upland inholdings within parks, refuges and other similarly protected areas automatically become part of that area upon purchase.

108 National Historic Preservation Act of 1966 (16 USC 470 et
1 seq.)

1 State and local zoning regulations

111 Section 22(g) of Alaska Native Claims Settlement Act of 1971

112
113 These regulations can provide high levels of protection in certain
114 cases, but do not provide a regulatory basis for managing an area
115 on an ecosystem level with the primary objective of restoring spill
116 injuries. The highest level of protection for recovering species
117 and habitats would be attained by placing public lands into special
118 protective status (e.g., refuge, park, sanctuary) with specific
119 intent language contained within the enabling statute. These types
120 of areas can be managed for a specific purpose, and the management
121 policies are enforceable.

122
123 Public lands which are not given any special protective status are
124 often required by law to be left open to certain types of
125 development (e.g., mining, logging, oil and gas production) which
126 may not be consistent with restoration objectives. Non-protected
127 lands are generally covered by some sort of resource agency
128 management plan, but the administering agency generally cannot
129 provide strong protection to lands which have not been classified
130 into a protective status.

131
132 **RELATIONSHIP WITH EXISTING/PLANNED USES OR MANAGEMENT** Government
133 acquisition and management of uplands could result in increased
134 regulation of public uses, e.g. development projects, certain
1 recreational and harvest activities, vehicle access, etc.

135
136
137 **TECHNICAL FEASIBILITY** This suboption is technically feasible.
138 Natural resource agencies routinely and successfully utilize land
139 acquisition and protection as a management tool to protect and
140 enhance both damaged and healthy ecosystems.

141
142 **POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE**
143 The spill area contains private uplands which support significant
144 resources and services. For example, privately owned forested
145 uplands around Cordova, Kachemak Bay and Afognak support multiple
146 commercial and recreational uses which potentially conflict with
147 the habitat requirements of species which were either injured in
148 the spill or are equivalent to injured species.

149
150 Acquisition and increased protection of these areas would ensure
151 that restoration objectives would receive management priority. It
152 could also enhance the services offered by these areas by providing
153 increased public access, viewer education and tourism. Given that
154 the acquisition process could, in some cases, take several years to
155 complete, implementation of this suboption should begin as soon as
156 possible.

157
158 **INDIRECT EFFECTS** Indirect effects could include the following:

- 159
1) Species not targeted for restoration efforts could benefit
1 from enhanced habitat protection.

368 The spill area contains private uplands which support significant
369 resources and services. For example, privately owned forested
370 uplands around Cordova, Kachemak Bay and Afognak support multiple
371 commercial and recreational uses which potentially conflict with
372 the habitat requirements of species which were either injured in
373 the spill or are equivalent to injured species.

374
375 Increased protection of these areas would ensure that restoration
376 objectives would receive management priority. It could also
377 enhance the services offered by these areas by providing increased
378 public access, viewer education and tourism. The time needed to
379 implement this option is variable and could range from a few months
380 to several years.

381
382 **INDIRECT EFFECTS** Indirect effects could include the following:

383
384 1) Species not targeted for restoration efforts could benefit
385 from enhanced habitat protection.

386
387 2) Healthier ecosystems resulting from enhanced protection
388 could provide socioeconomic benefits by attracting tourists,
389 providing increased recreational and harvest opportunities and
390 improving the quality of life.

391
392 3) Enhanced habitat protection could have negative economic
393 impacts due to increased restrictions on harvest levels,
394 certain types of recreational activities and development
395 projects.

396
397 **RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIVITIES** This
398 suboption could potentially overlap with options 23, 24, 26 and 29,
399 which deal with acquisition of marine bird habitat, private
400 inholdings within parks and refuges, anadromous stream buffer
401 strips and bird nesting habitat. Forested uplands can potentially
402 include some or all of these habitats or land types.

403
404 **OTHER OPTIONS THAT COULD ACHIEVE THIS OBJECTIVE** Suboption A of
405 Option 23 (above) could achieve the same objectives. In addition,
406 options 23, 24, 26 and 29 could achieve the same objectives if,
407 once these areas were acquired, they were provided with sufficient
408 levels of protection. There is, therefore, a strong potential for
409 a single acquisition to achieve multiple restoration objectives.

410
411 **LEGAL CONSIDERATIONS**

412
413 1) Consistency with settlement: Acquisition of land,
414 including acquisition of equivalent resources, is consistent
415 with the terms of the settlement.

416
417 2) Agencies with management/regulatory responsibilities:
418 Existing agency responsibilities do not conflict with the
419 implementation of this suboption. Agencies with management
420 authority over impacted species and habitats potentially
421 include the Alaska Departments of Natural Resources and Fish

216 **REPRESENTATIVE COSTS**

217 Federal land acquisition process -

219 OR

220 State land acquisition process -

221 NEPA compliance process (EA/EIS) -

222 Fair market value for land - varies w. quality and size of parcel

225 OR

226 Land exchange process/reconveyance

227 Process leading to legislative designation of protected areas -

229 OR

230 Process leading to administrative protection of acquired areas -

231 Costs for maintaining agency management and monitoring of areas -

232 Costs of enhancing compatible recreation opportunities; e.g.,
233 building and maintaining a parking lot, boardwalk & interpretive
234 signs -

235
236
237
238 TOTAL COST: Variable

239
240 **ADDITIONAL INFORMATION NEEDED**

241 Information is needed on the land acquisition processes, costs and
242 timelines from the state DNR.

243
244
245 Input from Trustee Council is needed on specific uplands eligible
246 for acquisition and special protective status. This must be based
247 on specified habitat types and conditions required for restoration
248 of injured species.

249
250 **CITATIONS**

251
252 Kim Sundberg, ADF&G, pers. comm.
253 Debby Clausen, ADF&G, pers. comm.
254 Al Carson, ADF&G, pers. comm.
255 Ray Thompson, USFS, pers. comm.
256 Steve Planchon, TNC, pers. comm.
257 TNC report
258 Jones and Stokes report
259 Restoration Framework document

June 23, 1992

Author: Chris Swenson

Updated

OPTION **Option 26: Extend Buffer Strips Adjacent to Anadromous Streams**

APPROACH CATEGORY **Habitat Protection and Acquisition**

INJURED RESOURCES AND SERVICES Anadromous streams and riparian habitat support many of the resources and services damaged by the spill, including: harlequin ducks; river otters; anadromous fish; bald eagles; recreational uses; sport, commercial and subsistence harvests; and intrinsic values.

SUMMARY Undisturbed riparian lands around anadromous streams are important natural buffers that protect the water quality of rivers and streams and provide food and cover for wildlife. Injured populations of anadromous fish, bald eagles, river otters and harlequin ducks depend on streams as feeding and/or reproductive habitat. These areas also have high intrinsic, recreational and sport fishing values in addition to supporting commercial and subsistence harvests.

The State Forest Practice Act of 1990 requires that logging operations leave buffer strips around anadromous and other fish-bearing streams on state and private lands, although reductions in buffer width can sometimes be authorized. Also, some smaller anadromous streams may not be protected by the act and, in other cases, the required buffers may not be wide enough to prevent disturbance of recovering species. Solutions to these potential problems include acquisition of fee title to privately owned riparian areas; other protection options, such as conservation easements, which leave the fee title in private ownership; and amending the State Forest Practices Act to provide larger buffers in state and privately owned areas recovering from the spill. Although not addressed within this option, expanding riparian buffer zones in the Chugach National Forest could be accomplished by changing federal statutes, regulations and/or management policies.

SUBOPTION A **Acquisition of fee title to buffer strips**

TARGET RESOURCES AND SERVICES This suboption potentially targets two groupings of resources and services:

- 1) privately owned riparian areas supporting resources and services directly injured by the spill
- 2) privately owned riparian areas supporting resources and services equivalent to those injured by the spill

DESCRIPTION State and/or federal governments could acquire fee title to privately owned riparian areas. These lands would then be managed to preserve and enhance injured resources and services.

54 These management objectives can be achieved by: a) legislative
55 designation of the uplands as a protected area, e.g. a critical
56 habitat area; or b) administrative actions such as amending
57 resource agency area management plans or coastal district
58 management plans.

59
60 **IMPLEMENTATION ACTIONS** Prior to implementing this option, the
61 Trustee Council will have to select and rank candidate lands for
62 purchase where there are willing sellers, and decide on the
63 appropriate protective status (e.g., refuge, sanctuary, etc.).
64 Implementation of Trustee Council decisions will occur in four
65 steps:

66
67 1) The appropriate agency will go through a NEPA compliance
68 process, possibly including preparation of an EIS.

69
70 2) The state or federal government will go through the
71 multiple steps necessary to request the legislature to place
72 land into special protective status or agencies take
73 administrative actions to protect habitat

74
75 3) The state or federal government will go through the
76 multiple steps necessary to purchase or reconvey land to
77 public ownership.

78
79 4) The appropriate agency will carry out management
80 responsibilities and monitoring.

81
82 **TIME NEEDED TO IMPLEMENT** The time needed to implement this option
83 is variable. Variables include:

84
85 Which government agency does acquisition

86 Time needed to negotiate with landowner

87 If EA or EIS is required

88 Time for state or federal legislatures to act (if necessary)

89 Time needed for administrative action (if necessary)

90 Time to write/amend management plan

91
92 **MEANS TO IMPROVE RECOVERY** Public ownership and enhanced protection
93 of riparian areas will facilitate natural recovery by restricting
94 activities stressful to already damaged populations and habitats,
95 and, when appropriate, providing public access and services. In
96 the case of areas which support resources and services equivalent
97 to those damaged by the spill, the implementation of this suboption
98 would guard against future habitat degradation and could enhance
99 the services provided.

100
101 **PROTECTION AND MANAGEMENT UNDER EXISTING LAWS** Existing regulatory
102 authorities potentially applicable on privately owned uplands
103 include:

104
105 Endangered Species Act of 1973 (16 USC 1531)

106 Marine Mammal Protection Act of 1972 (16 USC 1361 et seq.)

107 Migratory Bird Treaty Act of 1918 (16 USC 703-712)

Bald Eagle Protection Act of 1940 (16 USC 668)
Alaska Coastal Management Act of 1977 (AS 46.40)
Coastal resource district management plans (6 AAC 80 & 85)
ADF&G Anadromous Stream and Fishway Acts (AS 16.05.840 & 870)
Alaska Forest Practices Act of 1990 (AS 47.17)
Clean Water Act of 1977 (33 USC 1251 & 1344)
National Historic Preservation Act of 1966 (16 USC 470 et
seq.)
State and local zoning regulations
Section 22(g) of Alaska Native Claims Settlement Act of 1971

The State Forest Practice Act of 1990 requires that logging operations leave 66-foot buffer strips around anadromous and other fish-bearing streams on private lands, although reductions in buffer width to as little as 25 feet can sometimes be authorized. Also, some smaller anadromous streams may not be protected by the act and, in other cases, the required buffers may not be wide enough to prevent disturbance of recovering species.

The ADF&G Anadromous Stream and Fishway Acts regulate instream activities at or below the mean high water level, but does not provide specific authority to regulate activities in adjacent uplands which impact streams.

The regulations listed above can provide high levels of protection in certain cases, but do not provide a regulatory basis for managing an area on an ecosystem level with the primary objective of restoring spill injuries. The highest level of protection for recovering species and habitats would be attained by placing public lands into special protective status (e.g., refuge, park, sanctuary) with specific intent language contained within the enabling statute. These types of areas can be managed for a specific purpose, and the management policies are enforceable.

Public lands which are not given any special protective status are often required by law to be left open to certain types of development (e.g., mining, logging, oil and gas production) which may not be consistent with restoration objectives. Non-protected lands are generally covered by some sort of resource agency management plan, but the administering agency generally cannot provide strong protection to lands which have not been classified into a protective status.

RELATIONSHIP WITH EXISTING/PLANNED USES OR MANAGEMENT Government acquisition and management of uplands could result in increased regulation of public uses, e.g., development projects, certain recreational and harvest activities, vehicle access, etc.

TECHNICAL FEASIBILITY This suboption is technically feasible. Natural resource agencies routinely and successfully utilize land acquisition and protection as a management tool to protect and enhance both damaged and healthy ecosystems. However, the management of multiple buffer zones spread over a wide area could prove difficult. Consolidation of multiple buffer zones, along

162 with other injured habitat types, into a single management unit
163 should be considered.
164

165 **POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE**

166 The spill area contains privately owned riparian areas which
167 support significant resources and services. For example, privately
168 owned forested uplands around Cordova, Kachemak Bay and Afognak
169 contain anadromous streams which support multiple commercial and
170 recreational uses that potentially conflict with the habitat
171 requirements of species which were either injured in the spill or
172 are equivalent to injured species.
173

174 Acquisition and increased protection of these areas would ensure
175 that restoration objectives would receive management priority. It
176 could also enhance the services offered by these areas by providing
177 increased public access, viewer education and tourism. Given that
178 the acquisition process could, in some cases, take several years to
179 complete, implementation of this suboption should begin as soon as
180 possible.
181

182 **INDIRECT EFFECTS** Indirect effects could include the following:
183

184 1) Species not targeted for restoration efforts could benefit
185 from enhanced habitat protection.
186

187 2) Healthier ecosystems resulting from enhanced protection
188 could provide socioeconomic benefits by attracting tourists,
189 providing increased harvest and recreational opportunities and
190 improving the quality of life.
191

192 3) Enhanced habitat protection could have negative economic
193 impacts due to increased regulatory restrictions on harvest
194 levels, certain types of recreational uses and development
195 projects.
196

197 4) Public ownership of riparian areas could simplify public
198 access, when public uses are compatible with restoration
199 objectives.
200

201 **RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIVITIES** This
202 suboption could potentially overlap with Options 23, 24, 25 and 29,
203 which deal with acquisition of marine bird habitat, private
204 inholdings within parks and refuges, forested areas and bird
205 nesting habitat. Riparian areas can potentially include some or
206 all of these resources or land types.
207

208 **OTHER OPTIONS THAT COULD ACHIEVE THIS OBJECTIVE** This option
209 provides a very high level of legal protection for uplands.
210 However, there may be cases where the same objectives can be
211 achieved by suboptions B and C of Option 26 (below), which would
212 enhance riparian protection through a variety of non-purchase
213 alternatives. In addition, options 23, 24, 25 and 29 could achieve
214 the same objectives if, once these areas were acquired, they were
215 provided with sufficient levels of protection. There is,

therefore, a strong potential for a single acquisition to achieve multiple restoration objectives.

LEGAL CONSIDERATIONS

1) Consistency with settlement: Acquisition of land, including acquisition of equivalent resources, is consistent with the terms of the settlement.

2) Agencies with management/regulatory responsibilities: Existing agency responsibilities do not conflict with the implementation of this suboption. Agencies with management authority over riparian areas and species potentially include the Alaska Departments of Natural Resources and Fish and Game; the U.S. Forest Service; the Fish and Wildlife Service; and the National Park Service.

3) Permits required: No permits are required.

4) NEPA compliance: Land acquisitions may have to go through the NEPA process, which requires an EA and possibly an EIS.

5) Requirements for new legislative/regulatory actions: Legislative action is not required to purchase inholdings in state or federal protected lands. However, legislative action would be required for federal or state agencies to create new protected areas or to change statutes governing activities in existing ones.

MEANS TO EVALUATE SUCCESS The appropriate resource management agency will monitor how effectively their management program has prevented activities harmful to target resources and services and the degree to which the option has enhanced compatible public uses.

REPRESENTATIVE COSTS

Federal land acquisition process -

OR

State land acquisition process -

NEPA compliance process (EA/EIS) -

Fair market value for land - varies w. quality and size of parcel

OR

Land exchange process/reconveyance

Process leading to legislative designation of protected areas -

OR

Process leading to administrative protection of acquired areas -

Costs for maintaining agency management and monitoring of areas -

TOTAL COST: Variable

270 **ADDITIONAL INFORMATION NEEDED**

271
272 Information is needed on the land acquisition processes, costs and
273 timelines for the state DNR.

274
275 Input is also needed from the Trustee Council on specific buffer
276 areas eligible for acquisition and special protective status. This
277 must be based on specified habitat types and riparian buffer zone
278 widths required for restoration of injured species.
279

280 **CITATIONS**

281
282 Kim Sundberg, ADF&G, pers. comm.
283 Debby Clausen, ADF&G, pers. comm.
284 Al Carson, ADF&G, pers. comm.
285 Ray Thompson, USFS, pers. comm.
286 Steve Planchon, TNC, pers. comm.
287 TNC report
288 Jones and Stokes report
289 Restoration Framework document

SUBOPTION B Expand anadromous stream buffers without acquisition of fee title

TARGET RESOURCES AND SERVICES This suboption potentially targets two groupings of resources and services:

- 1) privately owned riparian areas supporting resources and services directly injured by the spill
- 2) privately owned riparian areas supporting resources and services equivalent to those injured by the spill

DESCRIPTION State and/or federal governments can enhance protection of privately owned riparian areas through means other than acquisition of fee title. A complete description of these protection options is beyond the scope of this document, but they could include the following: landowner contact and education; voluntary agreements with landowners; rights of first refusal; lease, license and cooperative management agreements; deed restrictions; and conservation easements or partial interests. For example, it is possible to buy timber rights and still leave the land in private ownership.

In addition, modifying local coastal district management plans, under the Alaska Coastal Management Program, could provide additional riparian protection and would not require any fee title purchases. Implementing the most effective protection option will require considerable planning and negotiation with the landowner.

IMPLEMENTATION ACTIONS Prior to implementing this option, the Trustee Council will have to select and rank candidate lands for protection, and decide on the appropriate level of protection. Implementation of Trustee Council decisions will occur in a maximum of three steps:

- 1) The appropriate agency will contact the landowner and negotiate terms of non-purchase protection option.
- 2) The appropriate agency will go through a NEPA process, possibly generating an EA.
- 3) The appropriate agency will carry out monitoring and any additional management responsibilities.

TIME NEEDED TO IMPLEMENT The time needed to implement this suboption should be less than for Suboption A but is variable. Variables include:

Negotiations with landowners
Time needed for EA (if applicable)
Process for purchasing less than fee simple title (if applicable)
Process for executing administrative actions (if applicable)

344 MEANS TO IMPROVE RECOVERY Enhanced protection of riparian areas
345 will facilitate natural recovery by restricting activities
346 stressful to already damaged populations and habitats and, when
347 appropriate, by providing public access. In the case of uplands
348 which support resources and services equivalent to those damaged by
349 the spill, the implementation of this suboption would guard against
350 future habitat degradation and could enhance the services provided.

351
352 PROTECTION AND MANAGEMENT UNDER EXISTING LAWS Existing regulatory
353 authorities applicable on private uplands potentially include:

354
355 Endangered Species Act of 1973 (16 USC 1531)
356 Marine Mammal Protection Act of 1972 (16 USC 1361 et seq.)
357 Migratory Bird Treaty Act of 1918 (16 USC 703-712)
358 Bald Eagle Protection Act of 1940 (16 USC 668)
359 Alaska Coastal Management Act of 1977 (AS 46.40)
360 Coastal resource district management plans (6 AAC 80 & 85)
361 ADF&G Anadromous Stream and Fishway Acts (AS 16.05.840 & 870)
362 Alaska Forest Practices Act of 1990 (AS 47.17)
363 Clean Water Act of 1977 (33 USC 1251 & 1344)
364 National Historic Preservation Act of 1966 (16 USC 470 et
365 seq.)
366 Section 22(g) of Alaska Native Claims Settlement Act of 1971
367 State and local zoning regulations
368

369 The State Forest Practice Act of 1990 requires that logging
370 operations leave 66-foot buffer strips around anadromous and other
371 fish-bearing streams on private lands, although reductions in
372 buffer width to as little as 25 feet can sometimes be authorized.
373 Also, some smaller anadromous streams may not be protected by the
374 act and, in other cases, the required buffers may not be wide
375 enough to prevent disturbance of recovering species.

376
377 The ADF&G Anadromous Stream and Fishway Acts regulate instream
378 activities at or below the mean high water level, but does not
379 provide specific authority to regulate activities in adjacent
380 uplands which impact streams.

381
382 While these authorities can provide high levels of protection in
383 some cases, they do not provide a regulatory basis for managing an
384 area on an ecosystem level with the primary objective of restoring
385 injured resources and services. Coastal district management plans
386 can be amended to designate areas which are to be managed for
387 specific purposes, but this management authority only has force on
388 private lands when the landowner requires permits for activities on
389 their land. In the absence of sufficiently specific and
390 enforceable regulations, the best restoration option is to
391 negotiate legally binding agreements with landowners which leave
392 the land in private ownership but guarantee that no activities
393 harmful to the injured resources will be allowed.

394
395 RELATIONSHIP WITH EXISTING/PLANNED USES OR MANAGEMENT Enhanced
396 protection and management of riparian areas could result in
397 increased restrictions on public uses, e.g., development projects,

certain recreational and harvest activities, vehicle access, etc.

TECHNICAL FEASIBILITY This suboption is technically feasible. Natural resource agencies and private conservation organizations routinely and successfully utilize land protection strategies as management tools to protect and enhance both damaged and healthy ecosystems. For example, the Nature Conservancy recently negotiated a cooperative management agreement in the Mad River Slough and Dunes area of California, involving private landowners and the federal Bureau of Land Management. Each group retained ownership of their lands, but has entered into a mutual agreement to increase protection of natural resources. The agreement also allows for public access and compatible recreational uses.

This suboption would be less complex than acquisition of fee title, since the managing agency would be relieved of trying to manage several small and widely spread areas as protected lands. If the managing agency can negotiate a satisfactory level of resource protection with the landowner, this could achieve a high level of protection.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

The spill area contains privately owned riparian areas which support significant resources and services. For example, privately owned forested uplands around Cordova, Kachemak Bay and Afognak contain anadromous streams which support multiple commercial and recreational uses that potentially conflict with the habitat requirements of species which were either injured in the spill or are equivalent to injured species.

Increased protection of these areas would ensure that restoration objectives would receive management priority. It could also enhance the services offered by these areas by providing increased public access, viewer education and tourism. Given that the implementation of this suboption could from a few months to several years to complete, it should begin as soon as possible.

INDIRECT EFFECTS Indirect effects could include the following:

- 1) Species not targeted for restoration efforts could benefit from enhanced habitat protection.
- 2) Healthier ecosystems resulting from enhanced protection could provide socioeconomic benefits by attracting tourists, providing increased recreational and harvest opportunities and improving the quality of life.
- 3) Enhanced habitat protection could have negative economic impacts due to increased restrictions on harvest levels, certain types of recreational activities and development projects.
- 4) Management agreements with landowners could provide for allowing public access, if compatible with restoration

objectives.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIVITIES This suboption could potentially overlap with Options 23, 24, 25 and 29, which deal with acquisition of marine bird habitat, private inholdings within parks and refuges, forested uplands and bird nesting habitat. Riparian areas can potentially include some or all of these resources or land types.

OTHER OPTIONS THAT COULD ACHIEVE THIS OBJECTIVE Suboptions A and C Option 26 could achieve the same objectives. In addition, options 23, 24, 25 and 29 could achieve the same objectives if, once these areas were acquired, they were provided with sufficient levels of protection. There is, therefore, a strong potential for a single acquisition to achieve multiple restoration objectives.

LEGAL CONSIDERATIONS

1) Consistency with settlement: Acquisition of land, including acquisition of equivalent resources, is consistent with the terms of the settlement.

2) Agencies with management/regulatory responsibilities: Existing agency responsibilities do not conflict with the implementation of this suboption. Agencies with management authority over riparian areas potentially include the Alaska Departments of Natural Resources and Fish and Game; the U.S. Forest Service; the Fish and Wildlife Service; and the National Park Service.

3) Permits required: No permits are required.

4) NEPA compliance: Since title to the land would be retained by the private parties, it is unlikely that an EIS would have to be prepared, although an EA may be necessary.

5) Requirements for new legislative/regulatory actions: In most cases, no such actions will be necessary.

MEANS TO EVALUATE SUCCESS The appropriate resource management agency will monitor how effectively this suboption has prevented activities harmful to target resources and services and the degree to which the option has enhanced compatible public uses.

REPRESENTATIVE COSTS

Costs of preparing EA (if necessary) -

Costs of negotiating agreements with landowners -

Costs of acquiring less than fee simple rights to land (if applicable) -

Costs for monitoring - \$12,000/yr (based on inspection &

506 permitting costs for ADF&G special areas)
507

509 TOTAL COST: Variable

510 **ADDITIONAL INFORMATION NEEDED**

511
512 Input is needed from the Trustee Council on specific riparian areas
513 eligible for acquisition and enhanced habitat protection. This
514 must be based on specified habitat types and buffer zone widths
515 required for restoration of injured species.
516

517 **CITATIONS**

518
519 Kim Sundberg, ADF&G, pers. comm.
520 Debby Clausen, ADF&G, pers. comm.
521 Ray Thompson, USFS, pers. comm.
522 Steve Planchon, TNC, pers. comm.
523 TNC report
524 Jones and Stokes report
525 Restoration Framework document
526
527

528 **SUBOPTION C Amend State Forest Practices Act**

529
530 **TARGET RESOURCES AND SERVICES** This suboption potentially targets
531 two groupings of resources and services:
532

533 1) private and state-owned riparian areas supporting resources
534 and services directly injured by the spill

535
536 2) private and state-owned riparian areas supporting resources
537 and services equivalent to those injured by the spill
538

539 **DESCRIPTION** The Alaska legislature could amend the Alaska Forest
540 Practices Act of 1990 to increase riparian buffers around
541 anadromous streams supporting resources and services injured by the
542 spill. The amendment would change buffer requirements on certain
543 state and private lands.
544

545 **IMPLEMENTATION ACTIONS** Prior to implementing this option, the
546 Trustee Council will have to designate which streams require
547 additional protection, specify the appropriate buffer width, and
548 state the length of time such restrictions might be required.
549 Given this information, the successful implementation of this
550 action could proceed as follows:
551

552 1) Staff from the appropriate state agencies will draft a
553 proposed amendment and justification for the legislature.
554

555 2) After approval by the commissioners of the appropriate
556 state agencies, the proposed amendment will then be submitted
557 to the legislature as a bill by the Governor or a legislator.
558

559 3) The legislature will act on the proposed amendment after
560

560 reviewing the proposal, holding hearings and soliciting public
561 comments.

562
563 4) The appropriate agency will enforce the amended statute
564 (and any implementing regulations) and monitor its
565 effectiveness in achieving restoration objectives.
566

567 **TIME NEEDED TO IMPLEMENT** The time needed to implement this option
568 is at least one year, although controversial bills can take much
569 longer. Variables include:

570
571 Time to draft initial proposed amendment
572 Negotiation time between state agencies
573 Public comment periods
574 If EA or EIS is required
575 Time for state legislatures to act on proposal
576 Whether amendments to regulations were also necessary
577 Time needed to amend state management plans
578

579 **MEANS TO IMPROVE RECOVERY** Increased statutory protection of
580 riparian areas will facilitate natural recovery by restricting
581 activities stressful to already damaged populations and habitats.
582 In the case of areas which support resources and services
583 equivalent to those damaged by the spill, the implementation of
584 this suboption would guard against future habitat degradation.
585

586 **PROTECTION AND MANAGEMENT UNDER EXISTING LAWS** Existing regulatory
587 authorities potentially applicable on state and private uplands
588 include:

589
590 Endangered Species Act of 1973 (16 USC 1531)
591 Marine Mammal Protection Act of 1972 (16 USC 1361 et seq.)
592 Migratory Bird Treaty Act of 1918 (16 USC 703-712)
593 Bald Eagle Protection Act of 1940 (16 USC 668)
594 Alaska Coastal Management Act of 1977 (AS 46.40)
595 Coastal resource district management plans (6 AAC 80 & 85)
596 ADF&G Anadromous Stream and Fishway Acts (AS 16.05.840 & 870)
597 Alaska Forest Practices Act of 1990 (AS 47.17)
598 Clean Water Act of 1977 (33 USC 1251 & 1344)
599 National Historic Preservation Act of 1966 (16 USC 470 et
600 seq.)
601 State and local zoning regulations
602 Section 22(g) of Alaska Native Claims Settlement Act of 1971
603

604 These regulations can provide high levels of protection in certain
605 cases, but they do not provide a regulatory basis for managing an
606 area on an ecosystem level with the primary objective of restoring
607 injured resources and services. Statutory requirements for
608 increased buffer zones would help to fill this gap by providing
609 protection from logging for riparian habitats and their associated
610 species.
611

612 **RELATIONSHIP WITH EXISTING/PLANNED USES OR MANAGEMENT** Increased
613 government regulation of riparian areas could result in increased

614 restrictions on logging operations.

615 **TECHNICAL FEASIBILITY** This suboption is technically feasible.
617 There is a well-defined legislative procedure for amending state
618 statutes. However, given the controversial nature of the riparian
619 buffer zones, the amendment process would probably not be completed
620 quickly.

621 **POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE**

622 The spill area contains privately owned riparian areas which
623 support significant resources and services. For example, privately
624 owned forested uplands around Cordova, Kachemak Bay and Afognak
625 contain riparian areas which support injured species and could
626 subject to logging in the near future.

627 Increased regulatory protection of riparian buffer zones could
628 prevent further damage to the area, provided that agencies had the
629 funding to maintain sufficient levels of monitoring and
630 enforcement. Given that the acquisition process could take at
631 least one year to complete, implementation of this suboption should
632 begin as soon as possible.

633 **INDIRECT EFFECTS** Indirect effects could include the following:

634 1) Species not targeted for restoration efforts could benefit
635 from enhanced habitat protection.

636 2) Healthier ecosystems resulting from enhanced protection
637 could provide socioeconomic benefits by attracting tourists,
638 providing increased harvest and recreational opportunities and
639 improving the quality of life.

640 3) Enhanced habitat protection could have negative economic
641 impacts due to increased regulatory restrictions on harvest
642 levels, certain types of recreational uses and development
643 projects.

644 4) Public ownership of riparian areas could simplify public
645 access problems.

646 **RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIVITIES** This
647 suboption could potentially overlap with Options 23, 24, 25 and 29,
648 which deal with acquisition of marine bird habitat, private
649 inholdings within parks and refuges, forested areas and bird
650 nesting habitat. Riparian areas can potentially include some or
651 all of these habitats or land types.

652 **OTHER OPTIONS THAT COULD ACHIEVE THIS OBJECTIVE**

653 Suboptions A and B (above) of option 26 could achieve the same
654 objectives. In addition, options 23, 24, 25 and 29 could achieve
655 the same objectives if, once these areas were acquired, they were
656 provided with sufficient levels of protection. There is,
657 therefore, a strong potential for a single acquisition to achieve

multiple restoration objectives.

LEGAL CONSIDERATIONS

1) Consistency with settlement: Habitat restoration through legislative action is consistent with the terms of the settlement.

2) Agencies with management/regulatory responsibilities: Existing agency responsibilities do not conflict with the implementation of this suboption. Agencies with management authority over riparian areas potentially include the Alaska Departments of Natural Resources and Fish and Game; the U.S. Forest Service; the Fish and Wildlife Service; and the National Park Service.

3) Permits required: No permits are required.

4) NEPA compliance: Federal involvement in the restoration process may necessitate the preparation of an EA or EIS to assess the impacts of the statutory amendment.

5) Requirements for new legislative/regulatory actions: Legislative action is required to amend state statutes.

6) Other: Once a bill is submitted for legislative action, it is impossible for agencies to guarantee the nature of the final version that is passed. Accordingly, there is a risk that proposed amendments to the Forest Practices Act will not be passed as submitted or that additional amendments will be made which may or may not achieve restoration objectives.

MEANS TO EVALUATE SUCCESS The appropriate resource management agency will monitor how effectively the amendment has prevented activities harmful to injured resources and services.

REPRESENTATIVE COSTS

Staff time to prepare proposed amendment and justification and, possibly, to testify before the legislature -

NEPA compliance process (EA/EIS) -

Costs for additional agency management and monitoring of areas -

ADDITIONAL INFORMATION NEEDED

Prior to implementing this option, the Trustee Council will have to designate which streams require additional protection, specify the appropriate buffer width, and state the length of time such restrictions might be required.

CITATIONS

722 Kim Sundberg, ADF&G, pers. comm.
723 Debby Clausen, ADF&G, pers. comm.
Al Carson, ADF&G, pers. comm.
725 Ray Thompson, USFS, pers. comm.
726 Steve Planchon, TNC, pers. comm.
727 TNC report
728 Jones and Stokes report
729 Restoration Framework document

Add to

Research Areas

June 25, 1992

Author: John Strand

OPTION 27 - Designate and Protect "Benchmark" Monitoring Sites.

APPROACH CATEGORY Habitat protection and acquisition.

INJURED RESOURCES AND SERVICES Marine, intertidal and adjacent uplands habitats and the biological communities supported by these habitats.

SUMMARY

A comprehensive monitoring plan has been suggested for consideration by the Trustees (Option 31). Integral to the comprehensive monitoring plan is the designation of discrete and permanent monitoring sites within the oil spill area. Permanent monitoring sites would be used to follow the recovery of injured habitats and species and also would allow for the establishment of a baseline environmental condition to use as a reference standard. These sites could include representative habitat types, unoiled control sites, oiled set-aside and oiled-treated sites. There are several designations appropriate for monitoring sites including National Estuarine Research Reserve (National Oceanic and Atmospheric Administration), Research Natural Area (U.S. Forest Service) and Long-Term Ecological Research site (National Science Foundation). The U.S. Forest Service is presently considering several Research Natural Areas in Alaska including one at Green Island in Prince William Sound.

SUBOPTION Designate National Estuarine Research Reserve Site(s).

TARGET RESOURCES AND SERVICES Marine and intertidal habitats and associated biota.

DESCRIPTION

It is the objective of this suboption to implement designation and development of one or more sites in the spill area as National Estuarine Research Reserves (NOAA 1990a). These sites would become "benchmark" monitoring sites and would be integral to the comprehensive monitoring program described in Restoration Option 31. Permanent monitoring sites would be used to assess recovery of natural resources injured by the oil spill, and would allow for the establishment of baseline environmental conditions to use as a reference standards. These sites could include representative habitat types, oiled-treated, oiled set-aside, and oiled-control study sites.

IMPLEMENTATION ACTIONS

A state may apply for Federal Government financial assistance for purposes of site selection, preparation of documents (draft management plan, environmental impact statement [EIS]) and the conduct of research necessary to complete site characterization. The process leading to designation includes the following steps:

- 1) The state initiates a proposal to the Federal Government to establish a site in a portion of a shared biogeographic region.
- 2) The state acquires site(s) upon approval of the Federal Government.
- 3) The Federal Government prepares an EIS.
- 4) The state completes a final management plan.
- 5) The governor of the state making application nominates candidate site(s).
- 6) A memorandum of understanding (MOU) detailing the state-Federal roles in research reserve management is signed by the state and Federal Governments.
- 7) The Federal Government "designates" site(s).
- 8) The state protects and operates site, conducts research and monitors, and provides interpretative and educational opportunities as specified in the management plan.

TIME NEEDED TO IMPLEMENT

The overall process generally takes three years.

MEANS TO IMPROVE RECOVERY

The intent of designation of one or more reserves is to facilitate further research and monitoring of injured resources. Reserves offer a measure of protection not realized outside of formal state or Federal designation. The reserve ensures a stable environment for research and monitoring through long-term protection of estuarine resources. Reserves provide for manipulative research opportunities aimed at improved understanding and management of estuarine areas. Although restoration of degraded areas is not a primary purpose of the System, such activities are permitted to improve the representative character and integrity of a site.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

The National Estuarine Reserve Research System (NERRS) was established under the Coastal Zone Management Act of 1972 (Section

315, as amended; 86 Stat. 1280 [16 U.S.C. 1461]) to address threats to the nation's estuaries. Individual reserves are managed by the states in partnership with NOAA. NOAA is responsible for designating the reserves and administering the overall NERRS program. The state operates/manages individual sites and provides staff on a cost sharing basis with NOAA.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

By regulation, NOAA can disapprove any activity considered incompatible with the mission of NERRS; but in practice, NOAA has typically approved most requests to "grandfather" pre-existing uses (e.g., hunting and fishing).

TECHNICAL FEASIBILITY

Eighteen National Estuarine Research Reserves protecting approximately 267,000 acres of estuarine lands and waters have been established in 13 coastal states since the inception of the program (NOAA 1990b). One additional site (Jobos Bay) has been established in Puerto Rico, and one site (Old Woman Creek) has been established on Lake Erie in Ohio. A wide range of research projects are conducted at the 18 existing sites. These include physical, chemical and biological characterizations, studies of ecosystem processes, and studies designed to answer management- and regulatory-related questions for the reserves and the coastal zone.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

Monitoring is necessary to assess the adequacy of natural recovery. Resources that are found to be recovering at an unacceptable rate may have to be reconsidered as candidates for restoration action. Likewise, resources that are found to be recovering faster than anticipated may allow for an early completion of a restoration action. Monitoring of important physical, chemical and biological properties will establish an environmental baseline for affected ecosystems. This baseline then can be used as a standard reference to evaluate the effects of future disturbances, e.g., earthquakes, oil spills. This standard also can be used to improve our ability to manage affected resources over the long-term.

Research reserves ensure a stable environment for research and monitoring through long-term protection of reserve resources. They also increase public awareness and understanding of the need to protect vulnerable resources and provide suitable opportunities for public education and interpretation.

INDIRECT EFFECTS

There need be no significant adverse environmental, socio-economic, and human health and safety effects associated with the designation of a research reserve, however, the potential for both adverse and

beneficial effects are the subject of an environmental impact statement that NOAA prepares. By the nature of NERRS, however, every effort is extended to protect the environment. Construction is usually kept to a minimum, research (even habitat manipulation) must not impact the representative ecological character and integrity of the reserve. Monitoring is conducted using non-destructive and the least intrusive methods available, where possible.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

The designation of research reserves could facilitate monitoring as described in Option 31.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Both Option 21 (Acquire Tidelands), Option 22 (Designate Protected Marine Areas), and Option 24 (Acquire "Inholdings" within Parks and Refuges) also could achieve this same objective.

LEGAL CONSIDERATIONS

NOAA manages the overall program, but individual units are managed by the states. The designation of a National Estuarine Research Reserve is deemed a federal action and must be undertaken in a manner consistent with provisions of the:

1) National Environmental Policy Act of 1969, as amended. The state is required to provide all necessary information to NOAA concerning the environmental and socio-economic impacts associated with implementing the management plan and alternatives to the plan for the proposed site.

2) approved state coastal zone program as provided by section 1456 (c) (1) of the Coastal Zone Management Act of 1972 as amended. NOAA is responsible for certifying that designation of the reserve is consistent with the state approved coastal zone management program. The state is required to concur with or object to certification.

The designation of one or more research reserve sites is consistent with the provisions of the settlement that direct the Governments to jointly use natural damage recoveries for purposes of restoring, replacing, enhancing, rehabilitating or acquiring the equivalent of natural resources injured as a result of the oil spill.

MEANS TO EVALUATE SUCCESS

Monitoring the rate of recovery of injured species and/or habitats on the reserve site would be the principle means of evaluating success.

REPRESENTATIVE COSTS

The costs of designation will vary significantly by site; and for this reason, a detailed budget will not be attempted at this time. Instead, a summary of the allowable costs and/or matching funds available from the Federal Government (NOAA, Marine and Estuarine Management Division) will be used as a basis for estimating costs likely to be associated with designation.

Up to \$100K in Federal funds can be provided for designation of the site. Of this amount, \$25K can be used for site selection. An additional \$40K of this amount can be used for development of a draft management plan and for collection of the information for preparation of the environmental impact statement. In reality, a state may spend an equal or greater amount in support of designation (Terrence Stevens, Padilla Bay National Estuarine Research Reserve, Mt. Vernon, WA., pers. comm.).

Post-site designation, Federal supplemental acquisition and development awards of \$4.0M (land) and \$1.5M (physical construction) also are available but must be matched by the state on a 50/50 basis. Again, costs of acquisition and development may greatly exceed the Federal contribution.

Federal funds up to \$70K per year to be matched by the state on a 50/50 basis, also are available for operation and management, including the design and implementation of an environmental monitoring program. However, annual operation and management costs will undoubtedly be significantly greater. The assumption is that other sources of funding (e.g. grants) will be required.

ADDITIONAL INFORMATION NEEDED None.

CITATIONS

1) NOAA (National Oceanic and Atmospheric Administration). 1990a. National Estuarine Reserve Research System Program Regulations; Interim Final rule, 15 CFR Part 921, Federal Register 55 (141): 299940-29962, Monday July 23, 1990.

2) NOAA (National Oceanic and Atmospheric Administration). 1990b. National Estuarine Research Reserve System Site Catalogue. National Oceanic and Atmospheric Administration, Washington, D.C.

SUBOPTION B Designate Research Natural Area(s).

TARGET RESOURCES AND SERVICES Marine, intertidal and adjacent upland habitats and the biological communities supported by these habitats.

DESCRIPTION

It is the objective of this suboption to implement designation and development of one or more sites in the spill area as Research Natural Areas (RNA). These sites are established by the Chief of the U.S. Forest Service to illustrate or typify for research and educational purposes the important forest types within each region that have special or unique scientific interest and importance. RNAs could become integral to a comprehensive and integrated restoration monitoring plan and used to assess recovery of natural resources injured by the oil spill. Permanent RNAs will allow for the establishment of baseline environmental conditions to use as reference standards in assessing damages from future disturbances. RNAs could include but would not be limited to oiled, oiled-treated, oiled-untreated and unoiled-control intertidal habitats as well as contiguous beach fringe and uplands linked to marine study sites.

IMPLEMENTATION ACTIONS

Designation of an RNA is a two step process. First, the establishment of the RNA must be recommended by the regional forester in the appropriate national forest land and resource management plan. Second, an establishment record and designation order for the RNA is issued which amends the appropriate national forest land and resource management plan to be consistent with the management direction of the RNA identified in the establishment record and designation order. The forest supervisor then notifies the public of the amendment and mails copies of the designation order to all persons on the national forest land and resource management plan mailing list.

TIME NEEDED TO IMPLEMENT

Green Island Research was nominated as a RNA in 1984 during the development of the Chugach National Forest Land and Resource Management Plan. It still has not been officially designated although the Establishment Record and Designation Order for Green Island Natural Area has been submitted to the Regional Forester for his signature. In 1992, establishment records and designation orders will be submitted for signature on five of nine original RNAs (including Green Island) proposed in the Chugach National Forest Land and Resource Management Plan in 1984 (Glenn P. Juday, Alaska Ecological Reserve Coordination Office, University of Alaska Fairbanks, pers. comm.).

The 10-12 years since inclusion of the Green Island RNA in the Chugach National Forest Land and Resource Management Plan appears to be inordinately long given the requirements of the designation process, although in this case there were mitigating circumstances. Green Island was not visited for purposes of conducting scientific surveys until 1986. Development of input to the Establishment Record for Green Island Research Natural Area was also interrupted by the oil spill. Accordingly, the 10-12 years it has taken to designate Green Island as an RNA could easily be reduced to five or six years to designate future sites.

MEANS TO IMPROVE RECOVERY

The intent of designation of one or more RNAs is to facilitate long-term monitoring of recovery from the oil spill. The ideal site will have a record of pre-spill intertidal life and will be suitable for detailed studies of the linkage between terrestrial and marine ecosystems. The designation ensures a stable environment for research and monitoring through long-term protection. RNA's also provide for manipulative research opportunities aimed at improved understanding and management of both coastal and upland habitats.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

The authority to establish RNAs is provided the Chief of the Forest Service in 36 CFR 251.23. "The Chief of the Forest service shall establish a series of research natural areas, sufficient in number and size to illustrate adequately or typify for research or educational purposes, the important forest and range types in each forest region, as well as other plant communities that have special or unique characteristics of scientific interest or importance."

As provided in 36 CFR 219.25, forest planning is to include the establishment of RNAs. "Planning shall make provision for the identification of examples of important forest, shrubland, grassland, alpine, aquatic, and geologic types that have species or unique characteristics of scientific interest and importance and that are needed to complete the network of RNAs. Biotic, aquatic, and geologic types needed for the network shall be identified using a list provided by the Chief of the Forest Service."

To operate a site, grant monies can be obtained through the U.S. Forest Service National Competitive Research Initiative Grants Program (7 CFR 3200). Authority to administer this program is provided by Section 2(b) of The Act of August 4, 1965, as amended by Section 1615 of The Food, Agriculture, Conservation and Trade Act of 1990 (7 CFR 450). Monies can be used to "improve research capabilities in the agricultural, food and environmental sciences," "including long-term applied research problems."

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

RNAs as defined in 36 CFR 251.23 will be "retained in a virgin or unmodified condition except where measures are required to maintain the plant community which the area is intended to represent. Within areas designated by this regulation, occupancy under a special use permit is not allowed, nor the construction of permanent improvements permitted except improvements required in connection with their experimental use, unless authorized by the Chief of the Forest Service."

TECHNICAL FEASIBILITY

By the close of 1992, establishment records and designation orders will be submitted to the Forest Service for approval of five of nine RNAs proposed in the Chugach National Forest Land and Resource Management Plan of 1984.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

Monitoring will be implemented to follow the progress of both natural recovery and recovery associated with restoration. It also may be necessary to research basic processes affecting the rate of recovery of key species and habitats impacted by the oil spill. Monitoring important physical, chemical, and biological properties of the RNA will establish an environmental baseline for affected ecosystems. This baseline can be used as a reference standard to evaluate the effects of future disturbances, e.g., earthquakes, oil spills, etc.

INDIRECT EFFECTS

There need be no significant adverse environmental, socio-economic, and human health and safety effects associated with the designation of RNAs; however the potential for adverse as well as beneficial effects will be the subject of a National Environmental Policy Act review conducted at the program level by the Trustees, and at the site-specific level by the U.S. Forest Service. By the nature of the RNA program, every effort is extended to protect the environment. Construction is kept to a minimum and research (even manipulation) must not impact the representative ecological character and integrity of the site.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

The designation of an RNA could facilitate monitoring as described in Option 31 (Develop Comprehensive Monitoring Plan).

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Options 21 (Acquire Tidelands), Option 22 (Designate Protected Marine Areas), and Option 24 (Acquire "Inholdings" within Parks and Refuges) also could achieve this same objective.

LEGAL CONSIDERATIONS

The designation of a RNA is deemed a Federal action and must be undertaken in a manner consistent with the provisions of the National Environmental Policy Act of 1969. In the case of the proposed Green Island RNA, an analysis was included as part of the Final Environmental Impact Statement for the National Forest Land and Resource Management Plan (U.S. Forest Service 1984). X

The U.S. Forest Service also would be responsible for certifying that designation is consistent with both the Coastal Zone Management Act of 1972, and state approved coastal zone management programs, if the RNA is sited in the coastal zone.

MEANS TO EVALUATE SUCCESS

In the context of restoration, monitoring and documenting recovery of injured resources on the RNA will be the principle means of evaluating success. Success of the program to meet other objectives of RNAs will be assessed at the time a renewal proposal for continued funding is received by the U.S. Forest Service.

REPRESENTATIVE COSTS

enabling
Grant?

The costs of developing first-hand data (field documentation) that is used in preparing the Establishment Record for a proposed site ranges between \$20K and \$50K (Glenn P. Juday, Alaska Ecological Reserves Coordination Office, University of Alaska Fairbanks, pers. comm.). This estimate is based on the assumption of two visits to a remotely located site during the same field season by an interdisciplinary field team of 3-4 scientists and students. Preparation of the Establishment Record for each site (includes both field documentation data as well as data derived from the scientific literature) could cost an additional \$50K. Once designated, it is realistic to assume that operational costs will run between \$50-\$100 per year, but could be more (\$350-\$500K) as in the case of the Long-Term Ecological Research sites supported by the National Science Foundation.

ADDITIONAL INFORMATION NEEDED None.

CITATIONS

1) USDA (U.S. Department of Agriculture) Forest Service. 1984. Chugach National Forest Land and Resource Management Plan. Administrative Document 127B. USDA Forest Service, Alaska Region, Juneau, Alaska.

SUBOPTION C Selection of Long-Term Ecological Research Site(s).

TARGET RESOURCES AND SERVICES Marine, intertidal and adjacent upland habitats and the biological communities supported by these habitats.

DESCRIPTION

It is the objective of this suboption to obtain support through the National Science Foundation (NSF) for one or more Long-Term Ecological Research sites (LTERs) which could be integral to the comprehensive monitoring program described in Restoration Option 31. With NSF support, permanent monitoring sites at oiled, oiled-treated, oiled-untreated and unoiled (control) locations within the spill zone could be selected to follow and better understand recovery of injured resources. LTER support also will allow for the establishment of baseline environmental conditions to use as reference standards when assessing damages from future disturbances.

A wide range of research projects are conducted at the existing seventeen LTERs (Brenneman 1989). Five core research areas have become the major program theme including:

- 1) pattern and control of primary production;
- 2) spatial and temporal distribution of populations selected to represent trophic structure;
- 3) pattern and control of organic matter accumulation in surface layers and sediments;
- 4) patterns of inorganic inputs and movements of nutrients through soils, groundwater and surface waters; and
- 5) patterns and frequency of site disturbance.

IMPLEMENTATION ACTIONS

The LTER Network is administered by the National Science Foundation. The selection of new sites is the subject of periodic competitions where special panels are created to peer review specific proposals to establish LTER sites (Franklin et al., 1990). Site selection is based on the quality of the proposals, not on their potential place within a larger network of sites. Nineteen sites have been funded as a result of four separate competitions since the inception of the program in 1977. Awards have usually been for five-year periods, after which sites must submit renewal proposals.

It should be understood that the NSF does not enter into the process to establish or ensure the physical integrity of a proposed

research site; that is, they are not concerned with ownership, site operation or management. Rather, the NSF is a granting agency whose mission through the LTER Network is to support long-term ecological research (John Vande Castle, LTER Network Office, University of Washington, pers. comm.).

TIME NEEDED TO IMPLEMENT

Although somewhat dependent upon the site, a successful proposal could take up to a year to write. This assumes that sufficient data are available to prepare the proposal. Otherwise, even a cursory site characterization will add one to three years to the process. NSF's panel review will take one year from the time a call for proposals is issued.

MEANS TO IMPROVE RECOVERY

The LTER System provides a stable environment for research and monitoring through long-term financial support. LTERs also support manipulative research aimed at a better understanding of ecosystem response to both natural and human disturbance.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Most sites are managed by agencies of the Federal Government or by academic institutions. Some LTERs are managed jointly by agencies of the Federal Government and academic institutions. As such they are protected by either or both Federal and state laws.

The authority of the National Science Foundation is defined in Chapter VI of Title 45, Code of Federal Regulations. Administrative requirements for NSF's grants program is found in 45 CFR 600.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Because most sites were used for research and/or monitoring prior to their selection as LTERs, potential conflict with existing or planned uses or management is not viewed as a problem. Some sites were designated in order to study the long-term effects of human disturbance, and in this sense, existing use and/or management was "grandfathered."

TECHNICAL FEASIBILITY

There are seventeen sites in the current network of LTERs (Brenneman 1989). Sites in the system extend from Puerto Rico to northern Alaska and represent a broad diversity of environments and ecosystems. Included are agricultural, grassland, desert, forest, tundra, lake, stream, river, and coastal ecosystems. All sites are large enough to incorporate landscape mosaics, and the majority include human-manipulated as well as natural ecosystems.

Most present-day LTERs were operated as research sites by academic institutions and agencies of the Federal Government long before selection as LTERs. Some were established in the 1940's (e.g., H.J. Andrews Experimental Forest LTER Site); some date back to the early 1900's (e.g., Harvard Forest LTER Site); and others were established in the early 1980's, (e.g., North Inlet Marsh-Estuarine System LTER Site).

There are two sites in Alaska. The Arctic Tundra LTER Site is located in the Brooks Range and is operated by a consortium of six universities and the Marine Biological Laboratory at Woods Hole, MA. The Bonanza Creek Experimental Forest LTER Site is located near Fairbanks, Alaska and is operated the University of Alaska and the U.S. Forest Service.

Conspicuously absent from the LTER network is a coastal forest ecosystem site as can found in Prince William Sound.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

Obtaining NSF support for one or more LTER sites could improve or enhance recovery of injured resources. LTER support can facilitate monitoring to assess both the rate of natural recovery and the efficacy of restoration. Monitoring can identify where additional restoration may be appropriate, and determine when injury has been delayed. Monitoring of important physical, chemical and biological properties will establish an environmental baseline for affected ecosystems. This baseline with the addition of manipulative research can be used to evaluate the effects of future disturbance; and as well, improve our ability to manage affected resources and services over the long-term.

INDIRECT EFFECTS

There need be no significant adverse environmental, socio-economic, and human health and safety effects associated with the designation of a research site that will receive LTER support; however, the potential for adverse effects as well as beneficial effects are the subject of NEPA review conducted at the program-level by the Trustees, and at the site specific-level by the agency establishing the site. By the nature of the Trustees' program, every effort is extended to protect the environment. Construction will be kept to a minimum and research (even manipulation) will not impact the representative ecological character and integrity of the site.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

The selection of an LTER could facilitate monitoring as described in Option 31 (Develop Comprehensive Monitoring Plan).

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Options 21 (acquire Tidelands), Option 22 (Designate Protected Marine Areas), and Option 24 (Acquire "Inholdings" within Parks and Refuges) also could achieve the same objective.

LEGAL CONSIDERATIONS

If a research site was established by a Federal Agency, the action would be considered a federal action and must be undertaken in a manner consistent with the provisions of the National Environmental Policy Act of 1969. The agency (Federal or state) also would be responsible for certifying that designation is consistent with both the Coastal Zone Management Act of 1972 and state approved coastal zone management programs.

To develop LTER support is consistent with the provisions of the settlement that direct the Governments to jointly use natural resource damage recoveries for purposes of restoring, replacing, enhancing, rehabilitating or acquiring the equivalent of natural resources injured as a result of the oil spill.

MEANS TO EVALUATE SUCCESS

Monitoring and documenting recovery of injured resources on the LTER is the principle means of evaluating success.

Funding for LTERs also expires in five years but can be renewed for five additional years. The review process is more lengthy the second time around due to the need to peer review a larger document (proposal). The renewal proposal will include research results compiled over the preceding five years. The review process also will include a site visit.

REPRESENTATIVE COSTS

Grants from NSF average \$350K per year but may be as much as \$525K per year over a five year period.

The cost to develop a sufficiently large database to attract NSF-LTER support is not easily estimated, and it will most certainly vary with site location. While most LTERs were operated as research sites prior to designation and had developed large databases which helped justify their designation, a few LTERs were approved with little or no supporting data. A notable example is the Arctic Tundra LTER Site in the Brooks Range, Alaska, which was established in 1975. Long-term aquatic research began in 1975, and terrestrial ecologists began working there in 1976.

Even if new data on a candidate site is not required, there is still a cost associated with preparing a proposal to NSF in support of LTER support. Conservatively, this effort will cost \$50K.

ADDITIONAL INFORMATION NEEDED None.

CITATIONS

Brenneman, J. (editor) 1989. Long-Term Ecological Research in the United States, A Network of Research Sites. 5th Edition, Revised. Long-Term Ecological Research Network Office, College of Forestry Resources AR-10, University of Washington, Seattle, Washington.

Franklin, J.F., C.S. Bledsoe and J.T. Callahan. 1990. Contributions of the Long-Term Ecological Research Program. Bioscience 40 (7): 509-524.

Add new section dealing with ANCSA 17b



June 23, 1992

Author: Chris Swenson

Updated

OPTION Option 28: Acquire Access to Sport-Fishing and Recreational Areas

APPROACH CATEGORY Habitat Protection and Acquisition

INJURED RESOURCES AND SERVICES The spill injured anadromous fish populations and the recreational services they provided.

SUMMARY Anadromous fish species, such as cutthroat trout, and the recreation services provided by these fish were injured by the oil spill. Although most of the oil spill area is in ~~private~~ *public* ownership, some areas that provide important sport-fishing and recreational opportunities are not. Acquiring access to such areas can replace or enhance the injured services and also relieve pressure on streams with injured fish stocks. Acquisition of sport-fishing and recreational access could be achieved by various mechanisms, including purchase of fee simple title, or negotiating easements with landowners. Candidate sites can be identified based on knowledge of agency personnel, public nominations and proposals from landowners.

SUBOPTION A Acquisition of Fee Title

TARGET RESOURCES AND SERVICES This suboption potentially targets two groupings of resources and services:

1) streams and recreational sites on private land with inadequate public access which support resources and services directly injured by the spill

2) streams and recreational sites on private land with inadequate public access which support resources and services equivalent to those injured by the spill

DESCRIPTION State or federal land management agencies could acquire fee title to privately owned access routes to areas with high recreational or sport-fishing value. Public use facilities such as boat ramps and camping areas could be built, if this was compatible with other restoration objectives. In some cases, proper siting of access areas could relieve pressure on injured habitats and species.

IMPLEMENTATION ACTIONS Prior to implementing this option, the Trustee Council will have to select and rank candidate lands for purchase, and decide on appropriate levels of facility development. Implementation of Trustee Council decisions will occur in three steps:

1) The appropriate agency will go through a NEPA compliance process, possibly including preparation of an EIS.

54 2) The state or federal government will go through the
55 multiple steps necessary to purchase or reconvey land to
56 public ownership.

57
58 3) The appropriate agency will carry out management
59 responsibilities and monitoring, including preparation of a
60 management plan.

61
62 **TIME NEEDED TO IMPLEMENT** The time needed to implement this option
63 is variable, although in some cases it could be as little as only
64 a few months. Variables include:

65
66 Which government agency does acquisition
67 Time needed to negotiate with landowner
68 If an EA or EIS is required
69 Time to write/implement management plan
70

71 **MEANS TO IMPROVE RECOVERY** Acquisition of recreational access could
72 replace or enhance lost services by improving fishing and
73 recreational opportunities or creating opportunities where none had
74 previously existed. In addition, by directing public uses to
75 specific areas, human pressures on sites still recovering from
76 spill injuries can be lessened.

77
78 **PROTECTION AND MANAGEMENT UNDER EXISTING LAWS** Existing regulatory
79 authorities potentially applicable on private lands include:

80
81 Endangered Species Act of 1973 (16 USC 1531)
82 Marine Mammal Protection Act of 1972 (16 USC 1361 et seq.)
83 Migratory Bird Treaty Act of 1918 (16 USC 703-712)
84 Bald Eagle Protection Act of 1940 (16 USC 668)
85 Alaska Coastal Management Act of 1977 (AS 46.40)
86 Alaska Forest Practices Act of 1990 (AS 47.17)
87 Coastal resource district management plans (6 AAC 80 & 85)
88 ADF&G Anadromous Stream and Fishway Acts (AS 16.05.840 & 870)
89 Clean Water Act of 1977 (33 USC 1251 & 1344)
90 National Historic Preservation Act of 1966 (16 USC 470 et
91 seq.)
92 Section 22(g) of Alaska Native Claims Settlement Act of 1972
93 State and local zoning regulations
94

95 These regulations can provide high levels of protection in certain
96 cases, but they do not require that private landowners allow access
97 across their land as a means of restoring injured recreational
98 services.

99
00 **RELATIONSHIP WITH EXISTING/PLANNED USES OR MANAGEMENT** Government
01 acquisition and management of public access routes could result in
02 increased regulation of public uses in access areas, such as
03 development projects and other private uses. Agencies should also
04 carefully consider the siting of public access routes and
05 associated facilities. In some cases, increasing public uses of
06 recovering areas may be incompatible with the overall goal of
07 restoring injured resources and services.

108 **TECHNICAL FEASIBILITY** This suboption is technically feasible.
Natural resource agencies routinely and successfully utilize land
acquisition as a management tool to guarantee public access to
111 recreational areas. For example, the Alaska Department of Fish and
112 Game (ADF&G) has completed several sport fish access projects in
113 southcentral Alaska and is in the planning stages for others.
114

115 **POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE**
116

117 Prince William Sound, Cook Inlet and Kodiak are heavily used for
118 sport fishing and recreation. Given the existing use pressures on
119 these areas and the popularity of existing recreational access
120 improvements, it is highly likely that additional access would be
121 used, especially in the more popular areas. For instance, ADF&G is
122 currently considering sport fish access projects near Cordova,
123 Whittier, Valdez and on Kodiak and the Kenai Peninsula.
124

125 **INDIRECT EFFECTS** Indirect effects could include the following:
126

127 1) Improved access could provide socioeconomic benefits by
128 attracting tourists and recreational users to the area, thus
129 increasing the amount of money circulated through the economy
130 of cities and villages in the spill area.
131

132 2) Agency acquisition and management of access points could
133 have negative economic impacts due to increased regulatory
134 restrictions development projects and other private uses.

135 3) Acquisition of access routes could relieve trespass
136 problems experienced by private landowners.
137

138 4) Proper siting of access areas could relieve human
139 pressures on recovering habitats and species.
140

141 5) Increased public use could result in habitat degradation
142 and overharvest.
143
144

145 **RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIVITIES** This
146 suboption could potentially overlap with options 24, 25 and 26,
147 which deal with acquiring private inholdings within parks and
148 refuges, upland forests and watersheds and stream buffers. Public
149 access points can potentially be included in these areas.
150

151 **OTHER OPTIONS THAT COULD ACHIEVE THIS OBJECTIVE** Option 28, part
152 B (below) could potentially achieve the same objectives through a
153 variety of non-purchase options. Also, acquisition of inholdings
154 (option 24), upland areas (option 25), and stream buffers (option
155 26) could also provide public access, if this was compatible with
156 other management objectives. There is, therefore, potential for a
157 single acquisition to achieve multiple restoration objectives.
158

159 **LEGAL CONSIDERATIONS**
160

1) Consistency with settlement: Acquisition of land,

including acquisition of equivalent resources, is consistent with the terms of the settlement.

2) Agencies with management/regulatory responsibilities: Existing agency responsibilities do not conflict with the implementation of this suboption. Agencies with land management responsibilities include the Alaska Department's of Natural Resources and Fish & Game; the National Park Service; the Fish and Wildlife Service; and the Forest Service. The Alaska Department of Fish and Game is most actively involved in providing public access for sport fishermen.

3) Permits required: No permits are required for land acquisition, although road and facility construction could require permits from a variety of state and federal agencies, depending on the type and location of the project.

4) NEPA compliance: Land acquisitions may have to go through the NEPA process, which requires an EA and possibly an EIS.

5) Requirements for new legislative/regulatory actions: Legislative action would not be required.

MEANS TO EVALUATE SUCCESS The appropriate resource management agency will monitor the degree to which the option has enhanced public uses as well as any detrimental impacts caused by increased human pressures.

REPRESENTATIVE COSTS

Federal land acquisition process -

OR

State land acquisition process -

NEPA compliance process (EA/EIS) -

Fair market value for land - varies w. quality and size of parcel

OR

Land exchange process/reconveyance

Costs for maintaining agency management and monitoring of areas -

Costs of enhancing compatible recreation opportunities; e.g., building and maintaining a boat launch, parking lot, etc.

TOTAL COST: Variable

ADDITIONAL INFORMATION NEEDED

Input is needed from the Trustee Council on specific areas where increased public access would be appropriate and could decrease pressures on recovering areas.

CITATIONS

216 Kevin Delaney, ADF&G
217 Steve Planchon, TNC, pers. comm.
TNC report
219 Jones and Stokes report
220 Restoration Framework document

221 **SUBOPTION B Acquire Access Without Purchase of Fee Title**

222
223 **TARGET RESOURCES AND SERVICES** This suboption potentially targets
224 two groupings of resources and services:
225

226 1) streams and recreational sites on private lands with
227 inadequate public access which support resources and services
228 directly injured by the spill
229

230 2) streams and recreational sites with inadequate public
231 access on private lands which support resources and services
232 equivalent to those injured by the spill
233

234 **DESCRIPTION** State and/or federal governments can provide public
235 access through means other than acquisition of fee title. A
236 complete description of these protection options is beyond the
237 scope of this document, but they could include the following:
238 voluntary agreements with landowners; lease, license and
239 cooperative management agreements; deed restrictions; and
240 conservation easements or partial interests. Implementing the most
241 effective protection option will require considerable planning and
242 negotiation with the landowner.
243

244 **IMPLEMENTATION ACTIONS** Prior to implementing this option, the
245 Trustee Council will have to select and rank candidate lands.
246 Implementation of Trustee Council decisions will occur in two
247 steps:
248

249 1) The appropriate agency will contact the landowner and
250 negotiate terms of non-purchase protection option.
251

252 2) The appropriate agency will carry out monitoring and any
253 additional management responsibilities, including writing a
254 management plan.
255

256 **TIME NEEDED TO IMPLEMENT** The time needed to implement this option
257 is variable. Variables include:
258

259 Time to negotiate with landowner

260 Time to write/implement management plan

261 Time to build roads or facilities, if necessary
262

263 **MEANS TO IMPROVE RECOVERY** Additional recreational access could
264 replace or enhance lost services by improving fishing and
265 recreational opportunities or creating opportunities where none had
266 previously existed. In addition, by directing public uses to
267 specific areas, human pressures on sites still recovering from
268 spill injuries can be lessened.
269

270 **PROTECTION AND MANAGEMENT UNDER EXISTING LAWS** Existing regulatory
271 authorities potentially applicable on private lands include:
272

273 Endangered Species Act of 1973 (16 USC 1531)

274 Marine Mammal Protection Act of 1972 (16 USC 1361 et seq.)

275 Migratory Bird Treaty Act of 1918 (16 USC 703-712)
276 Bald Eagle Protection Act of 1940 (16 USC 668)
Alaska Coastal Management Act of 1977 (AS 46.40)
278 Coastal resource district management plans (6 AAC 80 & 85)
279 ADF&G Anadromous Stream and Fishway Acts (AS 16.05.840 & 870)
280 Alaska Forest Practices Act of 1990 (AS 47.17)
281 Clean Water Act of 1977 (33 USC 1251 & 1344)
282 National Historic Preservation Act of 1966 (16 USC 470 et
283 seq.)
284 Section 22(g) of Alaska Native Claims Settlement Act of 1972
285 State and local zoning regulations
286

287 These regulations can provide high levels of protection in certain
288 cases, but they do not require that private landowners allow access
289 across their land as a means of restoring injured recreational
290 services. Short of fee title purchase, the best way to guarantee
291 public access is to negotiate legally binding agreements with
292 private landowners.
293

294 **RELATIONSHIP WITH EXISTING/PLANNED USES OR MANAGEMENT** Government
295 management of public access routes could result in increased
296 regulation of public uses in access areas, e.g., development
297 projects. Agencies should also carefully consider the siting of
298 public access routes. In some cases, increasing public uses of
299 recovering areas is incompatible with the overall goal of restoring
300 injured resources and services.
301

302 **TECHNICAL FEASIBILITY** This suboption is technically feasible.
Resource agencies and private conservation organizations routinely
304 negotiate agreements with landowners to achieve management
305 objectives without purchase of fee title to lands. For example,
306 the Nature Conservancy recently negotiated a cooperative management
307 agreement in the Mad River Slough and Dunes area of California,
308 involving private landowners and the federal Bureau of Land
309 Management. Each group retained ownership of their lands, but
310 entered into a mutual agreement to increase protection of natural
311 resources while also providing for public access and compatible
312 recreational uses.
313

314 **POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE**

315

316 Prince William Sound, Cook Inlet and Kodiak are heavily used for
317 sport fishing and recreation. Given the existing use pressures on
318 these areas and the popularity of existing recreational access
319 improvements, it is highly likely that additional access would be
320 used, especially in the more popular areas.
321

322 **INDIRECT EFFECTS** Indirect effects could include the following:

- 323
324 1) Improved access could provide socioeconomic benefits by
325 attracting tourists and recreational users to the area, thus
326 increasing the amount of money circulated through the economy
327 of cities and villages in the spill area.

2) Agency management of access points could have negative economic impacts due to increased regulatory restrictions on development projects and other private uses.

3) Access routes could relieve trespass problems experienced by private landowners.

4) Proper siting of access areas could relieve human pressures on recovering habitats and species.

5) Increased public use could result in habitat degradation and overharvest.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIVITIES This suboption could potentially overlap with options 24, 25 and 26, which deal with acquisition of private inholdings within parks and refuges, upland forests and watersheds, and stream buffers. Public access points can potentially be included in these areas.

OTHER OPTIONS THAT COULD ACHIEVE THIS OBJECTIVE Suboption A of option 28 (above) could potentially achieve the same objectives through acquisition of fee title. Also, management agreements with private parties owning inholdings (option 24), upland areas (option 25), and stream buffer areas (option 26) could provide public access, if this was compatible with other management objectives. There is, therefore, potential for a single agreement to achieve multiple restoration objectives.

LEGAL CONSIDERATIONS

1) Consistency with settlement: Restoration of injured recreational services is consistent with the terms of the settlement.

2) Agencies with management/regulatory responsibilities: Existing agency responsibilities do not conflict with the implementation of this suboption. Agencies with land management responsibilities include the Alaska Department's of Natural Resources and Fish & Game; the National Park Service; the Fish and Wildlife Service; and the Forest Service. The Alaska Department of Fish and Game is most actively involved in providing access for sport fishermen.

3) Permits required: No permits are required for land acquisition.

4) NEPA compliance: Since title to the land remains in private hands, an EIS or EA would probably not be required.

5) Requirements for new legislative/regulatory actions: Legislative action would not be required.

MEANS TO EVALUATE SUCCESS The appropriate resource management agency will monitor the degree to which the option has enhanced

383 public uses as well as any detrimental impacts caused by increased
384 human pressures.

386 **REPRESENTATIVE COSTS**

387
388 Costs of negotiating agreements with landowners -

389
390 Costs of acquiring less than fee simple rights to land (if
391 applicable) -

392
393 Costs for monitoring - \$12,000/yr (based on inspection &
394 permitting costs for ADF&G special areas)

395
396 **ADDITIONAL INFORMATION NEEDED**

397
398 Input is needed from the Trustee Council on specific areas where
399 increased public access would be appropriate and could decrease
400 pressures on recovering areas.

401
402 **CITATIONS**

403
404 Kevin Delaney, ADF&G
405 Steve Planchon, TNC, pers. comm.
406 TNC report
407 Jones and Stokes report
408 Restoration Framework document

June 11, 1992

Author: Bruce Wright

OPTION 29: Establish or Extend Buffer Zones for Nesting Birds

APPROACH CATEGORY: Habitat Protection and Acquisition

INJURED RESOURCES AND SERVICES: Bald Eagle and Harlequin Duck
(Habitat protection and extended buffer zones for murrelets and marbled murrelets will be addressed in options 23 and 25 respectively.)

SUMMARY: Most birds have specific nesting requirements. Actions which alter nesting habitat or disturb nesting birds may disrupt nesting thus reducing productivity and slowing recovery of injured species. During the period that bald eagles and harlequin ducks are recovering from the spill, a multi-zone land management scheme should be adopted on state and federal owned lands. Disruptive human activities which may impact nesting bald eagles and harlequin ducks would be prohibited.

SUBOPTION A: Recommend implementation of special agency management practices

Move to 20c

TARGET RESOURCES AND SERVICES: Bald Eagles and Harlequin Ducks

DESCRIPTION

BALD EAGLES: Stalmaster (1987) describes three methods for protecting bald eagle nests:

- (1) circular zoning; a concentric circle extends a specified distance around the nest inside of which human activities would be managed or excluded.
- (2) territory zoning; a non-concentric area around a nest which includes additional habitat features required by nesting eagles.
- (3) regional zoning; encompasses an area which includes active and non-active eagle nests (circular zones), important eagle habitat (territory zones) and potential bald eagle habitats allowing for recovery and expansion of the bald eagle population over the long term.

To protect bald eagle nesting habitat in the Tongass National Forest the United States Forest Service and United States Fish and Wildlife Service entered into a interagency agreement. The focus of the agreement was to establish a 100 meter radius circular zoning around bald eagle nesting trees whether the nests were active or not. Extended zones were necessary to prevent disturbances from blasting and repeated helicopter flights. The nest buffer zone is maintained even if the nest becomes unsuitable for use. This ensures protection of known nesting habitat (Sidle et al. 1986).

The use of 100 meter buffer zones in intensively developed areas may result in the "creation of small islands of habitat that will be insufficient to fully provide for future eagle habitat requirements" (USFWS Bald Eagle Management Recommendations). If circular zoning is to be used it should be large enough to screen noise and visual distractions associated with human activities. This may require a primary zone (100 meter) to protect the immediate nesting area and a secondary zone from 100 meter to 200 meter to protect the nesting tree from wind throw and other human and natural calamities which may damage the integrity of the primary nesting zone (Hodges 1982).

The 100 meter buffer zone has been in effect in southeast Alaska since 1969. Hodges (1982) determined that logging activities did not directly impact bald eagle nesting when they were protected by the 100 meter buffer zone. However, after five years windthrow reduced buffer zones by an average of 17 percent. To protect the integrity of the 100 meter buffer strip Corr (1974) recommended that a buffer zone of 200 meter radius be used in areas scheduled for timber harvest.

Of 3,850 nests surveyed in southeast Alaska, 92 percent occurred within 300 feet (91 m) of the shoreline, and the average distance from the nest to the shoreline was 120 feet (37 m) (Hodges and Robards 1982).

Bald eagles are closely associated with the intertidal areas in Prince William Sound (PWS). They use these areas for feeding and nesting almost exclusively within 200 meters of the beach (Phil Schempf, pers. comm. 1992).

In addition to circular zones around nests, maintaining contiguous areas of habitat would provide sites for perching, future nesting trees, and provide protection to areas where bald eagles often congregate to utilize abundant food sources such as herring and salmon spawning areas (Hensel and Troyer, 1964). The 1991 Tongass Land Management Plan Revision lists a land use designation alternative called beach fringe management zone. This zone is defined as 500 feet slope distance from mean high tide. The beach fringe management zone was introduced initially to protect bald eagles (Lowell Suring, pers. comm. 1992), and well over 95% of the bald eagle nests occur in this zone. In addition to protecting bald eagle habitat, a variety of other natural resources may benefit from establishing the protected zones including marine associated species, shorebirds, waterfowl, river otters, visual resources and cultural resources.

HARLEQUIN DUCKS: Patten and Crowley (1991) located harlequin duck nesting sites in PWS and found they were within 25 meters of streams or small tributaries to streams. The streams are evidently useful for feeding and avoiding predation, particularly when the young have hatched (Bellrose, 1980).

Some researchers consider harlequin ducks an indicator of pristine ecosystems partially because of their sensitivity to human disturbances. Cassirer and Groves (1990) observed harlequin broods more often on undisturbed streams away from human activities. Only 20-30 streams in all of Idaho have breeding harlequin ducks and these are the least impacted, most pristine streams (Cassirer, pers. comm. 1992, 208-443-2512). Cassirer and Groves (1990) proposed an interim recommendation of a 50 meter undisturbed riparian corridor with limited human activity during the breeding season to reduce impacts of timber harvesting.

Patten and Crowley (1991) tentatively recommended a 50 meter buffer strip along harlequin duck nesting streams in PWS. However, they indicated that disturbances associated with logging require a wider buffer strip.

Cassirer (pers. comm. 1992) has analyzed aerial photographs of clear cut and associated streams. She found that, in Idaho, clear cuts from approximately 50 meters from streams up to the stream banks did not have nesting harlequin ducks. However, some adjacent streams where clear cuts were at least 100 meters from the stream had breeding harlequin ducks. The streams with logging activity, including logging roads, within 50 meters of streams would not have harlequin duck breeding activity for more than 20 years after the initial cut. Cassirer is now recommending that logging activities not approach closer than 100 meters to expected harlequin duck nesting streams, and to exclude logging activities during the duck's nesting season.

IMPLEMENTATION ACTIONS

BALD EAGLES: The Trustees would recommend establishment of a multi-zone approach to protecting bald eagle nesting sites and habitat. The primary zone would be a concentric zone with a 100 meter radius around all bald eagle nests, including inactive nests. All human activity occurring within this zone would be approved by the appropriate land manager.

A secondary zone would be established from 100 meters to 200 meters from active and inactive bald eagle nests. Human activity within the secondary zone would be limited during the nesting season from February to September. All activity occurring during the nesting season in this zone would be approved by the appropriate land manager.

A beach fringe management zone would also be established. This zone is defined as 200 meter slope distance from mean high tide on all Federal and State lands within the oil spill zone. Areas adjacent to the oil spill, including rivers used by nesting eagles, would also be considered for inclusion in the beach fringe management zone to allow for continued production and

recruitment of bald eagles into adjacent oil impacted areas. The beach fringe management zone would be protected from long-term human disturbances such as logging, road building, field camps, and excessive aircraft activity. Fall and wintering communal feeding areas would also be included in the beach fringe management zone.

HARLEQUIN DUCKS: Trustees would recommend establishment of a 100 meter primary buffer strip along stream and tributaries to streams with potential harlequin duck nesting activity. Human activities would be minimized within this primary buffer strip so that pre-nesting and nesting harlequin ducks are not disturbed.

A secondary buffer strip would also be established which restricts disruptions to harlequin duck pre-nesting and nesting activities. The secondary buffer strip would restrict operations such as road building and timber harvests during the nesting season.

TIME NEEDED TO IMPLEMENT

Time needed to develop a cooperative agreement among the State and federal land managers and the Trustee Council could range from 3 to 6 months depending upon the nature of the agreement.

MEANS TO IMPROVE RECOVERY

BALD EAGLES: Reduced human disturbance would allow for increased chick production. Protection of all potential nesting habitat (beach fringe management zone) would permit offspring to locate a nesting site thus increasing the total breeding population in the impacted areas.

Bald eagles will often congregate in the fall and winter in areas with late salmon runs. These areas are important to the survival of the region's bald eagles which, unlike most Alaskan birds, usually don't migrate south for the winter.

HARLEQUIN DUCKS: Reduced human disturbance at harlequin duck breeding and molting sites may increase productivity by allowing paired ducks to maintain their pair-bonds during the pre-nesting and nesting seasons, and reduce mortality associated with stressed molting birds. Protection of breeding habitat may be essential for eventual recolonization of breeding harlequin ducks in western PWS (Patten and Crowley, 1991).

Harlequin ducks congregate at the mouths of suitable streams in May. During this time pairs fly from their intertidal feeding areas to upstream areas in search of nest sites. Disturbance at this time could prevent the pairs from searching and locating adequate nest sites.

Molting periods are physiologically stressful for harlequin ducks since they molt all their flight feathers at one time making them flightless for a few weeks. If the ducks are disturbed at this critical time they may be more susceptible to predation and increased mortality including hunting (Ian Goudie, pers. comm. 1992. Can. Wildl. Ser. 604-666-0143)

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

BALD EAGLES: In all states where it occurs, except Alaska, the bald eagle is classified as an endangered or threatened species and receives federal protection under the Endangered Species Act of 1973. Although the bald eagle in Alaska is classified as neither threatened nor endangered, the species is protected under the Bald Eagle Protection Act of 1940 (as amended) and the Migratory Bird Treaty Act. The Bald Eagle Protection Act makes it illegal to take, possess, disturb, or molest eagles, eagle parts, eggs or nests.

On National Forests in Alaska, protection measures for bald eagles and their nesting habitats are prescribed in the Memorandum of Understanding between the USDA Forest Service and the U.S. Fish and Wildlife Service. The Memorandum provides for the exclusion of all land-use activities within a buffer zone of 100 meter radius around all active and inactive bald eagle nests.

HARLEQUIN DUCKS: The Alaska Department of Fish and Game establishes waterfowl hunting regulations within Alaska. The harvest of harlequin ducks was restricted within PWS during the 1991 waterfowl hunting season to protect the resident birds.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

BALD EAGLES: Logging of the beach fringe would almost certainly impact bald eagles and their nesting habitat.

HARLEQUIN DUCKS: Throughout the pre-nesting period and early nesting time frames harlequin ducks are susceptible to a variety of human disturbances including activity associated with research of harlequin ducks and other species (Ian Goudie, pers. comm. 1992), logging and near shore boating activities.

Harlequin ducks are hunted during the regular waterfowl hunting season. However, the harlequin duck opening was postponed by 30 days in PWS and the eastern Kenai Peninsula during the 1991 season to protect the resident population.

Logging and associated activities would adversely impact harlequin duck nesting and nesting habitat.

TECHNICAL FEASIBILITY

BALD EAGLES: The 100 meter buffer zone has been in effect in southeast Alaska since 1969.

HARLEQUIN DUCKS: Current buffer strips of 28.8 meters are required along anadromous fish streams. However, 3 of the 5 streams where harlequin ducks were found nesting in 1991 were on very small tributaries. These were probably not protected as anadromous fish streams.

Cassirer (pers. comm. 1992) indicated 100 meter minimum buffer strips are being required along harlequin nesting streams in Idaho where timber harvesting and road building is occurring.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

BALD EAGLES: Hodges (1982) determined that logging activities did not directly impact bald eagle nesting if they were protected by the 100 meter buffer zone. However, after five years windthrow reduced buffer zones by an average of 17 percent. Use of the beach fringe management zone would help protect the nest buffer zone trees from windthrow.

As long as bald eagle nesting habitat is protected annual recruitment will potentially increase the population to levels seen prior to the oil spill.

HARLEQUIN DUCKS: Cassirer (pers. comm. 1992) has analyzed aerial photographs of clear cut and associated streams. She found that, in Idaho, clear cuts from approximately 50 meters from streams up to the stream banks did not have nesting harlequin ducks. However, some adjacent streams where clear cuts were at least 100 meters from the stream had breeding harlequin ducks. The streams with logging activity, including logging roads, within 50 meters of streams would not have harlequin duck breeding activity for more than 20 years after the initial cut. Streams with buffer strips of at least 100 meters have maintained harlequin duck breeding populations in Idaho.

INDIRECT EFFECTS

Establishment of buffer zones and buffer strips would offer some protection of a wide variety of other resources, many of which were impacted by the oil spill. Creation of the beach fringe management zone would act as sanctuary for the wildlife using that habitat including furbearers, river otters, bald eagles, shorebirds, bears, deer and a variety of other species. In addition nearshore marine habitats, many subsistence and cultural resources would be relatively protected.

Creation of stream buffer strips would offer protection for anadromous species including salmon and Dolly Varden which were injured by the oil spill. The stream buffer strips also afford travel corridors and cover for many species of birds and mammals.

Removal of buffer zones and buffer strips from timbering operation may increase the expense of the operation and lower the amount of timber taken from an area. This could impact the number of available timber harvesting jobs or eliminate some logging projects.

Bald eagles are important to the tourism trade. Maintaining this species at high numbers would have a positive effect on the PWS tourism industry.

Increased numbers of harlequin ducks would allow for a greater sport/subsistence harvest especially during the early portion of the season before wintering birds move into the area.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

BALD EAGLES: Disturbance to nesting bald eagles by oil clean up activities may have resulted in some nesting failures (Schempf and Bowman, 1991). Aircraft traffic associated with clean up and research efforts may have impacted bald eagle behavior and nesting success (Phil Schempf, pers. comm. 1992).

HARLEQUIN DUCKS: Preliminary results from the harlequin duck NRDA studies indicate that Response and some field studies exacerbated the effects of the oil spill. This probably resulted in increased nesting failures in western PWS (Patten, 1991).

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Option 6 considers redesignating a portion of the Chugach National Forest as a National Recreation Area or Wilderness Area. These designations could protect bald eagle and harlequin duck habitat in PWS.

Option 7 would increase management and education efforts on public lands. These actions could reduce human activities near critical bald eagle and harlequin duck nesting habitats.

Option 8 to restrict or eliminate legal harvest of sea ducks could have a positive impact on the impacted harlequin ducks in western PWS and allow for additional recruitment from adjacent areas.

Harlequin ducks in western PWS continue to be injured by consuming contaminated prey, particularly mussels. Option 13 would help eliminate the contaminated prey possibly resulting in helping harlequin duck populations recovery in PWS.

Option 20 could result in establishing "special management areas" potentially resulting in protection of critical nesting habitat of bald eagles and harlequin ducks.

Harlequin ducks and bald eagles could benefit from purchase and protection of tidelands, marine areas, marine birds habitats, upland forests and watersheds (Options 21-25) since this could ultimately result in reduced human activity in these important areas.

Option 26 proposes to extend buffer strips adjacent to anadromous fish streams using a variety of approaches including purchase of title or rights, or amending the Alaska Forest Practices Act. Any of these measures has the potential to protecting important harlequin duck nesting habitat.

LEGAL CONSIDERATIONS

BALD EAGLES: The U.S. Fish and Wildlife Service has primary responsibility for protecting bald eagles under the Bald Eagle Protection Act of 1940 and Migratory Bird Treaty Act.

HARLEQUIN DUCKS: The Alaska Department of Fish and Game has primary responsibility for management of waterfowl and the waterfowl hunting regulations.

MEANS TO EVALUATE SUCCESS

Censuses designed to monitor the population levels of bald eagles and harlequin ducks in the oil impacted areas will indicate if the reduced disturbance, in conjunction with other restoration options, is effective in helping these bird populations to recover.

REPRESENTATIVE COSTS

Costs associated with developing special agency management practices would need to include travel and salaries of the agency personnel involved.

ADDITIONAL INFORMATION NEEDS

BALD EAGLES:

1. Maps depicting locations of bald eagle nest sites.
2. Identity of important bald eagle concentration sites.
3. List of lands requiring special agency management practices.
4. Population model for bald eagles in PWS.

HARLEQUIN DUCKS:

1. Determine conclusively harlequin duck nesting habitat requirements.
2. Determine the buffer zone size needed along streams where harlequin ducks nests that will adequately protect them from human and machinery disturbances associated with logging operations.

CITATIONS

Bald Eagle Management Recommendations. 1992. USFWS, Anchorage, Alaska. contact Gary Wheeler 271-2786.

Bellrose, F.C. 1980. Ducks, geese, and swans of North America. Stackpole Books. Harrisburg, PA.

Cassirer, E.F. and C.R. Groves. 1990. Distribution, habitat use and status of harlequin ducks (Histrionicus histrionicus) in northern Idaho, 1990. Nat. Her. Section, Nongame and Endg. Wildl. Prog., Bureau of Wildl. Idaho Dept. Fish and game.

Corr, P.O. 1974. Bald eagle (Haliaeetus leucocephalus alaskanus) nesting related to forestry in southeastern Alaska. M.S. thesis, Univ. Alaska, College. 144 pp.

Hensel, R.J. and W.A. Troyer. 1964. Nesting studies of the bald eagle in Alaska. Condor 66:282-86.

Hodges, J.I. 1982. Evaluation of the 100 meter protective zone for bald eagle nests in southeast Alaska. U.S. Dep. Interior, unpublished report. Juneau, Alaska. 11 pp.

Hodges, J.I., and F.C. Robards. 1982. Observations of 3,850 bald eagle nests in southeast Alaska. Pages 37-54 in W.N. Ladd and P.F. Schempf (eds.) Proceedings of a Symposium and Workshop on Raptor Management and Biology in Alaska and Western Canada, February 17-20, 1981, Anchorage, Alaska. U.S. Dep. Interior, Fish and Wildl. Serv., Alaska Reg. Rep. Proc-82. Anchorage, Alaska. 335 pp.

Patten, S.M. and D.W. Crowley. 1991. Preliminary statue report of harlequin duck restoration project in PWS. 34 pp.

Patten, S.M., R. Gustin and T. Crowe. 1991. Injury assessment of hydrocarbon uptake by sea ducks in Prince William Sound and the Kodiak Archipelago, Alaska. NRDA Bird Study #11; Draft Preliminary Status Report. 50 pp.

23 June 1992

Author: Chris Swenson (updated)

SUBOPTION B Negotiate cooperative mechanisms for achieving similar management practices on private lands

TARGET RESOURCES AND SERVICES The spill injured bald eagles, harlequin ducks, recreational viewing opportunities, tourism, and sport and subsistence harvest.

DESCRIPTION State and/or federal governments can enhance protection of bird nesting habitats through management agreements with private landowners. A complete description of these protection options is beyond the scope of this document, but they could include the following: landowner contact and education; voluntary agreements with landowners; lease, license and cooperative management agreements; deed restrictions; and conservation easements or partial interests. For example, it is possible to purchase timber rights to a critical nesting area and leave the fee title to the land in private ownership. These options afford varying levels of protection and are appropriate in different situations. Implementing the most effective protection option will require considerable planning and negotiation with the landowner.

IMPLEMENTATION ACTIONS Prior to implementing this option, the Trustee Council will have to select and rank candidate lands for protection, and decide on the appropriate level of protection. Implementation of Trustee Council decisions will occur in a maximum of three steps:

- 1) The appropriate agency will contact the landowner and negotiate terms of non-purchase protection option.
- 2) The appropriate agency may go through a NEPA process, possibly generating an EA.
- 3) The appropriate agency will carry out monitoring and any additional management responsibilities.

TIME NEEDED TO IMPLEMENT The time needed to implement this suboption should be less than for Suboption A but is variable. Variables include:

Time for negotiations with landowners
Time needed for EA (if applicable)
Process for purchasing less than fee simple title (if applicable)

MEANS TO IMPROVE RECOVERY Enhanced protection of bird nesting habitats will facilitate natural recovery by restricting activities stressful to already damaged populations and habitats. In the case of unoilied areas which support resources and services equivalent to those damaged by the spill, the implementation of this suboption would guard against future habitat degradation and could enhance the services provided.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS Existing regulatory

97 authorities potentially applicable on private lands include:

100 Endangered Species Act of 1973 (16 USC 1531)
101 Marine Mammal Protection Act of 1972 (16 USC 1361 et seq.)
102 Migratory Bird Treaty Act of 1918 (16 USC 703-712)
103 Bald Eagle Protection Act of 1940 (16 USC 668)
104 Alaska Forest Practices Act of 1990 (AS 47.17)
105 Alaska Coastal Management Act of 1977 (AS 46.40)
106 Coastal resource district management plans (6 AAC 80 & 85)
107 ADF&G Anadromous Stream and Fishway Acts (AS 16.05.840 & 870)
108 Clean Water Act of 1977 (33 USC 1251 & 1344)
109 National Historic Preservation Act of 1966 (16 USC 470 et
110 seq.)
111 Section 22(g) of Alaska Native Claims Settlement Act of 1971
112 State and local zoning regulations

113 The Bald Eagle Protection Act, the Migratory Bird Treaty Act, the
114 Alaska Forest Practices Act, and their associated regulations
115 provide the most direct protection for nesting birds. Fish and
116 Wildlife regulations specify *****? foot buffer zones around
117 active eagle nests, but this may not be sufficient in some cases.
118 There are no buffer zones established for nesting harlequin ducks.
119 The Forest Practices Act establishes logging buffers for streams,
120 but these may not be sufficient to prevent disturbance to birds and
121 may not even apply to smaller streams. Coastal district management
122 plans can be amended to designate areas which are to be managed for
123 specific purposes, but this management authority only has force on
124 private lands when the landowner requires permits for activities on
125 their land.

126
127 If lands remain within private ownership, the best option for
128 reducing disturbance of nesting birds is to negotiate legally
129 binding management agreements with the landowners. These
130 agreements can be tailored to meet the needs of all parties
131 involved and are enforceable.

132
133 **RELATIONSHIP WITH EXISTING/PLANNED USES OR MANAGEMENT** Enhanced
134 protection and management of bird habitats could result in
135 increased restrictions on public uses, e.g., development projects,
136 certain recreational and harvest activities, vehicle access, etc.

137
138 **TECHNICAL FEASIBILITY** This suboption is technically feasible.
139 Natural resource agencies and private conservation organizations
140 routinely utilize land protection strategies as management tools to
141 protect and enhance both damaged and healthy ecosystems. For
142 example, the Nature Conservancy recently negotiated a cooperative
143 management agreement in the Mad River Slough and Dunes area of
144 California, involving private landowners and the federal Bureau of
145 Land Management. Each group retained ownership of their lands, but
146 has entered into a mutual agreement to increase protection of
147 natural resources. The agreement also allows for public access and
148 compatible recreational uses.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

151 The spill area contains privately owned coastal and upland areas
152 used by nesting birds. Multiple commercial and recreational uses
153 of these areas potentially conflict with the habitat requirements
154 of bald eagles, ducks and other species which were either injured
155 in the spill or are equivalent to injured species. Disturbance of
156 harlequin duck and eagle nesting sites has been documented to
157 increase nesting failure (CITES). Increased protection of these
158 areas would ensure that restoration of injured populations would
159 receive management priority. It could also enhance the services
160 offered by these areas by enhancing recreational, sport and
161 subsistence uses provided by these species. This suboption could
162 take anywhere from a few months to years to implement.

163
164 **INDIRECT EFFECTS** Indirect effects could include the following:

- 165
166 1) Species not targeted for restoration efforts could benefit
167 from enhanced habitat protection.
168
169 2) Healthier ecosystems resulting from enhanced protection
170 could provide socioeconomic benefits by attracting tourists,
171 providing increased recreational and harvest opportunities and
172 improving the quality of life.
173
174 3) Enhanced habitat protection could have negative economic
175 impacts due to increased restrictions on harvest levels,
176 certain types of recreational activities and development
177 projects.
178

179 **RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIVITIES** This
180 suboption could potentially overlap with options 21, 23, 24, 25 and
181 26, which deal with acquisition of tidelands, marine bird habitat,
182 private inholdings within parks and refuges, anadromous stream
183 buffers and upland forests. Bird nesting habitat can potentially
184 include some or all of these areas.
185

186 **OTHER OPTIONS THAT COULD ACHIEVE THIS OBJECTIVE** Suboption A of
187 option 29 (above) could achieve the same objectives. In addition,
188 options 21, 23, 24, 25, and 26 could achieve the same objectives
189 if, once these areas were acquired, they were provided with
190 sufficient levels of protection. There is, therefore, potential
191 for a single acquisition to achieve multiple restoration
192 objectives.
193

194 **LEGAL CONSIDERATIONS**
195

- 196 1) Consistency with settlement: Acquisition of less than fee
197 simple rights to land, including acquisition of rights to
198 equivalent resources, is consistent with the terms of the
199 settlement.
200
201 2) Agencies with management/regulatory responsibilities:
202 Existing agency responsibilities do not conflict with the
203 implementation of this suboption. The Fish and Wildlife
204 Service has lead responsibility for managing waterfowl and

eagles. The Alaska Department of Fish and Game co-manages these species. Agencies with land management responsibility in the spill area potentially include the Alaska Departments of Natural Resources and Fish and Game; The National Park Service; the Fish and Wildlife Service; and the Forest Service.

3) Permits required: No permits are required.

4) NEPA compliance: Since title to the land would be retained by private parties, it is unlikely that an EIS would have to be prepared, although an EA may be necessary.

5) Requirements for new legislative/regulatory actions: None

6) Other: Complicating factors could include legal conflicts over ownership of avulsed lands and the state challenges to federal claims of ownership of Alaskan tidelands and submerged lands.

MEANS TO EVALUATE SUCCESS The appropriate resource management agency will monitor how effectively this suboption has prevented activities harmful to target resources and services and the degree to which the suboption has enhanced compatible public uses.

REPRESENTATIVE COSTS

Costs of preparing EA (if necessary) -

Costs of negotiating agreements with landowners -

Costs of acquiring less than fee simple rights to land (if applicable) -

Costs for monitoring - \$12,000/yr (based on inspection & permitting costs for ADF&G special areas)

TOTAL COST: Variable

ADDITIONAL INFORMATION NEEDED

Input is needed from the Trustee Council on specific nesting areas eligible for protection, as well as the appropriate level of protection. This must be based on specified habitat types and conditions required for restoration of injured species.

CITATIONS

Kim Sundberg, ADF&G, pers. comm.

Steve Planchon, TNC, pers. comm.

TNC report

Jones and Stokes report

Restoration Framework document

✓

DRAFT

May 18, 1992

Author: John Strand

OPTION 31: Develop Comprehensive Restoration Monitoring Program

APPROACH CATEGORY: Other

INJURED RESOURCES AND SERVICES: All

SUMMARY (ABSTRACT): There is need for a comprehensive and integrated monitoring strategy to assess recovery of injured natural resources and services in the oil-spill area. Monitoring is required to determine if and when injured resources and services return to their baseline conditions, to evaluate the effectiveness of restoration activities, to detect latent injuries and to reveal long-term trends in the health of ecosystems affected by the spill. Development of a monitoring plan will take one year and will be conducted in two phases. Phase 1., which focuses on development of a conceptual design, is intended to guide more detailed and technical planning in Phase 2. The proposed monitoring plan is consistent with existing law (e.g.; Natural Resource Damage Assessment Regulations found in the Comprehensive Environmental Response, Compensation, and Liability Act of 1980; and the National Environmental Policy Act of 1969 as amended). The proposed monitoring is also technically feasible and specific monitoring protocols for Prince William Sound and the Gulf of Alaska can be developed from earlier conducted response, damage assessment and restoration science studies. The duration of the monitoring program will depend on the severity of injury, the capacity of injured resources and services to recover, and the time required to establish a trend for recovery. Estimated costs of planning the proposed monitoring program will be \$500K.

DESCRIPTION: It is the objective of this option to develop and implement a comprehensive and integrated restoration monitoring program that will follow the progress of natural recovery, evaluate the effectiveness of restoration activities, and to establish an ecological baseline from which future disturbances can be evaluated. Permanent monitoring sites could include representative habitat types, oiled, unoiled control, untreated set-aside, damage assessment, and EXXON study sites.

IMPLEMENTATION ACTIONS:

- 1) Design and implement monitoring to follow natural recovery of injured resources and services;
- 2) Design and implement monitoring to evaluate the effectiveness of restoration activities, identify where additional restoration activities may be appropriate, and determine when injury is delayed, and

3) Design and implement monitoring of other components to document long-term trends in the environmental health of the affected ecosystems.

TIME NEEDED TO IMPLEMENT: While some monitoring was conducted in 1990 and 1991, and additional monitoring will be conducted in 1992, implementation of the fully expanded and integrated monitoring program will not occur before the summer of 1993. Planning will occur over a period of essentially one year and be complete prior the beginning of the field season in May 1993. Planning will be conducted in two phases. In Phase 1, a conceptual design will be developed that addresses such issues as goals and objectives, what to monitor, what institutional models are required for management, what relationships need be established with other monitoring programs in the spill zone, and how can monitoring be funded over the long-term. The conceptual design will serve to guide more detailed, technical planning in Phase 2. This phase will specify the technical design for each monitoring component, create a data management system and quality assurance plan to handle all monitoring data, establish costs and develop a strategy for review and update of monitoring methods.

Once implemented, the duration of monitoring for either natural recovery or recovery following restoration will generally depend upon the severity of injury, the capacity of injured resources and services to recover, and the time necessary to establish a trend for recovery.

MEANS TO IMPROVE RECOVERY: Monitoring is necessary to assess the adequacy of natural recovery. Resources and associated services that are found to be recovering at an unacceptable rate may have to be reconsidered as candidates for restoration action. Likewise, resources and services that are found to be recovering faster than anticipated may allow for an early completion of a restoration action. Monitoring of important physical, chemical and biological properties will establish an environmental baseline for the affected ecosystems. This baseline then can be used as a standard reference to evaluate the effects of future disturbances, e.g., earthquakes and oil spills. This standard also could be used to assess the anticipated effects of human development and to improve our ability to manage affected resources and services over the long-term.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS: The inclusion of monitoring in a restoration plan is not a new concept. Monitoring of the Savannah River was one of five restoration projects implemented with funds obtained by the State of Georgia in litigation following the Amazon Venture oil spill (Brown 1989). "Monitoring the condition of the resource" also is cited as an example of an allowable restoration cost in the Department of Interior's proposed revisions to the Natural Resource Damage Assessment (NRDA) Regulations found in the Comprehensive

Environmental Response, Compensation, and Liability Act of 1980 (Department of the Interior 1991).

The proposed monitoring program also is consistent with the provisions of the National Environmental Policy Act of 1969 as amended, that requires several forms of monitoring including: implementation monitoring to assure the public that we did what we said; effectiveness monitoring to show that the proposed restoration options are achieving our intent; and validation monitoring to show that our management is resolving the issues overall.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT: The proposed monitoring program will be integrated with other monitoring programs in the spill area. The Prince William Sound Regional Citizens Advisory Council will soon design a program to monitor the potential effects of oil transport in Prince William Sound. It would be our intent to integrate the two programs where possible so as to avoid duplication of effort and to maximize use of logistics.

TECHNICAL FEASIBILITY: Most, if not all, proposed monitoring approaches will have their basis in the earlier conducted response, damage assessment, and restoration science studies. Additional monitoring approaches will be considered based on a proven ability to effectively document recovery following ecological disturbance. It is anticipated that each monitoring approach will be periodically reviewed and updated as monitoring results are reviewed and interpreted and new information is gained from the scientific literature.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE: Monitoring is an effective management tool and will significantly improve our ability to restore resources and services injured by the spill. Without monitoring, we have no way of evaluating the success of other proposed restoration options.

INDIRECT EFFECTS: There need be no significant adverse environmental, socio-economic, and human health and safety impacts associated with restoration monitoring activities, however, the potential for such impacts are the subject of an environmental impact statement that the Trustees will prepare. Where possible, only non-destructive and the least-intrusive monitoring approaches will be implemented. The only human health and safety issues contemplated are those associated with the requirement for investigators to work on the water or to travel to and from remote monitoring sites by boat, helicopter or float-plane. These risks, however, are considered to be minimal.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS: Implementation of a restoration monitoring program will provide the basis by which all other restoration options will be evaluated.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE: None.

LEGAL CONSIDERATIONS: As stated above, development and implementation of a restoration monitoring program is mandated by the National Environmental Policy Act of 1969 as amended.

Various agencies of the State of Alaska and the U.S. Government have regulatory and management oversight. The state of Alaska Department of Natural Resources has regulatory authority for all tide lands of the State. The state of Alaska Department of Fish & Game manages fish and wildlife including non-game species. With the assistance of the Alaska Department of Fish and Game, the National Marine Fisheries Service and the U.S. fish and Wildlife Service implement the provisions of the Marine Mammal protection Act. The U.S. Fish and Wildlife Service manage migratory birds.

Permits would be required for sampling of all biological materials.

MEANS TO EVALUATE SUCCESS: An annual assessment will be conducted to determine if plans, projects and related activities are implemented as designed and in compliance with the Restoration Plan, the Restoration Monitoring Plan and the National Environmental Policy Act of 1969 as amended.

REPRESENTATIVE COSTS: It is expected that an environmental consultant will be asked to assist the Trustees in developing a monitoring plan. As shown in Table 1, conceptual planning activities in Phase 1 will cost \$154.00K. Developing detailed study plans in Phase 2 will cost an additional \$342.25K.

ADDITIONAL INFORMATION NEEDED: None.

CITATIONS:

1) Brown, J.D. 1989. "Successful Natural Resource Damage Claim for a Coastal Oil Spill." In Proceedings of the 1989 Oil Spill Conference (Prevention, Behavior, Control, Cleanup). p. 293-296. American Petroleum Institute, Washington, D.C.

2) Department of the Interior. 1991. "43 CFR Part 11 - Natural Resource Damage Assessments; Notice of Proposed Rulemaking." Federal Register 56 (82) 19752-19773.

TABLE 1. Projected Costs of Implementing Option 31.

<u>ITEM</u>	<u>\$K</u>	<u>BASIS</u>
<u>PHASE 1</u> - Development of Conceptual Plan		
Project Administration		
Salaries		
Project Leader	6.25	1 man months over 1/2 year
Agency Scientists	13.75	3 man months over 1/2 year
Clerical Support	8.50	3 man months over 1/2 year
Travel	2.50	sub-contract reviews
Peer Review		
Outside	5.00	minimum of two reviewers
Agency	5.00	minimum of three reviewers
Sub-Contract	100.00	consultant services - design/implementation of workshop, preparation of conceptual plan.
Publication	7.50	conceptual plan
Supplies	5.50	paper, computer, mailing
Sub-Total		\$154.00K

PHASE 2 - Development of Detailed Protocols

Project Administration

Salaries

Project Leader	18.75	3 man months over 1/2 year
Agency Scientists	55.00	1 man year over 1/2 year
Clerical Support	8.50	3 man months over 1/2 year
Travel	7.50	sub-contract reviews

TABLE 1 (continued)

<u>ITEM</u>	<u>\$K</u>	<u>BASIS</u>
Peer Review		
Outside	10.00	minimum of 5 reviewers
Agency	10.00	minimum of 5 reviewers
Sub-Contract	200.00	consultant services - design/implementation of one or more workshops, preparation of detailed monitoring plan
Publication	25.00	monitoring plan
Supplies	7.50	paper, computer, mailing
	<hr/>	
Sub-Total	\$342.25K	
Total	\$496.25K	

June 17, 1992

Author: Stan Senner

OPTION 32, Endow a Fund to Support Restoration Activities

SUMMARY

APPROACH CATEGORY Other Options

INJURED RESOURCES AND SERVICES all

SUMMARY

SUBOPTION

TARGET RESOURCES AND SERVICES

DESCRIPTION

The purpose of an endowment is to produce income. Thus, in the context of the restoration program, an endowment is a means of providing long-term funding for a restoration program or projects. There are several major, interrelated issues that must be considered in developing the concept, and there there are a number of different ways to address each issue, depending on specific needs and goals. Here are examples of key issues and possible ways to address them:

(1) What programs or projects are to be supported?

The endowment can support only a limited program or projects of a certain type, or it can be the source of funds for the entire restoration program.

(2) How shall the fund be established and governed?

The endowment can be set up as a new private, independent foundation separate of the Trustees, one or more endowments can be established within appropriate existing institutions, or an endowment can be administered by the Trustees under the existing structure and program.

(3) How shall the money be invested and managed?

The endowment can be invested and managed to provide a perpetual, inflation-proof source of income, with only that income being allocated for projects, or both the principal and investment income can be allocated as deemed appropriate. Spending of endowment income could begin immediately or be deferred until after the 10-year payout and completion of any expenditures of settlement funds not placed in the endowment.

(4) How much money will be invested and when or at what annual

rate?

All or only part of the settlement funds can be added to the endowment; if only part of the settlement funds are added to the endowment, the deposits can be spread over the 10-year payout or be made early or late in that period (any schedule is possible).

(5) Whom shall be eligible to apply for and receive funds from the endowment?

Grants from the endowment can support only agency projects or, on a competitive basis, be available to a full array of recipients, including public agencies, nonprofit organizations, academic institutions, etc.; alternatively, some portion of funds could be earmarked for agency projects and other portions for nonagency work.

Given the several choices for each issue, it is clear there are almost endless permutations of the endowment concept.

For illustrative purposes, two specific concepts are described below:

Private Foundation: (1) spending of endowment income would target long-term needs in a limited number of program areas (e.g., marine research and monitoring); (2) the fund would be established as an incorporated entity independent of the Trustee Council and have a board of directors with both public officials and private citizens as members; (3) the funds would be invested and managed to provide a perpetual, growing, inflation-proofed source of income and only that income would be spent; (4) not all settlement monies necessarily would be invested in the endowment; and (5) endowment income potentially would be available on a competitive basis to public agencies, private organizations and corporations, academic institutions, etc.

Government Trust: (1) spending from the trust would support all projects carried out under the Restoration Plan; (2) the trust would be administered by the Trustee Council; (3) funds would be invested to provide growth, but the Trustee Council would retain the option of spending both the principal and investment income; (4) all settlement funds other than reimbursements to the governments would be deposited in the trust; and (5) a portion of funds are earmarked for agency research and management needs, with the balance available on a competitive basis to private organizations, academic institutions, etc.

IMPLEMENTATION ACTIONS

The following implementation actions are common to any endowment concept:

- (1) review specific alternative concepts or models;
- (2) resolve policy issues described above;
- (3) draw up a charter and seek public comment;
- (3) prepare documents as needed;
- (4) develop program guidelines and grant-making procedures;
and
- (5) begin operations.

TIME NEEDED TO IMPLEMENT

The private foundation concept could require at least one year to implement, because of the needs to resolve various structural and programmatic issues, file various legal documents, name a board of directors, etc. The government trust concept could be implemented in a matter of months (after approval of a Restoration Plan), because it is only a variation on the current structure.

MEANS TO IMPROVE RECOVERY

An endowment, per se, is not a means to improve recovery. Recovery is achieved only through the projects supported by the endowment. An endowment, however, has the potential to prolong the funds available to support restoration projects beyond the 10 years of settlement payments.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Not applicable.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Not applicable.

TECHNICAL FEASIBILITY

There are a number of instances where enforcement actions, settlement of litigation, or mitigation of environmental impacts have resulted in the creation of endowments or trusts dedicated to a variety of objectives (Foster et al., 1989). Several examples follow: Within Alaska, The Kodiak Brown Bear Research and Habitat Maintenance Trust was established to help mitigate environmental impacts resulting from the Terror Lake Hydroelectric Project (LTN Group, 1992). The trust has both public and private trustees. The Virginia Environmental Endowment is an independent, permanent, grantmaking foundation established with funds from obtained through state and federal environmental enforcement actions. The Platte River Whooping Crane Trust in Nebraska resulted from the settlement of litigation over Platte River water rights; its three trustees represent the parties to that litigation.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

The timing, rate, and size of deposits into an endowment determines how quickly and when funds will be available for allocation to

restoration projects. The more slowly that a fund is built up, the longer it will take before significant income is available for distribution. This, in turn, may pre-determine the choice and timing of the restoration options selected for implementation, especially for expensive actions such as land acquisition. For example, if all funds are deposited in an endowment and spending is limited to endowment income, then relatively small amounts of money would be available early.

INDIRECT EFFECTS

Depending on where the endowment would be housed administratively, there would be some long-term local economic benefits (e.g., jobs created, salaries spent in local stores, etc.). Any environmental or human health/safety issues are a function of when, where, and how much money is allocated from the endowment or trust, and are not issues arising from the mechanism itself.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

The endowment is a source of support for restoration actions.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

This option is unique.

LEGAL CONSIDERATIONS

There are a number of considerations here that will require analysis with respect to both federal and state law. The private foundation concept described above would require incorporation of a new private, independent, nonprofit corporation. It is not known whether legislation would be required. There would appear to be no need for environmental or other permits that concern activities in the field.

MEANS TO EVALUATE SUCCESS

The ultimate measure of success is whether the fund successfully serves as a source of support for a restoration program or projects. Another measure of success would be whether the investment and management strategy results in an increasing amount of money available for allocation.

REPRESENTATIVE COSTS

Regardless of the particular structure adopted, there will be start-up and operating costs. If the structure selected is a variation on the current structure, then current operating costs may be representative of the operating costs. If a private foundation is established, there would be start-up costs, mostly the time needed to analyze legal issues and prepare documents. Once operating, there would be on-going expenses, such as the costs

of convening and informing a board of directors, administering the fund (including investment fees), paying an executive director and small support staff, and paying program staff commensurate with annual grant expenditures. Foster et al. (1989) suggest that there needs to be one program officer for every grant category involving expenditures of \$1 million or more annually. One survey reported a median value of 10.1% for "charitable administrative expenses" as a percent of grants (Council on Foundations, 1990).

ADDITIONAL INFORMATION NEEDED

Analysis of legal issues, especially federal versus state.

CITATIONS

Council on Foundations. 1990. 1990 foundation management report. Council on Foundations, Washington, DC. [this is in the RPWG files]

Foster, C.H.W., J.E. Bodovitz, and F. Foster-Simons. 1989. Establishing the fund for Alaska: the procedural, program, and legal options. Feasibility report and Appendix. The World Wildlife Fund (U.S.) and The Conservation Foundation. Washington, DC. [this is in the RPWG files]

LTN Group (The). 1992. Analysis of Program Options and Priorities. The Kodiak Brown Bear Research and Habitat Maintenance Trust. Anchorage, AK. [this is in the RPWG files]

Contacts

see materials from Council on Foundations; also The Conservation Foundation, which commissioned the study by Foster et al. (cited above).



June 17, 1992

Author: Sanford P. Rabinowitch

OPTION

#33 Develop integrated public information and education program¹

APPROACH CATEGORY

Other options

INJURED RESOURCES AND SERVICES

All

SUMMARY

There are many publically operated visitor centers (i.e. parks, refuges, communities) throughout the oil spill area that see hundreds of thousands of visitors each year. Residents and visitors alike continue to seek information about not only the oil spill, but the recovery of injured species. By developing informational and educational products the Trustees can help the public become better informed about this significant event in Alaska's history. Through information people can understand how they can participate in the efforts to speed recovery of injured resources. _____ needs work and to be integrated with others sub-options

SUBOPTION

(a) Develop program to provide and distribute up-dated information, and educational products

TARGET RESOURCES AND SERVICES

All injured resources and services

DESCRIPTION

This options would design and develop information available from the damage assessment and restoration process to inform the public of ways they can help injured resources recover from the effects of the spill and the resulting clean up efforts. Specifically, the information would explain changes to the ecosystem and how people can lessen their potential for creating additional harmful human disturbance. The information would be delivered through brochures, posters, video, enhancement of school curricula, and other informational media. The material would be delivered to state and federal visitors centers, state ferries, and cooperating private businesses and organizations throughout the entire spill zone.

¹We need to look again, at how this option and others with educational components, like #7(a) can be best integrated!

53 Additionally, Trustee agencies would be encouraged to take the
54 information to the public by making their interpreters available to
55 groups and organizations associated with the injured resources and
56 services throughout the state. The project would seek to recognize
57 restoration within the context of the entire ecosystem, rather than
58 throughout a species-specific approach.

60 IMPLEMENTATION ACTIONS

62 Develop and provide updated summaries of oil spill injuries and
63 make them available to the public.

65 Produce brochures, posters and other informational products for
66 distribution to local, state and federal visitor facilities
67 throughout the spill zone.

69 TIME NEEDED TO IMPLEMENT

71 The option would take six to twelve months to deliver initial
72 products. Time requirements will vary depending upon the date of
73 initiation and the type of products produced.

75 MEANS TO IMPROVE RECOVERY

77 Information products would explain how people, who live in or visit
78 the oil spill area, can lessen their potential for creating
79 additional harmful human disturbances.

81 PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

83 All of the Trustee agencies have specific responsibilities within
84 the oil spill area. Yet, due to the large size of the area and the
85 difficulty of access, simple enforcement action by the agencies is
86 not completely effective.

88 RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

90 Information and education programs are carried out by most Trustee
91 agencies about resources that they manage. Any such program
92 developed for the oil spill area should be coordinated with these
93 ongoing efforts.

95 TECHNICAL FEASIBILITY

97 The option is technically feasible. Most Trustee agencies already
98 carry-out information and education programs in Alaska.

100 POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

102 The potential to improve recovery of injured species and services
103 is good. Effective information and education efforts are regularly
104 developed for a great variety of programs.

106 INDIRECT EFFECTS

107 Environmental
108
109 None
110
111 Socio-economic
112
113 Enhancement of public understanding of natural resources and
114 services provided by the public lands in the oil spill area.
115 (anyone have more ideas here?)
116
117 Human health and safety
118
119 none
120
121 RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS
122
123 Any information and education program should be carefully
124 coordinated with all other Trustee agencies actions, both in
125 response and restoration.
126
127 OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE
128
129 None known
130
131 LEGAL CONSIDERATIONS
132
133 Consistency with settlement
134
135 The option is consistent with the settlement. A public information
136 and education program could become an effective part of the
137 Trustee's development of a meaningful public involvement program.
138
139 Permits required
140
141 None anticipated
142
143 NEPA compliance
144
145 This type of work is generally categorically excluded from the
146 requirements of NEPA compliance.
147
148 Additional /new legislation or regulatory actions
149
150 None needed
151
152 MEANS TO EVALUATE SUCCESS
153
154 All staff and volunteers associated with the distribution of
155 information and education products, (i.e. interpreters) will be
156 asked to gather opinion regarding the quality and usefulness of the
157 products. These anecdotal reports will be collected and worked
158 into an annual project report.

161
162
163
164 **REPRESENTATIVE COSTS**

165
166 (Budget comes from 1992 project submission- needs further review
167 before it is used for final version of this option)
168

169 **Personal Services:**

170 * Staff time to update slide program (summer 1991) \$1,000
171

172 **Travel & Per Diem:**

173 * Staff travel 3,000
174

175 **Contractual:**

176 * Slide duplication - 10 copies X 100 1,000
177 * Convert slide program to video tape with voice 500
178 * Duplicate slide tape - 20 copies 200
179 * Graphic artist - develop two posters 10,000
180 * Print 10,000 copies (5000 each) 20,000
181 * Graphic artist - develop brochure 5,000
182 * Print 20,000 copies 20,000
183 * Print fact sheets (5) X 5000 copies 1,500
184 * Develop new slide program 5,000
185 * Slide duplication - 10 copies X 100 1,000
186 * Convert slide program to video tape with voice 1,000
187 * Duplicate slide tape - 20 copies 200
188 * Additional printing costs for 1992 distribution 20,000
189 * Contingency 11,500
190 * **Total cost** \$100,000
191

192 **ADDITIONAL INFORMATION NEEDED**
193

194 An informal survey should be conducted to determine the kind of
195 informational products that would be most useful to Alaskans and
196 visitors.
197

198 **CITATIONS**
199

200 * Restoration Framework (p. B-38)
201
202 * "Public Information and Education Recovery and Protection
203 of Alaska's Marine and Coastal Resources (Detailed Work Plan),
204 submitted to the Trustee Council by the NPS, 1992
205
206

June 17, 1992

Author: Sanford P. Rabinowitch

OPTION

#35 (a) Replacement of archaeological artifacts

APPROACH CATEGORY

Other options

INJURED RESOURCES AND SERVICES

Archaeological sites and artifacts

SUMMARY

Conservative estimates based on injury studies to date suggest that between 300 and 500 archeological sites located on State and Federal land within the Exxon Valdez oil spill pathway sustained at least some degree of injury from oiling, oil spill cleanup activities, or vandalism. Site-specific injury is documented in oil spill response records for a sample of 35 known sites. This option seeks to replace and/or recover those artifacts that have been lost and place or return them to public ownership for appropriate public display and for scientific uses.

SUBOPTION

Investigate incidents of looting and vandalism and strive to regain possession of publicly owned artifacts

TARGET RESOURCES AND SERVICES

Archaeological sites and artifacts

DESCRIPTION

This option would identify institutions, ~~agencies~~ (non-Alaskan) and individuals with archaeological artifacts from the oil spill region who would be willing to sell some or all of their artifacts to the EVOS Trustees. In turn, the Trustees (or would each agency buy some directly??) would transfer acquired artifacts to appropriate public institutions within the oil spill area for public display (i.e. museums) and appropriate scientific use and study.

IMPLEMENTATION ACTIONS

Identify owners of artifacts, prepare list of artifacts available for sale, determine public value of list items (non-monetary value) and prioritize list for public acquisition, acquire artifacts within spending limits, identify appropriate public institutions in the oil spill area for housing and public display of artifacts acquired, transfer artifacts to institutions in oil spill area.

need to
have
exposed
to reflect
artifacts
Need to
discuss
opportunity
to return
artifacts
to Natives

55 TIME NEEDED TO IMPLEMENT

56
57 It is estimated that preparation of a list of owners,
58 prioritization of, and actual acquisition would take a period of
59 two years.

60
61 MEANS TO IMPROVE RECOVERY

62
63 This option will not improve recovery. It will return illegally
64 obtained artifacts to appropriate public agencies and institutions.

65
66 PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

67
68 Archaeological sites and artifacts are protected under federal law
69 by the Archaeological Resources Protection Act of 1971, 16 USC 470,
70 and under state law by the Alaska Historic Preservation Act, Alaska
71 Statute 41.35.010. In spite of these laws, and the efforts of land
72 managing agencies like the National Park Service, the Fish &
73 Wildlife Service, the Forest Service and the Alaska Division of
74 Parks and Outdoor Recreation, many artifacts have been removed
75 from sites as a result of the oil spill

76
77 RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

78
79 What are agencies doing??
80 _____
81 _____
82

83 TECHNICAL FEASIBILITY

84
85 The option is feasible. Institutions normally have good records of
86 artifacts in their possession and can determine their willingness,
87 or lack thereof, to sell specific artifacts. Evaluations and
88 appraisals can determine fair prices. For individuals, the process
89 is similar.

90
91 POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

92
93 This option will not improve recovery, it will however enhance the
94 service provided by archaeological artifacts by replacing
95 publically owned artifacts that have been lost, stolen or damaged
96 with other, similar artifacts from the same area and make them
97 available to the public.

98
99 INDIRECT EFFECTS

100
101 Environmental

102
103 None anticipated

104
105 Socio-economic

106
107 People will see that the state and federal governments are dealing
108 directly with the injuries and losses to archaeological sites and

artifacts in the oil spill area.

Human health and safety

None

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

Most of the looting and vandalism documented is attributed to oil spill clean

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

No other option is able to exactly achieve this objective.

LEGAL CONSIDERATIONS

Consistency with the settlement

Archaeological sites and artifacts are specifically addressed in the civil settlement between the United States, the State of Alaska and Exxon Corporation (cite)_____. The actions described in this option are consistent with the terms of the settlement.

Agencies with management/regulatory responsibilities

The U.S. National Park Service, U.S. Fish & Wildlife Service, U. S. Forest Service, U. S. Bureau of Indian Affairs and the Alaska Division of Parks and Outdoor Recreation all manage land in the oil spill area. These agencies have both management and regulatory responsibilities for archaeological sites and artifacts that are found on public lands within their jurisdiction. Additionally, the Alaska Division of Parks and Outdoor Recreation has responsibilities for resources beyond the borders of state owned land.

Permits required

None required

NEPA compliance

None required

MEANS TO EVALUATE SUCCESS

Annual report to EVOS Trustee Council on the number of owners identified, the number of artifacts prioritized for acquisition (within annual budget), the number of artifacts acquired and the actual placement of acquired artifacts into public institutions. Based upon this annual report, the Trustees would determine the success, or lack thereof. (Work into text public review & opinion)

163 **REPRESENTATIVE COSTS**

164
165 Need to talk with archs (Susan Morton and law enforcement dude
166 shackelton) for costs (They should be able to give me prices (in a
167 range)).

168
169 **ADDITIONAL INFORMATION NEEDED**

170
171 Need to talk with archs (Susan Morton, Ted B. and law enforcement
172 dude shackelton.

173
174 **CITATIONS**

175
176 none

177 **SUBOPTION**

178
179 # 35 (b) Investigate incidents of looting and vandalism and strive
180 to regain possession of publicly owned artifacts
181

182 **TARGET RESOURCES AND SERVICES**

183
184 Archaeological artifacts
185

186 **DESCRIPTION**

187
188 This suboption would establish agency and possibly inter-agency
189 teams of law enforcement officers and archaeologists who would
190 investigate cases of looting and vandalism. These teams would
191 operate in the EVOS spill area and strive to recover artifacts
192 taken from the area. Recovered artifacts would be returned to the
193 appropriate public land managing agency, or other public
194 institutions for scientific and public use.
195

196 **IMPLEMENTATION ACTIONS**

197
198 Establish agency teams of law enforcement officers and
199 archaeologists to carry out appropriate investigations, conduct
200 investigation and attempt to recover artifacts, close cases when
201 artifacts are recovered or when recovery seems unlikely.
202

203 **TIME NEEDED TO IMPLEMENT**

204
205 Approximately three years would be required to establish agency
206 teams, investigate all know incidents of looting and vandalism and
207 take appropriate actions to regain possession of publicly owned
208 artifacts.
209

210 **MEANS TO IMPROVE RECOVERY**

211
212 This option will not improve recovery. It will return illegally
213 obtained artifacts to appropriate public agencies and institutions.
214

215 **PROTECTION AND MANAGEMENT UNDER EXISTING LAWS**

216
217 Archaeological sites and artifacts are protected under federal law
218 by the Archaeological Resources Protection Act of 1971, 16 USC 470,
219 and under state law by the Alaska Historic Preservation Act, Alaska
220 Statute 41.35.010. In spite of these laws, and the efforts of land
221 managing agencies like the National Park Service, the Fish &
222 Wildlife Service, the Forest Service and the Alaska Division of
223 Parks and Outdoor Recreation, many artifacts have been removed
224 from sites as a result of the oil spill
225

226 **RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT**

227
228 Get update on ARPA rangers existing duties...
229

231 **TECHNICAL FEASIBILITY**

232
233 The option is technically feasible. Appropriate law enforcement
234 personnel can investigate, track and attempt to recover artifacts
235 illegally removed from the oil spill area.
236

237 **POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE**

238
239 This option will not improve recovery. It will return illegally
240 obtained artifacts to appropriate public agencies and institutions.
241

242 **INDIRECT EFFECTS**

243
244 Environmental

245
246 None anticipated
247

248 Socio-economic

249
250 People will see that the state and federal governments are dealing
251 directly with the looting and vandalism problem associated with
252 archaeological sites in the oil spill area.
253

254 Human health and safety

255
256 None
257

258 **RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS**

259
260 Most of the looting and vandalism documented is attributed to oil
261 spill cleanup.
262

263 **OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE**

264
265 None
266

267 **LEGAL CONSIDERATIONS**

268
269 Consistency with the settlement

270
271 Archaeological sites and artifacts are specifically addressed in
272 the civil settlement between the United States, the State of Alaska
273 and Exxon Corporation (cite)_____. The actions described
274 in this option are consistent with the terms of the settlement.
275

276 Agencies with management/regulatory responsibilities

277
278 The U.S. National Park Service, U.S. Fish & Wildlife Service,
279 U. S. Forest Service, U. S. Bureau of Indian Affairs and the Alaska
280 Division of Parks and Outdoor Recreation all manage land in the oil
281 spill area. These agencies have both management and regulatory
282 responsibilities for archaeological sites and artifacts that are
283 found on public lands within their jurisdiction. Additionally, the
284 Alaska Division of Parks and Outdoor Recreation has

responsibilities for resources beyond the borders of state owned land.

Permits required

None required

NEPA compliance

None required

MEANS TO EVALUATE SUCCESS

Annual report to EVOS Trustee Council on the number of pending and completed investigations, the number of artifacts recovered, and an analysis of their monetary and non-monetary values. Based upon this annual report, the Trustees would determine the success, or lack thereof. (Work into text public review & opinion)

REPRESENTATIVE COSTS

This option can be accomplished at a wide range of funding levels. In plain terms, as funding increased more cases would be investigated and carried to a logical conclusion. A suggested range of costs is \$150,000 to \$300,000 annually for three years.

ADDITIONAL INFORMATION NEEDED

Peer review of damage assessment report on looting and vandalism, and site specific evaluation of each site known to have been looted within the oil spill area.

CITATIONS

None

SUBOPTION B Enhance protection of privately or municipally owned tidelands without acquisition of fee title

TARGET RESOURCES AND SERVICES This suboption potentially targets two groupings of resources and services:

- 1) forested uplands and watersheds supporting resources and services directly injured by the spill
- 2) forested uplands and watersheds supporting resources and services equivalent to those injured by the spill

DESCRIPTION State and/or federal governments can enhance protection of uplands through means other than acquisition of fee title. A complete description of these protection options is beyond the scope of this document, but they could include the following: landowner contact and education; voluntary agreements with landowners; rights of first refusal; lease, license and cooperative management agreements; deed restrictions; and conservation easements or partial interests. For example, it is possible for an agency to purchase mineral or timber rights and still leave the land in private ownership.

In addition, modifying local coastal district management plans, as described in option 22, could provide additional tidelands protection and would not require any fee title purchases. Implementing the most effective protection option will require considerable planning and negotiation with the landowner.

IMPLEMENTATION ACTIONS Prior to implementing this option, the Trustee Council will have to select and rank candidate lands for protection, and decide on the appropriate level of protection. Implementation of Trustee Council decisions will occur in a maximum of three steps:

- 1) The appropriate agency will contact the landowner and negotiate terms of non-purchase protection option.
- 2) The appropriate agency will go through a NEPA process, possibly generating an EA.
- 3) The appropriate agency will carry out monitoring and any additional management responsibilities.

TIME NEEDED TO IMPLEMENT The time needed to implement this suboption should be less than for Suboption A but is variable. Variables include:

Negotiations with landowners
Time needed for EA (if applicable)
Process for purchasing less than fee simple title (if applicable)
Process for executing administrative actions (if applicable)

MEANS TO IMPROVE RECOVERY Enhanced protection of upland species

and services will facilitate natural recovery by restricting activities stressful to already damaged populations and habitats. In the case of uplands which support resources and services equivalent to those damaged by the spill, the implementation of this suboption would guard against future habitat degradation and could enhance the services provided.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS Existing regulatory authorities applicable on private uplands include:

- Endangered Species Act of 1973 (16 USC 1531)
- Marine Mammal Protection Act of 1972 (16 USC 1361 et seq.)
- Migratory Bird Treaty Act of 1918 (16 USC 703-712)
- Bald Eagle Protection Act of 1940 (16 USC 668)
- Alaska Coastal Management Act of 1977 (AS 46.40)
- Coastal resource district management plans (6 AAC 80 & 85)
- ADF&G Anadromous Stream and Fishway Acts (AS 16.05.840 & 870)
- Clean Water Act of 1977 (33 USC 1251 & 1344)
- National Historic Preservation Act of 1966 (16 USC 470 et seq.)
- Section 22(g) of Alaska Native Claims Settlement Act of 1971
- State and local zoning regulations

While these authorities can provide high levels of protection in some cases, they do not provide a regulatory basis for managing an area on an ecosystem level with the primary objective of restoring injured resources and services. Coastal district management plans can be amended to designate areas which are to be managed for specific purposes, but this management authority only has force on private lands when the landowner requires permits for activities on their land. In the absence of sufficiently specific and enforceable regulations, the best restoration option is to negotiate legally binding agreements with landowners which leave the land in private ownership but guarantee that no activities harmful to the injured resources will be allowed.

RELATIONSHIP WITH EXISTING/PLANNED USES OR MANAGEMENT Enhanced protection and management of uplands could result in increased restrictions on public uses, e.g. development projects, certain recreational and harvest activities, vehicle access, etc.

TECHNICAL FEASIBILITY This suboption is technically feasible. Natural resource agencies and private conservation organizations routinely and successfully utilize land protection strategies as management tools to protect and enhance both damaged and healthy ecosystems. For example, the Nature Conservancy recently negotiated a cooperative management agreement in the Mad River Slough and Dunes area of California, involving private landowners and the federal Bureau of Land Management. Each group retained ownership of their lands, but has entered into a mutual agreement to increase protection of natural resources. The agreement also allows for public access and compatible recreational uses.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

2) Healthier ecosystems resulting from enhanced protection could provide socioeconomic benefits by attracting tourists, providing increased harvest and recreational opportunities and improving the quality of life.

3) Enhanced habitat protection could have negative economic impacts due to increased regulatory restrictions on harvest levels, certain types of recreational uses and development projects.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIVITIES This suboption could potentially overlap with options 23, 24, 26 and 29, which deal with acquisition of marine bird habitat, private inholdings within parks and refuges, anadromous stream buffer strips and bird nesting habitat. Since forested uplands can include some or all of these resources or land types, a single acquisition could accomplish multiple restoration objectives.

OTHER OPTIONS THAT COULD ACHIEVE THIS OBJECTIVE This option provides a high level of legal protection for forested uplands. However, there may be cases where the same objectives can be achieved by Suboption B of Option 25 (below), which would enhance upland protection through a variety of non-purchase alternatives.

LEGAL CONSIDERATIONS

1) Consistency with settlement: Acquisition of land, including acquisition of equivalent resources, is consistent with the terms of the settlement.

2) Agencies with management/regulatory responsibilities: Existing agency responsibilities do not conflict with the implementation of this suboption. Agencies with management authority over impacted species and habitats potentially include the Alaska Departments of Natural Resources, Fish and Game and Environmental Conservation; the Forest Service; the Fish and Wildlife Service; and the National Park Service.

3) Permits required: No permits are required.

4) NEPA compliance: Land acquisitions may have to go through the NEPA process, which requires an EA and possibly an EIS.

5) Requirements for new legislative/regulatory actions: Legislative action is not required to purchase inholdings in state or federal protected lands. However, creating new protected areas out of acquired lands would require legislative action, if the land is outside existing specially designated areas.

MEANS TO EVALUATE SUCCESS The appropriate resource management agency will monitor how effectively their management program has prevented activities harmful to target resources and services and the degree to which the option has enhanced compatible public uses.

and Game; the Forest Service; the Fish and Wildlife Service; and the National Park Service.

3) Permits required: No permits are required.

4) NEPA compliance: Since title to the uplands would be retained by the private parties, it is unlikely that an EIS would have to be prepared, although an EA may be necessary.

5) Requirements for new legislative/regulatory actions: In most cases, no such actions will be necessary.

MEANS TO EVALUATE SUCCESS The appropriate resource management agency will monitor how effectively this suboption has prevented activities harmful to target resources and services and the degree to which the option has enhanced compatible public uses.

REPRESENTATIVE COSTS

Costs of preparing EA (if necessary) -

Costs of negotiating agreements with landowners -

Costs of acquiring less than fee simple rights to land (if applicable) -

Costs for monitoring - \$12,000/yr (based on inspection & permitting costs for ADF&G special areas)

TOTAL COST: Variable

ADDITIONAL INFORMATION NEEDED

Input is needed from Trustee Council on specific uplands eligible for acquisition and enhanced habitat protection. This must be based on specified habitat types and conditions required for restoration of injured species.

CITATIONS

Kim Sundberg, ADF&G, pers. comm.
Debby Clausen, ADF&G, pers. comm.
Ray Thompson, USFS, pers. comm.
Steve Planchon, TNC, pers. comm.
TNC report
Jones and Stokes report
Restoration Framework document

IMPLEMENTATION ACTIONS Prior to implementing this option, the Trustee Council will have to select and rank candidate lands for purchase where there are willing sellers, and decide on the appropriate protective status (e.g. refuge, sanctuary, etc.). Implementation of Trustee Council decisions will occur in four steps:

1) The appropriate agency will go through a NEPA compliance process, possibly including preparation of an EIS.

2) The state or federal government will go through the multiple steps necessary to request the legislature to place land into special protective status or agencies take administrative actions to protect habitat (although this step may not be necessary in the case of inholdings).

3) The state or federal government will go through the multiple steps necessary to purchase or reconvey land to public ownership.

4) The appropriate agency will carry out management responsibilities and monitoring.

TIME NEEDED TO IMPLEMENT The time needed to implement this option is variable. Variables include:

Which government agency does acquisition
Time needed to negotiate with landowner
If EA or EIS is required
Time for any necessary legislative action
Time needed for administrative action
Time to write or amend a management plan

MEANS TO IMPROVE RECOVERY Public ownership and enhanced protection of uplands will facilitate natural recovery by restricting activities stressful to already damaged populations and habitats. In the case of uplands which support resources and services equivalent to those damaged by the spill, the implementation of this suboption would guard against future habitat degradation and could enhance the services provided. Public ownership could also, where appropriate, facilitate enhanced public access and activities in areas where such uses had previously been restricted.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS Existing regulatory authorities applicable on privately owned uplands can include:

Endangered Species Act of 1973 (16 USC 1531)
Marine Mammal Protection Act of 1972 (16 USC 1361 et seq.)
Migratory Bird Treaty Act of 1918 (16 USC 703-712)
Bald Eagle Protection Act of 1940 (16 USC 668)
Alaska Coastal Management Act of 1977 (AS 46.40)
Coastal resource district management plans (6 AAC 80 & 85)
ADF&G Anadromous Stream and Fishway Acts (AS 16.05.840 & 870)
Clean Water Act of 1977 (33 USC 1251 & 1344)

write-up needs to reflect that recovery monitoring will be ongoing
even before this facility is made.

OPTION: 34 **Establish a Marine Environmental Institute**

APPROACH CATEGORY Other .

INJURED RESOURCES AND SERVICES All

SUMMARY

The area affected by the oil spill contains an exceptionally diverse marine biota and assemblage of marine habitats. The proposed action is to establish a new marine environmental institute within the oil spill affected area in order to both study this environment and provide public education. The institute would also serve to coordinate recovery monitoring, basic and applied research and environmental education programs dealing with the effects of the spill. Public exhibits and marine aquaria will be an integral part of the institute. These will provide both support for the research scientists and as well as living examples of Alaskan marine habitats, plants animals and seabirds .

DESCRIPTION

Aside from the lingering effects of the spill, the natural environment within Prince William Sound and the adjacent Gulf of Alaska is relatively unaffected by human impact. Consequently, the area represents a perfect location for the establishment of a research/teaching facility for both basic marine research and for spill recovery monitoring. The intertidal habitats and nearshore waters of southcentral Alaska contain highly diverse invertebrate and finfish communities as well as diverse and abundant populations of seabirds and marine mammals. Moreover, the economically important tourist, commercial and sport fishing industries are dependent upon an understanding of nearshore marine systems.

Research in the institute would focus on the ecology of nearshore Alaskan marine habitats; the biology of Alaskan sea life, marine mammals and seabirds and the monitoring of the effects of the Exxon Valdez oil spill on the marine environment. Research efforts and support would be coordinated with the University of Alaska's Institute of Marine Science. Environmental education programs would have the same goal. The public education effort would be facilitated by the live exhibits of both animals and habitats that are created and used by the scientists for their research. Field trips, for the public, would be conducted by institute staff. These field trips would visit nearby marine habitats that would be readily accessible by small boat or on foot. The environmental education program would be coordinated with that of the Alaska public school system and University of Alaska.

A major resource management effort would be based at the Institute. The goal of this program would be to develop baseline information

on both species and habitat diversity within the oil spill affected area. The program would identify the animals and plants that utilize this area as habitat and then map those habitats on a Geographic Information System [GIS]. These kinds of information were sorely lacking at the time of the spill. If made available, as a result of this program, these data would provide invaluable assistance to oil spill response planners and for future damage assessment and restoration efforts in the event of another spill.

A key element of the proposed institute is the relationship between the public exhibits and the needs of the research scientists. These exhibits, especially the aquaria, would allow the public to closely observe marine creatures and habitats that they otherwise would probably never see. These same facilities would serve as holding and observation tanks for researchers. This arrangement has worked quite well in other parts of the country. Examples are the Rosenstiel School of Marine and Atmospheric Sciences [University of Miami] and the Miami Seaquarium; and the Monterey Aquarium and the Monterey Marine Lab [Stanford University].

The institute should be located in an area that provides quick, easy and ice-free boat access to the oil spill affected area. The site should lie immediately adjacent to a source of pollution-free sea water that is not subject to wide fluctuations in salinity or temperature. The site should be connected by paved road to the state road system in order to accommodate both the public and institute staff. A nearby airport with regularly scheduled flights to and from Anchorage is desirable. Reliable electrical power and telecommunications would also be necessary.

IMPLEMENTATION ACTIONS

1. Impanel a team of marine scientists, environmental educators, marine aquarium specialists and science administrators to develop the concept in detail and establish site and design selection criteria.
2. Survey the oil spill affected area, choose and acquire a site.
3. Hire a team of consultants to prepare an architectural design and master plan.
4. Acquire the necessary building permits.
5. Select a contractor and build the institute.

TIME NEEDED TO IMPLEMENT

One year for site selection. Two years for planning and design. Two to three years for construction. One year to equip and staff the facility.

MEANS TO IMPROVE RECOVERY

Option 34
Environmental Institute

Establish a Marine

The institute would provide support and coordination for direct restoration projects, feasibility studies and monitoring of injured resources and services. Environmental education programs developed and implemented by the institute would help to minimize additional impacts on injured resources and services. Living exhibits would introduce the public to animals and habitats injured by the spill and facilitate an understanding of their life histories and sensitivities to human disturbance.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Management to be determined.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

The institute's research, monitoring and education programs would be coordinated with those of the University of Alaska's Institute of Marine Science and the Alaska public school system. Research would also be coordinated with the Prince William Sound Science Center and resource agencies. Monitoring programs funded by the Trustees and those supported by the Prince William Sound Regional Citizens Advisory Council will also be coordinated with that of the institute.

TECHNICAL FEASIBILITY

Technical feasibility of the concept has been demonstrated in other areas, e.g., University of Miami/Miami Seaquarium, Stanford University/Monterey Aquarium, etc. A potential sites for this facility has already been identified in Seward.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

Recovery monitoring provides information on the recovery status of injured resources and services. Information from the monitoring program is essential to successful direct restoration design and implementation. Environmental education programs developed and implemented by the institute would help to minimize additional impacts on injured resources and services.

INDIRECT EFFECTS

There would be no adverse impacts upon injured resources or services. The institute would have a significant socio-economic impact upon the local community and region. The institute would probably attract numerous tourists, Alaska residents and school

Option 34
Environmental Institute

Establish a Marine

children with consequent impacts on the local economy and the regional road system. Staff would require housing as well as urban infrastructure support.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

The institute could provide technical support and facilities for restoration feasibility studies and the monitoring program. Data from research programs would be made available to restoration scientists and resource managers.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

None

LEGAL CONSIDERATIONS

Permitting

NEPA ?

MEANS TO EVALUATE SUCCESS

Assessment of research and environmental education programs by peer reviewers.
Annual visitation figures.

REPRESENTATIVE COSTS

Site selection, planning and design.....\$ 2 million
Site acquisition and construction.....\$40 million

ADDITIONAL INFORMATION NEEDED

CITATIONS

June 27, 1992

Author: John Strand/Art Weiner

OPTION 14 Accelerate Recovery of Upper Intertidal Zone

APPROACH CATEGORY Manipulation of Resources

INJURED RESOURCES AND SERVICES Upper intertidal community of algae and invertebrates (upper *Fucus* zone).

SUMMARY

Much of the upper intertidal zone within the oil spill area was heavily oiled and subjected to intense clean-up. Along many Prince William Sound shorelines, this zone is dominated by the brown alga, *Fucus gardneri* (popweed), which has been slow to recover. Moreover, many of the other life forms that use the upper intertidal zone are dependent upon *Fucus* for both cover and food. The scientific literature documents that *Fucus* is slow to recover from severe disturbance and that its recovery affects that of the rest of the intertidal community. It is the objective of this restoration option to establish ways of accelerating the recovery of the upper intertidal zone and to evaluate the long-term effects of various clean-up techniques used during the oil spill. Conclusions derived from this program may bear on clean-up decisions for future oil spills.

DESCRIPTION

This option is a feasibility study designed to test several approaches for accelerating the rate of recovery of *Fucus* assemblages. These include a trickle irrigation system to enhance moisture retention in the upper intertidal during low tide periods to protect new recruits, 2) a biodegradable substratum modifier made of hemp rope or fabric which is designed to provide additional substrate for germling attachment and protection, and 3) cobble assemblage transplants of adult plants. The proposed feasibility study will include an analysis of cost versus benefit. Studies also will be conducted to determine the causes of variable recruitment. Additionally, monitoring will be conducted to follow the long-term recovery of the upper intertidal zone in relation to the different cleanup technologies used during the spill.

IMPLEMENTATION ACTIONS

- 1) Evaluate and implement cost-effective ways to accelerate the recovery of the upper *Fucus* zone,
- 2) Design and implement a monitoring program that will assess:
 - a) the efficacy of several candidate approaches to accelerating recovery of *Fucus*,

b) the role of important physical, chemical and biological factors affecting recovery of *Fucus*.

c) the effects of various methods used to remove oil from the upper intertidal zone following the oil spill.

TIME NEEDED TO IMPLEMENT

Two additional field seasons will be required to test the feasibility of the several potential restoration approaches to accelerate recovery of the *Fucus* zone. Assuming proven feasibility, implementation of one or more of these restoration approaches at three to five of the most severely damaged areas will occur over three additional field seasons. Monitoring will be continued over the entire five year period, but will likely be reduced in frequency thereafter.

In 1990, research was initiated aimed at developing a better understanding of the underlying mechanisms limiting *Fucus* populations (De Vogelaere and Foster 1990; Houghton et al. 1991, Highsmith et al. 1991[?]; perhaps others). These studies included an evaluation of important abiotic and biotic factors (texture of substrate, canopy shading and presence/absence of local adults, etc.) affecting recruitment of *Fucus*. Monitoring the recovery of *Fucus* in relation to the quantity of residual oil in the upper intertidal zone also was undertaken. Additionally, preliminary experiments were conducted on the feasibility of using cobble assemblage transplants to accelerate recovery.

MEANS TO IMPROVE RECOVERY

By understanding the causes for variation in recovery rates among study sites following the *EXXON Valdez* oil spill, methods to enhance *Fucus* restoration should become more clear. Additionally, by comparing recovery in areas where either the method or intensity of cleaning differed, it should be possible to assess the relative benefits of effectively removing oil versus *Fucus* recruitment potential.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

A measure of protection and management is afforded by the Coastal Zone Management Act of 1972 (Section 315, Public Law 92-583, as amended; 86 Stat. 1280 [16 U.S.C. 1461]) and the Alaska Coastal Management Act and Alaska Coastal Management Act Regulations (AS 46.40, 6 AAC 80 and 85).

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Knowledge gained by implementing Restoration Option 14 may be useful in making decisions on whether or not to physically or chemically (includes bioremediation) remove sources of persistent contamination in or near mussel beds and other biologically important areas.

TECHNICAL FEASIBILITY

While approaches to monitor the long-term effects of various clean-up techniques used during the spill are available and have been implemented in some oiled and cleaned areas, additional research is required to test the feasibility of several potential restoration approaches to accelerate recolonization of *Fucus*.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

It is reasonable to assume that if a new *Fucus* canopy can be established, other seaweeds, invertebrates and even terrestrial animals will be afforded a suitable habitat and/or source of food. It also has been observed that new *Fucus* plants are more likely to recruit in rock cracks, other rough surfaces and not on tar or bare rock; and the presence of adult *Fucus* enhanced local recruitment. Restoration approaches based on these research results could significantly increase the rate of *Fucus* recovery.

INDIRECT EFFECTS

There need be no adverse environmental, socio-economic and human health and safety effects associated with this option, however, the potential for such effects will be addressed in environmental assessments or environmental impact statements at the project level. As already stated, this approach has every potential to benefit a wide variety of plants and animals found in the intertidal zone. Construction will be kept to a minimum, and research (habitat manipulation) will not further degrade the integrity of the intertidal ecosystem. Where possible, monitoring will be conducted using non-destructive and the least intrusive methods available.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

Option 13, although focused directly on elimination of residual contamination, also is designed to accelerate recovery of the intertidal zone. The monitoring component of this option will be integrated with the comprehensive monitoring plan described in Option 31.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

There are no other restoration options that propose direct restoration (manipulation) of the *Fucus* community.

LEGAL CONSIDERATIONS

The State of Alaska Department of Natural Resources has regulatory authority for all tidelands of the State. The State of Alaska Department of Fish & Game manages fish and wildlife including non-game species. Both agencies require and issue permits for scientific work in the intertidal zone. Other permits may be required by the U.S. Forest Service, National Park Service, or the Alaska State Parks System, dependent upon the site(s) of the proposed feasibility studies. For work proposed on or adjacent to private lands, permission will have to be obtained from the private land owner.

MEANS TO EVALUATE SUCCESS

This option includes a monitoring component designed to assess the efficacy of several methods used to accelerate recovery of *Fucus* in the high intertidal zone. Also, monitoring growth and survival in relation to texture of substrate, canopy shading and presence/absence of adult plants, etc., will allow a better understanding of the factors and/or mechanisms affecting recovery.

REPRESENTATIVE COSTS

As shown in TABLE 1, expected costs for Year 1 will be \$148.50K. With a 10% escalation, expected costs for Year 2 will be \$163.85.

ADDITIONAL INFORMATION NEEDED

None.

CITATIONS

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Others

TABLE 1. Projected Costs of Implementing Option 14.

<u>ITEM</u>	<u>\$K</u>	<u>BASIS</u>
<u>Year 1</u>		
Salaries		
Project Leader	35.00	6 man months over 1 year.
Technician	20.00	6 man months over 1 year.
Clerical Support	6.00	2 man months over 1 year.
Travel from lower 48 for two	12.50	Airfare to and from Alaska researchers, to include per diem for two month field season.
Boat Charter	28.00	For two month field season.
Equipment/Supplies	17.00	Sampling gear, PVC, fabric,
Chemical Analysis	25.00	Petroleum hydrocarbons
Publication support, editing, page	5.00	Report duplication, graphics charges (journal), mailing.
<hr/>		
Sub-Total	\$148.50K	

Year 2

Essentially same effort extended over same period of time but with a 10% escalation applied.

Sub-Total \$163.85K

Total \$312.35K

E/S

D

W-17

(2)

This item is too large to fit into a file folder and is located elsewhere with other free-standing items.

Catalog of Alameda County Records

Birds
GLOBAL SEARCH

: (seabird* or sea bird* or murre* or alcid* or brachyrampt
or ~~larus~~ or ~~laridae~~) and (~~disturb~~* or
researcher*)

call Sam
Sam Patton
6+6

267-2179 careful

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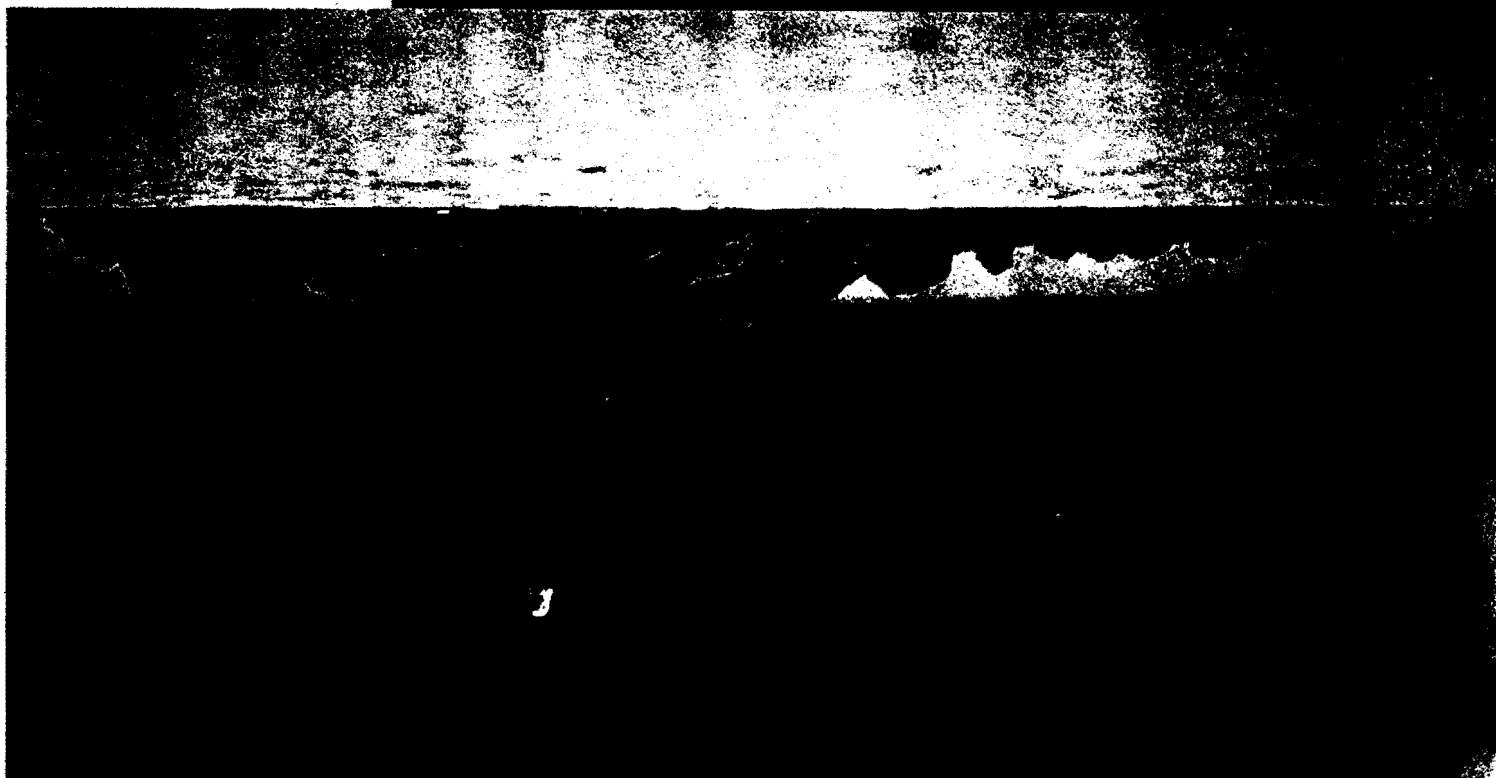
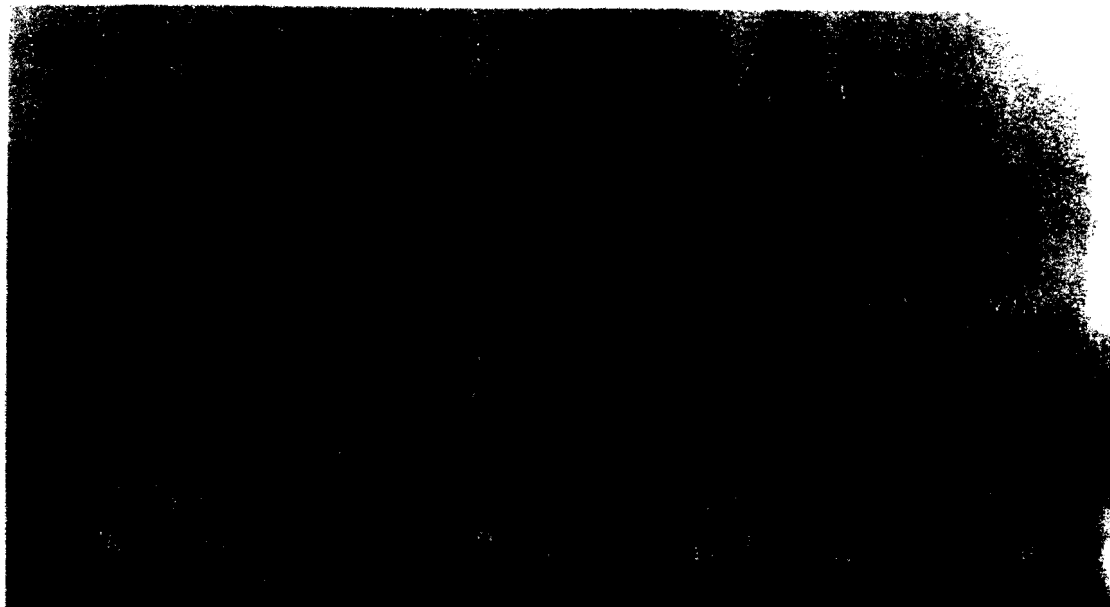
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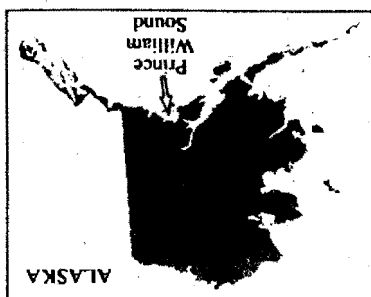
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Alaska



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More Than 5,000 Eagles and Eaglets

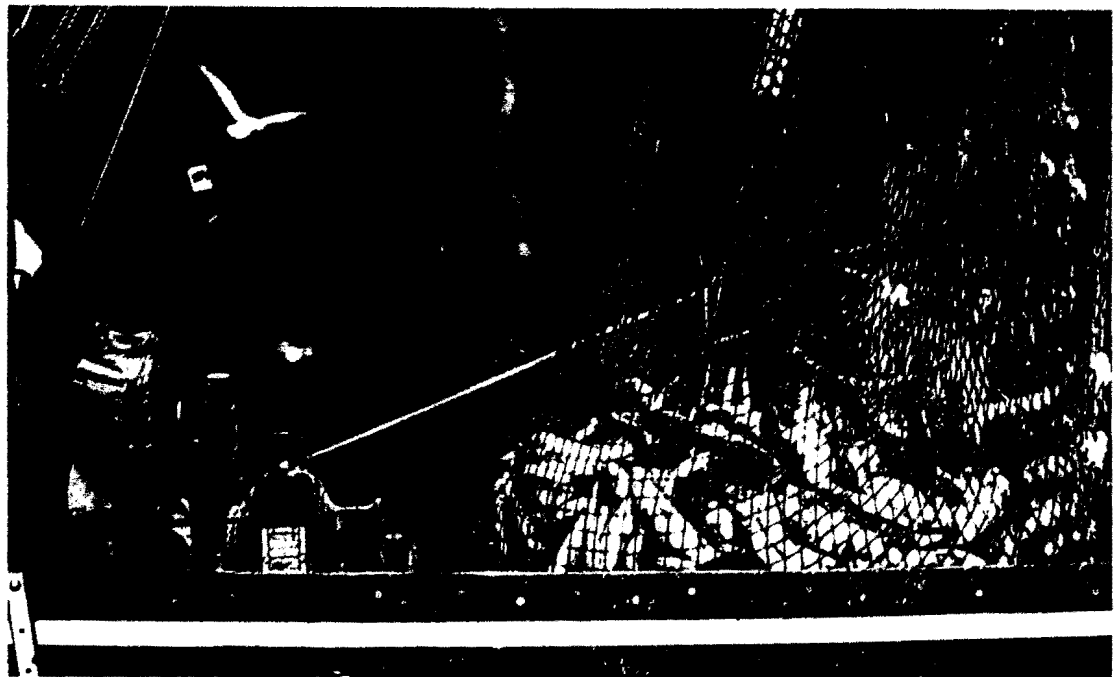
Prince William Sound is a near perfect habitat for the bald eagle. Thanks to ample food sources and shoreline forests for perching and nesting, more than 5,000 bald eagles make the area their home.

Biologists believe the population is a "saturated" one. That is, the environment could not support a larger stable eagle population.

In 1990, the U.S. Fish & Wildlife Service pinpointed more than 1,000 active eagle nests in the area.



More than 1,000 active eagle nests were pinpointed in the area during 1990 by the U.S. Fish & Wildlife Service.



Eagles and humans alike feasted on the 1990 record-breaking pink salmon catch.

1990's Record Fish Harvests

Many of Prince William Sound's eagle nests support more than one chick. That is unusual, since eagles in

most places find it too difficult to secure enough food for more than one youngster.

But food is not a problem in Prince William Sound. The eagles can rely on the area's renowned fish stocks for prey.

1990's record-breaking commercial salmon and herring harvests reflect the abundance of fish stocks in the area.



Less than 20% of the Prince William Sound area coastline was oiled in 1989. Today, the shorelines are essentially clean.

Clean, Nearly Recovered Habitat

Following harsh winter storms and two summers of clean-up operations, Prince William Sound is essentially cleansed of oil from the Valdez spill. By the end of 1989, there were no oil slicks on the water's surface and the small amount of oil that remained had "weathered" (i.e., changed chemical composition) and presented no threat to eagles.

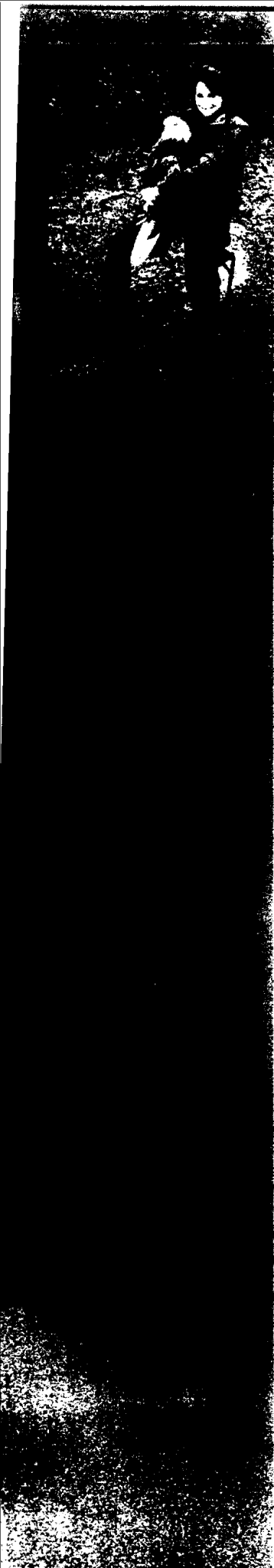
Immediately after the accident, eagles were able to find non-oiled areas in which to hunt fish. The tanker spill impacted less than 20% of the area's shoreline. Also, because the pattern of oil dispersal was dictated by the ocean currents, the oil was not evenly distributed in 1989. Where one beach might have been covered with crude, an adjacent beach might have been totally clean.

Healthy, Thriving Eagle Population

Immediately after the 1989 oil spill, many people feared the worst and worried whether eagles would be able to recover from the spill. Now, nearly two years after the spill, the evidence shows that eagles and eaglets are thriving in the area.

The Valdez spill was an unfortunate accident and everything reasonable should be done to prevent another spill. Nature's restorative powers should not be taken for granted.

Yet, now that the evidence shows that the eagles are doing well, we can be grateful for nature's resilience.



Marge Gibson has focused her life on caring for birds of prey through research, education and rehabilitation. In 1989, she led a team of eagle experts who captured Prince William Sound bald eagles to evaluate their health following the Valdez oil spill.

If you are interested in more details about the Prince William Sound bald eagles, please write to: Exxon Company, U.S.A., Eagles, P.O. Box 2180, Houston, Texas, 77252-2180 for a technical report entitled "Results of the Eagle Capture, Health Assessment and Short-term Rehabilitation Program Following the Valdez Oil Spill" by Marge Gibson and Jan White, D.V.M.



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MARINE OPERATIONS AND LOGISTICS DURING THE *EXXON VALDEZ* SPILL CLEANUP

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ABSTRACT: *The Exxon Valdez oil spill required unprecedented marine operations and logistics support for cleanup. At the peak of operations, more than 11,000 people, 1,400 vessels and 85 aircraft were required.*

Due to the remoteness of the spill location and the absence of land access, virtually all cleanup was conducted from vessels. Three types of vessels were used: landing craft and barges for oil recovery and shoreline treatment; berthing vessels for housing offshore workers; and support vessels for transporting personnel and materials.

Major logistic challenges in the oil spill response included providing offshore housing; replenishing food, water, and fuel for the offshore operations; establishing a large aircraft operation; installing a telecommunications network that was essentially built from scratch; providing onshore support; handling and disposing of more than 25,000 tons of oily solid waste and several hundred thousand barrels of oily liquid waste; and safely demobilizing the effort.

The March 24, 1989 grounding of the tank vessel *Exxon Valdez* on Bligh Reef resulted in an oil spill of approximately 258,000 barrels that began in Prince William Sound and later impacted portions of the southern Alaska shorelines in the Gulf of Alaska, as shown in Figure 1. The resulting cleanup operations were spread over an area more than 500 miles long, although less than 15 percent of the shoreline in this area was impacted by the oil spill. The areas impacted were remote in that virtually all of them required access by water or air, few could be served by existing communications, little housing was available, and the entire operation was distant from most sources of cleanup equipment and materials.

The remoteness combined with the magnitude of the task and limited weather window in which to conduct the work resulted in very high marine operations and logistics requirements. At the peak of operations, more than 11,000 personnel, 1,400 vessels, and 85 aircraft were working on the cleanup. Figure 2 shows the personnel buildup and illustrates the high support requirements of the operations. Of the more than 11,000 total personnel, about 3,400 worked on shoreline treatment and the remaining were onshore and offshore. Figure 3 shows the buildup of vessels. In order to utilize all available vessels in the response and to quickly mobilize and construct specialized vessels, it was necessary to obtain a number of waivers from normal Coast Guard requirements.

Overall operations were coordinated out of the Valdez Command Center and were geographically divided into Prince William Sound (PWS) and Gulf of Alaska (GOA) areas. PWS operations were also

coordinated from Valdez while GOA operations were coordinated out of satellite command centers in Seward, Homer, and Kodiak (Figure 1).

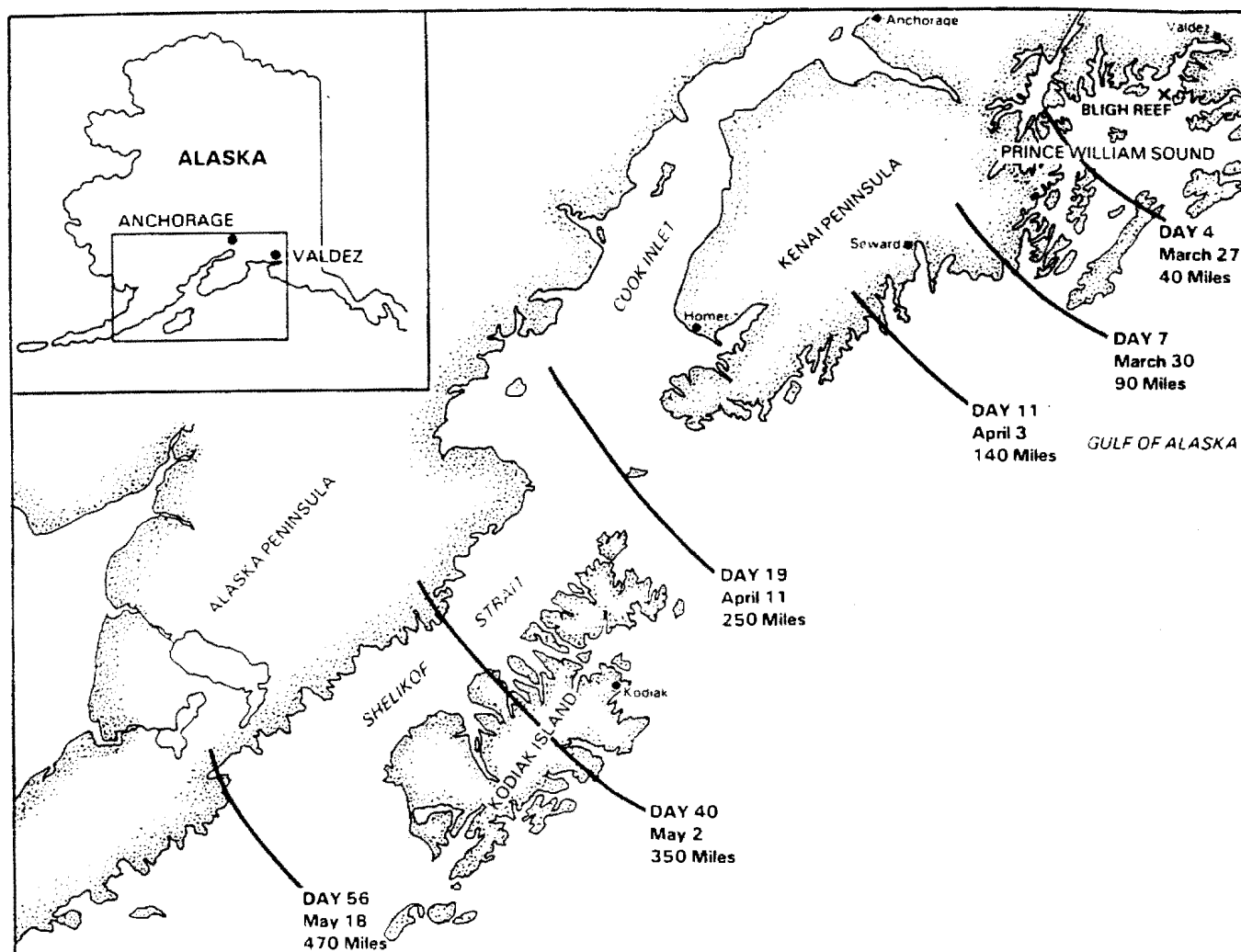
From the onset, safety was a major priority. The first formal safety training was performed on day nine of the cleanup effort. The cleanup methods changed throughout the effort and the safety programs changed in concert. In spite of the massive personnel buildup and inherently difficult working conditions, the safety program showed continual improvement and the total injury index averaged 34 percent less than heavy construction overall as shown in Figure 4.

This paper describes the approach taken to deal with the remoteness factors so that the necessary personnel and equipment could be mobilized and supported to effectively and efficiently carry out the 1989 oil spill response. Since the spill originated in PWS, the areas of largest impacts occurred there and the greatest numbers and concentrations of personnel and equipment were deployed there—5,200 of the 7,000 total offshore workers were in PWS. GOA operations were generally similar to PWS but on a lesser scale and will not be specifically discussed. Also, 1989–90 Winter Operations and 1990 activities are not included in this report.

PWS marine operations and logistics

Six large task forces were assembled for Prince William Sound operations, with each composed of about 400 to 700 people and 70 to 100 vessels. As shown in Figure 5, approximately one-half were direct cleanup personnel, either oil spill response technicians (OSRTs) or treatment vessel crews, and the remaining were support personnel. Common logistics vessels, animal rescue operations and other support also required more than 1,000 offshore people. The vessels in a typical task force included barges, landing craft, skimmers, cruisers, skiffs, and numerous fishing boats such as bowpickers, seiners, and tenders. Their functions are shown in Table 1. Task Force 2's support complex, consisting of a berthing barge, supply barge, shower/wash barge, and associated operations and support vessels is shown in Figure 6. In addition to the task forces, a number of vessels and personnel provided common support to all task forces and smaller units.

Berthing vessels. All of the shoreline cleanup and offshore support personnel had to be housed on the water. To meet the large requirements, several different types of vessels were used. At first, fishing boats and other readily available marine craft were used. These small vessels continued to be used for smaller teams after larger units were available.

Figure 1. Chronology of oil movement from the *Exxon Valdez*

Excursion boats and fish processing ships were the fastest way to obtain larger numbers of berths, but they were still a limited source. Navy transport ships quickly provided a larger number of berths but the quarters were cramped for extended operations. The majority of the long-term berths were provided by camps on eleven conventional

deck barges. The camp housing was installed on the barges in shipyards, where plumbing and electrical work was also done. Because berthing barges were considered facilities and not vessels, they were subject to largely the same food service, fresh water and wastewater permitting requirements as permanent onshore commercial facilities.

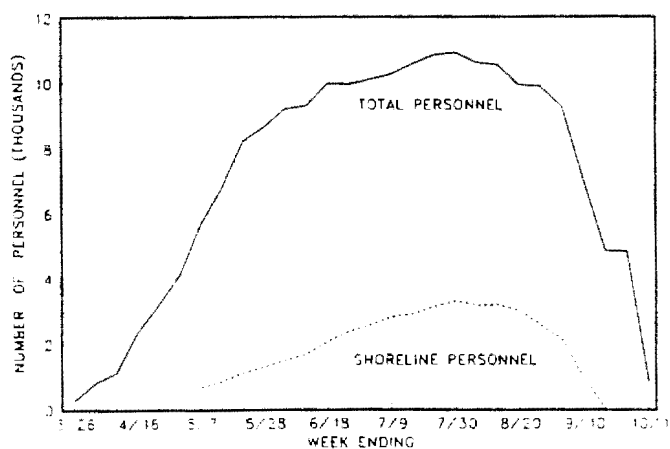


Figure 2. Number of shoreline and total personnel for oil spill response

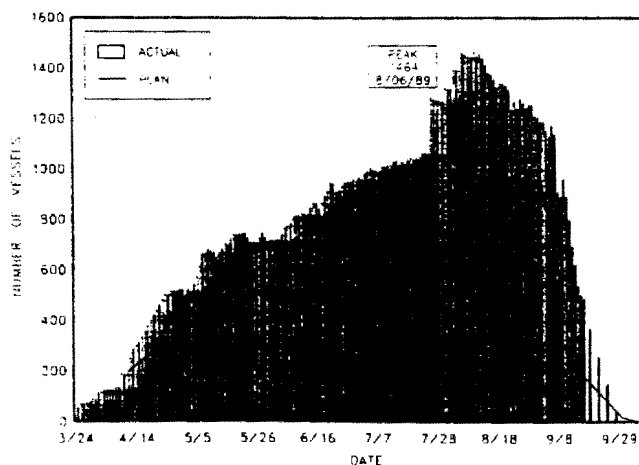


Figure 3. Number of vessels utilized in oil spill response

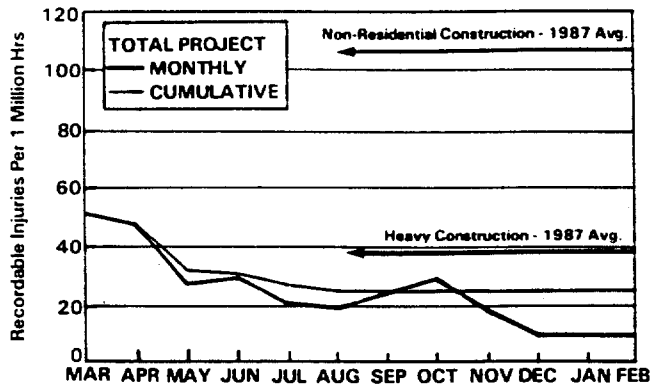


Figure 4. Safety performance during oil spill response

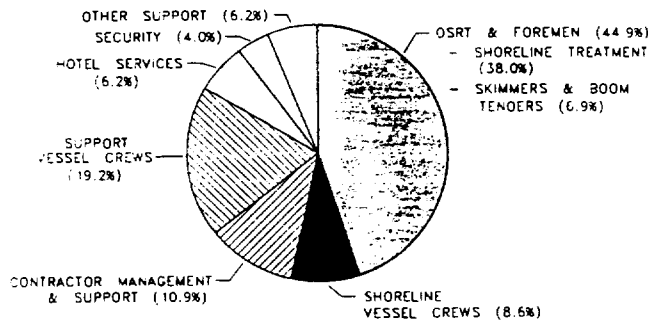


Figure 5. Functions of task force personnel (excluding Exxon and Crawford)

A self-contained semi-submersible derrick barge was able to provide the largest number of berths in a single vessel. Table 2 compares the key characteristics of the major berthing vessel types.

The berthing vessels and other barges were moored in sheltered bays and coves within Prince William Sound to reduce their exposure to extreme weather conditions. Local fishermen were consulted as to the best sites for the moorings based on their knowledge of winds, seas, and underwater hazards. All mooring systems were designed as single point moorings (SPM) with a design basis of 50 knot winds and ten-foot seas. A tug was assigned to each barge or cluster of barges to assist in the event of a storm in excess of the design conditions.

Crew transfer vessels. A large number of vessels were needed for crew transfers between the command center cities, berthing vessels, production and support vessels, and the shoreline work sites. The

Table 1. Typical task force vessels,

Logistics vessels	
Berthing vessels	3
Crew transfer	18
Storage/resupply	11
Waste handling	8
Safety/medical	4
Other	9
	53
Cleanup vessels	
Shoreline treatment	17
Boom tending	14
Crew transfer	20
	51

1. Numbers reflect the average composition of the fleet. Vessel types and numbers varied from task force to task force and from day to day.

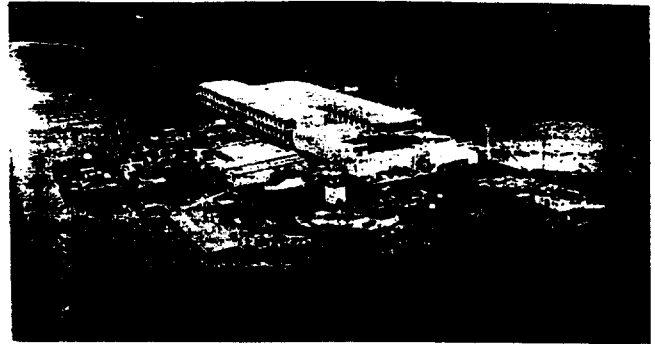


Figure 6. Task Force 2 support complex

Table 2. Berthing vessels

Vessel type	Beds	Days to outfit	Comments
Excursion boats	25-100	4-9	Quickly mobilized, limited mooring systems, require support barge with gear washing, potable water, and sewage handling
Fish processors	50-200	2-5	Largely self-sufficient, good propulsion and mooring systems
Navy ships	500	1-2	Quickly mobilized, large capacity but cramped berthing, good propulsion and mooring, require support barge with gear washing and sewage storage
Camp barges	50-250	7-29	Slower mobilization, large capacity, no mooring systems, require support barge, most weather sensitive
Derrick barge	548	1-2	Large capacity, slow mobilization, existing mooring system but lengthy installation, self-sufficient

majority of these were 24- to 40-ft fishing boats, although they varied from small inflatables to large ocean-going crew boats. Many functioned in multiple roles such as tending boom, transporting supplies, and transferring trash.

Shoreline treatment vessels. At the peak, 87 vessels were outfitted with equipment for treating the shorelines: 61 landing craft and 26 barges. Construction was performed in Valdez, Seattle, and Ketchikan. A number of skimmers and small pontoon barges were also used. The primary types were:

- **Mini-vessels.** The 61 landing craft equipped with both cold and hot water washing equipment were referred to as mini production vessels. These were the smallest shoreline treatment vessels, and their self propulsion, shallow draft, and bow ramps facilitated their ability to maneuver and access shorelines. Many were readily available in Alaska, and they could be mobilized the soonest; outfitting time was less than one day. About 40 percent came from military sources.

- **Maxi-barges.** Conventional barges outfitted to provide larger quantities of heated water were called maxi-barges. The time to outfit these barges was typically 6 days. The maxi-barges varied in length from 128 to 180 feet, and in width from 33 to 54 feet. Their higher freeboards and deeper drafts, combined with the need for a tug to maneuver them, made the Maxis best suited for treating longer sections of impacted shorelines.

- **Omni-barges.** The omni-barges were equipped with industrial heaters and an articulating arm to allow delivering heated water to hard-to-reach areas. They were 115 feet to 140 feet long and about 40 feet wide, with drafts of 2.5 to 4 feet. All but one were self-propelled and constructed of interlocking sectional barge components as shown in Figure 7. The Omnis required five to seven days for assembly. An

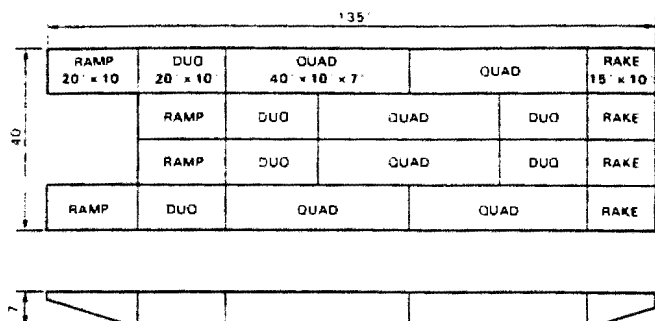


Figure 7. Interlocking float pattern for one Omni-barge configuration

additional 4–5 days were required to install the shoreline cleanup equipment.

• **Bioremediation vessels.** To apply the liquid fertilizer used in the shoreline bioremediation process later in the cleanup, water washing equipment was removed from six cold water mini vessels, and bioremediation application tanks and sprayers were installed. To access shallow areas that the minis couldn't reach, small pontoon vessels were similarly outfitted.

Resupply in Prince William Sound. At the peak of offshore operations, the six task forces required about 100,000 gallons of fuel, 30 tons of food, 150,000 gallons of fresh water, and 18 tons of materials on a daily basis. Additional supplies were required for the vessels and personnel providing common offshore logistic support and government agency operations. Even larger quantities of waste were hauled back daily.

To expedite the fueling of vessels and helicopters, two fuel depots were set up in Prince William Sound. Motor gasoline, aviation gasoline, jet fuel, diesel fuel, lube oil, and hydraulic oil were available. Food, water, and materials were delivered on ocean-going workboats on a regular schedule to each task force. In addition, smaller boats delivered fresh groceries and specialty items on an as-needed basis. Later, fresh water sources were developed in PWS to reduce logistical needs.

Other support vessels. Barges were particularly important in meeting the various marine support needs. Due to limited availability in Alaska, most of these vessels were mobilized from the lower 48 states. Some of the support vessel requirements were:

• **Skimmed oil/water storage.** Five large (25–50,000 barrels) tank barges were used for storing and transporting oil and water from skimming operations.

• **Boat and boom cleaning vessels.** It was necessary to clean response vessels before they left the cleanup areas and to clean other vessels that incidentally became oiled before they could enter harbors. Boat washing stations were established that generally consisted of a work barge, pontoon floats, and associated pumping, washing, and oil containment equipment. Boom washing stations were set up on barges to clean oiled boom.

• **Repair vessels.** Two major repair facilities were set up in Prince William Sound. One facility consisted of three barges moored together, including a crane barge. A second facility consisted of two floating dry docks, a crane barge, a slop barge, and an accommodations barge as shown in Figure 8. The floating dry docks were also used for boat cleaning.

• **Clinic barge.** A fully staffed medical clinic was established on a barge to provide medical services in the vicinity of the operations.

• **Kelp/popweed washer.** During the early days of the spill response there was concern that major quantities of oiled kelp and popweed would be encountered. In response, a hot water washing system was constructed on a barge and a series of collection and disposal vessels were mobilized. Ultimately, little oiled kelp was found.

Aircraft and onshore support

Aircraft operations. At the peak, 85 fixed wing aircraft and helicopters were used in support of the cleanup and animal rescue operations. During these peak months, five thousand to six thousand flight hours

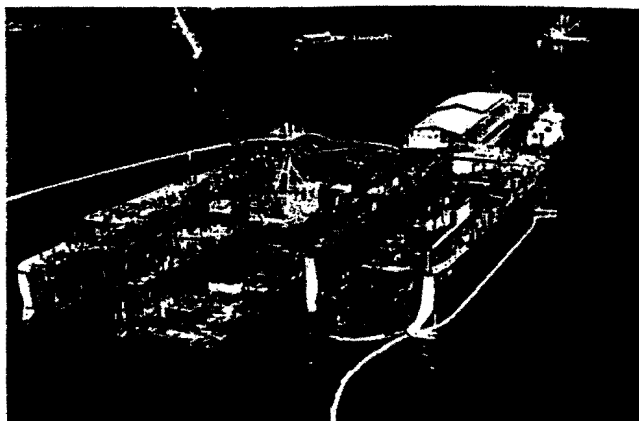


Figure 8. Dry dock repair facility

were required to transport about 20,000 passengers and 800,000 pounds of cargo. Over 20,000 total flight hours were experienced in 1989. Exxon weather criteria (flight minimums) were established to ensure safety and uniformity of air operations. Operations offices were established at the Valdez, Cordova, Homer, Seward, and Kodiak airports. A floatplane base was established on a lake near Valdez. Flight following was employed to monitor aircraft positions and thereby reduce the time required to locate and rescue the crew and passengers in the event an aircraft went down. Fuel caches were provided in remote areas for helicopter refueling.

Telecommunications. Extensive telecommunications facilities were required because of the large operating area, limited existing facilities, and mountainous terrain. Locations of telecommunications facilities changed throughout the operating period in response to the changing spill response needs.

Major fixed repeater stations were established on mountain peaks or other locations to provide broad coverage. These fixed repeaters were supplemented with small solar-powered, mobile repeaters that were moved many times during the spill response to reach specific bays or locations. VHF-UHF translator repeaters (Figure 9) were developed to reduce frequency crowding and meet special frequency needs. Ultimately, the telecommunications network included UHF, VHF, and HF radio systems, microwave stations, satellite stations (INMAR-SAT), and improved mobile telephone service (IMTS) as summarized in Table 3. Exxon was authorized to use all available frequencies, including the entire business radio spectrum.

Onshore berthing, offices, and food. Approximately 4,000 onshore support personnel were involved, with the majority located in Valdez.

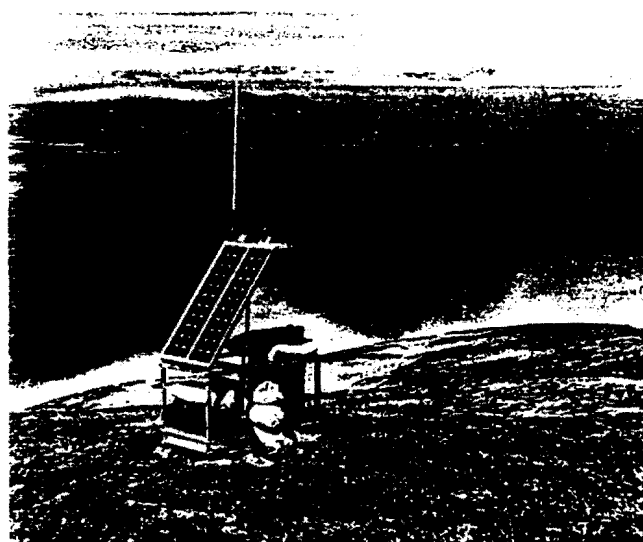


Figure 9. Translator-repeater on Kodiak Island

Table 3. Telecommunication equipment used during spill response

Systems	Number used
Wide area UHF radio system	50 fixed repeaters 600 mobile radios 2,040 hand-held radios
VHF—AM and FM radio systems	15 base stations 200 mobile radio 1,150 hand-held radios
Translator repeaters	15 repeaters
HF—single sideband	30 radios
Microwave radio stations	4 fixed stations
Satellite communications	5 earth stations 15 INMARSAT terminals
Improved mobile telephone service (IMTS)	3 systems
Telephone systems	5 PBXs 27 key systems 517 lines and trunks

Housing for these personnel was provided by a number of means including all available hotel/motel space, private homes functioning as "bed and breakfasts," portable camps, and mobile homes. Food catering was provided to accommodate the expanded population in Valdez. Exxon's Valdez Command Center began in a hotel conference room. It later moved into available office space and then into a dedicated building erected by Exxon.

Transportation. Although truck and sea transport were used where feasible, the need for speed led to air shipment of most equipment and materials. At one point, all available commercial cargo flights were on contract to Exxon. Additionally, Exxon used the maximum military airlift capability possible while still allowing for national defense. Because of restrictions at the Valdez airport, most of the equipment delivered by air was flown to Anchorage and transferred to smaller aircraft. Air shipment continued to be the primary means of transport throughout the cleanup, since equipment and materials were needed as soon as they could be manufactured. More than 15,000 tons was shipped by air.

Weather forecasting. Throughout most of the oil spill cleanup operation, weather forecasts were provided by the National Oceanic and Atmospheric Administration (NOAA) and supplemented by local observations. Special forecasting arrangements were made for work on the Barren Islands due to the variability and potential severity of wind and sea conditions in that area. To enhance safety during the period of typically worsening weather leading up to September 15, a specialized contractor was hired to provide more frequent weather monitoring and forecasting within Prince William Sound.

Security. Almost 400 personnel were employed for security in Alaska at the peak of operations. Security functions included controlling access to facilities, providing bear guards on the shorelines, monitoring for alcohol and drugs, and safeguarding personnel and equipment.

Contracting and procurement. Contracting and procurement functions were performed both by Exxon and prime contractor personnel. Vessel contracting was complicated by the speed of mobilization, limited availability of vessels, and the need for some Jones Act waivers for foreign flag vessels. Approximately 1,000 separate contracts were involved and literally thousands of purchase orders were issued, which led to creation of a major data base.

Waste management

The cleanup effort generated quantities of both oily and non-oily liquid and solid wastes. Management of these wastes required extensive facilities for collection, temporary storage, transport, processing, and safe disposal. Final waste disposal methods included landfill, incineration, treatment, or recycling.

Solid waste handling and disposal. Oily solid waste from Prince William Sound, where shoreline cleanup techniques focused on water

washing, consisted mainly of oiled sorbent materials and shoreline debris. In the Gulf of Alaska, the wastes were primarily oily sand and gravel collected as a result of removing mousse patties and tarballs from the shoreline. The initial plan was to incinerate most oily solid wastes offshore on two specially constructed barges. Due to delays in permitting, however, an alternative plan for secure landfill disposal was implemented. Table 4 summarizes the disposal quantities by method. In addition, there was a considerable amount of non-oily solid waste, which included household refuse as well as wood and metal waste, that was sent to municipal landfills in Alaska. The major steps and facilities included:

- **Waste handling.** Oily materials from shoreline cleanup were put in plastic bags and taken to central storage or staging barges equipped with cranes and watertight containers. "Circuit" barges and vessels transported the waste containers to shore. Facilities in Valdez and Seward were constructed to receive, separate/sort, store, transship and/or incinerate oily solid waste. The layout of the Valdez site is shown in Figure 10.

- **Repackaging and landfill operations.** Oily solid waste was transported to repackaging sites in Anchorage and Seward. These facilities reduced the waste volume by shredding, added absorbent material to stabilize free liquids, and packaged it into one and one-half cubic yard bags called "supersacks" for disposal in an out-of-state landfill.

- **Incineration.** To begin disposing of the anticipated large quantity of oily solid waste, Exxon utilized five small onshore incinerators until higher capacity waste handling facilities were available. Two air curtain incinerators were tested, but standard air emission limits on particulates could not be applied to an incinerator without an exhaust stack, and operating permits were not issued.

One of the two incinerator barges (Figure 11) had a silo hearth incinerator with an operating capacity of about 40–70 tons per day. It was chosen for its early availability, positive emissions control system, simple and reliable operation, ability to directly feed large waste materials, and ability to burn high-BTU waste. Although startup was delayed by permitting until nearly the end of the operating season, the unit did operate long enough to conduct air emissions tests. It burned about 500 tons of waste, which was a fraction of its intended use. The other incinerator barge had a rotary kiln incinerator with a projected disposal capacity of 120 tons per day for oil sand and gravel. Permitting also delayed startup of this barge, and further permitting and mechanical problems prevented its use.

Liquid waste handling and disposal. Several hundred thousand barrels of liquid wastes, with the largest amount of this being skimmed oil and water, were generated and disposed of.

- **Skimmed oil and oily water.** Free water from skimming activities and other oily waters were transported to Alyeska Pipeline Service Company's Valdez terminal for processing through its ballast water treating system. Emulsified oil and water from skimming operations were transported to Seattle or to Exxon's Baytown refinery for processing, oil recovery, and waste water treating.

- **Sanitary waste.** Offshore discharge of untreated sanitary wastes from berthing vessels was not allowed, and this waste was transported to the Valdez municipal treatment system. Later, a barge was modified to serve as an offshore treatment facility.

Table 4. Summary of oily solid waste disposal

Processing facility	Tons processed
Incineration	
Onshore incinerators	2,100
Silo incinerator barge	500
Total incineration	2,600
Lower 48 landfill	
Anchorage repackaging facility	15,900
Seward repackaging facility	6,500
Subtotal	22,400
Absorbent added in processing	8,000
Total landfill	30,400
Total oily solid waste disposal	33,000

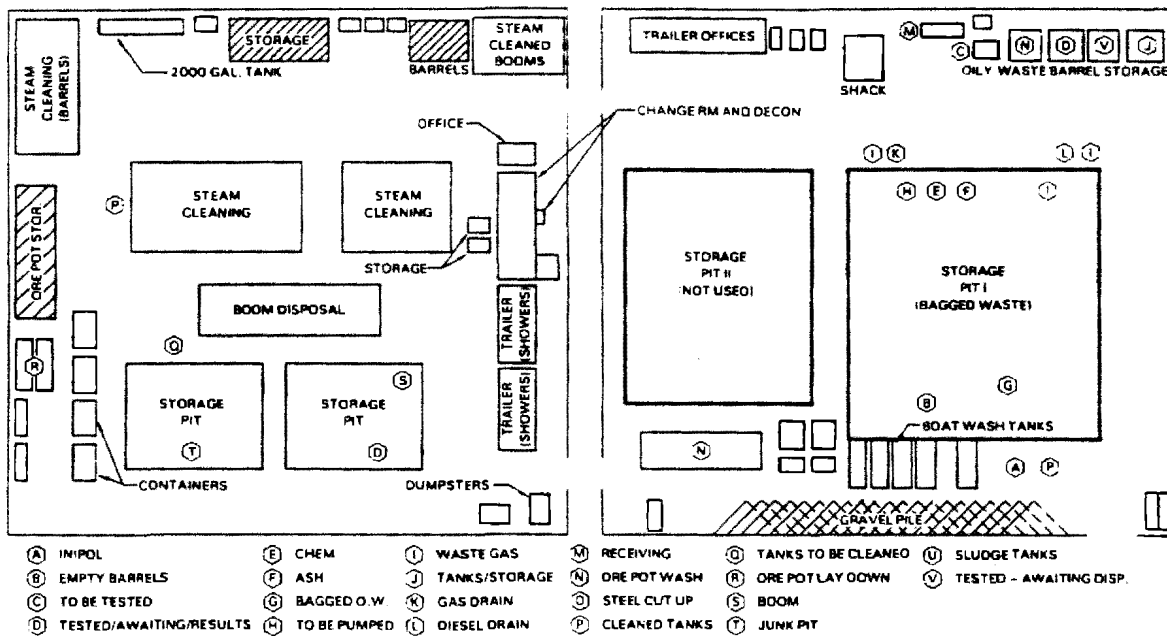


Figure 10. Layout of Valdez waste handling site

• **Cleaning waters.** Oily washwater generated from cleaning boats, protective gear, or booms, was pretreated to reduce the oil and grease to levels acceptable for treatment in the Valdez municipal treatment facility.

Hazardous wastes. The spill cleanup wastes were not classified as hazardous under state and federal laws, but some associated wastes were and required special handling and disposal in out-of-state facilities.

Demobilization

During early June, Exxon began to plan the demobilization of the cleanup operations and the transition to the 1989-1990 Alaska winter program. A review of historical weather patterns showed that by the middle of September offshore operations would have to cease because deteriorating weather conditions would seriously impact the safety of

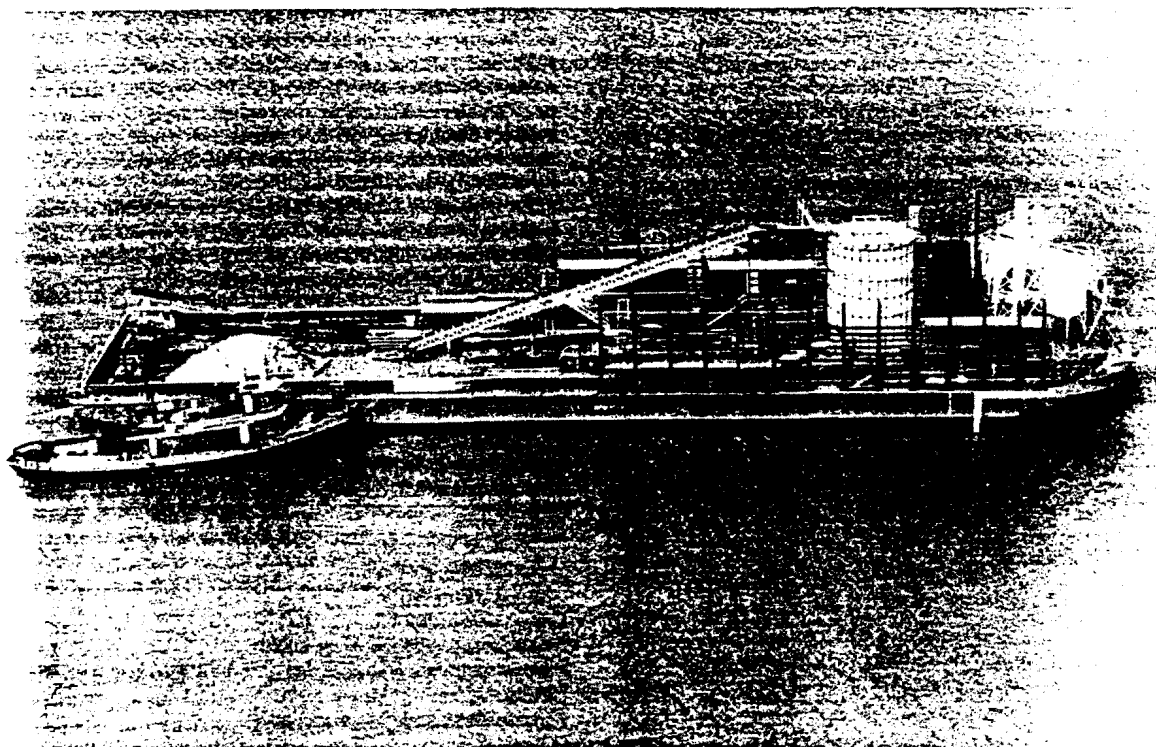


Figure 11. Barge mounted silo incinerator

the cleanup. A demobilization schedule was prepared that permitted work to continue as long as possible and still allow vessels to transit safely to their home ports before the forecasted onset of weather conditions that would exceed each vessel's operating limits. Vessel demobilization was complete in late October.

Vessel data base. The large number of vessels involved in the cleanup operation and the short demobilization period made it imperative for the supervisors of this operation to have an accurate knowledge of the vessels, owners, charter terms, and off-hire redelivery ports with which they would be dealing. A demobilization vessel data base was put together from several operating data bases to meet this need. This data base was used to schedule sailing plans for vessels and to monitor status of the program.

Vessel preparation and cleaning. All vessels were cleaned of oil as part of demobilization; additional vessel cleaning stations were established to meet this need.

Within Valdez harbor, demobilization facilities for equipment removal included three shore sites, three crane barges, and two staging areas with moorings. A separate complex in Louis Bay, including a derrick barge, was used for dismantling sectional barge assemblies.

Transit to home port. For the transit to home port, the larger barges were used to transport equipment and smaller vessels. A tow survey was conducted prior to departure to ensure that the vessels and tow hardware were safe and seaworthy. When the vessel reached its home port and was ready to go off-hire, a surveyor representing Exxon and a representative of the owner inspected the vessel.

AN OVERVIEW OF THE EXXON VALDEZ OIL SPILL

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ABSTRACT: While the Exxon Valdez oil spill had a significant and far-reaching impact, important progress has been made since the massive cleanup operation was launched in the spring of 1989. In 1989, Exxon treated almost 1,100 miles of shoreline identified to be impacted. This effort involved more than 11,000 people and 1,400 marine vessels. Environmental recovery is well under way in areas impacted by the spill, thanks to nature's own cleansing power and man's efforts. The 1990 cleanup primarily used nonintrusive techniques and addressed 10 to 15 percent of the shoreline treated in 1989. Much has been learned about how to prevent and respond to such an incident in the future.

Early in the morning on Friday, March 24, 1989, the *Exxon Valdez*, a 987-foot, state-of-the-art tanker carrying 1.25 million barrels of North Slope crude oil, ran hard aground on Blight Reef in Alaska's Prince William Sound. The grounding left 8 of the vessel's 11 cargo tanks and 3 of its 5 ballast tanks holed extensively, causing some 258,000 barrels of crude to spill into the water, most of it within the first few hours.

The spill occurred in a remote location in open water, in an undeveloped area of rugged terrain where boats and aircraft provided the only access to the impacted areas (Figure 1). The site was far from major population areas—about equidistant from New York and Tokyo and more than 3,000 miles from Exxon USA's principal operations along the Gulf coast of the United States. Exxon is not an operator in Alaska, and at the time of the accident, only a couple of dozen Exxon employees were in the entire state.

Immediately following the accident, the tanker captain notified the U.S. Coast Guard. Consistent with the oil spill contingency plan developed by the Alyeska Pipeline Service Company (operator of the marine terminal in Valdez) and approved by both federal and state authorities in 1977, and again as recently as January 1987, the initial spill response was carried out by Alyeska and the U.S. Coast Guard. It is important to note that the contingency plan focused on spill sizes of 1,000 or 2,000 barrels, in the belief that these were "most likely" to occur. It specifically recognized that a spill in the 200,000-barrel range could not be fully contained, and that a significant amount of oil would reach shore.

Exxon's response

From its offices in Exxon USA's headquarters building in Houston, Exxon Shipping Company began to mobilize the Exxon response team. A command center was established in Houston before dawn, and phone calls were placed around the world to locate and assemble needed materials and equipment. Arrangements were made for the first of many flights to Alaska to airlift equipment from oil spill cooperatives and other organizations. The Exxon response team left Houston by air before 8:30 a.m., arriving in Valdez by 5:20 p.m. on the

day of the spill. Dozens more trained people and tons of supplies began arriving that same day.

When Exxon's team arrived, they found the *Exxon Valdez* impaled precariously on a reef, in imminent danger of capsizing. The threat to the crew and the remaining cargo—another million barrels of oil, four times the amount spilled—was an immediate concern. One of the most pressing tasks was clear: to transfer—or lighter—the remaining crude to other tankers and keep the ship afloat.

Lightering operations began the morning after the spill. Transferring the million barrels of crude oil that remained in the *Exxon Valdez* to other tankers was an extremely delicate operation. Three tankers were diverted to the site and each was carefully maneuvered alongside the grounded vessel to offload the oil. Every barrel of oil removed was replaced with sea water to avoid potentially disastrous shifts in weight. Within 10 days, a small group of Exxon Shipping Company employees, displaying superb seamanship and on-the-spot technical innovation, successfully removed all the remaining cargo—and with it the threat of a much greater spill.

Simultaneously, the effort began to contain and clean up the oil that had already spilled.

To reduce substantially the volume of oil that might reach land, the contingency plan stressed the importance of the early use of dispersants and open burning. Unfortunately, there were inordinate delays in obtaining approval from the authorities for these methods.

A severe storm at the end of the third day following the spill spread the oil slick over a distance of 40 miles and onto island shorelines. At that point, containment was no longer possible, and cleanup became a key priority.

Wildlife. Another concern was the rescue and treatment of animals affected by the spill, and Exxon immediately committed extensive resources to this effort. From March through September of 1989, Exxon organized the largest and most comprehensive bird and sea otter rescue and rehabilitation program ever attempted. Facilities for holding, cleaning, and caring for oiled birds and otters were built in Valdez, Seward, Homer, Kodiak, and Anchorage. The rescue and rehabilitation efforts were overseen by established experts in the field, who arrived in Alaska within days of the spill.

More than 140 boats were used to retrieve oiled birds and otters from remote locations throughout Prince William Sound and the Gulf of Alaska. More than 700 specialists and volunteers were involved in the rescue and rehabilitation effort. Expenditures for the bird and sea otter programs exceeded \$45 million.

Claims. Exxon also moved quickly to establish claims offices to work with hatcheries, canneries, fishermen's groups, and many individuals to assure their financial viability through a system of advance payments.

The first claims office opened in Valdez on March 31, 1989, a week after the spill, and funds were available locally that same day. By the end of the summer of 1990, Exxon had paid over \$230 million to more than 12,000 fishermen and other claimants.

Mobilization. At the same time that Exxon was removing oil from the vessel, caring for wildlife, and launching a claims program, inten-



Figure 1. Map of Exxon Valdez oil spill site

sive efforts were under way to assemble the personnel, equipment, and supplies needed to implement the cleanup.

Bringing about this mobilization required a tailor-made organization that addressed every aspect of the cleanup effort, including planning and coordination, logistics, operations, technical and accounting, public affairs, and telecommunications.

Assembling the necessary people was the key to this mobilization, and that effort accelerated rapidly over time. Twenty-four hours after the spill, Exxon had 35 employees on the scene, and had hired 200 others. After one week, 800 people were dedicated to the effort; after one month, 3,000—and that number nearly quadrupled at the height of activity in the summer of 1989 (see Figure 2).

People were added as quickly as equipment arrived to support their activities. Most of the needed equipment had to be transported from the Lower 48 states, Canada, and several European countries.

Techniques. While this huge mobilization progressed, Exxon began to focus on what was needed to treat the affected shorelines. It became clear that two different kinds of operations had to be mounted because two different sets of cleanup problems existed.

In Prince William Sound, the shoreline is largely a collection of rocks of varying sizes, and this effectively determined what cleanup methods would be developed and tried. The principal cleaning method was to wash the oil from the rocks, using warm or cold water, or both (see Figure 3). The oil loosened by this washing was flushed into the sound, where it was contained by booms, picked up by skimmers, and held for subsequent treatment in onshore separation facilities.

In time, Exxon had to find innovative methods to bring more water for use on the shorelines. Accordingly, what came to be the workhorse piece of equipment for this phase of the cleanup—the maxi-barge—was developed. These custom-built barges had a crew of about 50, some 10,000 feet of boom, a couple of oil skimmers, fuel and storage tanks, a 225 kw generator, and several water heaters (Figure 4).

Many of the maxi-barges had a piece of equipment that made it possible to treat shorelines that could not be reached by foot. This device was called an "omni-boom," a hydraulically articulated delivery

system normally used for pumping concrete on construction projects (Figure 5).

At the peak of operations, systems capabilities were substantial: the ability to heat enough water to serve a city of half a million people. Overall, some 200 million gallons were delivered daily—enough to meet the needs of a city of one million persons.

Operations varied somewhat in the Gulf of Alaska, where the terrain was different and the impacts of the spill were less severe. There, the shorelines are less rocky and more sandy than those in the sound; more like what most people envision when they think of beaches.

Largely, the cleanup job entailed collecting, by rake and shovel, oily sand and tar balls, and disposing of the debris in plastic bags. In about six months, workers collected some 25,000 tons of solid wastes. Most of this waste material was sent to a landfill in the Lower 48 states.

Bioremediation. One of the most promising cleanup methods developed to deal with the spill was bioremediation. It has long been known that certain microbes have a taste for the complex hydrocarbons that make up crude oil. They ingest these hydrocarbons and break them down into harmless water and carbon dioxide.

The Environmental Protection Agency, working jointly with Exxon, undertook a test program that was encouraging. It led to using bioremediation on selected areas of shorelines. In all, in 1989 about 70 miles were treated with nutrients that supported these microorganisms.

Results. In the spring and summer of 1989, Exxon treated a total of nearly 1,100 miles of shoreline identified to be impacted—about 360 miles in Prince William Sound and more than 730 miles in the Gulf of Alaska—leaving them in an environmentally stable condition, safe for wildlife (see Figure 6 for cleanup timetable). While this was a major undertaking, it is important to bear in mind that the oil spill affected less than 15 percent of the total shoreline in these two areas.

At the peak of activity, the cleanup effort involved more than 11,000 workers—of whom about 3,500 were working directly on the beach—as well as some 84 aircraft and more than 1,400 vessels of all types.

In such a labor-intensive operation, safety was of the highest prior-

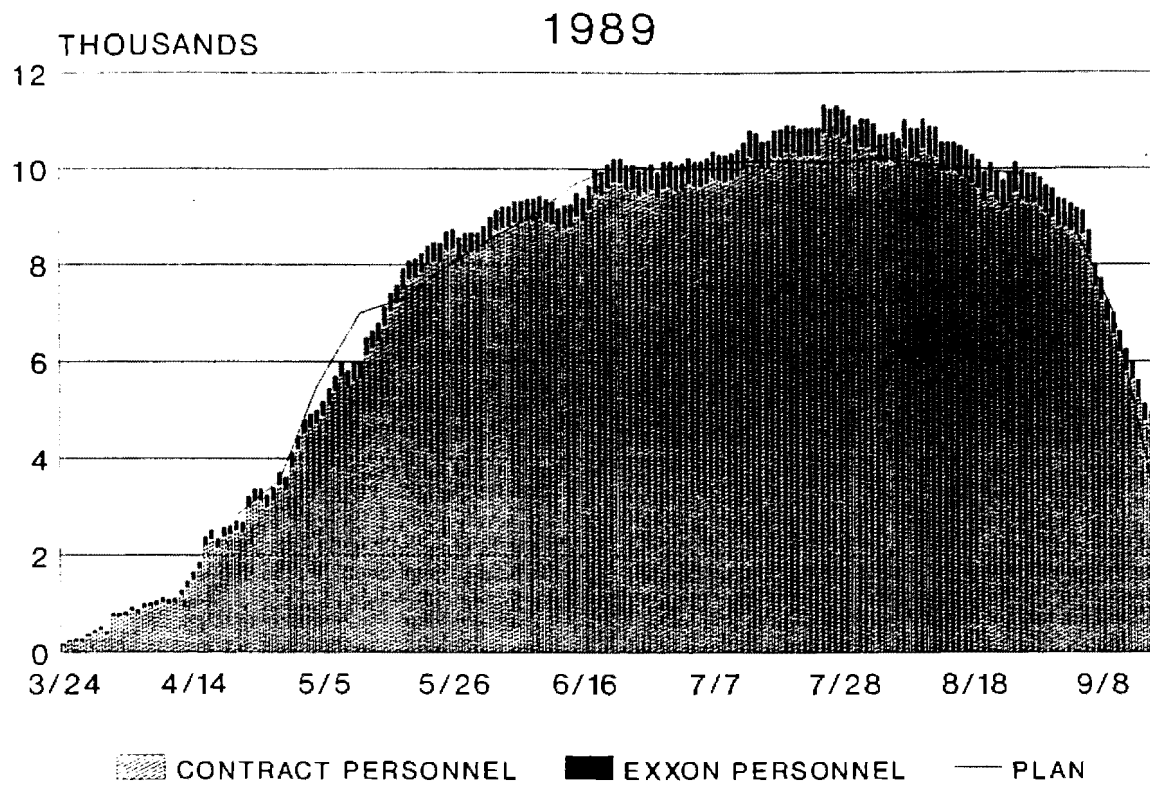


Figure 2. Personnel employed in oil spill response effort



Figure 3. Washing oil from rocks in Prince William Sound



Figure 4. Maxi-barge working at shoreline

ity, and Exxon was pleased with its performance. There were 24.9 total recordable accidents per million manhours, which compares to 38 for heavy construction in general and 107 for non-residential construction.

Winter 1989-90

By mid-September, weather conditions required that shoreline activities be phased down because of the serious risk of life posed by the onset of the arctic winter. In Prince William Sound, winter gales can create waves 10 to 15 feet high, while 30-foot waves are common in the Gulf of Alaska. Wind speeds in the area are shown in Figure 7. Temperatures plunge well below freezing, and daylight diminishes to five hours per day by the time of the winter solstice.

Exxon maintained a large presence in Alaska over the winter and carried on a multifaceted program. More than 700 Exxon and contract employees remained at work, most based in Anchorage, where equipment also was maintained. Ships, aircraft, and other materials were strategically deployed in Anchorage, Valdez, and other communities. A number of people residing in Alaskan villages, who worked in the summer cleanup effort, were retained on "call up" status as a contingency strike force. Sixteen villages were under contract to Exxon to conduct winter shoreline monitoring of designated beach areas.

In addition, Exxon's comprehensive winter science program encompassed more than two dozen environmental field studies, involving some 300 scientists and technicians from all over the United States.

As anticipated, both in Prince William Sound and the Gulf of Alaska, fierce winter storms made major improvements on high- and moderate-energy shorelines. In the areas where it was applied, bioremediation enhanced those natural processes. As a result, the condition of the shorelines continued to improve.

Environmental recovery

By the spring of 1990, it was clear not only that shoreline conditions had markedly improved, but also that environmental recovery was well under way (see Figure 8).

In April, three distinguished scientists from the United Kingdom visited Alaska to conduct field observations on the environmental impacts of the spill. One of their principal observations was: "Only a portion of the shoreline had been oiled, and, as with most other oil spills, the bulk of the damage had disappeared during the first year. The area has retained its natural beauty; there are abundant signs of plant and animal life, and recovery is well under way on even the most severely impacted beaches."¹

Equally encouraging results were seen in studies of water quality. In the spring of 1990, findings were published based on water quality studies conducted by four prestigious research organizations: Arthur D. Little Marine Sciences, Battelle Ocean Sciences, Kinetic Laboratories, Inc., and America North, Inc.

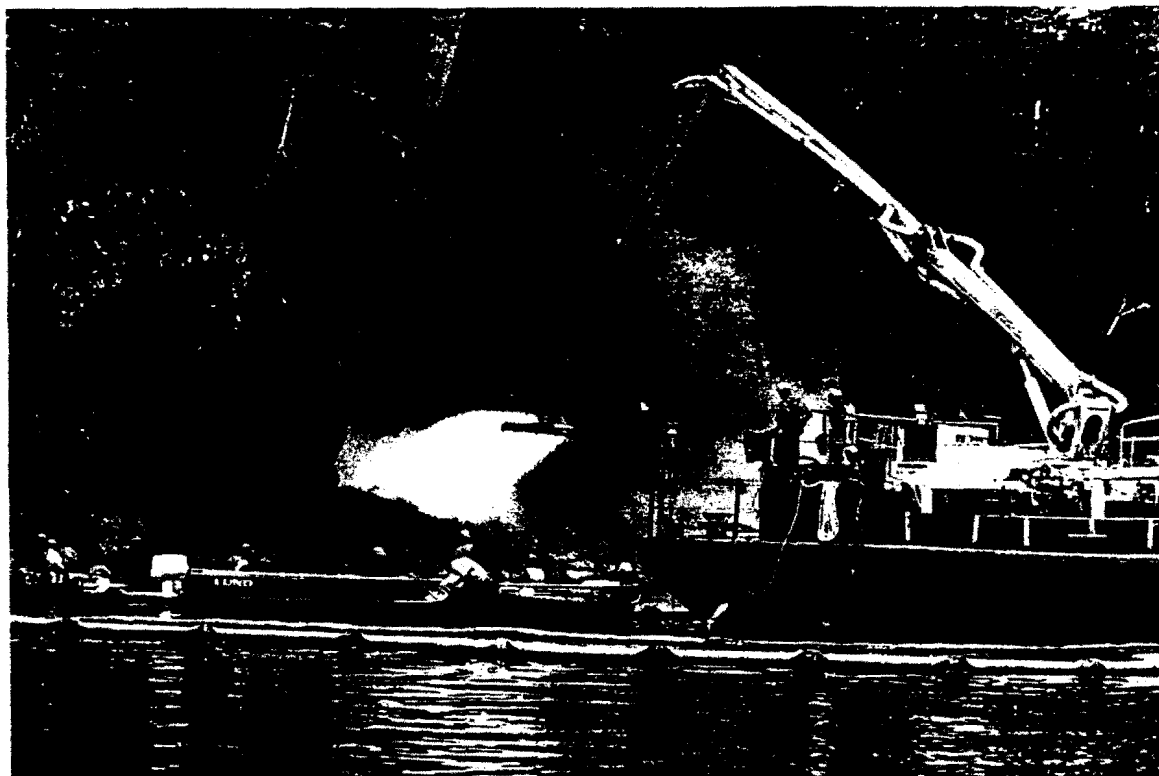


Figure 5. Omni-boom spraying water on shoreline

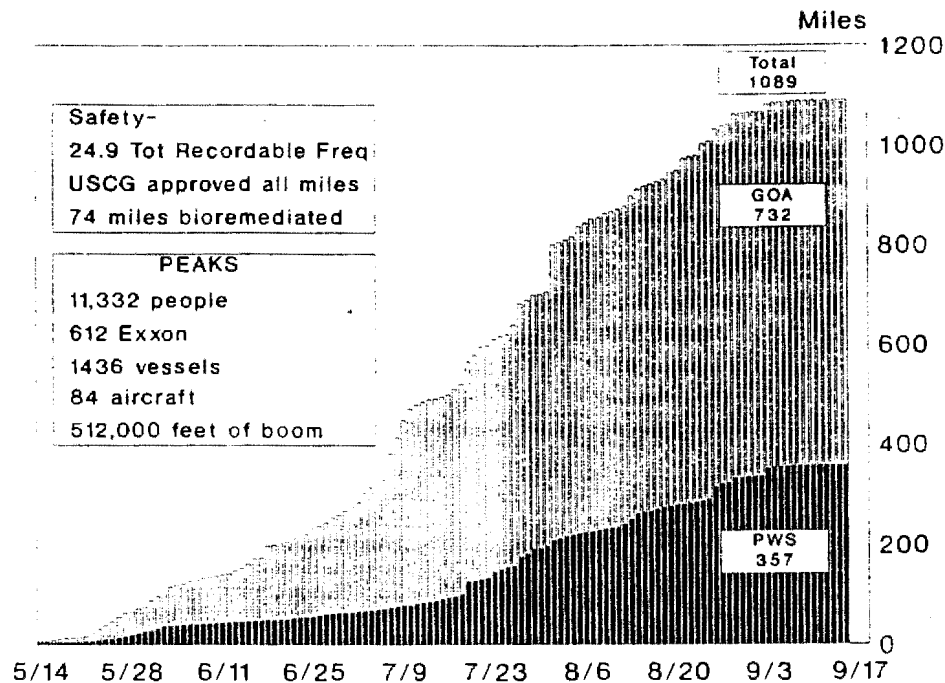


Figure 6. Graph of 1989 shoreline cleanup progress

Dr. Jerry M. Neff, a Battelle scientist, reported that average aromatic hydrocarbon concentrations in the waters of Prince William Sound had remained well below State of Alaska standards. Over 2,300 water samples were taken from the sound and all had shown consistently low hydrocarbon levels since April of 1989. In most cases, the levels were 10 to 1,000 times below the concentrations found to cause harm to marine animals. In addition, he concluded, "It is extremely unlikely that hydrocarbon concentrations resulting from the spilled oil have had or will in the future have any adverse effects on plants and animals living below the surface in the water column of Prince William Sound, including commercial fishery species."²

This judgment was confirmed by the fact that commercial fishermen realized highly successful catches in 1990, including a record-setting pink salmon harvest in Prince William Sound. Moreover, field observations confirmed a large number and diversity of birds, otters, and other mammals thriving in the spill-impacted area. Given the 10 million seabirds and 12,000 otters in the affected area and their natural resiliency, all species were expected to recover rapidly.

Spring and summer 1990

The major objective of studies conducted over the winter was to assess the need for additional work and to make plans to conduct whatever activities were needed in the spring and summer of 1990. While winter storms and tidal actions further cleaned the shorelines, particularly those exposed to higher and moderate wave energy, some areas required additional cleaning and Exxon performed that task over the summer.

The 1990 cleanup focused on techniques that were least intrusive to the recovering environment while achieving the desired results. Over-

all, the objective was to complete the appropriate cleanup work in a way that provided a further net benefit to the environment, minimized the negative impacts on wildlife, did not interfere with fishing, and enhanced the natural recovery that had already begun.

Consistent with these goals, principal cleanup methods used in 1990 included manual oil removal, tar-mat removal, spot washing, tilling and raking, and bioremediation. Some 1,000 people and 70 vessels were involved in the 1990 cleanup operation, which re-treated 10 to 15 percent of the total shoreline mileage treated in 1989.

The U.S. Coast Guard monitored day-to-day shoreline operations, with extensive technical support from the National Oceanic and Atmospheric Administration (NOAA). The professionalism and technical and operating expertise provided by these key government agencies were an important factor in the success of the 1990 effort.

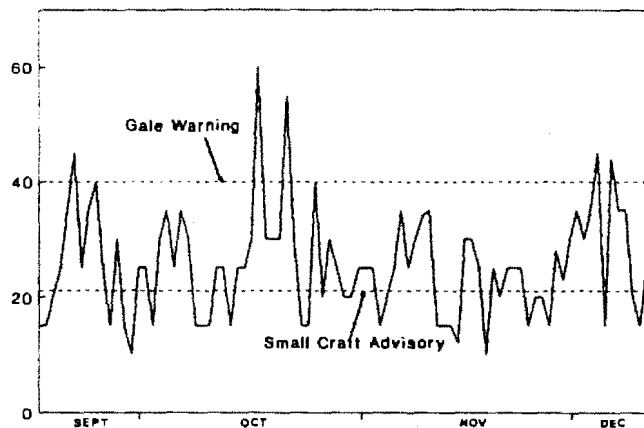
A joint shoreline assessment program was conducted in August 1990 to identify sites for possible re-treatment in 1990 and to recommend priority sites for reassessment in 1991.

It's expected that by the spring of 1991, few areas will remain with any significant oil and there will be no visible oil or stains on areas treated in 1990. Isolated pockets of subsurface oil will likely still remain, particularly in wave-sheltered areas. However, NOAA concluded in July 1990 that "deeply buried subsurface oil . . . poses little risk of causing further significant environmental injury."³

Lessons learned

As difficult as the spill and cleanup experience has been, it has yielded some important lessons about the management of such a crisis. That better advance preparation is needed for what to do when such an emergency occurs is obvious. The American petroleum industry has

Prince William Sound



Gulf of Alaska

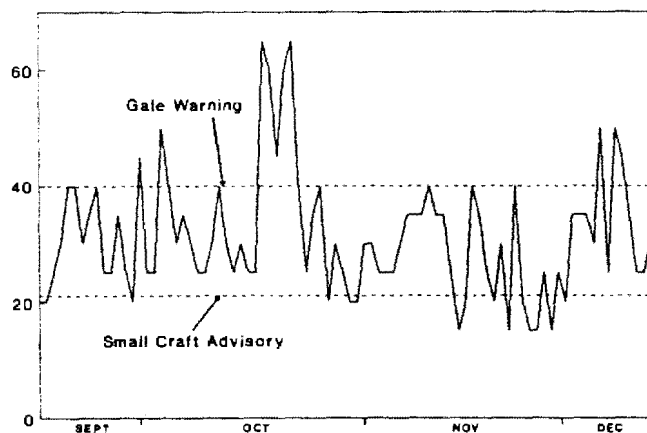


Figure 7. Graphs of 1989 winter wind speeds in knots

already taken this to heart in a plan for a series of response bases located along the coasts of the United States—the Petroleum Industry Response Organization, or PIRO. The proposed equipping and manning of these bases will be at a level far exceeding anything seen before.

Similar measures are adopted at the terminal operator Valdez, which as stockpiled additional boom, barges, and other spill-related equipment.

In addition, interim steps have been taken regarding vessel transit in and out of the port of Valdez. These include escorts and extending the distance from port during which a pilot must be onboard.

In the event of a spill, however, putting added resources to effective use is not an automatic process. Timely, effective action—the kind needed in an emergency—cannot be taken by committees. When several groups with different priorities and differing views about what should be done jointly face an urgent need for action, too often the outcome is conflict and no action at all—or, at best, a lowest common denominator approach. The larger interest tends to get lost in the give and take. Someone who can weigh the issues, cut through the disagreements, and force timely action must clearly be in charge. Most logically, that someone should be the U.S. Coast Guard.

Another area for close examination is the pre-approval of cleanup technology. Clearly, dispersants are the key to responding to a large spill, and their use must be cleared *in advance*—as if often done in Europe—if timely and effective action is to be taken. The same is true concerning the use of chemical cleaners, and even the more basic methods such as warm-water washing. Unfortunately, in the case of the *Valdez* spill, chemical cleaners were approved only in tests, and heated wash water temperatures were approved only in increments.

While speed and decisiveness are critical to effective spill response, the procedures in place in the United States are hardly conducive to either. Federal, state, and local authorities—as well as industry—have to develop a more effective response procedure in the event of an emergency. When it comes to a crisis, the federal government, which is best positioned to have the necessary technical expertise and to balance the diverse interests of the myriad of local, state, and national agencies involved, must have clear authority and the confidence to act decisively.



Figure 8. Seagulls off Green Island, April 1990

Changes within Exxon

Exxon has taken a number of specific steps to reduce the risk of oil spills and to strengthen cleanup capabilities.

Procedures have been revised concerning employee substance abuse to require random testing of employees in designated safety-sensitive positions, such as certain refinery and chemical plant operators, tanker officers, aircraft pilots, and tank truck drivers. No one who has, or has had, a dependency will be permitted to occupy such a position.

Exxon operating units in the United States and foreign affiliates have reviewed their oil spill prevention plans and response capabilities and have increased the amount of response equipment at their marine terminals. Collision warning systems for tankers are being upgraded with more sophisticated, integrated bridge navigation systems. Additional remotely-operated pipeline block valves have been installed where lines cross rivers or sensitive areas. Oil storage has been eliminated in exposed wing tanks of the Exxon offshore processing vessel in

California. And the frequency of vessel inspections of Exxon's fleet has been increased to as much as twice per year.

In addition, a new senior executive level position of Corporate Vice President, Environment and Safety, has been created to further assure that Exxon's environmental responsibilities are fulfilled.

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