November 12, 1992 Author: Sanford P. Rabinowitch

OPTION

#1 Archaeology Resource Protection

APPROACH CATEGORY

Management of Human Uses

INJURED RESOURCES AND SERVICES

Archaeological sites and artifacts

SUMMARY

(Need to merge this with other sub-option text)

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.

Studies have also show that oiled artifacts are not accurately dated by the established "carbon 14" procedure. Thus, artifacts recovered from oiled sites require additional costly cleaning to accurately gain information about their date of origin.

SUBOPTION

(A) Site Steward Program

TARGET RESOURCES AND SERVICES

Archaeological sites and artifacts

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.

IMPLEMENTATION ACTIONS

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.

TIME NEEDED TO IMPLEMENT

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. ***(Need to double check with PI to confirm)***

MEANS 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.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Archaeological sites and artifacts are protected under federal law by the Archaeological Resources Protection Act of 1971, 16 USC 470, and under state law by the Alaska Historic Preservation Act, Alaska Statute 41.35.010. Both state and federal agencies which manage land within the spill area have professional archaeologists on their staffs. These agencies include: 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. Some, but not all of these agencies, have law enforcement staffs (i.e. park rangers) who have law enforcement duties which encompass archaeology resources.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

This section to be developed_____What are agencies doing with arch program in the area because of the spill?_____ What were they doing before the oil hit? Is their any conflict with site steward program and these programs?_____

TECHNICAL FEASIBILITY

The project is technically feasible. Similar programs have been developed and used in the State of Arizona. A pilot program was developed in Kodiak, Alaska, but never implemented for lack of adequate funding.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

Because archaeology resources can not recover in the biological sense, we can only strive to lesson and/or stop the continuing

damage. 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

Environmental

None anticipated

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. 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 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.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

Most of the looting and vandalism documented is attributed to oil spill clean up activity.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Two other options appear to be capable of accomplishing the same objectives as the site stewardship program. The first is to hire local citizens as full time employees to do the work. The second option would be to significantly increase state and federal agencies's more centralized law enforcement staffs to do the patrolling work.

Legal Considerations

Consistency with 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. Archaeological sites and artifacts are protected under federal law by the Archaeological Resources Protection Act of 1971, 16 USC 470, and under state law by the Alaska Historic Preservation Act, Alaska Statute 41.35.010. Statute 41.35.010

Permits required

Valid research by non-government archaeologists is allowed on public lands under the terms and conditions of (permit XYZ, state/federal)_____ .

NEPA compliance

Archaeological research projects are subject to compliance with NEPA. Some work may be "categorically excluded" from this requirement depending upon the exact nature of the work proposed. As projects are proposed in the future, each agency should consult their compliance specialists to determine the requirements for NEPA compliance.

Additional/new legislation or regularity actions

For the benefit of cultural resources, including historical and archaeological resources defined in the Archaeological Resources Protection Act of 1971, the National Historic Preservation Act of 1966, as amended, and the Alaska Historic Preservation Act, the Comprhensive Environmental Response, Compensation, and Liability Act (Superfund), as amended, 42 U.S. C. A. 9601 could be amended to include these cultural resources. The amendment would add, to Section 101 (16) the words "cultural resources." The effect of such a change would be to clearly express that cultural resources, both those of historic and pre-historic times are contained in the list of resources that Trustees are responsible for. (I will work to sharpen this text up).

MEANS TO EVALUATE SUCCESS

State and federal land managing agencies participating in the program will continue to monitor archaeological sites for vandalism. The site steward program will issue an annual report,

to the Trustees, which reviews program activities and presents program results.

REPRESENTATIVE COSTS

(The following information is copied from the Trustee approved 1992 project for site stewards, items with ** could be cut out in future years -- I am checking with PIs)

Personal Services (Salaries and Benefits)

Project Coordinator Range 18L	6 months	$ 36,100
Education Specialist GS-11	4 Months	$ 14,800
Archaeologist GS-9	3 Months	$ 9,300
Archaeologist GS-12	1 Month	$ 5,200
Subtotal	14mm=1.2FTE	$ 65,400

Travel (Airfare and Per Diem)

**	Two persons, round trip to Phoenix, 5 days (To study Arizona program)	$ 2,141
**	Two persons, round trip to Kodiak, 2 days (To study KANA program)	$ 1,232
	Three persons, round trip to each of Kodiak, Seward, Homer, and Cordova, 2 days each (Public meetings)	$ 5,031
	Two persons two round trips to each of Kodiak, Seward, Homer, and Cordova, 2 days each (Site steward coordination and quality control)	$ 6,946
	Subtotal, Travel	$ 15,350

Supplies

Disposable cameras (3/steward, 50 stewards)	$ 2,250
Baseball Caps w/logo (50)	$ 500
Miscellaneous office supplies, film, etc.	$ 1,500
Subtotal, Supplies	$ 4,250

Equipment

**Camera, lenses, and case (project coordinator)	$ 1,500
**Laptop personal computer (project coordinator)	$ 2,500
Subtotal, Equipment	$ 4,000

Contractual

Film processing	$ 2,000
Charter aircraft (20 hours @ 250/hour)	$ 5,000
Training material production	$ 16,000
Contracts with Native corporations and community groups to provide local logistical and service support to stewards and project staff	$ 23,000
Subtotal, Contractual	$ 46,000
Total, Site Stewardship	**$135,000**
**** potential deletions from above**	**(7,373)**

ADDITIONAL INFORMATION NEEDED

None need

CITATIONS

* An Evaluation of Archaeological Injury Documentation Exxon-Valdez Oil Spill, M. Jesperson 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 re: Superfund amendment (get copy of Jerry Rodger's memo on subject)

* personal communication, Susan Morton, 257-2559, review text and provided comments

opt1.005

November 12, 1992 Author: Karen Klinge (UPDATED)

SUBOPTION B **Increase the field presence of management agencies within the affected area to provide greater protection for archaeological sites and artifacts.**

TARGET RESOURCES AND SERVICES Archaeological sites and artifacts

DESCRIPTION

Archaeological sites are located throughout the oil spill area. Because of the remote locations and the distances between these sites, managing agencies are limited in their ability to provide extensive field presence. Increased staff capability and frequencies of patrols would ensure greater compliance to existing Federal and State laws which currently provide protection to archaeological sites and would deter looters who are currently vandalizing and looting sites at an unprecedented rate. In addition, increased field presence by the managing agencies will allow for greater education opportunities discussed in Suboption C.

IMPLEMENTATION ACTIONS

Hire, train and equip additional staff to monitor activities at sensitive areas (archaeological sites) and to provide information to the commercial and recreational users of the areas.

Purchase boats (if needed) and other equipment necessary for the field work.

TIME NEEDED TO IMPLEMENT

The time required to hire and train personnel (both new and existing) will vary greatly depending on the existing skills of the employees.

Hiring new employees can generally be accomplished in a 6-9 month period.

Federal law enforcement training, if necessary, takes 9 weeks and is only offered in autumn.

Training non-archaeologists on key elements would take from a week to several months depending on the depth of knowledge required. (Need info. on ARPA training)

Acquire/purchase necessary equipment and supplies could take several months depending on the purchase (i.e. boat vs. office supplies)

MEANS TO IMPROVE RECOVERY

Continued vandalism and looting has been documented at archaeological sites since the oil spill. The large numbers of people involved in cleanup and response activities made the locations of these sensitive areas known to looters and vandals. Increased field presence by the agencies would help reduce continuing damage to these sites.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Archaeological sites and artifacts are protected under federal law by the Archaeological Resources Protection Act of 1971, 16 USC 470, and under state law by the Alaska Historic Preservation Act, Alaska Statute 41.35.010. Most state and federal agencies which manage land within the oil spill area have professional archaeologists who coordinate agency work to limit impacts on sites.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Some of the agencies within the oil spill areas have regular patrols (NPS) while others do not (USFS and USFWS). Increased field presence/law enforcement will be important for other resources - especially as restoration projects are implemented.

TECHNICAL FEASIBILITY

Increased field presence by the Trustee agencies is feasible. Personnel trained in law enforcement and knowledgeable about archaeology would be able to ensure greater compliance to laws.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

Looting and vandalism is known to have occurred at 19 of 35 sites studied within the oil spill area. An additional 16 are suspected to have been looted. Most of the agencies responsible for these archaeological sites have inadequate, or non-existant field presence to enforce the protection regulations. Simply knowing that an agency person is in the area, may deter people from collecting (looting) artifacts.

INDIRECT EFFECTS

The indirect environmental effects of increased field presence would help ensure that other restoration projects are undisturbed.

Indirect socio-economic effects are unknown, however some

expenditures in small communities would be expected and there may be opportunities for hiring local residents.

Normal risks to human health and safety that are associated with boat and aircraft travel and extended field work.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

Many of the other options and suboptions consider regulatory changes which would be much more effective with additional law enforcement capabilities. For example: Option 4, Suboption C may establish permanent buffer zones around sensitive areas, if that suboption is implemented it will be important to have adequate law enforcement capabilities.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Option 7 promotes an increased field presence for the impacted agencies, but it is not focused on archaeology. Archaeology is a logical component of option 7.

LEGAL CONSIDERATIONS

Consistency with the settlement. This suboption is consistent with the terms of the civil settlement that address archaeological sites and artifacts.

Agencies with management/regulatory responsibilities. Depending on the specific sites involved the land management agency (e.g. DNR, NPS, USFS or USFWS), and the Bureau of Indian Affairs. The Alaska Division of Parks and Outdoor Recreation has responsibilities for resources beyond the borders of state owned land.

Permits required. No permits would need to be obtain to implement any action in this suboption.

NEPA compliance. The actions described in this suboption should be "categorically excluded" from the NEPA process, however as work plan projects are proposed they should be reviewed for compliance.

Additional/new legislative or regulatory actions. None necessary.

MEANS TO EVALUATE SUCCESS

Continued monitoring of archaeological sites will determine the level of looting and vandalism. A photographic record of each site may help in this process.

REPRESENTATIVE COSTS

There are 8 different Federal and State parks (combining several of the state parks), refuges and forests in the spill affected area. Assume we support 1 FTE/year for each, at the lower level funding for law enforcement personnel (Technician level).

Salary: $40,000/year/agency ($320,000 total)
Boat maintenence: $1,500/boat/year = $12,000
Fuel: $50,000 (from 1991 law enforcement proposal)
Field supplies: 7,000
TOTAL: $390,000

[NOTE: A 1991 proposal for cultural resource protection asked for a $200,000 per annum budget. The following costs were described:

6 seasonal GS-5s for 8 pp	43,000
Equipment	7,000
Aircraft and Boats	100,000
Fuel	50,000

If Law Enforcement Training has to be provided the cost increases by $12,000 per person trained (for Federal Training).

ADDITIONAL INFORMATION NEEDS

SUBOPTION C Expand public education efforts

TARGET RESOURCES AND SERVICES Archaeological sites and artifacts

DESCRIPTION

Expand public education programs to inform the public of the significance and legal status of archaeological sites (e.g. legal protection against looters) and of the value of these sites as a part of Alaska's cultural heritage. The public should be aware of the cumulative impacts of weathering from the environment, oiling and looters. The education program would include publications (brochures/posters), other interpretive displays (video, displays, broadcast messages?), meetings and coordinating volunteer efforts. The program would distribute materials to the public through interpretive centers, schools and in affected villages.

IMPLEMENTATION ACTIONS

Determine which media (e.g. video, radio, displays, brochures, or through direct conversations with interpreters) would most effectively convey the message to the different audiences.

Create and distribute brochures and posters on the value of archaeological sites and artifacts and on the impacts of the oil spill on these non-renewable resources.

Coordinate agency archaeologists or Restoration representatives to conduct meetings at villages within the oil spill area to provide information. (This could include expanding the Alaska Archaeology Week program to affected communities.)

Coordinate public involvement with archaeology projects such as providing tours or using volunteers at digs.

Expand on-going interpretive programs to include archaeological information.

TIME NEEDED TO IMPLEMENT

Development of an education/interpretive plan should take about 6 months to complete.

The type of media selected will influence the time needed to implement this program.

Creating/distributing brochures and posters, could be easily accomplished in a 6 month period[1].

Coordinating and conducting meetings at concerned villages could be completed in a month or two but these should be an annual event until the desired behavioral changes are accomplished.

Other public involvement through tours or at digs could be implemented in a couple of month period, and should continue periodically over several years.

MEANS TO IMPROVE RECOVERY

Damage to archaeological sites and artifacts continue to occur as sites are looted and/or vandalized. Inherently, these sites and artifacts are non-renewable resources. Looting often occurs by individuals who may only take one or two small artifacts from a site. When this process is expanded to include many people and

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[1]Based on using a private printing company to create brochures/posters. If they were responsible for everything but picture and text selection, it could be done in 2 weeks.

the adverse impacts of weathering and continued oiling, it places the sites at risk. Any measure that can be taken to reduce human-induced damage would be beneficial. Informing people that a violation to the law (ARPA) that results in damages to a site or trade in artifacts over $500.00 is a felony offense may be particularly effective.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Archaeological sites and artifacts are protected under federal law by the Archaeological Resources Protection Act of 1971, 16 USC 470, and under state law by the Alaska Historic Preservation Act, Alaska Statute 41.35.010. Most state and federal agencies which manage land within the oil spill area have professional archaeologists who coordinate agency work to limit impacts on sites.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

The Chugach National Forest has recently adopted an education/interpretive program called "Pastport in Time (PIT)" which uses volunteers for excavation work. This is a National program. Further information is in the RPWG files. [J. Mattson 271-2513]

TECHNICAL FEASIBILITY

Education programs designed to lessen human impacts on natural resources have been successfully implemented by several agencies and organizations. For example:

> USFWS education campaign to gain support from subsistence hunters to harvest fewer geese in the spring was successful in changing the harvest level (Sue Mathews 235-6961). [Note: Sue Mathews said not to expect significant behavioral changes until approximately 5 years after a program was initiated.]

Volunteers are often used at archaeological digs and other scientific projects. An example of a formal volunteer involvement program would be EARTHWATCH.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

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. Education, and public involvement/ownership, can be an effective method to

lessen continuing impacts by people.

"Public education is the most cost effective approach to protect archaeological resources from the risk of looting brought about by the oil spill. It is important to implement this project as soon as possible. Unlike the situation with natural resources where the passage of time will assist recovery of the resources, the passage of time in this case will only increase the threat to the resources as information about these sites spreads through the local population and damages become cumulative." (From the NPS 1991 restoration proposal R2)

INDIRECT EFFECTS

Indirect environmental effects could include a decrease in other vandalism activities which occur on public lands.

It is possible that providing a greater sense of value towards archaeological artifacts could backfire if the public perceives an economic gain in acquiring artifacts. Great care would be taken to minimize this perception.

Indirect socio-economic effects would include a greater appreciation for the value of archaeological sites and artifacts as a part of our history.

Effects on human health and safety should be minimal.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

Option 10 would initiate excavation and restoration projects (i.e. erosion prevention measures) which could be used to involve the public through volunteer activities.

Option 35 is aimed at retrieving artifacts taken from the oil spill area, either legally or illegally. An education program would help encourage people to return items which they may have collected over the years.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Option 33 develops a comprehensive public information and education program which could cover these same objectives. This option also considers constructing or expanding existing visitor facilities/education centers. It may be appropriate to consider some of these activities specifically for archaeology.

LEGAL CONSIDERATIONS

Consistency with the settlement. The settlement specifically

identifies archaeological sites and artifacts as appropriate for restoration monies.

Agencies with management/regulatory responsibilities. The primary agencies with land management responsibilities within the oil-spill area include DNR, NPS, USFS, and USFWS. The Alaska Division of Parks and Outdoor Recreation has responsibilities for resources beyond the borders of state owned land. None of the agencies have adequate funding to support necessary law enforcement at archaeological sites.

Permits required. No permits should need to be obtained to implement any action in this suboption.

NEPA compliance. These types of activities are generally considered to be categorically excluded. However, should construction of new facilities be recommended, an EA or EIS would have to be completed.

Additional/new legislative or regulatory actions. None necessary.

MEANS TO EVALUATE SUCCESS

Monitoring the level of vandalism at sites would indicate whether this program, and companion protection programs are successful. Anecdotal information from surveying visitors and local residents would also indicate the success of these programs.

REPRESENTATIVE COSTS

The USFWS spent an average of $100,000/year on educational development and printing in their campaign to reduce the spring harvest of geese on the Y-K Delta.

Brochures: $2,500 for first 1000 tri-folds, $150.00 for additional thousand. Estimated costs ranged from $3,000 to nearly $4,000 for first 1000, 8.5 X 5.5" brochures with additional printings between $300-600 dollars.
Posters: $1000 for first 1000
Training costs: $1000/person
Salary (new hires): $40,000/yr/person (probably less)
Office supplies: 2,000/yr/agency
TOTAL: $100,000 - 200,000 (depending on the level of field time and volunteer involvement).

ADDITIONAL INFORMATION NEEDED

October 9, 1992 Authors: Ken Chalk/Chris S.

OPTION 2: Increase Fisheries Management

APPROACH CATEGORY: Management of Human Uses

INJURED RESOURCES AND SERVICES: Pink salmon, sockeye salmon, herring, rockfish, Dolly Varden, cutthroat trout, and the resources and services which depend on these species were injured by the spill.

SUMMARY

Existing fisheries management programs are based on varying amounts of scientific data. For example, more is known about intensively managed species, such as salmon, than about rockfish, which have historically not been a management focus. However, in all cases, additional data would greatly improve existing managment practices. More refined fisheries management could speed the natural recovery of injured stocks by restricting existing fisheries or redirecting them to alternative sites, while attempting to minimize impacts on human uses.

Successful restoration management depends on the ability to more precisely control stock-specific exploitation rates. Restoration based on stock-specific management requires varying amounts of additional data for different species. In general, though, any additional research would have to focus on stock characteristics such as age and size composition, natural mortality rates, seasonal movements, stock abundance and recruitment. Separation of discrete stocks through genetics research and other studies is also needed. Based on the data, the Alaska Department of Fish and Game will make management recommendations to the Board of Fisheries, which has the power to implement them in the form of new fishing regulations. Costs involved with this option are variable. Data acquisition and plan implementation would take about two years.

IMPLEMENTATION ACTIONS

- Acquire necessary biological data on population structure and dynamics, seasonal movements and stock separation for injured species. The amount and exact focus of research will vary by species.

- Develop a management plan based on this data that addresses specific restoration actions through redirection or restriction of harvests.

- Make specific recommendations to the Board of Fisheries for regulations on harvest quotas, seasons, gear types, harvest area closures, etc. to accomplish management objectives.

- When necessary, implement emergency closures to

accomplish management objectives.

- Monitor and evaluate the effectiveness of management plans in achieving targeted harvest rates and population levels of injured species.

TIME NEEDED TO IMPLEMENT

Implementation of upgraded management plans could take up to two years. This includes field research, data analysis, and plan preparation and review. Monitoring of plan efficacy would continue beyond initial implementation.

MEANS TO IMPROVE 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.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Management of fisheries within waters of the State of Alaska is authorized under the following selected state statutes:

- Title 16 - Fish and Game: Sec. 16.05.050-16.43.950.
- 5 AAC 01 to 5 AAC 39.
- 20 AAC 05.120

However, these authorities cannot be effectively applied without sufficient biological data upon which to base management decisions.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Management and restoration activities will affect commercial, sport and subsistence uses of the injured stocks. Some areas may be temporarily closed to fishing. Fishing effort may shift to other areas as healthy populations are identified.

TECHNICAL FEASIBILITY

Fisheries management plans are regularly written and implemented, but must be based on sufficient biological data to be properly defined. Various amounts of data are needed to develop management plans for different species. For instance, little is known about rockfish and considerable work will have to be done before they can be effectively managed.

Also, information about rockfish is difficult to obtain without causing additional damage to already injured populations. Traditional long-line and trawl surveys usually kill the fish they catch. Non-intrusive, non-lethal methods of monitoring, such as the use of un-manned submersibles, will need to be implemented if that situation is to be avoided.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

There are considerable fishing pressures on injured throughout the spill area. For instance, commercial fisheries are often mixed-stock fisheries that harvest both injured and healthy stocks. If fisheries can be redirected through intensified management and selectively target only healthy stocks, injured stocks will have a better chance of recovery.

INDIRECT EFFECTS

There will be socio-economic impacts to commercial, sport and subsistence fishermen if areas are closed to protect injured stocks or opened in areas 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.

RELATIONSHIP TO OTHER EVOS RESPONSE RESTORATION ACTIONS

The overall recovery monitoring program will determine the effectiveness of the increased fisheries management on population and ecosystem levels. Also, management plans will have to take into account other, concurrent fishery restoration options such as establishing new fish runs.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

None

LEGAL CONSIDERATIONS

1) Consistency with settlement: Enhanced regulatory protection of injured resources can establish restoration objectives through direct restoration or enhancement. Restoration and enhancement are consistent with the terms of the settlement.

2) Agencies with regulatory/management authority: ADF&G has regulatory and management oversight of fish and shellfish within state waters and can implement emergency closures of fisheries. The Board of Fisheries is responsible for making all regulations regarding fisheries.

3) Permits required: ADF&G permits would be required for

sampling of all biological material.

4) NEPA compliance: Since this action is an intensification of ongoing state management activities, it is unlikely that any NEPA documents will be required.

5) Requirements for new legislative/regulatory actions: New regulatory actions may be necessary to open or close seasons or fishing areas to protect injured stocks. The Board of Fisheries may adopt regulations it considers advisable in accordance with the Administrative Procedures Act (AS 44.62) for:

- establishing open and closed seasons and areas for the taking of fish
- setting quotas, bag limits, harvest levels, and sex and size limitations on the taking of fish
- establishing the means and methods employed in the pursuit, capture and transport of fish
- classifying as commercial fish, sport fish, personal use fish, subsistence fish, or predators or other categories essential for regulatory purposes.

MEANS TO EVALUATE SUCCESS

Project level monitoring will be conducted to determine if management plans are achieving stated goals and are accurately targeting healthy stocks and decreasing use pressures on injured stocks. The status of injured populations will be monitored by the overall restoration monitoring program.

REPRESENTATIVE COSTS

Variable

ADDITIONAL INFORMATION NEEDS

The Trustee Council needs to finalize the list of injured resources and services.

CITATIONS

Ken Chalk, ADF&G, pers. comm.
Joe Sullivan, ADF&G, pers. comm.

Ken Chalk/Chris S.

OPTION 2B: Increase management for fish and shellfish that previously did not require intensive management

APPROACH CATEGORY: Management of Human Uses

INJURED RESOURCES AND SERVICES: Rockfish, Dolly Varden, cuthtroat trout and the resources and services dependent on these species

PROPOSED ACTION

The objective of this option is to develop and implement fishery management plans for rockfish, Dolly Varden and cuthtroat trout. The management plans will establish harvest levels, times and areas that are appropriate to allow for recovery from oil-spill injuries.

SUMMARY

Prior to the oil spill, fishing pressures did not require comprehensive management plans for some fish species. This was true for rockfish, Dolly Varden and cutthroat trout. The directed harvest and bycatch of rockfish increased significantly in 1990 and 1991 because fishing efforts were shifted from salmon and herring to rockfish. Rockfish and similar species are of particular concern because they are long-lived and slow growing and population declines tend to be extremely long-lasting. Overharvest could greatly exacerbate oil-spill injuries. Recreational fishing for Dolly Varden and cutthroat trout was curtailed following the oil spill because of stock conservation concerns. Without the appropriate information of which to base management actions, injury may continue to already-depressed stocks. Development and implementation of comprehensive management plans will aid the recovery of these resources by ensuring that human uses are consistent with the status and productivity of post-spill populations.

DESCRIPTION

The development and implementation of a comprehensive management plan for these injured resources will:

- facilitate recovery of these populations to pre-spill conditions.
- provide baseline information against which the effectiveness of restoration activities will be measured.
- help determine when these injured resources are appropriately restored.
- establish an ecological baseline for the injured

populations against which future disturbances can be evaluated.

- improve our ability to manage injured resources and services in the future.

IMPLEMENTATION ACTIONS

- identify, measure and monitor the important physical, chemical and biological properties which will establish an ecological baseline for injured populations.
- identify and evaluate latent injuries to populations.
- develop and implement a management plan that addresses natural recovery as well as specific restoration actions.
- monitor populations to determine if and when injured resources return to pre-spill conditions.
- monitor other components of the ecosystem to document long-term trends in the health of the injured populations.
- evaluate the effectiveness of restoration activities to assure the public that we did what we said we would do.

TIME NEEDED TO IMPLEMENT

Plan preparation will take approximately two years for rockfish and one year for Dolly Varden and cutthroat trout. This include field research, data analysis, and plan preparation and review.

MEANS TO IMPROVE RECOVERY

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 healthier ones as the preferred method of restoring these injured populations. The sampling and monitoring programs, designed and implemented as part of the management plan, will be based on non-destructive sampling methods. The monitoring program will identify where natural restoration activities may be inappropriate and determine when recovery is delayed. In such cases, active restoration measures will be implemented.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Management of fisheries within waters of the State of Alaska is authorized under the following selected state statutes:

- Title 16 - Fish and Game: Sec. 16.05.050-16.43.950.
- 5 AAC 01 to 5 AAC 39.

- 20 AAC 05.120

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Management and restoration activities will affect present commercial, sport and subsistence uses of the injured resources. Some areas may be closed to fishing at times. Fishing effort may shift to other areas as healthy populations are identified.

TECHNICAL FEASIBILITY

Considerable information is needed to develop management plans, including data on commercial, sport and subsistence catches, to describe age and size composition, natural mortality rates, general seasonal movements, stock abundance and recruitment. Separation of discrete stocks through genetic and other studies are also needed to enable management to target on specific populations rather than on a broad-scale basis.

Information about bottomfish populations is difficult to obtain without causing serious additional damage to already injured populations. Traditional long-line and trawl surveys usually end in death to these kinds of fish. New non-intrusive, non-lethal methods of monitoring will need to be developed and implemented if that situation is to be avoided.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

A management plan directing fishing pressure away from injured stocks is an effective restoration option that will greatly improve our ability to facilitate natural recovery of injured populations. Monitoring is necessary to evaluate how well natural recovery is occurring.

INDIRECT EFFECTS

There could be significant adverse effects on bottomfish populations depending on the methods used to gather baseline information and monitoring of restoration efforts. Only non-destructive, least-intrusive methods will be used where possible.

There will be socio-economic impacts to commercial, sport and subsistence users when certain areas are closed to protect injured stocks or opened in areas not previously fished.

RELATIONSHIP TO OTHER EVOS RESPONSE RESTORATION ACTIONS

Development and implementation of a successful management plan requires a well-designed monitoring effort to determine the effectiveness of the restoration options employed.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

LEGAL CONSIDERATIONS

Permits would be required for sampling of all biological material.

New regulatory actions may be necessary to open or close seasons or areas to protect injured stocks. The Board of Fisheries may adopt regulations it considers advisable in accordance with the Administrative Procedures Act (AS 44.62) for:

- establishing open and closed seasons and areas for the taking of fish and shellfish.
- setting quotas, bag limits, harvest levels, and sex and size limitations on the taking of fish and shellfish.
- establishing the means and methods employed in the pursuit, capture and transport of fish and shellfish.
- classifying as commercial fish, sport fish, personal use fish, subsistence fish, or predators or other categories essential for regulatory purposes.

MEANS TO EVALUATE SUCCESS

Periodic assessments will be conducted to determine if plans, projects and related activities are implemented as designed and in compliance with the management plan, restoration plan, and a comprehensive and integrated monitoring strategy.

REPRESENTATIVE COSTS

ROCKFISH MANAGEMENT PLAN

Salaries:		
Management Biologist	24 work months	$150.0
Project Leader	36 work months	225.0
Field Technicians	192 work months	640.0
Genetics Technicians	36 work months	120.0
Biometrician	18 work months	94.5
Clerical support	18 work months	102.0
Travel/per diem		
Plan preparation/review		40.0
Vessel charter	200 days	520.0

Fixed-wing charter	200 hours	100.0
Scientific equipment		40.0
Equipment rental:		
Remotely-operated vehicle	200 days	600.0
	Subtotal	$2,631.5
Administrative Overhead/Coordination @15%		304.7
Contract administration @ 5%		30.0
	TOTAL	$2,966.2

INTENSIFY MANAGEMENT OF DOLLY VARDEN/CUTTHROAT TROUT

Salaries:		
Management Biologist	12 work months	$75.0
Project Leader	18 work months	112.5
Field Technicians	30 work months	100.0
Genetics Technicians	12 work months	40.0
Biometrician	12 work months	63.0
Clerical support	12 work months	34.0
Travel/per diem		40.0
Remote camp costs		150.0
Vessel charter:	50 days	65.0
Fixed-wing charter:	50 hours	12.5
Scientific equipment:		10.0
	Subtotal	$702.0
Administrative Overhead/Coordination @ 15%		105.3
	TOTAL	$807.3

ADDITIONAL INFORMATION NEEDS

Considerable information is needed to develop management plans, including data on commercial and sport catches to describe age and size composition, natural mortality rates, general seasonal movements, stock abundance and recruitment. Separation of discrete stocks through genetic and other studies are also needed to enable management on a targeted rather than broad-scale basis.

CITATIONS

November 12, 1992 Author: Catherine Berg

OPTION 3 Restrict or eliminate legal harvest of marine and terrestrial mammals and sea ducks.

APPROACH CATEGORY Management of Human Use

INJURED RESOURCES AND SERVICES Sea Otter, Harbor Seal, Brown Bear, River Otter, and Harlequin Duck.

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 affects 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.

Sport harvest of ducks and bears and commercial harvest of river otters is managed by the Alaska Department of Fish and Game. Subsistence harvest of marine mammals, migratory birds, and big game on Federal land in managed by the U.S. Fish and Wildlife Service. The Marine Mammal Protection Act of 1972 placed a moratorium of harvesting marine mammals, including sea otters and harbor seals. An exemption for Alaska Natives allows take for subsistence. Harlequin ducks and other sea ducks are protected under the Migratory Bird Treaty Act.

Temporary restriction or closure of harvest of the injured species on the oil-spill area 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. Changes could include complete closure for the season, adjusting seasonal openers, or reduction of bag limits. The Trustees could also recommend that subsistence users be encouraged to voluntarily limit their take of marine mammals and sea ducks instead of changing subsistence regulations. Changes in State harvest regulation would require up to 90 days or 24-48 hours in an emergency closure. Sport and subsistence hunters would be indirectly adversely impacted by Trustee recommendations for harvest reductions or closures.

The potential to improve recovery or enhance the resource through reduction or closure of harvest depends and the species being

discussed. For example, with brown bears, it is not known exactly what impacts the oil spill will have on brown bear populations. If populations are substantially affected, then restrictions on sport harvest could potentially improve recovery by reducing or eliminating a source of mortality. The same would be true for river otters, especially in western Prince William Sound where trapping is prevalent and it is believed that otters were substantially impacted in this area. In the case of sea otter and harbor seals, although it is known that both these species were impacted by the spill, it is not known to what extent these species are harvested so that a reduction in harvest may potentially have a minimal affect on improving recovery. With Harlequin ducks, timing of the harvest would potentially benefit the species equally or more so than reduction of bag limits. 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 benefit the resident birds by eliminating a source of mortality during a time when only resident birds are present.

SUBOPTION

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 Harlequin Duck.

DESCRIPTION

Subsistence users could be encouraged to voluntarily limit their take of sea otters, harbor seals, and harlequin ducks. 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 Department of Fish and 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.

IMPLEMENTATION ACTIONS

-- recommend that ADF&G close or limit sport harvest of brown bear

-- recommend that ADF&G close or limit commercial and subsistence trapping of river otter

-- recommend that ADF&G close harlequin duck season in the spill zone, reduce sport and subsistence bag limits of harlequin duck, or limit harlequin duck season within the spill zone.

-- Trustee agency encourage subsistence users to voluntarily reduce harvest of sea otter, river otter, harbor seal, and harlequin ducks.

-- Fish and Wildlife Service limit subsistence harvest of river otter and harlequin ducks on Federal lands.

TIME NEEDED TO IMPLEMENT

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. (Jim Lieb, Dept. of Wildlife Conservation, 267-2261.)

Visiting with the villagers to encourage voluntary reduction of harvest would require 30 to 60 days for correspondence, planning, and scheduling.

MEANS 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.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

The Marine Mammal Protection Act of 1972 placed a moratorium of harvesting marine mammals, including sea otters and harbor seals. An exemption for Alaska Natives allows take for subsistence.

Harlequin ducks are protected under the Migratory Bird Treaty Act.

Sport harvest of ducks and bears and commercial harvest of river otters is managed by the Alaska Department of Fish and Game. Subsistence harvest of marine mammals, migratory birds, and big game on Federal land in managed by the U.S. Fish and Wildlife Service.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Harvest regulations are created the Alaska Department of Fish and Game, Board of Game on a bi-annual basis. Recommended changes to

temporarily restrict of close harvests of injured species in the oil spill zone could be proposed during this time.

TECHNICAL FEASIBILITY

It would be technically feasible to recommend changes to ADF&G and USFWS harvest regulations.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

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

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. Therefore, it is difficult to judge how much a voluntary decrease in subsistence harvest would improve recovery of marine mammal species.

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.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

Harvest restrictions would be related to restoration projects including education and recreation enhancement including:
8(b); 12(a,b); 33(a)

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

LEGAL CONSIDERATIONS

MEANS TO EVALUATE SUCCESS

Animal populations for which harvest is restricted or eliminated would have to be monitored on a yearly basis to see if numbers are increasing.

REPRESENTATIVE COSTS

ADDITIONAL INFORMATION NEEDED

CITATIONS

November 12, 1992 Author: Karen Klinge

SUBOPTION B Educate public to encourage voluntary reductions of commercial, sport and subsistence 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 programs 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.

IMPLEMENTATION ACTIONS

Develop education program which would identify area-specific populations that would provide the greatest benefits to the recovery of the injured species within the oil spill area.

Determine which media (e.g. video, displays, brochures, or through direct conversations with interpreters) would most effectively convey the message to the different audiences.

Create and distribute brochures and posters on the oil spill and on the ways which people can minimize impacts on the recovery resources.

Coordinate biologists or Restoration representatives to conduct meetings at villages within the oil spill area to provide updated information on the recovery of the subsistence resources.

Explore opportunities for village residents to assist biologists on research and restoration projects.

TIME NEEDED TO IMPLEMENT

Development of an education/interpretive plan should take about a year to complete.

The type of media selected will influence the time needed to implement this program.

Creating/distributing brochures and posters, could be easily accomplished in a 6 month period[1].

Coordinating and conducting meetings at concerned villages could be completed in a month or two but these should be an annual event until the targeted populations are nearly recovered.

MEANS 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. Many of these people 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.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

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 lands (private?). Subsistence regulations do not include designated harvest levels for otters and harbor seals in the oil-spill area.

Brown bear harvests are regulated by ADF&G which establishes harvest limits by management area.

Harlequin ducks can only be hunted during waterfowl hunting seasons set by ADF&G. Last year, ADF&G designated an emergency closure on hunting harlequins in PWS until after September when resident birds are joined by migrants from other breeding areas. Harlequin ducks are also protected under the Migratory Bird Treaty Act.

Fur trapping season occurs from to . Individual trappers are not designated to specific areas, however the annual regulations can close specific areas to harvesting. These closures are made by the ADF&G Board of Game which meets bi-annually.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Alaska Department of Fish and Game currently has an education program for hunters and conducts periodic censuses to determine the

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[1]Based on using a private printing company to create brochures/posters. If they were responsible for everything but picture and text selection, it could be done in 2 weeks.

subsistence harvest.

TECHNICAL FEASIBILITY

Education programs designed to lessen human impacts on natural resources have been successfully implemented by several agencies and organizations. For example:

> USFWS education campaign using posters and calendars to gain support from subsistence hunters to harvest fewer geese in the spring (Sue Mathews 235-6961).

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

Sea otter, harbor seals, brown bears, river otters and harlequin ducks are all harvested through either subsistence or commercial/recreational programs. These species may have a slower recovery rate because of continued human use.

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.

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).

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 tradional activity. Although this impact 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. (Needs to be reworded)

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 .

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Option 4 develops an educational program designed to reduce disturbance to marine birds and mammals. These same brochures would be applicable for this suggested program.

Option 30 will need to educate subsistence users on the results of the hydrocarbon studies. These programs should be coordinated.

Option 33 develops a comprehensive public information and education program which could cover these same areas.

LEGAL CONSIDERATIONS

Consistency with the settlement. Yes

Agencies with management/regulatory responsibilities. ADF&G regulates 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. 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.

Permits required. No permits should need to be obtained to implement any action in this suboption.

NEPA compliance. These activities are generally categorically excluded from a detailed NEPA process.

Additional/new legislative or regulatory actions. None necessary.

MEANS TO EVALUATE SUCCESS

Monitoring the population levels of the targeted species, as well as the reported subsistence levels will evaluate this option.

REPRESENTATIVE COSTS

I am still working on this!

[Jim- what sort of costs are associated with your subsistence census?]

The USFWS program on the Yukon-Kuskokwim Delta spent approximately $100,000/year on educational development and distribution.

Personnel:
Travel: $500/trip (how many villages?)
Training:

ADDITIONAL INFORMATION NEEDED

CITATIONS

November 12, 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.

Opt#5.001

OPTION 5: Reduce harvest by redirecting sport fishing pressure

APPROACH CATEGORY: Management of Human Uses

INJURED RESOURCES AND SERVICES: Dolly Varden and coastal cutthroat trout

PROPOSED ACTION

Prepare and implement a fisheries management plan that includes some or all of the following alternatives:

- close oiled streams in Prince William Sound;
- redirect recreational fishing to non-oiled streams and drainages; and
- reduce creel limits in the affected area.

SUMMARY

Spill-related injuries to Dolly Varden and coastal cutthroat trout resulted in a loss of sport fishing opportunities in Prince William Sound. Both of these species are important components of recreational fisheries in this area. Moreover, because the affected population of cutthroat trout is at the extreme northern limit of its geographic range, it is important to protect the genetic integrity of this population. Management strategies in use at the time of the oil spill are not adequate to protect injured stocks from further degradation or to restore them to pre-spill conditions.

The proposed action is designed to manage this recreational fishery in a manner that would direct fishing pressure away from impacted stocks, maintain sport fishing opportunities and, at the same time, conserve the unique gene pool of wild stocks.

DESCRIPTION

The development and implementation of comprehensive programs for the management of these injured resources will:

- minimize further injury to the stocks.
- facilitate recovery of these populations to pre-spill conditions.

- provide baseline information against which the effectiveness of restoration activities will be measured.

- help determine when these injured resources are appropriately restored.

- establish an ecological baseline for the injured populations against which future disturbances can be evaluated.

- improve our ability to manage injured resources in the future.

IMPLEMENTATION ACTIONS

- identify the geographic distributions of injured populations.

- identify, measure and monitor the important physical, chemical and biological properties which will establish an ecological baseline for the affected populations.

- identify and evaluate latent injuries to populations.

- develop and implement a management plan that addresses natural recovery as well as specific restoration actions.

- monitor populations to determine if and when injured resources return to pre-spill conditions.

- monitor other components of the ecosystem to document long-term trends in the health of the injured populations.

- evaluate the effectiveness of restoration activities to assure the public that the actions taken were appropriate.

TIME NEEDED TO IMPLEMENT

Dolly Varden/Cutthroat Trout Management Plan

Field operations for data collection: April 1993 - December 1994.
Data analysis: December 1993 - March 1994.
Plan preparation and review: October 1993 - April 1994.
Plan implementation: April 1994.
Recovery monitoring: April 1994 - December 1996.

Monitoring of recovery will be an important part of each of these management plans. 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.

MEANS TO IMPROVE RECOVERY

When specific stocks have been identified and the health of these stocks determined, sport and subsistence fishing pressure will be directed away from injured stocks and toward healthier ones as the preferred method of restoring these injured populations. The sampling and monitoring programs, designed and implemented as part of the management plan, will be based on non-destructive, non-invasive sampling methods where appropriate to avoid further injury to populations. The monitoring program will identify where natural restoration activities may be inappropriate and determine when recovery is delayed. In such cases, active restoration measures will be developed and implemented.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

The Exxon Valdez oil spill settlement agreement approved on October 8, 1991 specifies that restoration funds must be spent to restore injured natural resources and services.

Monitoring the condition of a resource under restoration is an allowable cost in the U.S. Department of the Interior's proposed revisions to the Natural Resource Damage Assessment Regulations found in the Comprehensive Environmental Response, Compensation, and Liability Act of 1908 (U.S. Department of the Interior, 1991).

Restoration monitoring 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 actions were taken to restore the damaged resource; 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.

Management of fisheries within waters of the State of Alaska is authorized under the following selected state statutes:

- Title 16 - Fish and Game: Sec. 16.05.050-16.43.950.
- 5 AAC 01 to 5 AAC 39.
- 20 AAC 05.120

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Management and restoration activities will affect present sport and subsistence uses of the injured resources. Some areas may be

closed to fishing at times. Fishing effort may shift to other areas as healthy populations are identified.

TECHNICAL FEASIBILITY

Considerable information is needed to develop management plans, including data on sport and subsistence catches, to describe such population characteristics as age and size composition, natural mortality rates, general seasonal movements, stock abundance and recruitment. Separation of discrete stocks through genetic and other studies is also needed to enable management to target on specific populations rather than on a broad-scale basis.

Most, if not all of the proposed restoration and monitoring activities will have their basis in the response, damage assessment, and restoration science studies conducted earlier. Additional restoration and monitoring approaches will be based on a proven ability to effectively document recovery of injured resources. Management plans and their restoration options 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

A management plan directing fishing pressure away from injured stocks is an effective restoration option that will greatly improve our ability to facilitate natural recovery of injured populations. Monitoring is necessary to evaluate how well natural recovery is occurring. Intensifying present levels of management will require a concerted effort if these injured stocks are to be restored rapidly.

INDIRECT EFFECTS

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. 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 significantly above their present level and continue until the populations recover 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 planes.

RELATIONSHIP TO OTHER EVOS RESPONSE RESTORATION ACTIONS

Development and implementation of a successful management plan requires a well-designed monitoring effort to determine the effectiveness of the restoration options employed.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Complete closure of all sport and subsistence fishing could allow the populations to recover naturally. Without a well-designed monitoring effort, however, we will not know if the populations are, in fact, recovering.

LEGAL CONSIDERATIONS

Restoration of injured resources is required by the settlement. Development and implementation of a restoration monitoring program is mandated by the National Environmental Policy Act of 1969, as amended.

The State of Alaska Department of Fish and Game has regulatory and management oversight of fish and shellfish within state waters.

Permits would be required for sampling of all biological material.

New regulatory actions may be necessary to open or close seasons or areas to protect injured stocks. The Board of Fisheries may adopt regulations it considers advisable in accordance with the Administrative Procedures Act (AS 44.62) for:

- establishing open and closed seasons and areas for the taking of fish and shellfish.
- setting quotas, bag limits, harvest levels, and sex and size limitations on the taking of fish and shellfish.
- establishing the means and methods employed in the pursuit, capture and transport of fish and shellfish.
- classifying as commercial fish, sport fish, personal use fish, subsistence fish, or predators or other categories essential for regulatory purposes.

MEANS TO EVALUATE SUCCESS

Periodic assessments will be conducted to determine if plans, projects and related activities are implemented as designed and in compliance with the management plan, restoration plan, a comprehensive and integrated monitoring strategy and the National Environmental Policy Act of 1969, as amended.

REPRESENTATIVE COSTS

INTENSIFY MANAGEMENT OF DOLLY VARDEN/CUTTHROAT TROUT

Salaries:		
Management Biologist	12 work months	$75.0
Project Leader	18 work months	112.5
Field Technicians	30 work months	100.0
Genetics Technicians	12 work months	40.0
Biometrician	12 work months	63.0
Clerical support	12 work months	34.0
Travel/per diem		40.0
Remote camp costs		150.0
Vessel charter	50 days	65.0
Fixed-wing charter	50 hours	12.5
Scientific equipment		10.0
	Subtotal	$702.0
Administrative Overhead/Coordination @ 15%		105.3
	TOTAL	$807.3

ADDITIONAL INFORMATION NEEDS

Results from recovery monitoring studies will provide timing data for management actions. Results of survey and inventory studies will provide locations for alternative sport and subsistence fishing opportunities. Stock status data on Dolly Varden and cutthroat trout populations will aid in the development of the management plan.

Improved population modeling, application of genetic and other techniques to separate stocks, and other research and monitoring studies are needed to support intensified fisheries management.

CITATIONS

7Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (U.S. Department of the Interior, 1991).

Department of the Interior. 1991. "43 CFR Part II - Natural Resource Damage Assessments; Notice of Proposed Rulemaking."

Federal Register 56 (82) 19752-19773.

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

November 12, 1992 Auth[illegible]ren Klinge

SUBOPTION B **Use public education to encourage conservation for sport-fishing.**

TARGET RESOURCES AND SERVICES Dolly Varden and cutthroat trout

DESCRIPTION

This suboption describes implementing or expanding an education program to accompany any change in sport-fishing regulations designed to lessen the impact on injured populations. If catch-and-release regulations are established, fishing clinics, brochures and meetings with sport-fishing groups would encourage compliance with the new regulations and demonstrate the proper technique to reduce injury to the fish.

IMPLEMENTATION ACTIONS

Develop education plan, or expand the existing catch-and-release program, to encourage compliance to catch-and-release or closure regulations.

Coordinate closely with Alaska Department of Fish and Game (ADF&G) sport-fish division and Aquatic education program.

Establish meetings with recreational organizations/clubs to provide information.

Conduct sport-fishing clinics in Cordova, Valdez, Seward and Anchorage to demonstrate catch-and-release techniques.

Provide a greater distribution of the existing catch-and-release brochures (ADF&G) and video (USFWS). Develop new brochures, if necessary, that deal specifically with oil-spill impacts.

TIME NEEDED TO IMPLEMENT

Coordinate with existing programs by Alaska Department of Fish and Game to develop or expand programs for the oil-spill area. This should take 3-9 months depending on the applicability of the existing programs.

Schedule and conduct 1/2 - 1 day catch-and-release clinics in the

major sport-fishing communities in the oil-spill area (3 months?).

Design and distribute information about new regulations to sport fishermen (6-9 months).

MEANS TO IMPROVE RECOVERY

Enforcement of fishing regulations throughout the oil-spill area is nearly impossible due to the large geographic area with numerous fishing streams. Even within Prince William Sound compliance with regulations is essentially voluntary. Education programs are effective means to increase the compliance to regulations. Catch-and-release practices still provide enjoyment to many fishermen while limiting the impact on the fish populations. Many people would be willing to use catch-and-release techniques if regulations were established and they were convinced of the need to prevent further loss to specific populations. Providing information on new regulations and demonstrating low-impact fishing techniques would help fishermen enjoy the areas without slowing recovery.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Alaska Department of Fish and Game regulates sport-fishing activities in the oil-spill area and produces and annual booklet of regulations.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Cutthrout trout fishing in Prince William Sound is currently closed to sport-fishing as a result of the oil spill.

The Alaska Department of Fish and Game has an aquatic education program which encourages catch-and-release practices (Talk with John Lymen (465-4180).

TECHNICAL FEASIBILITY

All aspects of this option are technically feasible. Catch-and-release programs are used throughout the country.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

Cutthroat trout in Prince William Sound are at their most northern and western extent of their range. Damage Assessment studies have found reduced growth and poor survival rates for the adult trout returning to freshwater to spawn. Sport-fishing could cause additional losses to these populations that would slow recovery.

Sport-fishing in Prince William Sound generally focuses on salmon and halibut with relatively low pressure on cutthroat trout. Dolly

Varden are generally not targeted by sport-fishermen but are often caught while fishing for trout or salmon.

INDIRECT EFFECTS

Indirect environmental effects could include a more rapid recovery of injured species, and perhaps to nontarget species (through lessened disturbance).

Indirect socio-economic effects would potentially cause a reduction in sport-fishing opportunities in some areas. This would cause a corresponding decrease in revenue to communities and stores which supply the fishermen. However, current sport-fishing pressure on cutthrout trout and Dolly Varden is thought to be light.

Effects on human health and safety should be minimal.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Option 33 develops a comprehensive public information and education program which could cover sport-fishing.

LEGAL CONSIDERATIONS

Consistency with the settlement. This is consistent with the settlement and can also be applied to other areas and species under the equivalent resources clause.

Agencies with management/regulatory responsibilities. Alaska Department of Fish and Game has regulatory responsibility over the fish populations. The land management agencies (such as US Forest Service and National Park Service) have responsibilities for fish habitat within their lands.

Permits required. No permits need to be obtained to implement any action in this suboption, unless fishing clinics are conducted.

NEPA compliance. These activities are generally categorically excluded from NEPA.

Additional/new legislative or regulatory actions. None necessary.

MEANS TO EVALUATE SUCCESS

The monitoring program will document population changes. A census

of sport fishermen would provide a qualitative evaluation of a catch-and-release program.

REPRESENTATIVE COSTS

Personnel to design materials and conduct fishing clinics: (0.25-0.5 FTE?): $10,000 - 20,000
Travel (3 trips @ $500.00): $1,500
Posters: $1000 for first 1000
Office supplies: 2,000/yr
Total: $15,000-25,000 (This seems high.)

ADDITIONAL INFORMATION NEEDED

November 12, 1992 Author: Karen Klinge

OPTION 7: Increase management in parks, refuges and forests.

APPROACH CATEGORY Management of Human Uses

INJURED RESOURCES AND SERVICES

Coastal habitat, archaeological sites, wildlife, fisheries and recreation within State and Federal parks and refuges.

SUMMARY

There are many parks and refuges scattered throughout the oil-spill area. Because of the size and location of these areas, managing agencies are limited in their ability to provide an extensive field presence. Interpretive services and other educational aids would help educate the public about the oil spill and explain how they can minimize their chances of impeding resource recovery. It may be desirable to increase the staff capability and frequency of patrols to ensure that human use activities are conducted in a manner that safeguards the recovery potential of injured resources.

SUBOPTION A Educate public about minimizing their impacts on recovering resources.

TARGET RESOURCES AND SERVICES

Coastal habitat, wildlife, fisheries and recreation within State and Federal parks and refuges.

DESCRIPTION

Personnel working in new or existing interpretive centers would be provided with additional training on the effects of the oil spill and the sensitive populations or project sites within their agency's jurisdiction. In addition, these interpreters or representatives of the Trustee agencies would meet in person with recreational organizations/clubs to provide information. These aids and meetings would inform the public of the specific areas that need special treatment because of injuries suffered during the oil spill. Information on local policy or regulations and on environmentally sound practices will be provided to boaters, pilots, guides and other recreational users.

IMPLEMENTATION ACTIONS

Develop education plan which would identify if or where additional personnel may be needed and determine which media would most effectively convey the message to the public (e.g. video, displays, brochures, or through direct conversations with interpreters).

Create and distribute brochures and posters on the oil spill and ways which people can minimize impacts on the recovery resources.

Conduct meetings with recreational organizations/clubs to provide information.

TIME NEEDED TO IMPLEMENT

Development of an education/interpretive plan should take about a year to complete.

Hiring and training new personnel would take approximately 9 months.

Determine which media (eg. videos, displays, broadcasts etc...) would most effectively convey the message to the public.

The type of media selected will influence the time needed to implement this program.

Creating/distributing brochures and posters, and meetings with appropriate clubs could be easily accomplished in a 6 month period[1].

MEANS TO IMPROVE RECOVERY

Because of the requirements of the litigation process, many of the recreational and commercial users of the oil-spill area are unaware of the extent of the injuries. Many of these people would be willing to change their use patterns if they were convinced of the value of reducing further insult to specific resources. Providing information on alternative areas for kayaking or fishing etc... or on low-impact practices would help users enjoy the areas without slowing recovery or change their use patterns until recovery has occurred.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

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[1]Based on using a private printing company to create brochures/posters. If they were responsible for everything but picture and text selection, it could be done in 2 weeks.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Many of the State and Federal public lands have existing visitor centers and interpretive centers. These programs may already include oil-spill components.

Some agencies have developed education programs which include oil-spill components (eg. the Chugach National Forest), we could consider providing additional funding, or focus on a more 'oil-spill wide' program. Regardless, efforts should be made to coordinate the programs to prevent conflicting information.

TECHNICAL FEASIBILITY

This option is technically feasible. Education programs designed to lessen human impacts on natural resources have been successfully implemented by several agencies and organizations. For example:

USFWS education campaign using posters and calendars to gain support from subsistence hunters to harvest fewer geese in the spring (Sue Mathews 235-6961).

NPS conducts an annual tour-boat operators workshop in Seward. Through this series they have successfully gained the cooperation of the tour-boat operators to reduce disturbances associated with "whale chasing" and at marine mammal haul-outs. (Anne Castellina 224-3874)

Visitor centers already exist in many areas which provide a wide range of information to the public.

USFS arrangement with the Alaska State Ferry system to include interpreters on ferry routes in southcentral AK.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

Many of the resources damaged by the oil-spill are popular recreation areas. These, in particular, may have a slower recovery rate because of continued human use. In many cases these resources could still provide the same services if additional care is taken by the users.

For instance: Kayakers may be encouraged to avoid camping on certain beaches which are known nesting areas for black oystercatchers, or they could be informed that they would cause less disturbance if they camped in upland areas.

Site specific restoration projects could be inadvertently damaged by recreational and commercial users unless they are informed in advance of the purpose and location of the projects.

INDIRECT EFFECTS

Indirect environmental effects could include a more rapid recovery of injured species, and perhaps to nontarget species (through lessened disturbance).

Providing site specific information to the public on the location of sensitive habitat sites or project sites could cause more disturbance, or vandalism, of these areas from curious people.

Indirect socio-economic 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 should be minimal.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Option 1 develops an educational program for archaeological sites and artifacts.

Option 4 develops an educational program designed to reduce disturbance to marine birds and mammals. These same brochures would be applicable for this suggested program.

Option 5 includes an education component intended to redirect sport-fishing pressure away from streams with injured fish populations.

Option 33 develops a comprehensive public information and education program which could cover these same areas.

LEGAL CONSIDERATIONS

Consistency with the settlement. This is consistent with the settlement.

Agencies with management/regulatory responsibilities. The primary agencies with land management responsibilities within the oil-spill area include DNR, NPS, USFS, and USFWS. NOAA/NMFS would be involved with marine based programs.

Permits required. No permits should need to be obtained to implement any action in this suboption.

NEPA compliance. These types of programs are generally categorically excluded from NEPA requirements.

Additional/new legislative or regulatory actions. None necessary.

MEANS TO EVALUATE SUCCESS

Surveys of users within the oil-spill area could be conducted. Because this option attempts to change use patterns to low-impact habits, it will be very difficult to measure. It may not be cost-effective.

REPRESENTATIVE COSTS

The interpretive plan which the Chugach National Forest is proposing is expected to cost $50,000 over a two year program for development.

A private consultant firm (Inside/Outside) said they typically take 3-4 days to develop a draft conceptual plan, at a cost between $2,000 and $3,000 (John Hanna 512-327-3438).

Brochures: $2,500 for first 1000 tri-folds, $150.00 for additional thousand. Estimated costs ranged from $3,000 to nearly $4,000 for first 1000, 8.5 X 5.5" brochures with additional printings between $300-600 dollars.
Posters: $1000 for first 1000
Training costs: $1000/pers
Salary (new hires): $40,000/yr (probably less)
Office supplies: 2,000/yr

Total Costs:

ADDITIONAL INFORMATION NEEDED

Information on ideal low-impact uses is needed to effectively implement this option. Specific areas and times in which birds and mammals are especially vulnerable to human disturbance are needed to for developing brochures etc...

CITATIONS

SUBOPTION B **Increase the field presence of management agencies within the affected area.**

TARGET RESOURCES AND SERVICES

Common and thick-billed murres, harlequin ducks, sea otters, harbor seals and killer whales.

DESCRIPTION

There are many parks, refuges and forests scattered throughout the oil-spill area. Because of the remote locations and the distances between sensitive areas, managing agencies are limited in their ability to provide extensive field presence. Increased staff capability and frequencies of patrols would ensure greater compliance to existing Federal and State laws which currently provide protection to resources recovering from the oil-spill. In addition, increased field presence by the managing agencies will allow for greater education opportunities which were discussed in Suboption A.

IMPLEMENTATION ACTIONS

Hire and train additional staff to monitor activities at sensitive areas (including fish, wildlife, recreation and archaeological sites) and to provide information to the commercial and recreational users of the areas.

Develop monitoring program to document the success of these activities.

TIME NEEDED TO IMPLEMENT

Hire and train personnel could take 6-9 months.

Acquire/purchase necessary equipment and supplies could take several months depending on the purchase (i.e. boat vs. office supplies)

MEANS TO IMPROVE RECOVERY

There are several studies which document the effects of human disturbance on the reproductive success of birds and marine mammals (citesome). Increased field presence by the agencies would help ensure that disturbance is minimized. In addition, illegal activities such as harassment of marine mammals, vandalism at recreation or archaeological sites, etc... would also be reduced. Reduced disturbance would result in increased reproductive success of fish and wildlife and would prevent further injury to other

resources. Vandalism and looting of archaeological sites has increased dramatically since the oil spill. Since these sites are non-renewable in the sense of biological populations, it is especially important to prevent further damage.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

The Marine Mammal Protection Act of 1972 prohibits any activity of vessels and aircraft which intentionally or negligently disturb or molest a marine mammal (50 CFR 216.3).

The Migratory Bird Treaty Act and the Bald Eagle Protection Act protects birds.

Archaeological sites and artifacts are protected under federal law by the Archaeological Resources Protection Act of 1971, 16 USC 470, and under state law by the Alaska Historic Preservation Act, Alaska Statute 41.35.010. Both state and federal agencies which manage land within the oil spill area have professional archaeologists who coordinate agency work to limit impacts on sites.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

The National Park Service has patrol boats in many of their parks. Most other land management agencies do not conduct regular patrols.

TECHNICAL FEASIBILITY

Increased field presence by the Trustee agencies is certainly feasible. Personnel trained in law enforcement and knowledgeable about the species, services and regulations would be able to ensure greater compliance to laws.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

An increased field presence of the Trustee agencies near sensitive wildlife areas would encourage greater compliance to State and Federal laws designed to protect wildlife from disturbance and harassment and other resources such as archaeological sites from vandalism. Reduced disturbance could increase the overall productivity of injured species.

Incidences of vandalism, wildlife harassment, or illegal harvesting are reported each year by the various agencies. For example, vandalism has occurred at 19 of 35 archaeological sites studies so far and it is suspected to have occurred at an additional 16 sites. Agencies do not have sufficient funding and staffing capabilities to send more personnel into the field.

INDIRECT EFFECTS

The indirect environmental effects could include increased populations of non-targeted species as well as populations injured by the oil-spill.

The increased field presence would also lessen the disturbance or vandalism of restoration project sites designed to enhance the recovery of fish and wildlife populations.

Indirect socio-economic effects would include a long-term gain in viewing opportunities for tourists as the wildlife approach their pre-spill population levels. Fishing opportunities should increase as the populations recover.

There are always risks to human health and safety when extended field work is required. However, these risks can and will be greatly reduced through proper training and equipment.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

Many of the other options and suboptions consider regulatory changes which would be much more effective with additional law enforcement capabilities. For example: Option 4, Suboption C may establish permanent buffer zones around sensitive areas, if that suboption is implemented it will be important to have adequate law enforcement capabilities.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

This is the only option that considers providing increased field-presence to protect all injured resources. Option 1 is focused on archaeological sites, Option 4 is related to marine bird and mammal concentration areas.

LEGAL CONSIDERATIONS

Consistency with the settlement. This suboption is consistent with the terms of the settlement aimed at restoring natural resources injured by the oil spill.

Agencies with management/regulatory responsibilities. Depending on the specific sites involved the land management agency (e.g. DNR, NPS, USFS or USFWS), the agency responsible for the target species (USFWS or ADF&G), and the Department of Water (?) would need to be involved.

Permits required. No permits would need to be obtain to implement any action in this suboption (verify).

NEPA compliance. These activities are generally categorically excluded from NEPA review.

Additional/new legislative or regulatory actions. None necessary.

MEANS TO EVALUATE SUCCESS

Field personnel will be able to gage the success of this option by the number and types of contacts they have with users in the oil-spill area.

REPRESENTATIVE COSTS

There are 8 different Federal and State parks, refuges and forests in the spill affected area. Assume we support 1 FTE/year for each, at the lower level funding for law enforcement personnel (Technician level).

Salary: $40,000/year/agency ($320,000 total)
Boat maintenence: $1,500/boat/year = $12,000
Fuel: $50,000 (from 1991 law enforcement proposal)
Field supplies: 7,000
TOTAL: $390,000

[NOTE: A 1991 proposal for cultural resource protection asked for a $200,000 per annum budget. The following costs were described:

6 seasonal GS-5s for 8 pp	43,000
Equipment	7,000
Aircraft and Boats	100,000
Fuel	50,000

If Law Enforcement Training has to be provided the cost increases by $12,000 per person trained (for Federal Training).

ADDITIONAL INFORMATION NEEDS

November 12, 1992 Author: Catherine Berg

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

APPROACH CATEGORY Management of Human Use

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.

Sport harvest of ducks and bears and commercial harvest of river otters is managed by the Alaska Department of Fish and Game. Subsistence harvest of marine mammals, migratory birds, and big game on Federal land in managed by the U.S. Fish and Wildlife Service; subsistence harvest on State and private lands are managed by Alaska Department of Fish and Game.

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. Changes could include complete closure for the season, adjusting seasonal openers, or reduction of bag limits.

Suboption B discusses an education program which would encourage voluntary reductions in subsistence harvest. The educational products created for this suboption could also be directed at commercial and sport harvest of brown bear, harlequin ducks and river otter; however, this is less likely to succeed unless it corresponds with regulatory restrictions discribed in suboption A.

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.

IMPLEMENTATION ACTIONS

-- recommend that the State Board of Game close or limit sport harvest of brown bear

-- recommend that the State Board of Game close or limit commercial and subsistence trapping of river otter

-- recommend that the State Board of Game close harlequin duck season in the spill zone, reduce sport and subsistence bag limits of harlequin duck, or limit harlequin duck season within the spill zone.

-- Trustee agency encourage subsistence users to voluntarily reduce harvest of sea otter, river otter, harbor seal, and harlequin ducks.

-- Fish and Wildlife Service limit subsistence harvest of river otter and harlequin ducks on Federal lands.

TIME NEEDED TO IMPLEMENT

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. (Jim Lieb, Dept. of Wildlife Conservation, 267-2261.)

Visiting with the villagers to encourage voluntary reduction of harvest would require 30 to 60 days for correspondence, planning,

and scheduling.

MEANS 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.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

The Marine Mammal Protection Act of 1972 placed a moratorium of harvesting marine mammals, including sea otters and harbor seals. An exemption for Alaska Natives allows take for subsistence.

Harlequin ducks are protected under the Migratory Bird Treaty Act.

Sport harvest of ducks and bears and commercial harvest of river otters is managed by the Alaska Department of Fish and Game. Subsistence harvest of marine mammals, migratory birds, and big game on Federal land in managed by the U.S. Fish and Wildlife Service.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Harvest regulations are created by the Alaska Department of Fish and Game, Board of Game on a bi-annual basis. Recommended changes to temporarily restrict of close harvests of injured species in the oil spill zone could be proposed during this time.

TECHNICAL FEASIBILITY

It would be technically feasible to recommend changes to ADF&G and USFWS harvest regulations.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

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

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. Therefore, it is difficult to judge how much a voluntary decrease in subsistence harvest would improve recovery of marine mammal species.

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.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

Harvest restrictions would be related to restoration projects including education and recreation enhancement including:

8(b); 12(a,b); 33(a)

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

LEGAL CONSIDERATIONS

Consistency with the settlement. 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.

Agencies with management/regulatory responsibilities. 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.

Permits required. No permits should need to be obtained to implement any action in this suboption.

NEPA compliance. These activities are generally categorically excluded from a detailed NEPA process.

Additional/new legislative or regulatory actions. None necessary.

MEANS TO EVALUATE SUCCESS

Animal populations for which harvest is restricted or eliminated would have to be monitored on a yearly basis to see if numbers are increasing.

REPRESENTATIVE COSTS

Unknown. This should mostly be administrative costs towards working with the appropriate agency's regulatory boards.

ADDITIONAL INFORMATION NEEDED

November 12, 1992 Author: Karen Klinge

SUBOPTION B Educate public to encourage voluntary reductions of commercial, sport and subsistence 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 programs 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.

IMPLEMENTATION ACTIONS

Develop education program which would identify area-specific populations that would provide the greatest benefits to the recovery of the injured species within the oil spill area.

Determine which media (e.g. video, displays, brochures, or through direct conversations with interpreters) would most effectively convey the message to the different audiences.

Create and distribute brochures and posters on the oil spill and on the ways which people can minimize impacts on the recovery resources.

Coordinate biologists or Restoration representatives to conduct meetings at villages within the oil spill area to provide updated information on the recovery of the subsistence resources.

Explore opportunities for village residents to assist biologists on research and restoration projects.

TIME NEEDED TO IMPLEMENT

Development of an education/interpretive plan should take about a year to complete.

The type of media selected will influence the time needed to implement this program.

Creating/distributing brochures and posters, could be easily accomplished in a 6 month period[1].

Coordinating and conducting meetings at concerned villages could be completed in a month or two but these should be an annual event until the targeted populations are nearly recovered.

MEANS 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. Many of these people 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.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

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 lands (private?). Subsistence regulations do not include designated harvest levels for otters and harbor seals in the oil-spill area.

Brown bear harvests are regulated by ADF&G which establishes harvest limits by management area.

Harlequin ducks can only be hunted during waterfowl hunting seasons set by ADF&G. Last year, ADF&G designated an emergency closure on hunting harlequins in PWS until after September when resident birds are joined by migrants from other breeding areas. Harlequin ducks are also protected under the Migratory Bird Treaty Act.

Fur trapping season occurs from to . Individual trappers are not designated to specific areas, however the annual regulations can close specific areas to harvesting. These closures are made by the ADF&G Board of Game which meets bi-annually.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Alaska Department of Fish and Game currently has an education program for hunters and conducts periodic censuses to determine the

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[1]Based on using a private printing company to create brochures/posters. If they were responsible for everything but picture and text selection, it could be done in 2 weeks.

subsistence harvest.

TECHNICAL FEASIBILITY

Education programs designed to lessen human impacts on natural resources have been successfully implemented by several agencies and organizations. For example:

> USFWS education campaign using posters and calendars to gain support from subsistence hunters to harvest fewer geese in the spring (Sue Mathews 235-6961).

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

Sea otter, harbor seals, brown bears, river otters and harlequin ducks are all harvested through either subsistence or commercial/recreational programs. These species may have a slower recovery rate because of continued human use.

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.

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).

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 tradional activity. Although this impact 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. (Needs to be reworded)

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 .

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Option 4 develops an educational program designed to reduce disturbance to marine birds and mammals. These same brochures would be applicable for this suggested program.

Option 30 will need to educate subsistence users on the results of the hydrocarbon studies. These programs should be coordinated.

Option 33 develops a comprehensive public information and education program which could cover these same areas.

LEGAL CONSIDERATIONS

Consistency with the settlement. Yes

Agencies with management/regulatory responsibilities. ADF&G regulates 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. 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.

Permits required. No permits should need to be obtained to implement any action in this suboption.

NEPA compliance. These activities are generally categorically excluded from a detailed NEPA process.

Additional/new legislative or regulatory actions. None necessary.

MEANS TO EVALUATE SUCCESS

Monitoring the population levels of the targeted species, as well as the reported subsistence levels will evaluate this option.

REPRESENTATIVE COSTS

I am still working on this!

[Jim- what sort of costs are associated with your subsistence census?]

The USFWS program on the Yukon-Kuskokwim Delta spent approximately $100,000/year on educational development and distribution.

Personnel:
Travel: $500/trip (how many villages?)
Training:

ADDITIONAL INFORMATION NEEDED

CITATIONS

November 12, 1992 Author: Karen Oakley

OPTION 9 Minimize incidental take of marine birds by commercial fisheries

APPROACH CATEGORY Management of Human Uses

INJURED RESOURCES AND SERVICES 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 (DeGange et al. in press). 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.

TARGET RESOURCES AND SERVICES

Common murres, marbled murrelets and other marine birds

DESCRIPTION

Mortality of marine birds in North Pacific high seas gillnet fisheries has been relatively well-studied through observer programs (Ainley et al. 1981, DeGange et al. in press, DeGange and Day 1991, DeGange et al. 1985, Fitzgerald et al. in press, Johnson et al. in press, Ogi 1984, Ogi et al. in press). 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.

Carter and Sealy (1984) studied mortality of marbled murrelets in a coastal gillnet fishery in Barkley Sound, British Columbia. The fishing season coincided with the murrelets' nestling period, and high density aggregations of fishing boats and feeding murrelets occurred. They documented where most of the murrelet mortality occurred and determined that the majority of mortality occurred during the night. Annual mortality due to gillnet entanglement was estimated at 8 percent of the fall population size. The authors concluded that mortality would be eliminated by excluding gillnets from a small area where feeding murrelets aggregated or by allowing only daylight fishing in that area.

Takekawa et al. (1990) documented a dramatic decline in the common murre population of central California between 1980 and 1986. They attributed a significant proportion of the population decline to gillnet mortality in the halibut, starry flounder and white croaker fisheries. The white croaker fishery was new, and effort in the halibut and starry flounder fisheries had increased as much as 400-500 percent. A Central California Gill and Trammel Net Program was instituted to monitor bycatch in the fisheries. Based on these bycatch studies, the California Department of Fish and Game estimated that 70,000 to 75,000 common murres were killed between 1979 and 1987. This mortality accounted for almost half of the murres lost from the central California population between 1980 and 1986. The case of the central California murres is one of the few where a strong link between gillnet mortality and a change in the population has been demonstrated. Public outcry over the bycatch resulted in legislative action to close certain areas in central California, including Monterey Bay, to gillnet fishing [for history of the politics involved in closing the fisheries see Atkins and Heneman (1987), Salzman (1989) and Takekawa et al. (1990)]

Within Alaska, the only studies of marine bird mortality in the *Exxon Valdez* spill area are those of Wynne et al. (1991) and Wynne et al. (in prep). These studies were carried out for the National Marine Fisheries Service which was charged, under Marine Mammal Protection Act amendments of 1988, with studying the incidental take of marine mammals in fisheries, classified as Category I fisheries, that were suspected of having a frequent incidental take of marine mammals. The studied fisheries included the Prince William Sound drift and setnet fisheries and the Alaska Peninsula drift fishery. Although the regulations implementing the 1988 amendments did not require collection of data on marine bird entanglement, the researchers included birds in the study with encouragement from the Fish and Wildlife Service.

Using observers on fishing boats, the incidence of marine mammal and bird entanglement and death was determined. 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. Murres and murrelets were the most frequently entangled and killed species. Extrapolating based on estimated fishing effort, Wynne et al. (in prep.) estimated that over 460 common murres 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 murres and marbled murrelets, however, were two marine bird species that the *Exxon Valdez* oil spill was believed

to have injured (Nysewander and Dippel 1991, Kuletz 1991). Previous work elsewhere has shown the potential vulnerability of these two marine bird species to gillnet mortality [murres in central California, Takekawa et al. (1990); murrelets in British Columbia, Carter and Sealy (1984)].

To implement this option, a research advisory committee would be formed to supervise research needed to determine the extent of marine bird mortality due to gillnets used in coastal fisheries in and adjacent to the *Exxon Valdez* oil spill area. If this research determines that marine bird gillnet mortality is significant, the committee would then investigate new technology and strategies for reducing encounters between marine birds and gillnets used in coastal fisheries. Once the effectiveness of any promising technologies was demonstrated, proposals to change fishing regulations would be made to the Alaska Board of Fisheries.

IMPLEMENTATION ACTIONS

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.

(3) Incorporate relevant methodologies and strategies to reduce encounters between marine birds and gillnets into State of Alaska fishery management plans until populations recover.

TIME NEEDED TO IMPLEMENT

This option will require several years to implement. The first step in implementing this option will be to determine the extent of marine bird mortality, and this step will take two to three years to complete. Research on new technologies, prior to determining the extent of the problem, would be premature. Once the basic research has been completed, the research and testing on new technologies could commence. If any promising techniques were developed, proposals to incorporate the techniques into the fishing regulations would be made to the Alaska Board of Fisheries. Changes to regulations are proposed and considered on an annual basis.

MEANS 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 cause of mortality. Gillnet mortality affects marine bird populations by killing birds and by reducing nesting success of breeding birds. This option, by eventually removing or eliminating an ongoing source of mortality, could reduce the time needed for injured marine bird populations to return to pre-spill levels.

A management plan directing fishing pressure away from injured marine bird habitats is an effective restoration option that will greatly improve our ability to facilitate recovery of injured populations.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

The incidental take of marine birds by fisherman deploying gillnets is a violation of the Migratory Bird Treaty Act. However, the U.S Fish and Wildlife Service has not generally enforced the provisions of the act with respect to entanglement of birds in coastal fishery gillnets (see Atkins and Heneman 1987). For this reason, reduction of gillnet mortality of marine birds will most likely be achieved through changes in State of Alaska fishing regulations or laws.

Management of fisheries within waters of the State of Alaska is authorized under the following selected state statutes:

- Title 16 - Fish and Game: Sec. 16.05.050-16.43.950.
- 5 AAC 01 to 5 AAC 39.
- 20 AAC 05.120

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Following the 1988 amendments to the Marine Mammal Protection Act, the National Marine Fisheries Service began research on bycatch in Category I fisheries, including the Prince William Sound and Alaska Peninsula salmon net fisheries. Based on studies in 1990 and 1991, the mortality to marine mammals in these fisheries is not "frequent" by Congressional standards, and these fisheries may therefore be appropriately classified as Category II fisheries (Wynne et al. 1991, Wynne et al. in prep.).

TECHNICAL FEASIBILITY

This option is technically feasible. This option 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.

In the high seas squid fishery, where many of the entangled birds are surface feeders, experiments with nets that are suspended one, two and three meters below the surface have shown that bird mortality (and squid catch) is decreased (Pat Gould, U.S. Fish and Wildlife Service, 786-3382). DeGange et al. (1985) estimated that by removing the lower portion of the nets, alcid mortality in the Japanese salmon mothership fishery would be reduced 18% with only an 8% reduction in fishing efficiency. (The mothership fishery has since been closed.) In the central California halibut, flounder and croaker fisheries, temporary seasonal and area closures were used in areas where high conflicts between birds and nets were predicted; unfortunately, these closures were ineffective at reducing seabird mortality (Atkins and Heneman 1987). In British Columbia, elimination of night fishing was suggested as a possible way to reduce mortality of murrelets in gillnets (Carter and Sealy 1984).

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.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

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.

INDIRECT EFFECTS

The indirect effects of implementing this option could include:

- 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.

Proposed changes to fishing regulations may be very controversial. Generally, gear changes to reduce bycatch also reduce fishing efficiency, and any changes to fishing regulations that decrease fishing efficiency, are controversial.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

This option will require monitoring of marine bird populations within the area affected by the *Exxon Valdez* oil spill. Thus, this option would support the need for continued monitoring as a part of the restoration plan. A comprehensive monitoring program is proposed as Option 31 under "Other Options."

This option involves commercial fisheries and is therefore related to the other options addressing commercial fisheries, including:

Intensify management of fish and shellfish
Increase management for fish and shellfish that previously did not require it
Replace fisheries harvest opportunities by establishing alternative salmon runs

This option also involves marine birds and is therefore related to several options addressing marine birds and marine bird habitats. These options include:

Designate protected marine areas
Designate or extend buffer zones for nesting birds

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Designation of the entire *Exxon Valdez* spill zone or portions of the spill zone as a marine sanctuary in which no gillnet fishing was allowed would achieve the same objective.

LEGAL CONSIDERATIONS

Implementation of this option may result in changes to existing State of Alaska laws and regulations.

MEANS TO EVALUATE SUCCESS

The success of this option will be determined by studies carried out as an integral part of the option. These studies will determine the magnitude of marine bird gillnet mortality within the spill areas. Reductions in the number of birds killed by gillnets would be considered successful. Long-term monitoring of marine bird populations in the spill area will be required to determine whether any reductions in gillnet mortality increase marine bird populations. Since many other factors affect marine bird populations, the effect of reducing gillnet mortality may be difficult or impossible to determine.

REPRESENTATIVE COSTS

The costs to research and implement this option may be $250,000 to $300,000 per year.

ADDITIONAL INFORMATION NEEDED

The basic information on the extent of the problem of marine bird gillnet mortality is essential to implementing this option.

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November 12, 1992 Author: Sanford P. Rabinowitch

OPTION

#10 Preservation of archaeological sites and artifacts

APPROACH CATEGORY

Manipulation of Resources

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 p476Xon 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. 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.

SUBOPTION

none

TARGET RESOURCES AND SERVICES

Archaeological sites and artifacts

DESCRIPTION

The purpose of this option is to conduct individual, site-specific restoration assessments at sites with documented injury, but where there is insufficient information upon which to determine appropriate treatment. The second objective 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. If an archeological inventory and evaluation project (see separate Archeological Inventory and Evaluation Project proposal) is approved as a parallel and complementary project, other individual sites that demonstrate clear evidence of injury can be added to the original number scheduled for treatment. The results would include the prevention of further injury and professional documentation on the restorative actions taken.

IMPLEMENTATION ACTIONS

Conduct individual restoration assessments at injured sites. Carry out appropriate restorative action.

TIME NEEDED TO IMPLEMENT

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 TO IMPROVE RECOVERY

Since archaeology artifacts can not, in a biological sense recovery from injury or looting, recovery will not be aided.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Archaeological sites and artifacts are protected under federal law by the Archaeological Resources Protection Act of 1971, 16 USC 470, and under state law by the Alaska Historic Preservation Act, Alaska Statute 41.35.010. Both state and federal agencies which manage land within the spill area have professional archaeologists on their staffs. These agencies include: 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. Some, but not all of these agencies, have law enforcement staffs (i.e. park rangers) who have law enforcement duties which encompass archaeology resources.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

This section to be developed_____What are agencies doing with arch program in the area because of the spill?_____ What were they doing before the oil hit? Is their any conflict with site

steward program and these programs?_____

TECHNICAL FEASIBILITY

Excavation and recording of sites is technically feasible. Such work has occurred throughout Alaska, including within the spill zone, many times before.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

Because archaeology resources can not recover in the biological sense, we can only strive to lesson and/or stop the continuing damage.

INDIRECT EFFECTS

Environmental

None anticipated

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.

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

None

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. Archaeological sites and artifacts are protected under federal law by the Archaeological Resources Protection Act of 1971, 16 USC 470, and under state law by the Alaska Historic Preservation Act, Alaska Statute 41.35.010. Statute 41.35.010

Permits required

Valid research by non-government (contract) archaeologists is allowed on public lands under the terms and conditions of (permit XYZ, state/federal)_____ .

NEPA compliance

Archaeological research projects are subject to compliance with NEPA. Some work may be "categorically excluded" from this requirement depending upon the exact nature of the work proposed. As projects are proposed in the future, each agency should consult their compliance specialists to determine the requirements for NEPA compliance.

Additional/new legislation or regularity actions

For the benefit of cultural resources, including historical and archaeological resources defined in the Archaeological Resources Protection Act of 1971, the National Historic Preservation Act of 1966, as amended, and the Alaska Historic Preservation Act, the Comprehensive Environmental Response, Compensation, and Liability Act (Superfund), as amended, 42 U.S. C. A. 9601 could be amended to include these cultural resources. The amendment would add, to Section 101 (16) the words "cultural resources." The effect of such a change would be to clearly express that cultural resources, both those of historic and pre-historic times are contained in the list of resources that Trustees are responsible for. (I will work to sharpen this text up).

MEANS TO EVALUATE SUCCESS

To insure proper conduct of the work, peer review of the project could be administered by the NSF's Division of Polar Programs.

REPRESENTATIVE COSTS

Only a very rough and tentative estimate of cost can be offered at this time. The estimated yearly cost is $300,000. ____Need to

breakdown costs_____

ADDITIONAL INFORMATION NEEDED

A restorative evaluation is now (6/92) underway that will provide a much more informed cost estimate. The preliminary results of this evaluation will be available by the end of August 1992. Final results will be available by early fall of 1992.

CITATIONS

* Ted Birkedal, NPS, Chief of Cultural Resources 257-2657

* "Site-Specific Archeological Restoration (Interagency)", June 1992, EVOS Trustee Council Restoration Ideas (1993)

Opt#11.001

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

APPROACH CATEGORY: Manipulation of Resources

INJURED RESOURCES AND SERVICES: Pink and sockeye salmon

PROPOSED ACTION

Construct or implement stream and lake improvements for the spawning and rearing of wild salmonids.

SUMMARY

There are a variety of techniques for improving or supplementing spawning and rearing habitats to restore and enhance the productivity of 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 estimate the amount of oiled spawning habitat. 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.**

TARGET RESOURCES AND SERVICES

Pink salmon in Prince William Sound and sockeye salmon populations of Kodiak Island.

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.

- increase egg-to-fry survival by a factor of 5 to 8 in egg boxes.
- double the fry-to-adult survival of fish reared in net pens.
- accelerate the pace of recovery to pre-spill conditions by increasing the number of returning spawners.
- mitigate for reduced runs of pink and sockeye salmon expected over the next several years.
- offset any persistent injuries sustained by fish stocks.
- reduce exploitation of damaged stocks in the fisheries.

IMPLEMENTATION ACTIONS

- construct streamside egg boxes where appropriate.
- conduct remote egg takes and incubate eggs in boxes to increase survival.
- capture outmigrant fry and rear in net pens to increase survival.
- coded-wire tag a representative group of outmigrant fry to evaluate project success.
- recover coded-wire tagged fish to provide the information fishery managers need to reduce exploitation of damaged stocks.

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 a log jams.

Improving access to spawning areas will mitigate injuries to wild stocks by:

- providing access to spawning habitat for wild sockeye and pink salmon to replace damaged habitat.
- providing increased rearing habitat for sockeye fry.
- decreasing competition for available spawning habitat.

IMPLEMENTATION ACTIONS

- identify specific opportunities to improve access to spawning and rearing areas by wild stocks of sockeye and pink salmon.
- acquire suitable habitat where appropriate.
- design, construct and maintain fish passes and other improvements.
- remove instream migration barriers such as log jams.
- monitor the effect of improvements, evaluate their effectiveness and revise where appropriate.
- Evaluate effectiveness of previously constructed fish passes to assure competent operations. Make necessary modifications to improve effectiveness.

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.

Improving spawning and rearing habitat will:

- Provide spawning habitat to pink and sockeye salmon to replace damaged habitat.
- Restore the natural productivity of lake ecosystems and their capacity to rear sockeye salmon fry.
- increase wild fish stocks by providing higher quality habitat for spawners and rearing fry.
- minimize socio-economic impacts of human uses by maximizing the use of available habitats.

IMPLEMENTATION ACTIONS

- identify stream and lake habitats having good potential for improvement.
- develop a plan for site-specific improvements.
- design, acquire landholdings where appropriate, construct and maintain improvements.
- apply chemical fertilizers to sockeye salmon rearing lakes to restore lake productivity.
- monitor the effect of improvements, evaluate their effectiveness and revise where appropriate.

TIME NEEDED TO IMPLEMENT

Suboption A

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.

Suboption B

Survey area to identify opportunities, develop plans, and acquire landholdings:
June 1993-October 1994.
Construct instream structures:
February 1995-October 1996.
Recovery monitoring: Begins June 1997.

Suboption C

Apply fertilizer annually and monitor ecosystem effect:
June 1993-October 1998
Recovery monitoring: Begins June 1995

Monitoring of recovery will be an important part of each of these 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.

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.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

The Exxon Valdez oil spill settlement agreement approved on October 8, 1991 specifies that restoration funds must be spent to restore injured natural resources and services.

Monitoring the condition of a resource under restoration is an allowable cost in the U.S. Department of the Interior's proposed revisions to the Natural Resource Damage Assessment Regulations found in the Comprehensive Environmental Response, Compensation, and Liability Act of 1908 (U.S. Department of the Interior, 1991).

Restoration monitoring 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.

Management of fisheries within waters of the State of Alaska is authorized under the following selected state statutes:

- Title 16 - Fish and Game: Sec. 16.05.050-16.43.950.
- 5 AAC 01 to 5 AAC 39.
- 20 AAC 05.120

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

This option is consistent with planned restoration of wild pink and sockeye salmon stocks injured by the oil spill.

TECHNICAL FEASIBILITY

Each of the methods discussed have been employed in other locations successfully for many years. State-of-the-art methods will be the preferred methods. Each restoration approach will be reviewed periodically. New approaches may be implemented as results are reviewed and interpreted and new information is gained from the scientific literature.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

Application of established fish stock enhancement techniques will produce predictable increases in stock productivity that will accelerate recovery and enhance the resource/service. Fry rearing and lake fertilization techniques can be implemented immediately, because appropriate sites have already been identified. Fry rearing will immediately accelerate pink salmon recovery resulting in

greater adult returns from damaged stocks one year after implementation. Lake fertilization will immediately boost lake productivity and increase sockeye salmon fry/smolt survival. Adult returns will increase 2-3 years after implementation. One year of survey work will be required before an area plan for fish pass and spawning channel construction can be implemented. One year of survey work has already been completed and several sites have been identified. Fish passes and spawning channels will result in increased adult returns 2-5 years after construction depending on the species of salmon involved.

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.

RELATIONSHIP TO OTHER EVOS RESPONSE RESTORATION ACTIONS

Fry rearing will involve application of coded-wire tags to outmigrating wild salmon fry. Recovery of coded-wire tags in adult fish will provide the information needed by fishery managers to reduce exploitation of damaged wild stocks. The increased stock productivity resulting from all these enhancement techniques will enable damaged wild stocks to recover without disrupting existing fisheries.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

There are no other restoration techniques that will accelerate stock recovery as effectively without disrupting existing fisheries.

LEGAL CONSIDERATIONS

Restoration of injured resources is required by the settlement. Development and implementation of a restoration monitoring program is mandated by the National Environmental Policy Act of 1969, as amended.

The State of Alaska Department of Fish and Game has regulatory and management oversight of fish and shellfish within state waters.

Permits would be required for sampling of all biological material.

New regulatory actions may be necessary to open or close seasons or areas to protect injured stocks. The Board of Fisheries may adopt regulations it considers advisable in accordance with the Administrative Procedures Act (AS 44.62) for:

- establishing open and closed seasons and areas for the taking of fish and shellfish.
- setting quotas, bag limits, harvest levels, and sex and size limitations on the taking of fish and shellfish.
- establishing the means and methods employed in the pursuit, capture and transport of fish and shellfish.
- classifying as commercial fish, sport fish, personal use fish, subsistence fish, or predators or other categories essential for regulatory purposes.

Egg transplants will be guided by the Fish Genetics Policy of the Department of Fish and Game and reviewed through the ADF&G Fish Transport Permit system.

MEANS TO EVALUATE SUCCESS

Periodic assessments will be conducted to determine if plans, projects and related activities are implemented as designed and in compliance with the management plan, restoration plan, a comprehensive and integrated monitoring strategy and the National Environmental Policy Act of 1969, as amended.Consistency with the settlement.

REPRESENTATIVE COSTS

These budgets will vary depending on the scale of the program. The amounts may change after an area enhancement plan has been developed. These budget estimates are best estimates as to the scale of the program.

Suboption A - Supplement fry production

Salaries:		
Project Leader	40 work months	$250.0
Field Technicians	450 work months	1,500.0
Biometrics and review	4 work months	21.0
Clerical support	10 work months	28.0
Travel/per diem		10.0
Vessel charter	100 days	130.0
Fixed-wing charter	315 hours	79.0
Supplies and equipment		499.0
	Subtotal	$2,517.0
Administrative Overhead/Coordination @ 15%		377.6
	TOTAL	$2,894.6

Suboption B - Improve access to spawning areas

Salaries:		
Project Leader	24 work months	$150.0
Field Technicians	24 work months	80.0
Biometrics and review	4 work months	21.0
Clerical support	10 work months	28.0
Travel/per diem		16.0
Construction contracts		900.0
Fixed-wing charter	200 hours	50.0
	Subtotal	$1,245.0
Administrative Overhead/Coordination @ 15%		51.8
Contract administration @ 5%		45.0
	TOTAL	$1,341.8

Suboption C - Improve spawning and rearing habitat

Salaries:		
Project Leader	24 work months	$150.0

Field Technicians	24 work months	80.0
Biometrics and review	4 work months	21.0
Clerical support	10 work months	28.0
Travel/per diem		14.0
Construction Contracts		4,200.0
Fixed-wing charter	200 hours	50.0
	Subtotal	$4,543.0
Administrative Overhead/Coordination @ 15%		51.5
Contract administration @ 5%		210.0
	TOTAL	$4,804.5
	GRAND TOTAL	$9.040.9

ADDITIONAL INFORMATION NEEDS

Although stream and lake enhancement techniques are well established, there is need for site-specific analysis to determine where techniques are appropriate. An overall enhancement plan is needed to ensure an efficient, coordinated approach throughout the oil-spill area.

CITATIONS

November 12, 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. 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 establish ways of accelerating the recovery of this important habitat and to evaluate the long-term effects of various clean-up techniques used during the oil spill. Conclusions derived from this program may have significant bearing on clean-up decisions for future oil spills.

DESCRIPTION

It will be the objective of this option to test several promising approaches of 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 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 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, and

2) Design and implement a monitoring program that will assess:

   a) the efficacy of several candidate approaches to accelerating recovery of *Fucus*, and

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 (rugosity 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 nussel 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.

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 rugosity 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

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

TABLE 1. Projected Costs of Implementing Option 14.

ITEM	$K	BASIS

Year 1

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	12.50	Airfare to and from Alaska from lower 48 for two 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	5.00	Report duplication, graphics support, editing, page charges (journal), mailing.
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

Opt#15.001

OPTION 15: Supplement intertidal substrates for spawning herring

APPROACH CATEGORY: Manipulation of Resources

INJURED RESOURCES AND SERVICES: Pacific herring

PROPOSED ACTION

Enhance and replace spawning substrates in areas used by spawning herring

SUMMARY

Pacific herring spawn on a variety of intertidal and subtidal substrates, including Fucus and Laminaria. Herring eggs, larvae and spawning substrates were adversely impacted by the spill and cleanup. Attempts to supplement spawning habitat in the United States and abroad with both artificial and cultured marcoalgal substrates have successfully increased herring egg survival and populations. In Russia, spawning habitat enhancement has been successful in substantially increasing herring egg survival.

DESCRIPTION

The development and implementation of strategies to mitigate damages to herring spawning substrates will:

- minimize further injury to those stocks.
- facilitate recovery of these populations to pre-spill conditions.
- provide baseline information against which the effectiveness of restoration strategies will be measured.
- help determine when these injured resources are appropriately restored.
- establish an ecological baseline for the injured populations against which future disturbances can be evaluated.
- improve our ability to manage injured resources and services in the future.

IMPLEMENTATION ACTIONS

- identify and evaluate the extent of damages to herring spawning substrates from oil and from cleanup activities.
- identify and evaluate the extent of injuries to herring eggs and larvae from oil and from cleanup activities.
- review scientific literature and consult with other restoration workers to evaluate the appropriateness of methods currently in use in other areas.
- design and implement appropriate restoration strategies.
- monitor populations to determine if and when injured resources return to pre-spill conditions.
- monitor other components of the ecosystem to document long-term trends in the health of the injured populations.
- evaluate the effectiveness of restoration activities to assure the public that the actions taken were appropriate.

TIME NEEDED TO IMPLEMENT

Develop restoration plan

Field operations for data collection: April 1993 - November 1993.
Data analysis: September 1993 - January 1994.
Literature review and consultation: April 1993 - September 1993.
Plan development: December 1993 - June 1994.
Plan implementation: June 1994.
Recovery monitoring: June 1994 - November 1996.

MEANS TO IMPROVE RECOVERY

Injured substrates and population will be identified. Literature regarding restoration techniques will be reviewed and restoration workers will be consulted about appropriate techniques. Techniques most appropriate to specific habitats will be evaluated, modified where necessary, and implemented.

The monitoring program will be designed and implemented as part of the restoration plan. The monitoring program will determine the effectiveness of restoration approaches and identify when recovery is delayed.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

The Exxon Valdez oil spill settlement agreement approved on October 8, 1991 specifies that restoration funds must be spent to restore injured natural resources and services.

Monitoring the condition of a resource under restoration is an allowable cost in the U.S. Department of the Interior's proposed revisions to the Natural Resource Damage Assessment Regulations found in the Comprehensive Environmental Response, Compensation, and Liability Act of 1908 (U.S. Department of the Interior, 1991).

Restoration monitoring 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 actions were taken to restore the damaged resource; 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.

Management of fisheries within waters of the State of Alaska is authorized under the following selected state statutes:

- Title 16 - Fish and Game: Sec. 16.05.050-16.43.950.
- 5 AAC 01 to 5 AAC 39.
- 20 AAC 05.120

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Management and restoration activities will affect present commercial and subsistence uses of the injured resources. Some areas may be closed to fishing at times. Fishing effort may be shifted to other areas as healthy populations are identified.

TECHNICAL FEASIBILITY

Techniques for supplementing herring spawning substrates are relatively new and not well understood. Such techniques as are now in use may be inappropriate for the spill-damaged areas. New techniques may need to be developed or existing ones modified.

Most, if not all of the proposed monitoring activities will have their basis in the response, damage assessment, and restoration science studies conducted earlier. Additional monitoring approaches will be based on a proven ability to effectively document recovery of injured resources.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

The effectiveness of herring substrate and population restoration techniques used in other areas may not be directly applicable to the EVOS-impacted areas. Their effectiveness is speculative at this time.

INDIRECT EFFECTS

There will be socio-economic impacts to commercial and subsistence users of the fishery resources when certain areas are closed to protect injured substrates and populations. 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 above their present level and continue until the populations recover 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.

RELATIONSHIP TO OTHER EVOS RESPONSE RESTORATION ACTIONS

Option 2 addresses intensified management of Pacific herring. Information about herring populations from Option 2 will provide much of the population information needed for this option.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Complete closure of all commercial and subsistence fishing could allow the populations to recover naturally. Without a well-designed monitoring effort, however, we will not know if the populations are, in fact, recovering.

LEGAL CONSIDERATIONS

Restoration of injured resources is required by the settlement. Development and implementation of a restoration monitoring program is mandated by the National Environmental Policy Act of 1969, as amended.

The State of Alaska Department of Fish and Game has regulatory and management oversight of fish and shellfish within state waters.

Permits would be required for sampling of all biological material.

New regulatory actions may be necessary to open or close seasons or areas to protect injured stocks. The Board of Fisheries may adopt

regulations it considers advisable in accordance with the Administrative Procedures Act (AS 44.62) for:

- establishing open and closed seasons and areas for the taking of fish and shellfish.
- setting quotas, bag limits, harvest levels, and sex and size limitations on the taking of fish and shellfish.
- establishing the means and methods employed in the pursuit, capture and transport of fish and shellfish.
- classifying as commercial fish, sport fish, personal use fish, subsistence fish, or predators or other categories essential for regulatory purposes.

MEANS TO EVALUATE SUCCESS

Periodic assessments will be conducted to determine if plans, projects and related activities are implemented as designed and in compliance with the management plan, restoration plan, a comprehensive and integrated monitoring strategy and the National Environmental Policy Act of 1969, as amended.

REPRESENTATIVE COSTS

Salaries:		
Project Leader	18 work months	$112.5
Field Technicians	144 work months	480.0
Clerical support	12 work months	34.0
Travel/per diem		60.0
Vessel charter	100 days	130.0
Fixed-wing charter	100 hours	25.0
Scientific equipment		300.0
	Subtotal	$1,141.5
Administrative Overhead/Coordination @ 15%		126.2
Contract administration @ 5%		15.0
	TOTAL	$1,282.7

ADDITIONAL INFORMATION NEEDS

It will be necessary to test the feasibility of implementing this option on a scale sufficient to benefit the herring population.

Monitoring of recovery will be an important part of this effort.

Recovery of damaged substrates and injuries to herring populations 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.

CITATIONS

6Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (U.S. Department of the Interior, 1991).

Department of the Interior. 1991. "43 CFR Part II - Natural Resource Damage Assessments; Notice of Proposed Rulemaking."

Federal Register 56 (82) 19752-19773.

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

November 12, 1992 Author: Karen A. Klinge

OPTION 16 Test Feasibility of Enhancing Murre Productivity

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 vertebrate 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) to encourage nesting activity and improving the physical characteristics of nest sites (e.g., adding sills to ledges) to increase productivity. Removal of predators is also discussed, however, there are many problems associated with removal programs and it seems unlikely that the benefits would justify the project. These techniques are experimental and possibly intrusive, but if effective, have the potential to reduce the recovery time of murres nesting2016Xto be

in the decades. Suboptions A and B could cost approximately $250,000 the first year if implemented separately (this cost includes boat purchase which may not be necessary), but if combined the cost could be approximately $260,000. Additional monitoring of the experimental colony and controls could cost approximately 150,000 dollars per year.

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 the 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.

IMPLEMENTATION ACTIONS

Develop detailed study plan of suitable scope and duration to determine if enhancing social stimuli is a beneficial means to improve recovery.

Identify suitable locations to conduct the feasibility study and controls.

Implement plan.

TIME NEEDED TO IMPLEMENT

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.

The amount of time required to create decoys and obtain appropriate recordings is unknown. Decoys could be made by the researches or contracted-out for mass production.

MEANS TO IMPROVE RECOVERY

Birkhead (1977) found that the nesting density was the main factor influencing breeding success at murre colonies. Murres have their highest breeding success when they nest in high densities (greater than 10 birds/meter^2). 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. Birkhead showed 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.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

The Migratory Bird Treaty Act of 1918 (16 USC 703-712) protects murres from harvest and harassment.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

TECHNICAL FEASIBILITY

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 population.

Decoys were used to attract murres to a vacant colony in Japan with at least some successful breeding occurring at the new colony sites (Cite).

Decoys and recordings have been successfully used to establish new puffin and new roseate tern colonies in the Atlantic (Kress et al. in press).

Mirrors have been used to trick cranes into believing that they are surrounded by conspecifics (Cite).

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

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 (Point Reyes Report 1992), 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. This has been used in Japan to attract murres to a new colony site (CITE) and has also been used for puffins and terns (Kress et al. in press), petrels (Podolsky and Kress 1989 and 1992, Kress et al. in press), and albatross (Podolsky 1990). If the feasibility study is successful, it may reduce the time needed for the population to recover if it were implemented on a broad scale.

Potential Negative Effects: The following concerns were outlined in the 1991 memo from D. Roby. 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.

INDIRECT EFFECTS

Indirect environmental effects. **Ideas?**

Socio-economic effects. None anticipated

Human health and safety. Implementing this project would require extra precautions to protect personnel doing field work. Most of the murre colonies which were severely injured are in remote locations on very steep cliffs. Placing decoys or sound equipment on ledges is dangerous work.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

None?

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

None

LEGAL CONSIDERATIONS

Consistency with the settlement. This feasibility study is a form of direct restoration which is consistent with the terms of the civil settlement.

Agencies with management/regulatory responsibilities The US Fish and Wildlife Service has primary management responsibilities for murres. Most of the colonies of concern are within the Alaska Maritime National Wildlife Refuge. Alaska Department of Fish and Game may also have management responsibilites for this project.

Permits required. USFWS permits would need to be acquired to gain access to colony cliffs.

NEPA compliance. **[unknown - does this get excluded under the research clause?]**

Additional/new legislative or regulatory actions. None necessary

MEANS TO EVALUATE SUCCESS

The feasibility study will be designed to determine if the activities are beneficial to the population.

REPRESENTATIVE COSTS

Biologist	70,000
Technicians (2)	80,000
Decoys	1,000
Sound equipment	3,000
Boat	70,000

Fuel	??	5,000
Maintenance		1,500
Safety training		1,000
Other field equipment	??	3,000
Total		250,000

Additional years monitoring 150,000/year/isolated islands (i.e. Chiswell's versus Barren Islands).

ADDITIONAL INFORMATION NEEDED

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.

Kress S.W., D.N. Nettleship and R.H. Podolsky. in press. Reintroductions of Atlantic puffins, terns, and Leach's storm-petrels at formenr breeding sites in the Gulf of Maine. In B.D Bell and J. Kromdeur (Eds) Management methods for populations of threatened birds. International Council for Bird Preservation Technical Publication. Cambridge, England. 48 pp.

Podolsky, R.H. 1990. Effectiveness of social stimuli in attracting Laysan albatross to new potential nesting sites. The Auk. 107:119-125.

Podolsky, R.H. and S.W. Kress. 1992. Attraction of the endangered dark-rumped petrel to recorded vocalizations in the Galapagos Islands. The Condor 94:448-453.

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.

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

TARGET RESOURCES AND SERVICES Common and thick-billed murres

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 were proposed D.Roby and the experts he consulted with to write the 1991 memo to RPWG. 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.

IMPLEMENTATION ACTIONS

Develop detailed study plan of suitable scope and duration to determine if enhancing social stimuli is a beneficial means to improve recovery.

Identify suitable locations to conduct the feasibility study and controls.

Implement plan.

TIME NEEDED TO IMPLEMENT

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).

Development of an appropriate study plan may take several months in order to design enhancement techniques (3-6 months?).

Some techniques may require construction prior to on-site work, but the length of time is unknown.

(Personally, I would guess that a 9 month lead-in would be needed to before the field work begins. Comments?)

MEANS TO IMPROVE RECOVERY

The natural recovery rate for common and thick-billed murres is believed to be less than 10 percent per year for a healthy colony (Point Reyes). 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). 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.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Murres are protected by the Migratory Bird Treaty Act of 1918 (16 USC 703-712). In addition, access to nesting colonies is limited by the U.S. Fish and Wildlife Service.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

TECHNICAL FEASIBILITY

Part of the feasibility study will be to determine the technical aspects of the proposed actions. The Japanese project included constructing fake cliff walls as partitions on ledges () and Tuck (1960) successfully created new nesting sites by clearing debris and soil from ledges. In both cases, murres were not currently using the colonies which may create an added complication in the oil spill area. We are aware of no other examples for this type of habitat manipulation for murres.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

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. At some murre colonies egg breakage accounts for 60% of egg losses (Roby-Gaston). Providing sills to the ledges could prevent or reduce this additional loss.

"Protection of nest sites from avian predators would be enchanced by construction of partitions and/or roofs on nesting ledges (Roby-Gaston). Avian Predation on murre adults, chicks or eggs normally approach nesting ledges from above (eagles) or from the side (gulls), whereas adult murres approach their nest sites from below. Partitions and roofs may inhibit predators without detering use of nest sites by murres" (Roby).

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

Indirect environmental effects. Ideas?

Socio-economic effects. None anticipated

Human health and safety. Implementing this project would require extra precautions to protect personnel doing field work. Most of the murre colonies which were severely injured are in remote locations on very steep cliffs. Modifying the nesting ledges would be dangerous work.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

While no other options look at these same methods to reduce predation and increase productivity at murre colonies, Option 17 describes fox removal procedures which could benefit murre colonies.

LEGAL CONSIDERATIONS

Consistency with the settlement. This feasibility study is a form of direct restoration which is consistent with the terms of the civil settlement.

Agencies with management/regulatory responsibilities The US Fish and Wildlife Service has primary management responsibilities for murres. Most of the colonies of concern are within the Alaska Maritime National Wildlife Refuge. Alaska Department of Fish and Game may also have management responsibilites for this project.

Permits required. USFWS permits would need to be acquired to gain access to colony cliffs.

NEPA compliance. [unknown - does this get excluded under the research clause?]

Additional/new legislative or regulatory actions. None necessary

MEANS TO EVALUATE SUCCESS

The feasibility study will be designed to determine if the activities are beneficial to the population.

REPRESENTATIVE COSTS (Based on implementing this suboption alone)

Biologist		70,000
Technicians (2)		80,000
Construction equip.	??	4,000
Boat		70,000
Fuel	??	5,000
Maintenance		1,500
Safety training		1,000

Other field equipment ??	3,000
Total	250,000

Additional years monitoring 150,000/year/isolated islands (i.e. Chiswell's versus Barren Islands).

ADDITIONAL INFORMATION NEEDED

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.

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.

SUBOPTION C **Test the feasibility of reducing predators at depleted murre colonies.**

TARGET RESOURCES AND SERVICES Common and thick-billed murres

DESCRIPTION

Determine the extent of predation at injured murre colonies and implement a predator control program. Predation can have a significant affect on the productivity of murre colonies. Eagles, gulls are known predators of murres. If other activities to help the recovery of murre populations in the oil spill area are being negated by the effects of predation a program to move bald eagles from the area, and to eliminate predatory gulls could be implemented. Mammals such as foxes and mink have been known to prey on murres, however they are not known to be present at the injured murre colonies. Option 17 discusses a fox removal program.

IMPLEMENTATION ACTIONS

Conduct intensive field studies to document the extent of avian predation at injured murre colonies.

Determine most appropriate method for reducing gull populations at colony sites with minimal impacts on non-target species.

Coordinate with reintroduction programs to take eagle eggs from nests near the colonies.

Implement plan.

TIME NEEDED TO IMPLEMENT

At least one season of intensive research is needed to determine if this program can be justified.

Gulls and ravens nest earlier than murres so the timing would not need to cause additional disturbance to the murre colonies.

MEANS TO IMPROVE RECOVERY

The natural recovery rate for common and thick-billed murres is believed to be less than 10 percent per year for a healthy colony (Point Reyes). Predators such as gulls, eagles and ravens are especially effective when the density of nesting birds is low (Birkhead 1977). Predators also contribute to panic flights which result in eggs being knocked over the edge of the ledges. 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.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Murres are protected by the Migratory Bird Treaty Act of 1918 (16 USC 703-712). In addition, access to nesting colonies is limited by the U.S. Fish and Wildlife Service.

Bald eagles are protected by the Endangered Species Act of 1973 (16 USC 1531) and the Bald Eagle Protection Act of 1940 (16 USC 668).

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Bald eagle eggs have been collected from Alaska as part of efforts to reintroduce eagles into their historic range in the Lower 48.

TECHNICAL FEASIBILITY

This suboption is technically feasible. There are several methods which have been used to remove avian predators (poison and shooting the gulls are the most common methods). Collecting eggs from eagle nests have been successfully implemented as part of reintroduction programs.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

Dan Roby discussed predator removal with several experts. The following description is taken directly from the 1991 memo to RPWG. "Glaucous-winged gulls and northern ravens are the most frequent predators on murre eggs and young at spill-affected colonies (Nysewander). Gulls can be a major source of egg mortality, accounting for 40% of egg losses at some colonies (Gaston). Gulls also take chicks from nesting ledges or as they attempt to fledge. Gull colonies are associated with most of the murre colonies in the northern GOA. Gulls have a much higher reproductive rate than murres and populations in the Gulf of Alaska are generally increasing. Temporary gull control measures could enhance murre productivity without threatening gull populations...."

"Bald eagles, unlike gulls and ravens, are known to take adult murres (Nysewander). Eagles elicit a strong panic response from adult murres on nesting ledges and indirectly result in losses of eggs and young to other avian predators. Some juvenile Bald Eagles are resident at murre colonies during the breeding season and cause significant disruption of breeding activities (Nysewander)...".

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

Indirect environmental effects. Other seabirds would benefit from the removal of avian predators. If poison is used to eliminate gulls and ravens, non-targeted species could also be poisoned either directly or from eaten a poisoned gull. Bald eagles are also thought to be injured by the oil-spill, lowering the productivity of a segment of the population will slow the recovery of the EVOS area population.

Socio-economic effects. There is generally strong resistence from the public on programs which sanction the killing of nongame species. Public relations will be critical if this suboption is to be implemented.

Human health and safety. Implementing this project would require extra precautions to protect personnel doing field work. Most of the murre colonies which were severely injured are in remote locations on very steep cliffs. Modifying the nesting ledges would be dangerous work.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

Bald eagles are also thought to be injured by the oil-spill, lowering the productivity of a segment of the population will slow the recovery of the EVOS area population.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

While no other options look at these same methods to reduce predation and increase productivity at murre colonies, Option 17 describes fox removal procedures which could benefit murre colonies.

LEGAL CONSIDERATIONS

Consistency with the settlement. This feasibility study is a form of direct restoration which is consistent with the terms of the civil settlement.

Agencies with management/regulatory responsibilities The US Fish and Wildlife Service has primary management responsibilities for murres. Most of the colonies of concern are within the Alaska Maritime National Wildlife Refuge. Alaska Department of Fish and Game may also have management responsibilites for this project.

Permits required. USFWS permits would need to be acquired to gain access to colony cliffs. Alaska Dept. of Fish and Game permits would be needed to kill gulls or ravens (VERIFY!).

NEPA compliance. [unknown - does this get excluded under the research clause?]

Additional/new legislative or regulatory actions. None necessary

MEANS TO EVALUATE SUCCESS

The feasibility study will be designed to determine if the activities are beneficial to the population.

REPRESENTATIVE COSTS

Biologist		70,000
Technicians (2)		80,000
Boat		70,000
Fuel	??	5,000
Maintenance		1,500
Safety training		1,000
Helicopter charter (5 days?)		120,000
Other field equipment ??		3,000
Total		350,000

Additional years monitoring 150,000/year/isolated islands (i.e. Chiswell's versus Barren Islands).

ADDITIONAL INFORMATION NEEDED

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.

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.

November 12, 1992 Author: Klinge/Gorbics

OPTION 17:

APPROACH CATEGORY Manipulation of Resources

INJURED RESOURCES AND SERVICES Marine Birds

SUMMARY

Fox 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 eliminated populations of surface, burrow and in some cases cliff-nesting birds in a matter of years. 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.

TARGET RESOURCES AND SERVICES Marine birds

DESCRIPTION

The goal of this option would be to remove introduced fox from islands along the Alaska Peninsula and the Aleutians. In order to accomplish this project on large islands.

IMPLEMENTATION ACTIONS

- Identify and prioritize target islands.

- Work with the Environmental Protection Agency and Department of Agriculture to secure registration for toxins.

- Remove fox from up to 4 islands per year for a total of approximately 20 islands.

TIME NEEDED TO IMPLEMENT

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

MEANS 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 birds such as seabirds, waterfowl, shorebirds and passerine to reinhabit these islands after fox are removed. Fox are voracious predators of chicks and eggs. Fox climb among the cliff nesters and other vulnerable nesters to feed. Their removal

will allow the productivity of these islands to increase with increased survival of chicks and eggs.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

The U.S. Fish and Wildlife Service began eradicating fox on Amchitka Island in the Aleutian Islands Refuge in 1949 to restore habitat for the endangered Aleutian Canada Goose. By 1989, fox were believed to have been exterminated from only 15 islands. Fox eradication efforts did not begin on islands outside the Aleutians until 1984, with the removal of arctic fox from Bird Island, one of the Shumagin Islands. Ultimately, depending on funding availability, the U.S. Fish and Wildlife Service plans to remove introduced fox from all islands in the Alaska Maritime National Wildlife Refuge. Completing this goal will required many years because of funding constraints.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

The implementation of this option would clearly mesh into the plans of the U.S. Fish and Wildlife Service. Using *Exxon Valdez* restoration funds would accelerate the effort and allow for timely productivity increases on these islands. Not implementing this option under the *Exxon Valdez* restoration plans would reduce the ability of this technique to aid in the restoration of spill injured birds.

TECHNICAL FEASIBILITY

The best means of eliminating fox from islands, 1080 laced bait, was essentially banned along with most other toxicants for use as a predacide in 1972 (Federal Environmental Pesticide Control Act). A special exemption by the Environmental Protection Agency for restoration of Aleutian Canada Geese allowed its use in 1986. The registration for 1080 has now been withdrawn, precluding further use for fox eradication until new registration is obtained. Dispersal of toxic baits, preferably 1080, is the most efficient means of ridding islands of introduced fox, but because of severe restrictions on the use of poisons, mechanical means must also be relied on. Strychnine has not been used on any island since 1969, and it was always employed with 1080. Though effective on Amchitka, the largest island from which fox were removed, further use was banned in 1972. It is not now registered for use with fox.

Sodium cyanide ejectors (M-44s) were successfully used with other techniques on three islands. They were last used in 1984. The Alaska Maritime National Wildlife Refuge has not been able to use these devices since then despite repeated requests. Cyanide ejectors proved an invaluable backup to the elimination of trap-shy fox in 1983.

Since predacides became highly restricted in 1972 and now are available only for emergency use in conjunction with the effort to restore the endangered Aleutian Canada Goose, refuge personnel have

had to rely principally on leg-hold traps on most islands. Without predacides, eliminating the last few trap-shy fox is exceedingly difficult, if not impossible. Trapping is a viable eradication method only on small and moderate-sized islands. The largest island where trapping alone appears to have been successful was roughly 9300 ha.

Shooting fox, particularly where concentrated around seabird colonies, is locally fruitful, but nowhere has this technique alone been successful in eliminating all individuals from an island. Arctic fox often respond to predator calls, but fewer red fox respond. On most islands, shooting should be considered incidental to trapping and poisoning efforts.

In 1983, an experiment using five vasectomized male and five female red fox as biological control agents was initiated on Adugak, a small island in the eastern Aleutians. Rudzinski *et al* (1982) confirmed the dominance of red over arctic fox. They concluded that the larger and more aggressive red fox will outcompete the arctic fox by usurping dens and other limited resources. Arctic fox remained on Adugak Island for at least 14 months after reds were released, but then apparently disappeared. Though final confirmation of elimination of arctic fox by sterile red fox awaits the disappearance of all fox on these islands, it appears that red fox will eradicate arctic fox on at least small islands, through competitive exclusion.

Various combinations of eradication techniques are best suited to different islands, depending on size, topography, presence of non-target species, and other factors.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

The adverse impacts of fox appeared as early as 1811, only about 20 years after arctic fox were introduced. Burrow or surface nesting seabirds are particularly vulnerable to fox predation, however, even cliff-nesting seabirds were being affected by fox that crawl among the cliffs in search of birds. Birds were also harmed by incidental introductions of rodents, many of which were released to the islands to provide food for the fox. Waterfowl have also been adversely affected by the fox. One of the most dramatic ways to depict the impact of fox introductions on insular avifauna can be inferred by comparing bird populations and species diversity on similar islands which are and are not inhabited by fox. A marked difference exists between pristine islands and those which have or recently had fox. Cliff nesters such as kittiwakes and murres are less susceptible to fox predation. However, murre chicks are particularly susceptible if they travel across open ground when they fledge for the sea. ("Fledging" for murres occurs when the chicks leave the nesting ledges prior to their ability to fly.)

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 (Bailey, in prep), therefore, it is unlikely that there would be adverse economic effects as a result of removal of fox.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

None identified.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

None identified.

LEGAL CONSIDERATIONS

Toxicants and predacides cannot be used for this purpose until they are re-registered for fox eradication due to the *Exxon Valdez* oil spill.

MEANS TO EVALUATE SUCCESS

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.

REPRESENTATIVE COSTS

$140,000 per island (likely 20 islands would be targeted)
$500,000 to re-register toxicants

ADDITIONAL INFORMATION NEEDED

None identified.

Opt#18.001

OPTION 18: Replace fisheries harvest opportunities by establishing alternative salmon runs

APPROACH CATEGORY: Manipulation of Resources

INJURED RESOURCES AND SERVICES: Pink and sockeye salmon

PROPOSED ACTION

Develop new fisheries to provide new opportunities for fishing and harvest in new locations.

SUMMARY

There are a variety of well-established techniques for transplanting fish stocks into new locations to create or establish new fish populations for new fisheries and harvest locations. These include establishing new hatchery runs, transplanting hatchery-reared fish to depleted areas and using wild stocks as donor sources for new locations. These techniques may be used alone or in conjunction with other well known techniques such as lake fertilization, barrier removal or creation of new habitat (e.g., spawning channels - See: Option 11). In many areas, most available habitat is already populated so this option of establishing new runs is most commonly applied in association with other projects that create new habitat. Typically, hatchery stocks are convenient to use, however, it is more important to use stocks that are genetically most well suited to the particular site or need. Consequently, ADF&G standards and requirements for genetic and fish disease screening and brood stock selection must be followed before any new release site is begun and Regional Planning Team members must agree with the proposed action.

SUBOPTION A Establish additional hatchery runs.

TARGET RESOURCES AND SERVICES

Pink and chum salmon runs in EVOS affected areas with different run-timing than existing runs; sockeye salmon smolt and pre-smolt production.

DESCRIPTION

Rearing of juvenile fish under controlled conditions and releasing under the most favorable conditions will:

- increase survival of fry in the marine environment when they are released.
- increase the numbers 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.

IMPLEMENTATION ACTIONS

- increase incubation and rearing capacity in hatcheries to support additional eggs and fry with different run-timing.
- develop egg-take sites.
- incubate and rear to increase survival of fry.
- stock fed fry, pre-smolts or smolts to establish new runs to provide alternative fishing opportunities instead of injured wild stocks.
- monitor return of adult spawners, evaluate effectiveness of methods and revise where appropriate.

SUBOPTION B Transplant hatchery reared fish to depleted areas.

DESCRIPTION

After access to spawning areas has been improved or new habitat is made available (e.g., by Option 11), transplant fish to the newly-identified area.

IMPLEMENTATION ACTIONS

- Verify that depleted habitat is available to sustain a population of hatchery-reared fish.

- Confirm that the proposed transfer meets guidelines established by the ADF&G Fish Pathology and Fish Genetics

policies and the Regional Planning Team.

- After stocking, monitor evaluate the action to assure that the expected results are accomplished.

- Review and revise the action as necessary.

SUBOPTION C Use wild egg takes from non-inured streams to establish new runs.

DESCRIPTION

Select wild stocks with characteristics (e.g., size of individuals, run-timing) that are similar to those desired at the new location to establish a new run. This will increase wild fish population stocks by utilizing high quality habitat for spawners and rearing fry and minimize socio-economic impacts of human uses by maximizing the use of available habitats.

IMPLEMENTATION ACTIONS

- identify stream, estuary or lake habitats having good potential for improvement; e.g., by Option 11.

- Confirm that the proposed transfer meets guidelines established by the ADF&G Fish Pathology and Fish Genetics policies and the Regional Planning Team.

- monitor the effect of improvements, evaluate their effectiveness and revise where appropriate.

TIME NEEDED TO IMPLEMENT

Suboptions A, B and C

Hatchery modification and/or egg take site preparation: July 1993-August 1994.
First-year egg take, incubation, rearing and stocking of fry: July 1994-June 1995.
Second-year egg take, incubation, rearing and stocking of fry: July 1995-June 1996.
Monitoring: Begins June 1995.

Monitoring of recovery will be an important part of each of these 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 to measure the recovery.

MEANS TO IMPROVE RECOVERY

Sockeye fry that are short-term reared under controlled conditions have a much better chance of survival when they are released into a lake. Marine survival is also much higher than under uncontrolled conditions. Increased returns of adults is expected.

Wild pink salmon populations are expected to increase as they continue to populate the newly developed spawning areas and increased spawning capacity following establishment.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

The Exxon Valdez oil spill settlement agreement approved on October 8, 1991 specifies that restoration funds must be spent to restore injured natural resources and services.

Monitoring the condition of a resource under restoration is an allowable cost in the U.S. Department of the Interior's proposed revisions to the Natural Resource Damage Assessment Regulations found in the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (U.S. Department of the Interior, 1991).

Restoration monitoring 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.

Management of fisheries within waters of the State of Alaska is authorized under the following selected state statutes:

- Title 16 - Fish and Game: Sec. 16.05.050-16.43.950.
- 5 AAC 01 to 5 AAC 39.
- 20 AAC 05.120

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

This option will be applied with Option 11 and other projects as a means to populate newly-identified spawning or rearing habitats or to create new runs to the hatcheries to provide alternate opportunities from the stocks that were damaged by the EVOS. With more conservative management practices designed to protect wild

stocks, these new runs will provide alternative fishing opportunities.

TECHNICAL FEASIBILITY

Each of the methods discussed have been used successfully for a long time. State-of-the-art methods and ADF&G and Regional Planning Team guidelines will be followed. Each restoration approach will be reviewed periodically. New approaches may be implemented as results are reviewed and interpreted and new information is gained from the scientific literature.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

These techniques are well-established methods that provide excellent potential for recovery of the resource and to provide alternative opportunities. Depending on the specific project, implementation may be effected within 2-4 years; e.g., suboption A; other strategies - e.g., suboption C - may requires 2-3 generations of returns.

INDIRECT EFFECTS

Other species 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 are developed and implemented. The potential of such impacts will be discussed and evaluated in the Environmental Impact Statement that will be prepared by the Trustees. Wild stocks will recover more quickly if fishing effort is directed away from them and onto the hatchery-produced stocks.

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.

RELATIONSHIP TO OTHER EVOS RESPONSE RESTORATION ACTIONS

This option will provide a means of implementation for habitats identified by Option 11 and other projects. Management strategies, since the EVOS, have become more conservative to allow the wild-

stocks to recover to pre-spill conditions. This option will help to facilitate that action by providing alterative opportunities for fishing.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

As new habitats are created or discovered, they could be allowed to populate at a natural rate without new introductions. This is not acceptable because it would require many more generations before these depleted areas could achieve full productivity.

LEGAL CONSIDERATIONS

Restoration of injured resources is required by the settlement. Development and implementation of a restoration monitoring program is mandated by the National Environmental Policy Act of 1969, as amended.

The State of Alaska Department of Fish and Game has regulatory and management oversight of fish and shellfish within state waters.

Permits would be required for sampling of all biological material and before any new introductions are implemented.

New regulatory actions may be necessary to open or close seasons or areas to protect injured stocks. The Board of Fisheries may adopt regulations it considers advisable in accordance with the Administrative Procedures Act (AS 44.62) for:

- establishing open and closed seasons and areas for the taking of fish and shellfish.
- setting quotas, bag limits, harvest levels, and sex and size limitations on the taking of fish and shellfish.
- establishing the means and methods employed in the pursuit, capture and transport of fish and shellfish.
- classifying as commercial fish, sport fish, personal use fish, subsistence fish, or predators or other categories essential for regulatory purposes.

Fish or egg transplants will be guided by the Fish Genetics and the Fish Pathology Policies of the Department of Fish and Game and the concurrence of the Regional Planning Team.

MEANS TO EVALUATE SUCCESS

Periodic assessments will be conducted to determine if plans, projects and related activities are implemented as designed and in

compliance with the management plan, restoration plan, a comprehensive and integrated monitoring strategy and the National Environmental Policy Act of 1969, as amended. Consistency with the settlement.

REPRESENTATIVE COSTS

Suboption A - Establish additional hatchery runs

Salaries:		
Project Leader	24 work months	$150.0
Fish Culture	60 work months	180.0
Clerical support	18 work months	102.0
Biometrician	18 work months	90.0
Travel/per diem		40.0
Vessel charter	15 days	20.0
Fixed-wing charter	200 hours	100.0
	Subtotal	$682.0
Administrative Overhead/Coordination @ 15%		102.3
	TOTAL	$784.3

Suboption B - Transplant hatchery-reared fish to depleted areas

Salaries:		
Project Leader	24 work months	$150.0
Fish Culture Technicians	130 work months	433.0
Biometrician	18 work months	94.5
Clerical support	18 work months	51.0
Travel/per diem		40.0
Vessel charter	30 days	39.0
Fixed-wing charter	200 hours	12.5
	Subtotal	$820.0
Administrative Overhead/Coordination @ 15%		123.0
	TOTAL	$943.0

Suboption C - Establish new runs from wild egg takes

Salaries:		
Project Leader	24 work months	$150.0

Fish Culture Technicians	190 work months	633.5
Biometrician	18 work months	94.5
Clerical support	18 work months	51.0
Travel/per diem		40.0
Vessel charter	40 days	52.0
Fixed-wing charter	200 hours	50.0
	Subtotal	$1,071.0
Administrative Overhead/Coordination	@ 15%	123.0
	TOTAL	$1,194.0
	GRAND TOTAL	$2,921.3

ADDITIONAL INFORMATION NEEDS

Although fish technology and fish cultural techniques associated with fish or egg transfers and are well established, there is need for site specific studies to assure the best possible methods and a need to review state-of-the-art applications. An overall development and management plan is needed to ensure an efficient, coordinated approach throughout the oil-spill area.

CITATIONS

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (U.S. Department of the Interior, 1991).

Department of the Interior. 1991. "43 CFR Part II - Natural Resource Damage Assessments; Notice of Proposed Rulemaking."

Federal Register 56 (82) 19752-19773.

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

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.

IMPLEMENTATION ACTIONS

- increase incubation and rearing capacity in hatcheries to support additional eggs and fry with different run timing;
- identify injured stocks that would benefit from assistance;
- select stocks with appropriate return timing to minimize interference with wild stocks;
- develop egg-take sites;
- incubate and rear to increase fry survival;
- monitor return of adult spawners and fishing success, evaluate effectiveness of methods, and revise as appropriate.

TIME NEEDED TO IMPLEMENT

From two to five years will be required to design and implement, depending on the species. Actions that will need to be undertaken include:

- hatchery modification;
- egg-take site preparation;
- first-year egg take, incubation, rearing, and stocking of fry;
- second-year egg take, etc.

Recovery monitoring of the injured stocks and related services that are intended to be helped will be essential.

MEANS 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.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Management of fisheries within waters of the State of Alaska is authorized under the following selected state statutes:

- Title 16 - Fish and Game: sec. 16.05.050-16.43.950.
- 5 AAC 01 - 5 AAC 77.695.
- 20 AAC 05.120.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

This suboption will complement actions taken to protect injured stocks of salmon that will benefit from relief from fishing pressure. It will also benefit the services of commercial, sport, and subsistence fishing.

TECHNICAL FEASIBILITY

There are a number of concerns relating to fish hatcheries and the well-being of wild stocks of salmon. Among these are genetics, disease, and competition for food. It may be challenging to try to establish and maintain run timing to avoid interference with the wild stocks that are intended for rehabilitation. A terminal harvest at the hatchery may best

ensure that impacts to wild stocks are minimized, but commercial fishermen would prefer to intercept the fish earlier when quality is better.

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.

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.

RELATIONSHIP TO OTHER EVOS RESPONSE RESTORATION ACTIONS

Management strategies have become more conservative following EVOS to allow injured wild stocks to recover. This suboption will help to restore both the fishing service as well as the wild salmon stocks.

OTHER OPTIONS THAT COULD ACHIEVE THE SAME OBJECTIVE

More intensive management and stringent controls on harvest could be applied without the provision of alternative fisheries. This would aid the recovery of injured fish stocks, but would not restore the injured fisheries.

LEGAL CONSIDERATIONS

1) Consistency with settlement: To the extent that the actions taken under this suboption replace lost or injured runs of salmon to provide fishing (and ecosystem) services, this suboption is a replacement action. To the extent that fishing opportunities provided here permit injured stocks to recover, this suboption is a direct restoration action. Direct restoration and replacement are consistent with the settlement.

2) Agencies with management/regulatory authority: Existing agency responsibilities do not conflict with the implementation of this suboption. The agency with lead responsibility for anadromous fish is the Alaska Department of Fish and Game. Public land managers in the spill area include the Alaska Department of Natural Resources, the U.S. Forest Service, the National Park Service, and the Fish and Wildlife Service.

3) Permits required: Establishment of new hatchery salmon runs would be guided by the Fish Genetics Policy and the Fish Pathology Policy of the Alaska Department of Fish and Game and the concurrence of the Regional Planning Team.

4) NEPA compliance: Because the establishment of new hatchery runs of salmon could have significant environmental effects, NEPA documents may have to be prepared.

5) Requirements for new legislative/regulatory actions: Implementation would require protection of injured stocks and regulation of harvest of new runs.

MEANS TO EVALUATE SUCCESS

This suboption aims to improve the rate of recovery of injured stocks and to restore fishing opportunity, and therefore, there will be a need to monitor both.

REPRESENTATIVE COSTS

Costs would vary according to the nature of the project.

ADDITIONAL INFORMATION NEEDS

Although fish culture techniques are well-established, there will be a need to closely follow the effectiveness of projects conducted under this suboption to determine whether adjustments to the actions are needed.

CITATIONS

K. Chalk, ADF&G, personal communication
J. Sullivan, ADF&G, personal communication

9 Oct 92

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.

IMPLEMENTATION ACTIONS

- increase incubation and rearing capacity in hatcheries to support additional eggs and fry with different run timing;
- select stocks with appropriate return timing to minimize interference with injured wild stocks;
- identify candidate areas for transplantation;
- develop egg-take sites;
- incubate and rear to increase fry survival;
- monitor return of adult spawners, evaluate effectiveness of methods, and revise as appropriate.

TIME NEEDED TO IMPLEMENT

Two to five years will be required to design and implement, depending on the species. Actions that will need to be undertaken include:

- identify candidate areas for transplantation;
- hatchery modification;
- egg-take site preparation;
- first-year egg take, incubation, rearing, and stocking of fry;

- second-year egg take, etc.

Recovery monitoring of the injured stocks and related services that are intended to be helped will be essential. The newly established runs will need to be monitored as well.

MEANS 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.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Management of fisheries within waters of the State of Alaska is authorized under the following selected state statutes:

- Title 16 - Fish and Game: sec. 16.05.050-16.43.950.
- 5 AAC 01 - 5 AAC 77.695.
- 20 AAC 05.120.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

This suboption will complement actions taken to protect injured stocks of salmon that will benefit from relief from fishing pressure. It will also benefit the services of commercial, sport, and subsistence fishing.

TECHNICAL FEASIBILITY

There are a number of concerns relating to fish hatcheries, the artificial establishment of new "wild" fish runs, and the well-being of wild stocks of salmon. Among these are genetics, disease, and competition for food. It may be challenging to try to establish and maintain run timing to avoid interference with the wild stocks that are intended for rehabilitation. A terminal harvest at stream mouths might best ensure that only new stock fish would be caught in commercial fisheries, but fishermen would prefer to intercept the fish earlier when quality is better.

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 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.

RELATIONSHIP TO OTHER EVOS RESTORATION ACTIONS

Management strategies have become more conservative following EVOS to allow wild stocks to recover. This suboption will help to restore both the fishing service as well as the wild salmon stocks.

OTHER OPTIONS THAT COULD ACHIEVE THE SAME OBJECTIVE

More intensive management and stringent controls on harvest could be applied without the provision of alternative fisheries.

LEGAL CONSIDERATIONS

1) Consistency with settlement: To the extent that the actions taken under this suboption replace lost or injured runs of salmon to provide fishing (and ecosystem) services, this suboption is a replacement action. To the extent that fishing opportunities provided here permit injured stocks to recover, this suboption is a direct restoration action. Direct restoration and replacement are consistent with the settlement.

2) Agencies with management/regulatory authority: Existing agency responsibilities do not conflict with the implementation of this suboption. The agency with lead responsibility for anadromous fish is the Alaska Department of Fish and Game. Public land managers in the spill area include the Alaska Department of Natural Resources, the U.S. Forest Service, the National Park Service, and the Fish and Wildlife Service.

3) Permits required: Establishment of new hatchery salmon runs would be guided by the Fish Genetics Policy and the Fish Pathology Policy of the Alaska Department of Fish and Game and the concurrence of the Regional Planning Team.

4) NEPA compliance: Because the establishment of new hatchery runs of salmon could have significant environmental effects, NEPA documents may have to be prepared.

5) Requirements for new legislative/regulatory actions: Implementation would require protection of injured stocks and regulation of harvest of new runs.

MEANS TO EVALUATE SUCCESS

This suboption aims to improve the rate of recovery of injured stocks and to restore fishing opportunity, and therefore, there will be a need to monitor both.

REPRESENTATIVE COSTS

Costs would vary according to the nature of the project.

ADDITIONAL INFORMATION NEEDS

Although there is considerable understanding of the ecological requirements of salmon, there will be a need to closely follow the effectiveness of projects conducted under this suboption to determine whether adjustments to the actions are needed.

CITATIONS

K. Chalk, ADF&G, personal communication
J. Sullivan, ADF&G, personal communication

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.

IMPLEMENTATION ACTIONS

- select stocks with appropriate return timing to minimize interference with injured wild stocks;
- identify candidate areas for transplantation;
- develop egg-take sites;
- monitor return of adult spawners, evaluate effectiveness of methods, and revise as appropriate.

TIME NEEDED TO IMPLEMENT

Two to five years will be required to design and implement, depending on the species. Actions that will need to be undertaken include:

- egg-take site preparation;
- first-year egg take, second-year egg take, etc.;
- identify candidate areas for transplantation.

Recovery monitoring of the injured stocks and related services that are intended to be helped will be essential. The newly established runs will need to be monitored as well.

MEANS 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.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

- Title 16 - Fish and Game: sec. 16.05.050-16.43.950.
- 5 AAC 01 - 5 AAC 77.695.
- 20 AAC 05.120.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

This suboption will complement actions taken to protect injured stocks of salmon that will benefit from relief from fishing pressure. It will also benefit the service of commercial fishing.

TECHNICAL FEASIBILITY

There are a number of concerns relating to the artificial establishment of new "wild" fish runs, and the well-being of wild stocks of salmon. Among these are genetics, disease, and competition for food. It may be challenging to try to establish and maintain run timing to avoid interference with the wild stocks that are intended for rehabilitation. A terminal harvest at the stream mouth might best ensure that only new stock fish would be caught in commercial fisheries, but fishermen would prefer to intercept the fish earlier when quality is better.

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 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 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.

RELATIONSHIP TO OTHER EVOS RESTORATION ACTIONS

Management strategies have become more conservative following EVOS to allow wild stocks to recover. This suboption will help to restore both the fishing service as well as the wild salmon stocks.

OTHER OPTIONS THAT COULD ACHIEVE THE SAME OBJECTIVE

More intensive management and stringent controls on harvest could be applied without the provision of alternative fisheries.

LEGAL CONSIDERATIONS

1) Consistency with settlement: To the extent that the actions taken under this suboption replace lost or injured runs of salmon to provide fishing (and ecosystem) services, this suboption is a replacement action. To the extent that fishing opportunities provided here permit injured stocks to recover, this suboption is a direct restoration action. Direct restoration and replacement are consistent with the settlement.

2) Agencies with management/regulatory authority: Existing agency responsibilities do not conflict with the implementation of this suboption. The agency with lead responsibility for anadromous fish is the Alaska Department of Fish and Game. Public land managers in the spill area include the Alaska Department of Natural Resources, the U.S. Forest Service, the National Park Service, and the Fish and Wildlife Service.

3) Permits required: Establishment of new hatchery salmon runs would be guided by the Fish Genetics Policy and the Fish Pathology Policy of the Alaska Department of Fish and Game and the concurrence of the Regional Planning Team.

4) NEPA compliance: Because the establishment of new hatchery runs of salmon could have significant environmental effects, NEPA documents may have to be prepared.

5) Requirements for new legislative/regulatory actions: Implementation would require protection of injured stocks and regulation of harvest of new runs.

MEANS TO EVALUATE SUCCESS

This suboption aims to improve the rate of recovery of injured stocks and to restore fishing opportunity, and therefore, there will be a need to monitor both.

REPRESENTATIVE COSTS

Costs would vary according to the nature of the project.

ADDITIONAL INFORMATION NEEDS

Although there is considerable understanding of the ecological requirements of salmon, there will be a need to closely follow the effectiveness of projects conducted under this suboption to determine whether adjustments to the actions are needed. There will be a need to identify suitable vacant habitat (see Options 11&15).

CITATIONS

K. Chalk, ADF&G, personal communication
J. Sullivan, ADF&G, personal communication

November 12, 1992 Author: Chris Swenson

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

APPROACH CATEGORY Habitat Protection and Acquisition

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.

IMPLEMENTATION ACTIONS

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.

TIME NEEDED TO IMPLEMENT

The time needed to implement this option is dependent on the amount of land to be covered, as identified in the first two implementation actions. The time for each step involved is as

follows:

Identify public lands where imminent threat exists - 1 month

Identify areas with insufficient/absent stream data - 2 months

Survey team in field - Variable

Data entry into catalog and atlas - 3 months

MEANS TO IMPROVE RECOVERY

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

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Fish-bearing streams on public lands which are not included in the anadromous waters catalog and atlas are protected by the regulatory authorities listed below. Precisely which authorities apply will depend on which agency manages the land.

Alaska Coastal Management Act (AS 46.40) and coastal resource district management plans (6 AAC 80 & 85)

Clean Water Act (33 USC 1251 & 1344)

Alaska water quality standards (18 AAC 70)

Alaska Water Use Act (AS 46.15) and water management regulations (11 AAC 93)

ADF&G Fishway Act (AS 16.05.840)

State of Alaska 1988 PWS Area Management Plan

National Forest Management Practices Act of 1976 (16 USC)

Chugach National Forest Land and Resource Management Plan

Alaska National Interest Land Claims Act of 1980 (16 USC 3101)

Organic Act of 1916 (16 USC 1) and NPS park management plans

National Wildlife Refuge Administration Act of 1976 (16 USC 668) and FWS refuge management plans

The above regulatory authorities provide a general level of protection for wildlife, water quality and water use, but do not generally provide as much protection to anadromous fish, their spawning and rearing areas, or adjacent riparian habitat as the ADF&G statutes and the State Forest Practices Act.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Implementation of this option may result in increased regulation of public uses, e.g., logging, development projects, certain recreation and harvest activities, vehicle access, etc.

TECHNICAL FEASIBILITY

This option is technically feasible. ADF&G routinely surveys anadromous streams, adds them to the state catalog, and regulates subsequent uses and activities.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

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

INDIRECT EFFECTS

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

2) Healthier ecosystems resulting from enhanced resource 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 certain types of recreational activities and development projects.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

This option complements an ongoing restoration study which is surveying anadromous streams on some private lands which are threatened by imminent development activities. Surveying

additional streams on public and private lands will provide a more complete resource inventory and allow for better integrated management strategies. In addition, this option could provide information for the Trustees' evaluation of management, protection and acquisition options for restoring anadromous fish and their habitats.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

No other options trigger implementation of existing statutes or regulations which provide a level of protection comparable to the ADF&G anadromous stream statutes and the Alaska Forest Practices Act. Application of these regulatory tools is the most effective option for protecting unsurveyed anadromous streams.

LEGAL CONSIDERATIONS

1) Consistency with settlement: Regulatory protection of injured resources and services and their equivalents is consistent with the terms of the settlement.

2) Agencies with management/regulatory authority: Existing agency responsibilities do not conflict with the implementation of this suboption. The agency with lead responsibility for anadromous fish is the Alaska Department of Fish and Game. Public land managers in the spill area include the Alaska Department of Natural Resources, the U.S. Forest Service, the National Park Service and the Fish and Wildlife Service.

3) Permits required: ADF&G scientific collection permits are required for collecting anadromous fish and eggs. Special use permits may be required for landing helicopters and setting up field camps on lands managed by federal agencies.

4) NEPA compliance: Since this represents an intensification of ongoing state resource management practices, it is unlikely that any NEPA documents will be required.

5) Requirements for new legislative/regulatory actions: none

MEANS TO EVALUATE SUCCESS

The appropriate management agency will monitor how effectively the inclusion of additional streams has prevented activities harmful to target resources and services and the degree to which the option has enhanced compatible public uses.

REPRESENTATIVE COSTS

Total costs depend on the number of field seasons required to complete the project, which cannot be determined at this point.

ADDITIONAL INFORMATION NEEDED

The Trustee Council needs to finalize the list of injured resources and services.

CITATIONS

Mark Kuwada, ADF&G, pers. comm.
Ed Weiss, ADF&G, pers. comm.

November 12, 1992 Author: Chris S/Sandy R/John S

OPTION 22 Designate Protected Marine Areas

APPROACH CATEGORY Habitat Protection and Acquisition

INJURED RESOURCES AND SERVICES Coastal and nearshore habitats were heavily impacted by the spill. Many marine species were also injured, including seabirds, waterfowl, marine mammals, salmon, herring, invertebrates, seagrasses and intertidal algae. Injured services include commercial, subsistence and sport harvests; and aesthetic and recreational uses, such as birdwatching and kayaking.

SUMMARY

SUBOPTION A Designate New Alaska State Parks

TARGET RESOURCES AND SERVICES

1) Marine areas supporting aesthetic and recreational services injured in the spill

2) Marine areas supporting aesthetic and recreational services equivalent to those injured in the spill

DESCRIPTION

This suboption entails identifying and designating state lands and waters for inclusion in the Alaska State Park System. These areas could be designated as state parks or state marine parks. Areas greater than 640 acres would have to be designated by the Alaska legislature, while smaller areas do not require legislative action and could be added to the park system via a state land transfer. The Alaska Department of Natural Resources would manage the parks and enforce regulations.

IMPLEMENTATION ACTIONS

Prior to implementing this option, the Trustee Council must designate criteria for selecting and ranking lands for designation as parks, based on an analysis of the services injured and the types of land most capable of restoring these services.

1a) For areas under 640 acres, initiate state land transfer process

1b) For areas larger than 640 acres, initiate request for legislative designation

2) Write and implement management plans

TIME NEEDED TO IMPLEMENT

Implementation time could range from 13 to 25 months, based on the following estimations:

1a) State land transfer - 1 year

1b) Legislative designation - 2 years

2) Write management plan - 1 month

MEANS TO IMPROVE RECOVERY

Creation of additional state park units will provide new recreational opportunities and restore some of the recreational and aesthetic services injured by the spill. In addition, focussing recreational activities in designated park areas could reduce human disturbance of injured species and habitats in other areas.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Existing regulatory authorities applicable to unclassified state lands can include:

Alaska Coastal Management Act (AS 46.40) and coastal resource district management plans (6 AAC 80 & 85)

Clean Water Act (33 USC 1251 & 1344)

Alaska water quality standards (18 AAC 70)

Alaska Water Use Act (AS 46.15) and water management regulations (11 AAC 93)

Alaska Forest Practices Act of 1990 (AS 47.17)

ADF&G Anadromous Stream and Fishway Acts (AS 16.05.840 & 870)

State land use permits and area management plans (11 AAC 58, 95 & 96)

Alaska Historic Preservation Act (AS 41.35)

Designation of unclassified state lands as state park units would result in management of these areas primarily for recreational purposes, with the additional requirement that certain activities would require ADNR park use permits, as per 11 AAC 12. However, park regulations and management policies do not generally provide as much resource protection as the regulations covering certain federal conservation units or ADF&G special areas.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Lawful pre-existing uses of parks are maintained. State parks larger than 640 acres can only be closed to multiple uses by legislative action.

TECHNICAL FEASIBILITY

New park units are nominated on a regular basis and the processes for establishing parks is already in place. There are currently several state park units within the spill area and many of these are heavily used for recreational activities. It is reasonable to expect that additional parks in suitable locations would also receive substantial use.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

Much of the area impacted by the spill is heavily used for recreation, and there is public demand for recreational areas and facilities. Designating new parks units will help to meet this demand and will restore some of the lost recreational services injured by the spill. This option could take up to two years to complete.

INDIRECT EFFECTS

1) Socioeconomic benefits could result from increased spending in the spill area by recreational users.

2) Parks and public facilities tend to concentrate public uses, and could reduce damage to surrounding areas, such as trampled vegetation, littering, erosion, etc.

3) Alternatively, new park units could attract so many additional users that pressures on injured species and habitats increase, compounding existing injuries.

4) Prohibiting resource development and certain public uses in park units could result in negative economic impacts.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

This suboption is related to options 21 and 24, which potentially entail acquisition of tidelands and park inholdings. Lands acquired as part of these options could be subsequently designated as state park units. Also, option 12 (creation of new recreation facilities) could be relevant if the decision were made to build cabins or other facilities in the new park units.

When considering this option, new parks should not be sited in areas which sustained heavy damage from the spill, since increased human use might inhibit the rate of natural recovery.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Option 24, which entails acquisition of inholdings within parks, is

most likely to provide comparable enhancement of recreational resources since many parks and similar conservation units are managed to enhance public recreation. The other land options mentioned above could also potentially achieve the same objective, provided that intensive recreational use was compatible with the restoration of injured species and habitats.

LEGAL CONSIDERATIONS

1) Consistency with settlement: Restoration of injured recreational services is consistent with the terms of the settlement.

2) Agencies with management/regulatory authority: Existing agency responsibilities do not conflict with the implementation of this suboption. The agency with lead responsibility for managing state lands is ADNR. ADF&G is responsible for managing fish and wildlife resources.

3) Permits required: None

4) NEPA compliance: Since this represents an enhancement of existing state resource management practices and does not involve land acquisition, it is unlikely that any NEPA documents will be required. However, if very large parks were designated this could require NEPA analysis.

5) Requirements for new legislative/regulatory actions: Designation of park units larger then 640 acres requires a legislative designation. Areas smaller than this can be designated as parks via an administrative state land transfer process. Additional park units would require ADNR to write new or amend existing management plans.

MEANS TO EVALUATE SUCCESS

Use levels of new park units will be monitored by ADNR, providing an indication of increased recreational services.

REPRESENTATIVE COSTS

Complete land transfer process- $4,000 to $60,000

Complete legislative designation process- $20,000 to $50,000

Implement plan and enforce regulations-
$30,000/ranger per 6-7 parks
$10,000 for field support staff
$20,000 for a boat

ADDITIONAL INFORMATION NEEDED

Criteria for selecting areas which support injured recreational services or provide equivalent services.

CITATIONS

Dave Stevens, Div. of Parks/ADNR, pers. comm.
Jones and Stokes Report

SUBOPTION B Designate New ADF&G Special Areas

TARGET RESOURCES AND SERVICES

1) Marine areas supporting resources and services injured in the spill. These include coastal and nearshore habitats; seabirds; waterfowl; marine mammals; salmon; herring; invertebrates; seagrasses; intertidal algae; commercial, subsistence and sport harvests; and aesthetic and recreational uses, such as birdwatching and kayaking.

2) Marine areas supporting resources and services equivalent to those injured in the spill

DESCRIPTION

This suboption deals with the identification and designation of state lands and waters as ADF&G special areas, i.e., critical habitat areas, game refuges and sanctuaries. Marine areas critical to supporting injured resources and services would be designated as special areas by the state legislature and managed primarily by the Alaska Department of Fish and Game (ADF&G). If the state purchased inholdings within existing special areas, legislative action would not be necessary since they would automatically become part of the special area. ADF&G would write management plans for these area to ensure that they were managed to restore damaged resources and provide opportunities for compatible public uses. Special areas can, where appropriate, provide increased public access and other recreational and educational opportunities.

IMPLEMENTATION ACTIONS

Prior to implementing this option, the Trustee Council must designate criteria for selecting and ranking lands for designation as special areas, based on the habitat requirements of injured species.

1) ADF&G staff proposes designation of area to legislature.

2) Legislature designates special area, if the land is outside an existing special area.

3) ADF&G writes and implements management plan.

TIME NEEDED TO IMPLEMENT

Time needed to implement this option is approximately 25 months.

1) ADF&G writes proposal and justification - 1 month

2) Legislature designates special area - 1 year

3) ADF&G writes and implements management plan (assuming that legislature attaches funding to bill) - 1 year

MEANS TO IMPROVE RECOVERY

Enhanced protection of injured marine habitats will facilitate natural recovery by restricting activities stressful to already damaged resources. Protection of equivalent resources would guard against future habitat degradation. Special area designations can also enhance public education and compatible public uses by providing public access, interpretive signs, etc.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Existing regulatory authorities applicable to unclassified state lands and waters can include:

Alaska Coastal Management Act (AS 46.40) and coastal resource district management plans (6 AAC 80 & 85)

Clean Water Act (33 USC 1251 & 1344)

Alaska water quality standards (18 AAC 70)

Alaska Water Use Act (AS 46.15) and water management regulations (11 AAC 93)

Alaska Forest Practices Act of 1990 (AS 47.17)

ADF&G Anadromous Stream and Fishway Acts (AS 16.05.840 & 870)

State land use permits (11 AAC 58, 95 & 96)

Alaska Historic Preservation Act (AS 41.35)

These regulations 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. A very high level of protection for recovering species and habitats would be attained by classifying state lands as an ADF&G special area, 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.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Legal existing uses are permitted, although they must be compatible with special area regulations. Permits may be issued for future uses, provided they are compatible with the management plan. In addition, critical habitat areas can include private lands, which are, in some cases, subject to the regulations in the management plan.

TECHNICAL FEASIBILITY

ADF&G currently manages special areas throughout the state and adds areas at regular intervals. ADF&G has successfully managed these areas to provide and maintain important habitat and to allow for compatible public uses, including hunting, fishing, birdwatching and other recreational uses.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

Undesignated state lands which support injured resources and services exist throughout the spill area. Some of these lands are subject to ongoing or planned commercial and recreational activities which conflict with habitat requirements of injured species. Increased protection of these areas, via designation as an ADF&G special area, would ensure that restoration objectives would receive management priority. It could also enhance the services offered by these areas by increasing viewer education programs, public access and tourism. This option could take up to two years to complete.

INDIRECT EFFECTS

1) Species not targeted for restoration 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 resource development projects.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

This suboption is related to some of the restoration options which potentially entail land acquisitions or enhanced management in marine areas (i.e., options 21, 23, 24 & 29). Lands acquired or managed as part of these options could be subsequently designated as ADF&G special areas.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

The land acquisition options listed above could potentially achieve the same objectives, provided that the lands were subsequently designated as special areas or protected by cooperative management agreements which guaranteed an equivalent emphasis on restoration of injured resources and services. The designation of areas as National Marine Sanctuaries (suboption 22 c) or National Estuarine Reserves (suboption 22 d) may also achieve similar restoration objectives. Suboption 22e, modification of management plans, could achieve some of the same objectives, although management plans generally provide less enforcement authority on unclassified state lands than they do in special areas.

LEGAL CONSIDERATIONS

1) Consistency with settlement: Enhancement and restoration of injured resources and services is consistent with the terms of the settlement.

2) Agencies with management/regulatory authority: Existing agency responsibilities do not conflict with the implementation of this suboption. ADF&G has lead responsibility for managing fish and wildlife resources and special areas. ADNR co-manages special areas.

3) Permits required: None

4) NEPA compliance: Since this represents an enhancement of existing state resource management practices and doesn't entail acquisition of private land, it is unlikely that NEPA documents will be required. However, designation of particularly large or significant areas may require NEPA analysis.

5) Requirements for new legislative/regulatory actions: Special areas are designated by the state legislature. ADF&G writes and enforces area management plans.

MEANS TO EVALUATE SUCCESS

ADF&G would monitor effectiveness of special area designation in restricting activities detrimental to restoration. Enhanced recreational, sport and subsistence uses would also be documented.

REPRESENTATIVE COSTS

Management plan development - $70,000

Management costs:
permitting/inspections/educational - $12,000/yr

ADDITIONAL INFORMATION NEEDED

Scientific data on habitats necessary for restoration of injured species needs to be summarized and applied to developing criteria

for selecting lands and habitat types best suited to restore injured resources and services.

CITATIONS

Debra Clausen, ADF&G, pers. comm.
Jones and Stokes report

SUBOPTION C Designate National Marine Sanctuaries

TARGET RESOURCES AND SERVICES

DESCRIPTION

IMPLEMENTATION ACTIONS

TIME NEEDED TO IMPLEMENT

MEANS TO IMPROVE RECOVERY

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

TECHNICAL FEASIBILITY

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

INDIRECT EFFECTS

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

LEGAL CONSIDERATIONS

MEANS TO EVALUATE SUCCESS

REPRESENTATIVE COSTS

ADDITIONAL INFORMATION NEEDED

CITATIONS

SUBOPTION D Designate National Estuarine Reserves

TARGET RESOURCES AND SERVICES

DESCRIPTION

IMPLEMENTATION ACTIONS

TIME NEEDED TO IMPLEMENT

MEANS TO IMPROVE RECOVERY

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

TECHNICAL FEASIBILITY

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

INDIRECT EFFECTS

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

LEGAL CONSIDERATIONS

MEANS TO EVALUATE SUCCESS

REPRESENTATIVE COSTS

ADDITIONAL INFORMATION NEEDED

CITATIONS

SUBOPTION E Modify Management Plans or Policies

TARGET RESOURCES AND SERVICES

1) Marine areas supporting resources and services injured in the spill. These include coastal and nearshore habitats; seabirds; waterfowl; marine mammals; salmon; herring; invertebrates; seagrasses; intertidal algae; commercial, subsistence and sport harvests; and aesthetic and recreational uses, such as birdwatching and kayaking.

2) Marine areas supporting resources and services equivalent to those injured in the spill

DESCRIPTION

Natural resource management plans of various types can be modified to reflect an increased emphasis on restoring injured resources and services. These modifications do not require land purchase or legislative action, and can be accomplished by administrative action. Examples of relevant management plans which could be amended include the Chugach National Forest Land and Resource Management Plan; the Prince William Sound Area Management Plan for State Lands; and the Alaska Coastal Management Program (ACMP) resource management plans for the Kodiak and Kenai Boroughs, Cordova, Valdez and Whittier. The National Park Service and the Fish and Wildlife Service also have management plans for parks and refuges in the spill area. Modifications would rely on refocussing existing regulatory authorities to achieve restoration objectives, rather than creating new laws or placing public land into a new special protective status.

In general, this option is best suited for modifying resource management practices on public lands. While ACMP plan changes can apply to private lands, they are often not enforceable unless the owner requires a local, state or federal permit for activities on their land. In addition, state and federal agencies often do not have strong management authorities over private lands and inholdings and, therefore, cannot influence activities on private lands and inholdings through modification of management plans.

IMPLEMENTATION ACTIONS

The process for modifying management plans varies between coastal districts, state agencies and federal agencies but is not, in general, very complex. However, prior to initiating any type of plan amendment, the Trustee Council must specify what types of habitats and conditions are critical for restoring injured species. Four steps will follow:

1) The appropriate agency or coastal district will propose the amendment. Coastal districts may propose amendments by designating an Area Meriting Special Attention (AMSA).

2) The agency or coastal district will go through the approval process for the amendment.

3) A NEPA analysis will be done, if necessary.

4) Enhance monitoring and enforcement as appropriate.

TIME NEEDED TO IMPLEMENT

1 1/2 to 2 years will be needed to implement changes, depending on complexity of issues and whether or not a NEPA analysis is necessary.

MEANS TO IMPROVE RECOVERY

The public lands within the spill area are covered by one or more management plan. These plans set the resource management agencies' goals and objectives for certain areas. The plans embody and focus the relevant rules and regulations and are usually referred to first when making day-to-day management decisions. Amending plan policies can facilitate natural recovery by restricting activities stressful to already damaged resources and establishing a cohesive plan of action to facilitate natural recovery. Protection of equivalent resources would guard against future habitat degradation.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

State and federal authorities relevant in marine and coastal areas can include:

Alaska Coastal Management Act (AS 46.40) and coastal resource district management plans (6 AAC 80 & 85)

Clean Water Act (33 USC 1251 & 1344)

Alaska water quality standards (18 AAC 70)

Alaska Water Use Act (AS 46.15) and water management regulations (11 AAC 93)

Alaska Forest Practices Act of 1990 (AS 47.17)

ADF&G Anadromous Stream and Fishway Acts (AS 16.05.840 & 870)

State land use permits and area management plans (11 AAC 58, 95 & 96)

Alaska Historic Preservation Act (AS 41.35)

National Historic Preservation Act of *** (USC)

Archeological Resources Protection Act of *** (USC)

National Forest Management Practices Act of 1976 (16 USCA)

Chugach National Forest Management Plan

ANILCA, 1980 (16 USC 3101)

National Wildlife Refuge Administration Act of *** (**USC), ???

Endangered Species Act of 1973 (16 USC 1531)

Marine Mammals 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)

Organic Act of *** (USC)

Management plan amendments will not add new regulatory authority, but will refocus existing authorities onto specific restoration issues. However, most state and federal management plans do not have direct authority over private lands. While ACMP plans do apply to private lands, their policies are only enforceable when private parties require permits for their activities.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Modifying management plans does not require changes in land ownership or status. Existing uses and management practices compatible with restoration objectives will usually be maintained. Other uses, not compatible with restoration, would be prohibited.

TECHNICAL FEASIBILITY

Modification of management plans is a routine procedure and does not present technical difficulties. Most plans are scheduled to go through an amendment process on a regular basis.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

Federal and state agencies and coastal resource districts have varying degrees of management authority over a large percentage of the land within the spill area. These agencies and districts have a plans which direct management of marine and coastal resources throughout the spill area. The plans can be modified, through various administrative processes, to increase protection of injured resources. Resource agency management plans are routinely modified to protect damaged habitats and injured or depleted species.

INDIRECT EFFECTS

1) Species not targeted for restoration 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 resource development projects.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

This suboption is relevant to all marine area acquisition options (options 21, 23, 24 and 29) since all these lands could potentially be in public ownership and would be covered by management plans.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

All the land acquisition options listed above could potentially achieve the same objective, provided that the land was given some sort of special protective status subsequent to acquisition. Acquisition could entail purchase of fee title or acquiring a more limited set of management rights through negotiation with a private landowner. Also, the other suboptions listed in option 22 (above) could provide comparable or stronger management authority over public lands.

LEGAL CONSIDERATIONS

1) Consistency with settlement: Enhancement and restoration of injured resources and services is consistent with the terms of the settlement.

2) Agencies with management/regulatory authority: This suboption could potentially involve any of the state and federal agencies with species or land or species management responsibilities in marine areas. This includes the Alaska Departments of Fish and Game and Natural Resources; the U.S. Fish and Wildlife Service; the Forest Service; the National Park Service; and the National Marine Fisheries Service.

3) Permits required: None

4) NEPA compliance: It is unlikely that any modification of state and coastal district management and policies would go through the NEPA process since the action represents an enhancement of existing resource management practices and doesn't entail acquisition of private land. Modification of federal management and policies, however, could require an EA,

depending on the magnitude of the change.

5) Requirements for new legislative/regulatory actions: Modification of management plans and policies does not generally require legislative action and can be achieved through administrative actions by agencies and/or coastal resource districts.

6) Other: Federal claims to jurisdiction in Alaska coastal waters are contested by the state, which could complicate agreements on management practices.

MEANS TO EVALUATE SUCCESS

The appropriate agency would monitor how effectively the changes to management policies had prevented activities harmful to injured resources and services and the degree to which the changes had enhanced any compatible public uses.

REPRESENTATIVE COSTS

Modifying/re-writing agency management plan - usually covered under agency budget

or

Modify local ACMP district plan - $50,000 - $200,000 to write plan designating AMSA; depends on size of AMSA and complexity of issues

NEPA analysis - Variable

ADDITIONAL INFORMATION NEEDED

The Trustee Council must specify what types of habitats and conditions are critical for restoring injured species and require additional protection.

CITATIONS

Ray Thompson, USFS, pers. comm.
Glenn Seamen, ADF&G, pers.comm.
Debra Clausen, ADF&G, pers. comm.
George Constantino, FWS, pers. comm.
Jones and Stokes report

SUBOPTION

#22 (b.) National Marine Sanctuaries

TARGET RESOURCES AND SERVICES

Coastal habitat, marine birds and mammals, seabirds, fisheries, invertebrates, algae and seagrasses and recreation

DESCRIPTION

National Marine Sanctuaries are created to identify, designate, and manage areas of nationally significant marine waters. National significance is based on the conservational, ecological, aesthetic, recreational, historical, research, and /or educational value of the site. Management plans and regulations are created for each site to achieve comprehensive and coordinated conservation and to ensure that multiple uses are managed to remain compatible with resource protection.

IMPLEMENTATION ACTIONS

The National Oceanic and Atmospheric Administration (NOAA) is currently re-evaluating the Marine Sanctuary "site evaluation list." NOAA convenes a national team of experts who review the site selection process and criteria. Then, Regional Evaluation Teams are assembled, Alaska is a region. The regional teams develop their recommendations for listing and forwards them to NOAA for consideration. Areas that are accepted onto the site evaluation list are published on a formal list of candidate sites.

The new sites are then evaluated based on the goal of increasing the range of marine resources and ecosystems represented in the national system of sanctuaries. Sites containing significant historical resources will received special emphasis and areas will also be selected for their potential in conserving marine biodiversity, preserving sustained uses, and detecting signs of global climate change.

TIME NEEDED TO IMPLEMENT

Time needed to fully implement the formal designation of a Marine Sanctuary will vary. The current process of reviewing the Site Evaluation List will take approximately 2 years (ending in 1994). Once a site is on the list, and environmental impact statement and draft plan must be develop within 2.5 years. Should the Congress chose to establish a Marine Sanctuary in less time, they can do so by passing legislation. In such cases, the active encouragement by the state's governor is considered essential.

MEANS TO IMPROVE RECOVERY

Marine Sanctuaries could play a significant role in the process of restoring resources and resource services in the oil spill area.

Sanctuaries provide a unique mechanism for managing areas as a complete ecosystem, rather than just targeting activities or protecting only certain organisms. The approach is to create a management plan tailored to address the issues specific to a site and to identify solutions to problems using all available resources, both inside and outside NOAA.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Some marine resources (i.e. marine mammals) are afforded protection under current state or federal laws. Generally, marine resources are managed on a species by species basis. Often, the management emphasis is on how much a particular resource can be used, or taken, during a given year, or season. Efforts to coordinate research on multiple species and associated upland areas is generally considered poor.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Marine Sanctuaries would do little to conflict with existing or planned uses in the marine environment. Conflicts with existing activities (i.e. fishing) is not anticipated.

TECHNICAL FEASIBILITY

Establishment of Marine Sanctuaries is technically feasible. Sanctuaries have been established in nine different locations on the coasts of the Atlantic and Pacific Oceans and in the Gulf of Mexico. One Alaska area is currently on the Site Evaluation List, that being the islands of Attu and Kiska in the Aleutian Chain.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

The potential for a Marine Sanctuary to improve or enhance recovery of injured natural resources and services is good. With the establishment of a sanctuary, a small research focused staff, funded by NOAA, will begin to carry out their mission of conservation, ecological, aesthetic, recreational, and historical research, and education. Staff dedicated to these tasks can assist the Trustees in better understanding the progress of some restoration programs (i.e. monitoring). Such a sanctuary could also play a role in carrying out long term research beyond the scope of the restoration program.

INDIRECT EFFECTS

add subheadings:

<u>Environmental</u>

<u>Socio-economic</u>

<u>Human health and safety</u>

Marine Sanctuaries, in other regions of the United States, are helping local economies by drawing additional tourists to these areas. In Alaska, a marine sanctuary in association with upland parks, refuges or forests could become a particularly attractive destination for many tourists, especially in communities with existing services, like Kodiak, Homer, Seward and Cordova.

The establishment a Marine Sanctuary in the oil spill area would set a good example of state/federal cooperation in the aftermath of the oil spill.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

The establishment of Marine Sanctuaries could be part of a larger series of restorative actions taken by the Trustees specifically for the marine environment. For example, some areas of the spill area may be dedicated as state marine parks, or some as estuarine reserves. Each designation would serve a particular restoration need.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

The state of Alaska could establish, through an act of it's legislature, an area with similar goals like the Marine Protection, Research and Sanctuaries Act of 1972.

LEGAL CONSIDERATIONS

add in subheadings

Consistency with settlement

Agencies with management/regulatory responsibilities

Permits required

NEPA compliance

Additional/new legislation or regulatory actions

Experience in other states shows that cooperation between federal, state and local governments is needed to successful designate an area as a Marine Sanctuary.

MEANS TO EVALUATE SUCCESS

If a Marine Sanctuary were established, an independent evaluation of the sanctuary's contribution to filling gaps in existing management programs relative to the needs for restoration in the oil spill areas could be commissioned. (Does anyone have ideas here?)

REPRESENTATIVE COSTS

Development of a Marine Sanctuary's draft environmental impact

statement, draft plan and draft regulations generally costs $500,00 over a period of 2.5 years. These funds are normally provided to NOAA through Congressional appropriation.

ADDITIONAL INFORMATION NEEDED

New site evaluation list from NOAA.

CITATIONS

* Proceeding of the Workshop on Programs to Protect Marine Habitats, Jones & Stokes Associates, Inc, for the Environmental Protection Agency and the Restoration Planning Work Group, January 1992

* Summary Report on Programs to Protect and Manage Marine Habitats, Jones & Stokes Associates, Inc, for the Environmental Protection Agency and the Restoration Planning Work Group, January 1992

* Marine Protection, Research and Sanctuaries Act of 1972, __USC __

* Personnal communication with Miles Croom, NOAA, SEL Manager 202-606-4126

* Marine Protection, Research, and Sanctuaries Act, 33 USCA 1401, as amended

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November 12, 1992 Author: Chris Swenson

OPTION Option 23: Acquire Marine Bird and Mammal Habitats

APPROACH CATEGORY Habitat Protection and Acquisition

INJURED RESOURCES AND SERVICES Several species of marine birds and mammals were injured by the spill, including seabirds, sea ducks, sea otters and harbor seals. Injuries to these species also impacted recreational wildlife viewing opportunities and subsistence harvests.

SUMMARY A number of sites important to the recovery of injured marine species were impacted by the spill. These include small, rocky islands and cliffs used by colonies of nesting marine birds, riparian habitat used by nesting harlequin ducks and forested areas used by nesting marbled murrelets. Adjacent waters and tidelands are used by sea otters and harbor seals. The Alaska Maritime National Wildlife Refuge, managed by the U.S. Fish and Wildlife Service (FWS), was established for the conservation and management of marine species and includes many coastal habitat types within its boundaries. Inholdings containing key habitat types could be purchased and added to the refuge. The FWS could than manage these refuge areas to provide high levels of protection for injured species. Alternatively, there are several other protection options, such as negotiating conservation easements or purchasing timber rights, which would leave the land in private ownership and provide varying levels of protection. Either course of action will require increased levels of monitoring and enforcement.

SUBOPTION A Acquisition of fee title to privately owned marine mammal and bird habitats

TARGET RESOURCES AND SERVICES This suboption potentially targets three groupings of resources and services:

1) oiled coastal habitats supporting resources and services directly injured by the spill

2) unoiled habitats supporting injured resources and services (e.g., unoiled islands that provide habitat for injured migratory bird populations)

3) unoiled habitats supporting resources and services equivalent to those injured by the spill

DESCRIPTION The federal government could acquire fee title to privately owned inholdings within the Alaska Maritime National Wildlife Refuge. The land would automatically become part of the refuge and would be managed by the FWS 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:

1) The FWS will prepare a preliminary project proposal and go through a NEPA compliance process, which would probably entail preparation of an EA.

2) The FWS will go through the multiple steps necessary to purchase or reconvey land to public ownership.

3) The FWS will carry out management responsibilities and monitoring.

TIME NEEDED TO IMPLEMENT The FWS realty office estimates that the time needed to implement this option ranges from 6 months to 1 year. Variables include:

Time to negotiate with landowner
Time for for federal acquisition process
If an EA or EIS is required
Time to write or amend management plans

MEANS TO IMPROVE RECOVERY Public ownership and enhanced protection of oiled lands 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 inholdings within the Alaska National Maritime Wildlife Refuge 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 Forest Practices Act of 1990 (AS 47.17) and 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 Claim Settlement Act of 1971
State and local zoning regulations

These regulations 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 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 FWS has a section which deals specifically with realty and has acquired Alaskan refuge inholdings in the past.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE The spill area contains private islands and coastal habitats which support significant resources and services. For example, Afognak, East Amatuli and Gull Islands contain inholdings which could potentially support commercial and recreational uses that conflict with the habitat requirements of marine birds, mammals and other species which were either injured in the spill or are equivalent to injured species.

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 viewing opportunities, tourism and subsistence harvests. The acquisition process could take up to one year 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, 24, 25, 26 and 29, which deal with acquisition of tidelands, private inholdings within parks and refuges, bird nesting areas, anadromous stream buffers and upland forests. Marine bird and mammal habitats can potentially include some or all of these areas.

OTHER OPTIONS THAT COULD ACHIEVE THIS OBJECTIVE This option provides a high level of protection for islands and coastal areas. However, there may be cases where the same objectives can be achieved by suboption B of option 23 (below), which would enhance habitat protection through a variety of non-purchase alternatives. In addition, options 21, 24, 25, 26 and 29 could achieve the same objectives if, once these areas were acquired, they were given a level of regulatory protection comparable to national wildlife refuge status. 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 responsibility for coastal species and habitats potentially include the Alaska Departments of Natural Resources and Fish and Game; The National Park Service; the Fish and Wildlife Service; the Forest Service and the National Marine Fisheries Service.

3) Permits required: No permits are required.

4) NEPA compliance: Federal land acquisitions generally go through the NEPA process, which requires an EA and possibly an EIS. However, additions to existing refuges will probably only require an EA.

5) Requirements for new legislative/regulatory actions: None is required for purchase of inholdings within the refuge.

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 FWS will monitor how effectively their refuge management program has prevented activities harmful to injured resources and services and the degree to which the option

has enhanced compatible public uses.

REPRESENTATIVE COSTS

Federal 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 -

TOTAL COST: Variable

ADDITIONAL INFORMATION NEEDED

Input from Trustee Council is needed on specific coastal areas eligible for acquisition and subsequent refuge status. This must be based on specified habitat types and conditions required for restoration of injured species.

CITATIONS

Kim Sundberg, ADF&G, pers. comm.
Al Carson, ADF&G, pers. comm.
Bill Mattice, FWS Realty, pers. comm.
John Martin, FWS ANMWR Mgr., pers. comm.
Steve Planchon, TNC, pers. comm.
TNC report
Jones and Stokes report
Restoration Framework document

SUBOPTION B Enhance protection of privately owned coastal habitats without acquisition of fee title

TARGET RESOURCES AND SERVICES This suboption potentially targets three groupings of resources and services:

1) oiled islands and coastal habitats supporting resources and services directly injured by the spill

2) unoiled habitats supporting injured resources and services (e.g. unoiled intertidal areas that provide habitat for injured migratory bird populations

3) unoiled habitats 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 U.S. 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, 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 should be less than for suboption A and ranges but is

variable. Variables include:

Negotiations with landowners
Time needed for EA (if applicable)
Process for purchasing limited property or development rights (if applicable)
Process for executing administrative actions (if applicable)

MEANS TO IMPROVE RECOVERY Enhanced protection of oiled coastal habitats 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 the Alaska National Maritime Wildlife Refuge 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 Forest Practices Act of 1990 (AS 47.17) and 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 the injured resources 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.

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

The spill area contains private islands and coastal habitats which support significant resources and services. For example, private inholdings on Afognak, East Amatuli and Gull Islands could potentially support multiple commercial and recreational uses of these areas that conflict with the habitat requirements of marine birds and mammals and other 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 viewing opportunities, tourism and subsistence harvests. The time needed to implement this option is variable, but be less than a year.

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.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIVITIES This suboption could potentially overlap with options 21, 24, 25, 26 and 29, which deal with acquisition of tidelands, private inholdings within parks and refuges, bird nesting areas, anadromous stream buffers and upland forests. Marine bird and mammal habitats can potentially include some or all of these areas.

OTHER OPTIONS THAT COULD ACHIEVE THIS OBJECTIVE Suboption A of Option 23 (above) could achieve the same objectives. In addition, options 21, 24, 25, 26 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 less than fee simple rights to land, including acquisition of rights to 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 responsibility for coastal species and habitats potentially include the Alaska Departments of Natural Resources and Fish and Game; The National Park Service; the Fish and Wildlife Service; the Forest Service and the National Marine Fisheries 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 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 coastal 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

November 12, 1992 Author: Chris Swenson

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:

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

29, which deal with acquisition of tidelands, marine bird habitat, bird nesting areas, anadromous stream buffers and upland forests. Inholdings can potentially include some or all of these areas.

OTHER OPTIONS THAT COULD ACHIEVE THIS OBJECTIVE This option provides a high level of protection for inholdings. However, there may be cases where the same objectives can be achieved by Suboption B of option 24 (below), which would enhance habitat protection through a variety of non-purchase alternatives. In addition, options 21, 23, 25, 26 and 29 could achieve the same objectives if, once these areas were acquired, they were given a level of regulatory protection comparable to national wildlife refuge status. 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 responsibility for areas with inholdings 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: Land acquisitions generally go through the NEPA process, although small additions to existing conservation units may not have to.

5) Requirements for new legislative/regulatory actions: None is required for purchasing inholdings.

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.

7) ANILCA: With certain restrictions, ANILCA authorizes NPS and FWS to purchase inholdings from willing sellers. With minor exceptions, these agencies are not authorized to purchase outside the boundaries of existing conservation units. The USFS is also generally restricted to purchasing inholdings. However, the boundaries of the Alaska National Maritime Wildlife Refuge are loosely defined and include coastal areas, islets and spires along much of the Alaskan coast. Therefore, many privately owned coastal lands could qualify as inholdings.

MEANS TO EVALUATE SUCCESS The appropriate agency will monitor how effectively their management program has prevented activities harmful to injured resources and services and the degree to which the option has enhanced compatible public uses.

REPRESENTATIVE COSTS

Federal/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 -

TOTAL COST: Variable

ADDITIONAL INFORMATION NEEDED

Input is needed from the Trustee Council on specific inholdings eligible for acquisition and subsequent status. This must be based on specified habitat types and conditions required for restoration of injured species.

CITATIONS

Kim Sundberg, ADF&G, pers. comm.
Al Carson, ADF&G, pers. comm.
Bill Mattice, FWS Realty, pers. comm.
John Martin, FWS ANMWR Mgr., pers. comm.
Chuck Gilbert, NPS, pers. comm.
Robin Willis, ADF&G, pers. comm.
Steve Planchon, TNC, pers. comm.
TNC report
Jones and Stokes report
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.

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 Many state and federal conservation units in the spill area have private inholdings which support significant resources and services. Certain recreational and commercial activities on these lands conflict 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.

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 viewing opportunities and tourism. This suboption could take anywhere from a few 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 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.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIVITIES This suboption could potentially overlap with options 21, 23, 25, 26 and 29, which deal with acquisition of tidelands, marine bird habitat, bird nesting areas, anadromous stream buffers and upland forests. Inholdings can potentially include some or all of these areas.

OTHER OPTIONS THAT COULD ACHIEVE THIS OBJECTIVE Suboption A of Option 24 (above) could achieve the same objectives. In addition, options 21, 23, 25, 26 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 less than fee simple rights to land, including acquisition of rights to 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 primary land management responsibilities 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 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 the Trustee Council on specific inholdings 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

November 12, 1992 Author: Chris Swenson

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.

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)

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

These regulations 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.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE The spill area contains private uplands which support significant resources and services. For example, privately owned forested uplands around Cordova, Kachemak Bay and Afognak support multiple commercial and recreational uses which potentially conflict with the habitat requirements of species which were either injured in the spill or are equivalent to injured species.

Acquisition and 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 acquisition process could, in some cases, take several years to complete, implementation of this suboption 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 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.

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 -

Costs of enhancing compatible recreation opportunities; e.g., building and maintaining a parking lot, boardwalk & interpretive signs -

TOTAL COST: Variable

ADDITIONAL INFORMATION NEEDED

Information is needed on the land acquisition processes, costs and timelines from the state DNR.

Input from Trustee Council is needed on specific uplands eligible for acquisition and special protective status. 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.
Al Carson, ADF&G, pers. comm.
Ray Thompson, USFS, pers. comm.
Steve Planchon, TNC, pers. comm.
TNC report
Jones and Stokes report
Restoration Framework document

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

The spill area contains private uplands which support significant resources and services. For example, privately owned forested uplands around Cordova, Kachemak Bay and Afognak support multiple commercial and recreational uses which 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. The time needed to implement this option is variable and could range from a few months to several years.

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.

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. Forested uplands can potentially include some or all of these habitats or land types.

OTHER OPTIONS THAT COULD ACHIEVE THIS OBJECTIVE Suboption A of Option 23 (above) could achieve the same objectives. In addition, options 23, 24, 26 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 impacted species and habitats potentially include the Alaska Departments of Natural Resources and Fish

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

November 12, 1992 Author: Chris Swenson

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 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.

These management objectives can be achieved by: a) legislative designation of the uplands as a protected area, e.g. a critical habitat area; or b) administrative actions such as amending resource agency area management plans or coastal district management plans.

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

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 state or federal legislatures to act (if necessary)
Time needed for administrative action (if necessary)
Time to write/amend management plan

MEANS TO IMPROVE RECOVERY Public ownership and enhanced protection of riparian ares will facilitate natural recovery by restricting activities stressful to already damaged populations and habitats, and, when appropriate, providing public access and services. In the case of 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 potentially applicable on privately owned 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)
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

with other injured habitat types, into a single management unit should be considered.

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.

Acquisition and 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 acquisition process could, in some cases, take several years to complete, implementation of this suboption 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 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.

4) Public ownership of riparian areas could simplify public access, when public uses are 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 areas 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 This option provides a very high level of legal protection for uplands. However, there may be cases where the same objectives can be achieved by suboptions B and C of Option 26 (below), which would enhance riparian protection through a variety of non-purchase alternatives. 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 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

ADDITIONAL INFORMATION NEEDED

Information is needed on the land acquisition processes, costs and timelines for the state DNR.

Input is also needed from the Trustee Council on specific buffer areas eligible for acquisition and special protective status. This must be based on specified habitat types and riparian buffer zone widths required for restoration of injured species.

CITATIONS

Kim Sundberg, ADF&G, pers. comm.
Debby Clausen, ADF&G, pers. comm.
Al Carson, ADF&G, pers. comm.
Ray Thompson, USFS, pers. comm.
Steve Planchon, TNC, pers. comm.
TNC report
Jones and Stokes report
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)

MEANS TO IMPROVE RECOVERY Enhanced protection of riparian areas will facilitate natural recovery by restricting activities stressful to already damaged populations and habitats and, when appropriate, by providing public access. 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 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 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.)
- Section 22(g) of Alaska Native Claims Settlement Act of 1971
- State and local zoning regulations

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.

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 riparian areas 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.

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 &

permitting costs for ADF&G special areas)

TOTAL COST: Variable

ADDITIONAL INFORMATION NEEDED

Input is needed from the Trustee Council on specific riparian areas eligible for acquisition and enhanced habitat protection. This must be based on specified habitat types and buffer zone widths 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

SUBOPTION C Amend State Forest Practices Act

TARGET RESOURCES AND SERVICES This suboption potentially targets two groupings of resources and services:

1) private and state-owned riparian areas supporting resources and services directly injured by the spill

2) private and state-owned riparian areas supporting resources and services equivalent to those injured by the spill

DESCRIPTION The Alaska legislature could amend the Alaska Forest Practices Act of 1990 to increase riparian buffers around anadromous streams supporting resources and services injured by the spill. The amendment would change buffer requirements on certain state and private lands.

IMPLEMENTATION ACTIONS 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. Given this information, the successful implementation of this action could proceed as follows:

1) Staff from the appropriate state agencies will draft a proposed amendment and justification for the legislature.

2) After approval by the commissioners of the appropriate state agencies, the proposed amendment will then be submitted to the legislature as a bill by the Governor or a legislator.

3) The legislature will act on the proposed amendment after

November 12, 1992 Author: John Strand

OPTION 27 - Designate Long-Term Ecological Research Sites

APPROACH CATEGORY Habitat Protection and Acquisition

INJURED RESOURCES AND SERVICES All

SUMMARY

DESCRIPTION

It is the objective of this suboption to implement designation and development of one or more Long-Term Ecological Research Sites (LTERS) which could be integral to the comprehensive monitoring program. Permanent monitoring sites at unoiled locations within the spill zone will allow for the establishment of baseline environmental conditions to use as reference standards when assessing the rate of recovery of oil-impacted locations.

IMPLEMENTATION ACTIONS

The LTER System is administered by the Nation 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. 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 have been required to submit renewal proposals.

TIME NEEDED TO IMPLEMENT

Most present-day LTERs were first established as research and monitoring sites by the Federal Government or by academic institutions. 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). Only recently were most of these locations also designated LTERs. Accordingly, it may only take a year to obtain a National Science Foundation designation and obtain initial funding. In reality, however, it may take longer to develop sufficient data for a candidate to prepare a successful proposal.

MEANS TO IMPROVE RECOVERY

The LTER System provides a stable environment for research and monitoring through long-term protection. LTERS also allow for

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 Federal or state law or both authorities.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Because most sites were used for research and/or monitoring prior to their designation as LTERs, potential conflict with existing or planned uses or management is not viewed as a problem.

TECHNICAL FEASIBILITY

There are seventeen sites in the current network of LTERs. 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. A wide range of research projects are conducted at the seventeen sites. Five core research areas have become the major program theme of the 17 sites. These are:

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.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

Establishing and designating one or more LTER sites could improve or enhance recovery of injured resources. LTERs 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

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

LEGAL CONSIDERATIONS

MEANS TO EVALUATE SUCCESS

REPRESENTATIVE COSTS

ADDITIONAL INFORMATION NEEDED

CITATIONS

November 12, 1992 Auth0hris Swenson

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 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.

2) The state or federal government will go through the multiple steps necessary to purchase or reconvey land to public ownership.

3) The appropriate agency will carry out management responsibilities and monitoring, including preparation of a management plan.

TIME NEEDED TO IMPLEMENT The time needed to implement this option is variable, although in some cases it could be as little as only a few months. Variables include:

Which government agency does acquisition
Time needed to negotiate with landowner
If an EA or EIS is required
Time to write/implement management plan

MEANS TO IMPROVE RECOVERY Acquisition of recreational access could replace or enhance lost services by improving fishing and recreational opportunities or creating opportunities where none had previously existed. In addition, by directing public uses to specific areas, human pressures on sites still recovering from spill injuries can be lessened.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS Existing regulatory authorities potentially applicable on private lands 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)
Alaska Forest Practices Act of 1990 (AS 47.17)
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 1972
State and local zoning regulations

These regulations can provide high levels of protection in certain cases, but they do not require that private landowners allow access across their land as a means of restoring injured recreational services.

RELATIONSHIP WITH EXISTING/PLANNED USES OR MANAGEMENT Government acquisition and management of public access routes could result in increased regulation of public uses in access areas, such as development projects and other private uses. Agencies should also carefully consider the siting of public access routes and associated facilities. In some cases, increasing public uses of recovering areas may be incompatible with the overall goal of restoring injured resources and services.

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 recreational areas. For example, the Alaska Department of Fish and Game (ADF&G) has completed several sport fish access projects in southcentral Alaska and is in the planning stages for others.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

Prince William Sound, Cook Inlet and Kodiak are heavily used for sport fishing and recreation. Given the existing use pressures on these areas and the popularity of existing recreational access improvements, it is highly likely that additional access would be used, especially in the more popular areas. For instance, ADF&G is currently considering sport fish access projects near Cordova, Whittier, Valdez and on Kodiak and the Kenai Peninsula.

INDIRECT EFFECTS Indirect effects could include the following:

1) Improved access could provide socioeconomic benefits by attracting tourists and recreational users to the area, thus increasing the amount of money circulated through the economy of cities and villages in the spill area.

2) Agency acquisition and management of access points could have negative economic impacts due to increased regulatory restrictions development projects and other private uses.

3) Acquisition of 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 acquiring 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 Option 28, part B (below) could potentially achieve the same objectives through a variety of non-purchase options. Also, acquisition of inholdings (option 24), upland areas (option 25), and stream buffers (option 26) could also provide public access, if this was compatible with other management objectives. There is, therefore, 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 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.
218 TNC report
219 Jones and Stokes report
220 Restoration Framework document

SUBOPTION B Acquire Access Without Purchase of Fee Title

TARGET RESOURCES AND SERVICES This suboption potentially targets two groupings of resources and services:

1) streams and recreational sites on private lands with inadequate public access which support resources and services directly injured by the spill

2) streams and recreational sites with inadequate public access on private lands which support resources and services equivalent to those injured by the spill

DESCRIPTION State and/or federal governments can provide public access 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: voluntary agreements with landowners; lease, license and cooperative management agreements; deed restrictions; and conservation easements or partial interests. 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. Implementation of Trustee Council decisions will occur in two steps:

1) The appropriate agency will contact the landowner and negotiate terms of non-purchase protection option.

2) The appropriate agency will carry out monitoring and any additional management responsibilities, including writing a management plan.

TIME NEEDED TO IMPLEMENT The time needed to implement this option is variable. Variables include:

Time to negotiate with landowner
Time to write/implement management plan
Time to build roads or facilities, if necessary

MEANS TO IMPROVE RECOVERY Additional recreational access could replace or enhance lost services by improving fishing and recreational opportunities or creating opportunities where none had previously existed. In addition, by directing public uses to specific areas, human pressures on sites still recovering from spill injuries can be lessened.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS Existing regulatory authorities potentially applicable on private lands 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)
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.)
Section 22(g) of Alaska Native Claims Settlement Act of 1972
State and local zoning regulations

These regulations can provide high levels of protection in certain cases, but they do not require that private landowners allow access across their land as a means of restoring injured recreational services. Short of fee title purchase, the best way to guarantee public access is to negotiate legally binding agreements with private landowners.

RELATIONSHIP WITH EXISTING/PLANNED USES OR MANAGEMENT Government management of public access routes could result in increased regulation of public uses in access areas, e.g., development projects. Agencies should also carefully consider the siting of public access routes. In some cases, increasing public uses of recovering areas is incompatible with the overall goal of restoring injured resources and services.

TECHNICAL FEASIBILITY This suboption is technically feasible. Resource agencies and private conservation organizations routinely negotiate agreements with landowners to achieve management objectives without purchase of fee title to lands. 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 entered into a mutual agreement to increase protection of natural resources while also providing for public access and compatible recreational uses.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

Prince William Sound, Cook Inlet and Kodiak are heavily used for sport fishing and recreation. Given the existing use pressures on these areas and the popularity of existing recreational access improvements, it is highly likely that additional access would be used, especially in the more popular areas.

INDIRECT EFFECTS Indirect effects could include the following:

1) Improved access could provide socioeconomic benefits by attracting tourists and recreational users to the area, thus increasing the amount of money circulated through the economy 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

public uses as well as any detrimental impacts caused by increased human pressures.

REPRESENTATIVE COSTS

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)

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

Kevin Delaney, ADF&G
Steve Planchon, TNC, pers. comm.
TNC report
Jones and Stokes report
Restoration Framework document

November 12, 1992 Author: Chris Swenson

OPTION **Option 29: Establish or Extend Buffer Zones for Nesting Birds**

APPROACH CATEGORY Habitat Protection and Acquisition

INJURED RESOURCES AND SERVICES The spill injured bald eagles, harlequin ducks, recreational viewing opportunities, tourism, and sport and subsistence harvests.

SUMMARY Resource agencies could generate cooperative management plans for key habitats on public lands. Alternatively, there are several protection options for habitats in private ownership which could provide varying levels of protection.

SUBOPTION A Recommend implementation of special agency management practices

TARGET RESOURCES AND SERVICES The spill injured bald eagles, harlequin ducks, recreational viewing opportunities, tourism, and sport and subsistence harvests.

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 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 potentially applicable on private lands 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)
- 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

The Bald Eagle Protection Act, the Migratory Bird Treaty Act, the Alaska Forest Practices Act, and their associated regulations provide the most direct protection for nesting birds. Fish and Wildlife regulations specify *******? foot buffer zones around active eagle nests, but this may not be sufficient in some cases. There are no buffer zones established for nesting harlequin ducks. The Forest Practices Act establishes logging buffers for streams, but these may not be sufficient to prevent disturbance to birds and may not even apply to smaller streams. 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.

If lands remain within private ownership, the best option for reducing disturbance of nesting birds is to negotiate legally binding management agreements with the landowners. These agreements can be tailored to meet the needs of all parties involved and are enforceable.

RELATIONSHIP WITH EXISTING/PLANNED USES OR MANAGEMENT Enhanced protection and management of bird 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. Natural resource agencies and private conservation organizations routinely 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

The spill area contains privately owned coastal and upland areas used by nesting birds. Multiple commercial and recreational uses of these areas potentially conflict with the habitat requirements of bald eagles, ducks and other species which were either injured in the spill or are equivalent to injured species. Disturbance of harlequin duck and eagle nesting sites has been documented to increase nesting failure (CITES). Increased protection of these areas would ensure that restoration of injured populations would receive management priority. It could also enhance the services offered by these areas by enhancing recreational, sport and subsistence uses provided by these species. This suboption could take anywhere from a few months to years to implement.

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.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIVITIES This suboption could potentially overlap with options 21, 23, 24, 25 and 26, which deal with acquisition of tidelands, marine bird habitat, private inholdings within parks and refuges, anadromous stream buffers and upland forests. Bird nesting habitat can potentially include some or all of these areas.

OTHER OPTIONS THAT COULD ACHIEVE THIS OBJECTIVE Suboption A of option 29 (above) could achieve the same objectives. In addition, options 21, 23, 24, 25, and 26 could achieve the same objectives if, once these areas were acquired, they were provided with sufficient levels of protection. There is, therefore, potential for a single acquisition to achieve multiple restoration objectives.

LEGAL CONSIDERATIONS

1) Consistency with settlement: Acquisition of less than fee simple rights to land, including acquisition of rights to 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. The Fish and Wildlife 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

November 12, 1992 Author: Sanford P. Rabinowitch

OPTION

#33 Develop integrated public information and education program[1]

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 pubic 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.

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[1]We need to look again, at how this option and others with educational components, like #7(a) can be best integrated!

Additionally, Trustee agencies would be encouraged to take the information to the public by making their interpretors available to groups and organizations associated with the injured resources and services throughout the state. The project would seek to recognize restoration within the context of the entire ecosystem, rather than throughout a species-specific approach.

IMPLEMENTATION ACTIONS

Develop and provide updated summaries of oil spill injuries and make them available to the public.

Produce brochures, posters and other informational products for distribution to local, state and federal visitor facilities throughout the spill zone.

TIME NEEDED TO IMPLEMENT

The option would take six to twelve months to deliver initial products. Time requirements will vary depending upon the date of initiation and the type of products produced.

MEANS TO IMPROVE RECOVERY

Information products would explain how people, who live in or visit the oil spill area, can lessen their potential for creating additional harmful human disturbances.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

All of the Trustee agencies have specific responsibilities within the oil spill area. Yet, due to the large size of the area and the difficulty of access, simple enforcement action by the agencies is not completely effective.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Information and education programs are carried out by most Trustee agencies about resources that they manage. Any such program developed for the oil spill area should be coordinated with these ongoing efforts.

TECHNICAL FEASIBILITY

The option is technically feasible. Most Trustee agencies already carry-out information and education programs in Alaska.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

The potential to improve recovery of injured species and services is good. Effective information and education efforts are regularly developed for a great variety of programs.

INDIRECT EFFECTS

Environmental

None

Socio-economic

Enhancement of public understanding of natural resources and services provided by the public lands in the oil spill area. (anyone have more ideas here?)

Human health and safety

none

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

Any information and education program should be carefully coordinated with all other Trustee agencies actions, both in response and restoration.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

None known

LEGAL CONSIDERATIONS

Consistency with settlement

The option is consistent with the settlement. A public information and education program could become an effective part of the Trustee's development of a meaningful public involvement program.

Permits required

None anticipated

NEPA compliance

This type of work is generally categorically excluded from the requirements of NEPA compliance.

Additional /new legislation or regulatory actions

None needed

MEANS TO EVALUATE SUCCESS

All staff and volunteers associated with the distribution of information and education products, (i.e. interpreters) will be asked to gather opinion regarding the quality and usefulness of the products. These anecdotal reports will be collected and worked into an annual project report.

REPRESENTATIVE COSTS

(Budget comes from 1992 project submission- needs further review before it is used for final version of this option)

Personal Services:	
* Staff time to update slide program (summer 1991)	$1,000
Travel & Per Diem:	
* Staff travel	3,000
Contractual:	
* Slide duplication - 10 copies X 100	1,000
* Convert slide program to video tape with voice	500
* Duplicate slide tape - 20 copies	200
* Graphic artist - develop two posters	10,000
* Print 10,000 copies (5000 each)	20,000
* Graphic artist - develop brochure	5,000
* Print 20,000 copies	20,000
* Print fact sheets (5) X 5000 copies	1,500
* Develop new slide program	5,000
* Slide duplication - 10 copies X 100	1,000
* Convert slide program to video tape with voice	1,000
* Duplicate slide tape - 20 copies	200
* Additional printing costs for 1992 distribution	20,000
* Contingency	11,500
*** Total cost**	**$100,000**

ADDITIONAL INFORMATION NEEDED

An informal survey should be conducted to determine the kind of informational products that would be most useful to Alaskans and visitors.

CITATIONS

* Restoration Framework (p. B-38)

* "Public Information and Education Recovery and Protection of Alaska's Marine and Coastal Resources (Detailed Work Plan), submitted to the Trustee Council by the NPS, 1992

November 12, 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 (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.

TIME NEEDED TO IMPLEMENT

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

MEANS TO IMPROVE RECOVERY

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

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Archaeological sites and artifacts are protected under federal law by the Archaeological Resources Protection Act of 1971, 16 USC 470, and under state law by the Alaska Historic Preservation Act, Alaska Statute 41.35.010. In spite of these laws, and the efforts of land managing agencies like the National Park Service, the Fish & Wildlife Service, the Forest Service and the Alaska Division of Parks and Outdoor Recreation, many artifacts have been removed from sites as a result of the oil spill

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

What are agencies doing?? _____

_____

_____

TECHNICAL FEASIBILITY

The option is feasible. Institutions normally have good records of artifacts in their possession and can determine their willingness, or lack thereof, to sell specific artifacts. Evaluations and appraisals can determine fair prices. For individuals, the process is similar.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

This option will not improve recovery, it will however enhance the service provided by archaeological artifacts by replacing publically owned artifacts that have been lost, stolen or damaged with other, similar artifacts from the same area and make them available to the public.

INDIRECT EFFECTS

Environmental

None anticipated

Socio-economic

People will see that the state and federal governments are dealing directly with the injuries and losses to archaeologic 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)

REPRESENTATIVE COSTS

Need to talk with archs (Susan Morton and law enforcement dude shackelton) for costs (They should be able to give me prices (in a range)).

ADDITIONAL INFORMATION NEEDED

Need to talk with archs (Susan Morton, Ted B. and law enforcement dude shackelton.

CITATIONS

none

SUBOPTION

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

TARGET RESOURCES AND SERVICES

Archaeological 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 use.

IMPLEMENTATION ACTIONS

Establish agency teams of law enforcement officers and archaeologists to carry out appropriate investigations, conduct investigation and attempt to recover artifacts, close cases when artifacts are recovered or when recovery seems unlikely.

TIME NEEDED TO IMPLEMENT

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 TO IMPROVE RECOVERY

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

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Archaeological sites and artifacts are protected under federal law by the Archaeological Resources Protection Act of 1971, 16 USC 470, and under state law by the Alaska Historic Preservation Act, Alaska Statute 41.35.010. In spite of these laws, and the efforts of land managing agencies like the National Park Service, the Fish & Wildlife Service, the Forest Service and the Alaska Division of Parks and Outdoor Recreation, many artifacts have been removed from sites as a result of the oil spill

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Get update on ARPA rangers existing duties...

TECHNICAL FEASIBILITY

The option is technically feasible. Appropriate law enforcement personnel can investigate, track and attempt to recover artifacts illegally removed from the oil spill area.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

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

INDIRECT EFFECTS

Environmental

None anticipated

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.

Human health and safety

None

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

Most of the looting and vandalism documented is attributed to oil spill cleanup.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

None

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 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

November 12, 1992

OPTION 37 HABITAT PROTECTION/ACQUISITION

INJURED RESOURCES AND SERVICES[1]

This option is designed to protect habitats supporting:

δ Common murre, harlequin duck, marbled murrelet.

Σ Common murre, harlequin duck, marbled murrelet, river otter, anadromous fish, bald eagle, pigeon guillemot, sea otter, harbor seal, black oystercatcher, recreation, tourism, subsistence, sport fishing, hunting, wilderness and intrinsic values.

SUMMARY

The acquisition of private lands or partial interests in private lands, by the Trustees, is a method for protecting habitats linked to resources and/or services injured by the oil spill. For purposes of the Restoration Plan, it has been designated as the *Habitat Protection and Acquisition Process*[2]. *Policy guidance for this process is set forth in the Plea Agreement and in the Memorandum of Agreement and Consent Decree. It is designed to respond to both potential, long term threats and to more immediate or imminent threats to injured resources and services. The intent of habitat protection or land acquisition is either to prevent additional injury to resources and/or services or to acquire lands that contain resources equivalent to those injured by the spill.*

This approach to land acquisition is a multi-step evaluation process that includes threshold criteria for initial screening of proposals and more specific *evaluation and ranking criteria*. The threshold criteria are designed to eliminate proposals that are inappropriate or unreasonable. The evaluation and ranking criteria will be used by the Trustees to prioritize or rank those candidate lands that are in complete compliance with the threshold criteria. Prior to consideration of a parcel for acquisition, it must be demonstrated that: a) it contains essential habitat(s) of injured resources or contributes to creation or maintenance of an injured service(s); b) the rate and degree of recovery of the linked resource or service has been assessed to be inadequate; c) there is a willing seller and; d) Threshold Criterion #4 [To Be Determined].

In order to respond to proposed changes in land use that would foreclose habitat protection opportunities, an *Imminent Threat Process* was developed. This process is an accelerated assessment procedure that utilizes *short term protection tools*, such as a moratorium or rights of first refusal, to give the Trustees adequate time to gather enough information to make an informed decision

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[1] The following two lists represent the most conservative and most liberal interpretations of the injury summary and threshold criteria.

[2] Described in detail in the Appendix.

on acquisition. A *threat analysis* procedure has been developed to test the immediacy of, what are perceived to be, imminent threats.

Long term protection tools that will be considered for use by the Trustees include: fee acquisition, conservation easements, acquisition of partial interests and others. Subsequent to purchase, acquired parcels will be managed by the appropriate resource agency in a manner that is consistent with the restoration of the affected resources and/or services.

DESCRIPTION

Purchase of title to private lands or lesser property rights is intended, by the Trustees, to protect habitats that are linked to and benefit the recovery of resources and services injured by the *Exxon Valdez* oil spill. Land acquisition is also contemplated as *replacement* for injured resources and within the context of the alternative of *acquisition of equivalent resources* as a *means to compensate for an injured, lost or destroyed resource by substituting another resource that provides the same or substantially similar services as the injured resource*[3]*. On-going recovery of injured resources and services could be set back in time or actually prevented if essential habitats were adversely impacted by human activities. Consequently, protection of these habitats would prevent additional injury and benefit recovery.*

The Trustees will consider protection/acquisition of habitats within:

a) coastal forests and watersheds,
b) privately-owned inholdings within parks and refuges,
c) private and municipally-owned tidelands.

Species and services that were injured by the spill and depend upon upland or tideland habitats for essential life functions include: marbled murrelet, harlequin duck, river otter, bald eagle, anadromous fish, sport fishing, wilderness and recreation. Examples of these habitat requirements include: marbled murrelets are reported to require large trees within mature forest stands for nesting; harlequin ducks use the riparian area along the upper reaches of anadromous streams for nesting; spawning and rearing habitat of salmon and trout are dependent upon streamside vegetation and good water quality.

Affected services, including recreation, sport fishing and hunting, also have dependency relationships with uplands. Intact viewsheds are important to tourism and the wilderness experience that is so unique to outdoor recreation in Alaska. Healthy, productive fish populations are highly dependent upon the maintenance of good water quality which, in turn, is dependent upon watershed integrity, especially stream and riparian habitat stability. Unfortunately, the critical support functions that the

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56 Federal Register 8899(March 1, 1991).

uplands in the EVOS-affected area provide to these resources and services may be susceptible to human-induced degradation.

Land acquisition is a key element in the Habitat Protection and Acquisition Process that was developed to provide the Trustees a conceptual framework and strategy for habitat protection. The Trustee Council published, in July, 1992, a Supplement to the Restoration Framework. This document contains a narrative description of the process, flow charts that schematically depict the process, and a discussion and summary charts that present alternative threshold criteria. This process is designed to respond to both potential, long term threats and to more immediate or imminent threats to linked habitats. Imminent threats to lands containing linked habitats are identified by threat analysis. If a threat appears to be imminent, appropriate, short term protection options will be identified and may be implemented by the Trustees following successful negotiations with the land owner. Once the parcel has interim protection, it will be evaluated according to the scheme outlined by the *Evaluation Process*, that element of the Habitat Protection and Acquisition Process that addresses long term protection.

The initial step in the Habitat Protection and Acquisition Process is the identification of an injured resource or service whose rate and degree of recovery have been assessed as inadequate. The next series of steps include the identification of essential habitat types and an assessment of the adequacy of existing regulations and policies to protect them from adverse human impact. If it is determined that essential habitats occur on private lands and that existing regulations affecting private use do not provide enough protection, given the effects of the spill, nominations will be solicited from land owners, the public and from resource agencies. Nominated parcels will be evaluated against a set of threshold criteria designed to determine whether or not a nomination is acceptable for further consideration. Based on existing information, the threshold criteria will eliminate proposals that are inappropriate or unreasonable.

Nominations determined to be in compliance with the threshold criteria will be listed by the Trustees as *Candidate Lands*. Each candidate land will be evaluated and ranked against a set of detailed evaluation criteria. The appropriate and most cost-effective protection tool(s) will be matched to the ranked parcels. For long term protection, these could include: fee acquisitions, conservation easements, deed restrictions and reverters, acquisition of partial interests, or others, i.e., timber, mineral and access rights. Short-term protection options that could be recommended for interim protection as a consequence of the Imminent Threat Protection Process could include: development moratorium, lease, or management agreement.

Acquired rights or title will be incorporated into existing management plans where appropriate for achieving the goal of benefiting the long term recovery of resources and services injured by the oil spill. If necessary, a special management designation could be created. The Trustees will decide which agency will manage the land or may create a new management authority.

MEANS AND POTENTIAL TO IMPROVE RECOVERY

An intent of land acquisition is to prevent further damage to, and to foster recovery of resources or services injured by the *Exxon Valdez* oil spill. Acquisition of title or partial interests, followed by appropriate management, will prevent degradation of upland habitats considered to be essential to recovery of affected resources. Acquisition and protection of uplands linked to affected services will also prevent degradation of the latter.

INDIRECT EFFECTS[4]

o Protection of habitats, within acquired parcels, important to resources other than those affected by the oil spill.

o Protection of resources, within acquired parcels, important to services other than those affected by the oil spill.

o Improvement of public access to recreation resources.

o Improvement in management of existing public lands.

o Potential adverse impact upon local economy due to elimination of jobs tied to harvest of resources on acquired parcels.

OTHER INFORMATION

Federal and State acquisition processes.
Restoration Framework Supplement.

This section needs HPWG review and additional group discussion.

November 12, 1992 Author: Chris S/Sandy R/John S

OPTION 40 Designate Protected Areas

APPROACH CATEGORY Habitat Protection and Acquisition

INJURED RESOURCES AND SERVICES Coastal and nearshore habitats were heavily impacted by the spill. Many marine and coastal species were also injured, including seabirds, waterfowl, marine mammals, salmon, invertebrates, seagrasses and intertidal algae. Injured services include commercial, subsistence and sport harvests; and aesthetic and recreational uses, such as camping, 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, not provided by existing regulations, for recovering resources and services. Special designations may not be appropriate when they place significant restrictions on injured services or encourage intensive public use of recovering habitats.

Different designations place varying amounts of emphasis on providing resource protection, opportunities for public uses, and scientific research. The appropriate designation can be determined by examining which injured resources and services are present, any scientific monitoring opportunities offered by the area, what type of additional regulatory protection is required to continue recovery, and existing and planned human uses. Special designations under consideration include: Alaska State Parks, Alaska Department of Fish and Game special areas, National Marine Sanctuaries, National Estuarine Research Reserves, Research Natural Areas, National Recreation Areas, and Federal Wilderness areas.

SUBOPTION A Designate New Alaska State Parks

TARGET RESOURCES AND SERVICES

This suboption targets marine and coastal areas supporting high levels of recreational services, such as boating, fishing, hiking, camping and kayaking.

DESCRIPTION

This suboption entails identifying and designating state lands and waters for inclusion in the Alaska State Park System. These areas could be designated as state parks or state marine parks. Areas

greater than 640 acres would have to be designated by the Alaska legislature, while smaller areas do not require legislative action and could be added to the park system via a state land transfer. The Alaska Department of Natural Resources would manage the parks and enforce regulations.

IMPLEMENTATION ACTIONS

Prior to implementing this option, the Trustee Council must designate criteria for selecting and ranking lands for designation as parks, based on an analysis of the recreational services injured and the types of land most capable of restoring these services.

1a) For areas under 640 acres, initiate state land transfer process.

1b) For areas larger than 640 acres, initiate request for legislative designation.

2) Write and implement management plans.

TIME NEEDED TO IMPLEMENT

Implementation time could range from 13 to 25 months, based on the following estimations:

1a) State land transfer - 1 year

1b) Legislative designation - 2 years

2) Write management plan - 1 month

MEANS TO IMPROVE RECOVERY

Creation of additional state park units will provide new recreational opportunities and restore some of the recreational and aesthetic services injured by the spill. Resource development activities incompatible with recreational activities would generally be discouraged. In addition, focussing recreational activities in designated park areas could reduce human disturbance of injured species and habitats in other areas.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Existing regulatory authorities applicable to unclassified state lands can include:

Alaska Coastal Management Act (AS 46.40) and coastal resource district management plans (6 AAC 80 & 85)

Clean Water Act (33 USC 1251 & 1344)

Alaska water quality standards (18 AAC 70)

Alaska Water Use Act (AS 46.15) and water management regulations (11 AAC 93)

Alaska Forest Practices Act of 1990 (AS 47.17)

ADF&G Anadromous Stream and Fishway Acts (AS 16.05.840 & 870)

State land use permits and area management plans (11 AAC 58, 95 & 96)

Alaska Historic Preservation Act (AS 41.35)

Designation of unclassified state lands as state park units would result in management of these areas primarily for recreational purposes, with the additional requirement that certain activities would require ADNR park use permits, as per 11 AAC 12.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Lawful pre-existing uses of parks are maintained. State parks larger than 640 acres can only be closed to multiple uses by legislative action.

TECHNICAL FEASIBILITY

New park units are nominated on a regular basis and the process for establishing parks is already in place. There are currently several state park units within the spill area and many of these are heavily used for recreational activities. It is reasonable to expect that additional parks in suitable locations would also receive substantial use.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

Much of the area impacted by the spill is heavily used for recreation, and there is public demand for recreational areas and facilities. Designating new parks units will help to meet this demand and will restore some of the lost recreational services injured by the spill. In addition, it could refocus recreational uses away from habitats damaged by the spill. This option could take up to two years to complete.

INDIRECT EFFECTS

1) Socioeconomic benefits could result from increased spending in the spill area by recreational users.

2) Parks and public facilities tend to concentrate public uses, and could reduce damage to surrounding areas, such as trampled vegetation, littering, erosion, etc.

3) Alternatively, new park units could attract so many additional users that pressures on injured species and habitats increase, compounding existing injuries.

4) Prohibiting resource development and certain public uses in park units could result in negative economic impacts.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

This suboption is related to options which entail acquisition of tidelands and park inholdings. Lands acquired as part of these options could be subsequently designated as state park units. Also, the creation of new recreation facilities could be relevant if the decision were made to build cabins or other facilities in the new park units.

When considering this option, new parks should not be sited in areas which sustained heavy damage from the spill, since increased human use might inhibit the rate of natural recovery.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Acquisition of inholdings within parks is most likely to achieve comparable goals since many parks and similar conservation units are managed to enhance public recreation. Other land acquisition options could also potentially achieve the same objective, provided that intensive recreational use was compatible with the restoration of injured species and habitats.

LEGAL CONSIDERATIONS

1) Consistency with settlement: replacement and direct restoration of injured services is consistent with the terms of the settlement.

2) Agencies with management/regulatory authority: Existing agency responsibilities do not conflict with the implementation of this suboption. The agency with lead responsibility for managing state lands is ADNR. ADF&G is responsible for managing fish and wildlife resources.

3) Permits required: None

4) NEPA compliance: Since this represents an enhancement of existing state resource management practices and does not involve land acquisition, it is unlikely that any NEPA documents will be required. However, if very large parks were designated this could require NEPA analysis.

5) Requirements for new legislative/regulatory actions: Designation of park units larger then 640 acres requires a legislative designation. Areas smaller than this can be designated as parks via an administrative state land transfer process. Additional park units would require ADNR to write new or amend existing management plans.

MEANS TO EVALUATE SUCCESS

Use levels of new park units will be monitored by ADNR, providing an indication of increased recreational services.

REPRESENTATIVE COSTS

Complete land transfer process- $4,000 to $60,000

Complete legislative designation process- $20,000 to $50,000

Implement plan and enforce regulations-
- $30,000/ranger per 6-7 parks
- $10,000 for field support staff
- $20,000 for a boat

ADDITIONAL INFORMATION NEEDED

Criteria are needed for selecting areas which support injured recreational services or provide equivalent services.

CITATIONS

Dave Stevens, Div. of Parks/ADNR, pers. comm.
Jones and Stokes Report

SUBOPTION B Designate New ADF&G Special Areas

TARGET RESOURCES AND SERVICES

This option targets coastal and nearshore habitats which were impacted by the spill. Many marine species were also injured, including seabirds, waterfowl, marine mammals, salmon, herring, invertebrates, seagrasses and intertidal algae. Injured services include commercial, subsistence and sport harvests; and aesthetic and recreational uses, such as birdwatching and kayaking.

DESCRIPTION

This suboption deals with the identification and designation of state lands and waters as ADF&G special areas, i.e., critical habitat areas, game refuges and sanctuaries (as per AS 16.20). State lands and waters critical to supporting injured resources and services can be designated as special areas by the state legislature and then managed primarily by the Alaska Department of Fish and Game (ADF&G). If the state purchased inholdings within existing ADF&G special areas, legislative action would not be necessary since they would automatically become part of the special area. ADF&G would write management plans for special areas to ensure that they are managed to restore damaged resources and provide opportunities for compatible public uses. Special areas accommodate multiple uses and can, where appropriate, provide increased public access and other recreational and educational opportunities.

IMPLEMENTATION ACTIONS

Prior to implementing this option, the Trustee Council must designate criteria for selecting and ranking lands for designation as special areas, based on the habitat requirements of injured species.

1) ADF&G staff proposes an area designation to legislature.

2) Legislature designates special area and includes broad management guidelines in implementing legislation.

3) ADF&G writes and implements specific management plan.

TIME NEEDED TO IMPLEMENT

Time needed to implement this option is approximately 25 months.

1) ADF&G writes proposal and justification - 1 month

2) Legislature designates special area - 1 year

3) ADF&G writes and implements management plan (assuming that legislature attaches funding to bill) - 1 year

MEANS TO IMPROVE RECOVERY

Enhanced protection of injured habitats will facilitate natural recovery by restricting activities stressful to already damaged resources and services. Special area designations can also promote public education and compatible public uses by providing public access, interpretive signs, etc.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Existing regulatory authorities applicable to undesignated state lands and waters can include:

Alaska Coastal Management Act (AS 46.40) and coastal resource district management plans (6 AAC 80 & 85)

Clean Water Act (33 USC 1251 & 1344)

Alaska water quality standards (18 AAC 70)

Alaska Water Use Act (AS 46.15) and water management regulations (11 AAC 93)

Alaska Forest Practices Act of 1990 (AS 47.17)

ADF&G Anadromous Stream and Fishway Acts (AS 16.05.840 & 870)

State land use permits (11 AAC 58, 95 & 96)

Alaska Historic Preservation Act (AS 41.35)

These regulations 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. 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. By placing lands into special designations, resource management agencies can assure that restoration objectives receive management priority.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Legal existing uses are permitted, although they must be compatible with special area regulations. Permits may be issued for future uses, provided they are compatible with the management plan. In addition, critical habitat areas can include private lands, which are, in some cases, subject to the regulations in the management plan.

TECHNICAL FEASIBILITY

ADF&G currently manages special areas throughout the state and adds

areas at regular intervals. ADF&G has successfully managed these areas to provide and maintain important habitat and to allow for compatible public uses.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

Undesignated state lands which support injured resources and services exist throughout the spill area. Some of these lands are subject to ongoing or planned commercial and recreational activities which conflict with habitat requirements of injured species. Increased protection of these areas, via designation as an ADF&G special area, would ensure that restoration objectives would receive management priority. It could also enhance the services offered by these areas by increasing viewer education programs, public access and tourism. This option could take up to two years to complete.

INDIRECT EFFECTS

1) Species not targeted for restoration 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 resource development projects.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

This suboption is related to restoration options which potentially entail land acquisitions or enhanced management in marine areas. Lands acquired or managed as part of these options could be subsequently designated as ADF&G special areas.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

The land acquisition options references above could potentially achieve the same objectives, provided that the lands were subsequently designated as special areas or protected by cooperative management agreements which guaranteed an equivalent emphasis on restoration of injured resources and services. The designation of areas as National Marine Sanctuaries or National Estuarine Reserves may also achieve similar restoration objectives.

LEGAL CONSIDERATIONS

1) Consistency with settlement: Enhancement and restoration of injured resources and services is consistent with the terms of the settlement.

2) Agencies with management/regulatory authority: Existing agency responsibilities do not conflict with the implementation of this suboption. ADF&G has lead responsibility for managing fish and wildlife resources and special areas. ADNR co-manages special areas.

3) Permits required: None

4) NEPA compliance: Since this represents an enhancement of existing state resource management practices and doesn't entail acquisition of private land, it is unlikely that NEPA documents will be required. However, designation of particularly large or significant areas may require NEPA analysis.

5) Requirements for new legislative/regulatory actions: Special areas are designated by the state legislature. ADF&G writes and enforces area management plans.

MEANS TO EVALUATE SUCCESS

ADF&G would monitor effectiveness of special area designation in restricting activities detrimental to restoration. Enhanced recreational, sport and subsistence uses would also be documented.

REPRESENTATIVE COSTS

Management plan development - $70,000
Management costs:
permitting/inspections/educational - $12,000/yr
additional enforcement personnel - ?

ADDITIONAL INFORMATION NEEDED

The Trustee Council needs to finalize the list of injured resources and services. Also, scientific data on habitats necessary for restoration of injured species needs to be summarized and applied to developing criteria for selecting lands and habitat types best suited to restore injured resources and services.

CITATIONS

Debra Clausen, ADF&G, pers. comm.
Jones and Stokes report

SUBOPTION C Designate a National Marine Sanctuary

TARGET RESOURCES AND SERVICES

This option targets marine and coastal habitat, marine birds and mammals, seabirds, fish, invertebrates, algae and seagrasses, intrinsic values, and human uses dependent on these resources.

DESCRIPTION

The Marine Protection, Research and Sanctuaries Act of 1972 authorizes the designation of Marine Sanctuaries to preserve or restore marine and coastal waters for their conservation, recreational, ecological, historical or aesthetic values. Individual management plans and regulations are created for each site to achieve comprehensive and coordinated conservation and research, and to ensure that multiple uses are managed compatibly with resource protection.

IMPLEMENTATION ACTIONS

Prior to implementing this option, the Trustee Council must designate criteria for selecting and ranking lands for designation as special areas, based on the habitat requirements of injured species and requirements for implementing the overall recovery monitoring program.

In order to be designated as a marine sanctuary, a site must first go through a nomination process and be placed on the Marine Sanctuary Site Evaluation List (SEL). The National Oceanic and Atmospheric Administration (NOAA) is currently re-evaluating the SEL. Areas that are accepted onto the SEL are published on a formal list of candidate sites. These sites are then evaluated based on the goal of increasing the range of marine resources and ecosystems represented in the national system of sanctuaries. Areas will be selected by the Secretary of Commerce for their potential to conserve marine biodiversity and historical resources, preserve sustained uses, and detect signs of global climate change.

Sanctuary designations located within the territorial waters of a state can only be considered if the state's governor certifies that the designation is acceptable. In addition, significant public involvement is required throughout the designation process.

TIME NEEDED TO IMPLEMENT

The time needed to fully implement the formal designation of a Marine Sanctuary will vary. The current process of reviewing the SEL will take approximately 2 years (ending in 1994). Once a site is on the list, and environmental impact statement and draft plan must be develop within 2.5 years. Should Congress choose to establish a Marine Sanctuary in less time, they can do so by passing legislation. In such cases, active encouragement by the state's governor is considered essential.

MEANS TO IMPROVE RECOVERY

Marine Sanctuaries could play a significant role in the process of restoring resources and resource services in the oil spill area. By preventing human disturbance of recovering ecosystems, the natural recovery rate would be maximized. Sanctuaries provide a unique mechanism for managing areas as a complete ecosystem, rather than just targeting activities or protecting only certain organisms. The approach is to create a management plan tailored to address the issues specific to a site and to identify solutions to problems.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Some marine resources are afforded protection under current state or federal laws. However, marine resources are generally managed on a species by species basis. Often, the management emphasis is on how much a particular resource can be used during a given season, rather than on ecosystem-level management. In addition, efforts to coordinate research on multiple species and associated upland areas are generally considered inadequate. Also, 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. Specific regulations and management guidelines can be created for Marine Sanctuaries which address these potential problems.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Marine Sanctuaries do not necessarily prohibit pre-existing uses, although all activities must be consistent with the purposes for which the sanctuary was established.

TECHNICAL FEASIBILITY

Establishment of Marine Sanctuaries is technically feasible. Sanctuaries have been established in nine different locations on the coasts of the Atlantic and Pacific Oceans and in the Gulf of Mexico. One Alaska area is currently on the Site Evaluation List, that being the islands of Attu and Kiska in the Aleutian Chain.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

Undesignated public lands which support injured resources and services exist throughout the spill area. Some of these lands are subject to ongoing or planned commercial and recreational activities which conflict with habitat requirements of injured species and scientific monitoring studies. Increased protection of these areas, via special designations, would ensure that restoration and monitoring programs would receive management priority.

INDIRECT EFFECTS

1) Species not targeted for restoration could benefit from increased habitat protection.

2) Healthier ecosystems resulting from increased protection could provide socioeconomic benefits by supporting recreational, subsistence, and sport and commercial fishing opportunities.

3) Marine Sanctuaries in other regions of the United States are helping local economies by drawing additional tourists to these areas. In Alaska, a marine sanctuary in association with upland parks, refuges or forests could become a particularly attractive destination for many tourists, especially in communities with existing services, like Kodiak, Homer, Seward and Cordova.

4) Negative economic impact could result from increased regulatory restrictions on coastal and offshore development projects, harvest levels and certain recreational activities.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

The establishment of Marine Sanctuaries would simultaneously provide significant protection for recovering marine resources as well as a means to enhance scientific research and recovery monitoring.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

National Estuarine Research Reserves and ADF&G special areas provide varying degrees of protection for marine waters and resources.

LEGAL CONSIDERATIONS

Consistency with settlement: Restoration and replacement of damaged resources and services through special designations is consistent with the settlement.

Agencies with management/regulatory responsibilities: NOAA administers the Marine Sanctuary Program. Law enforcement is carried out by the U.S. Coast Guard and state and local law enforcement agencies.

Permits required: None

NEPA compliance: An EA and EIS would be required.

Additional/new legislation or regulatory actions: Individually tailored regulations and a management plan would be written for a new Marine Sanctuary. Experience in other states shows that cooperation between federal, state and local governments is needed

to successfully designate and manage an area as a Marine Sanctuary.

MEANS TO EVALUATE SUCCESS

An evaluation of the sanctuary's contribution to filling gaps in existing management programs relative to restoration needs could be commissioned or carried out by appropriate resource management agencies.

REPRESENTATIVE COSTS

The cost of designating a Marine Sanctuary, which includes development of a draft environmental impact statement, a draft management plan and draft regulations generally costs $500,00 over a period of 2.5 years. These funds are normally provided to NOAA through Congressional appropriation. Operational costs for a Marine Sanctuary unit are $600,000 to $800,000 per year and are funded by NOAA.

ADDITIONAL INFORMATION NEEDED

The Trustee Council must finalize the list of injured resources and services and then specify marine areas which both support these resources and services and are adversely impacted by human activities. Also, scientific data on habitats necessary for restoration of injured species needs to be summarized and applied to developing criteria for selecting lands and habitat types best suited to restore injured resources and services and are suitable to include as monitoring sites.

CITATIONS

Jones & Stokes Report

Personal communication with Miles Croom, NOAA, SEL Manager 202-606-4126

Marine Protection, Research, and Sanctuaries Act, 33 USC 1401, as amended.

National Marine Sanctuary Program Regulations, 15 CFR Part 992.

SUBOPTION D Designate National Estuarine Research Reserve Sites

TARGET RESOURCES AND SERVICES This option targets estuarine and nearshore habitats which were impacted by the spill. Many marine species were also injured, including seabirds, waterfowl, marine mammals, salmon, herring, invertebrates, seagrasses and intertidal algae. Injured services include commercial, subsistence and sport harvests; and aesthetic and recreational uses, such as birdwatching and kayaking.

DESCRIPTION

The National Estuarine Reserve Research System (NERRS) was established under the Coastal Zone Management Act of 1972, as amended, to address threats to the nation's estuaries. A research reserve may encompass coastal waters, tidelands and adjacent uplands.

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 and manages individual sites and provides staff on a cost sharing basis with NOAA. Although direct restoration of degraded areas is not a primary purpose of the reserve system, such activities are permitted to improve the representative character and integrity of a site.

The establishment of a estuarine research reserve would be integral to a comprehensive recovery monitoring program and could be used to assess recovery of natural resources injured by the oil spill. Permanent monitoring sites allow for the establishment of baseline environmental conditions to use as reference standards. It is also possible to designate a multiple-site research reserve, including representative habitat types within a region, as well as oiled, unoiled control, and damage assessment study sites. In addition, research reserves are managed to maintain the ecological integrity of study sites and could provide additional protection to recovering resources.

IMPLEMENTATION ACTIONS

Prior to implementing this option, the Trustee Council must designate criteria for selecting and ranking lands for designation as special areas, based on the habitat requirements of injured species and requirements for implementing the overall recovery monitoring program.

A state may apply for federal 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 biogeographic region.

2) Early in the site selection process, the state is required to hold public hearings and consult with all affected landowners, local governments and state and federal agencies.

3) The state acquires site(s) upon approval of the federal government through purchase of fee title, conservation easement, etc.

4) The federal government prepares an EIS.

5) The state completes a final management plan.

6) The governor of the state making application nominates candidate site(s).

7) An MOU detailing the state-federal roles in research reserve management is signed by the state and federal governments.

8) The federal government designates a research reserve site(s).

9) 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

After a site is selected, the state will request that NOAA begin the designation process, which generally takes three years.

MEANS TO IMPROVE RECOVERY

The primary intent of designating one or more reserves is to facilitate further research and monitoring of injured resources. 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 affected ecosystems. Reserves provide for research opportunities aimed at improved understanding and management of estuarine areas and injured resources dependent on those areas. They also offer a measure of protection not realized outside of formal state or federal designations. The reserve ensures a stable environment for research and monitoring through long-term protection of reserve resources, which can improve the rate of natural recovery. Reserves also increase public awareness and understanding of the need to protect vulnerable resources and provide suitable opportunities for public education and interpretation.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Some marine and estuarine resources (i.e., marine mammals) are afforded protection under current state or federal laws. However, resources are generally managed on a species by species basis. Often, the management emphasis is on how much a particular resource can be used during a given season, rather than on ecosystem-level management. In addition, efforts to coordinate research on multiple species and associated upland areas are generally considered inadequate. Also, 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. National Estuarine Research Reserves address these potential problems since they are managed both to maintain ecological integrity and encourage research on estaurine ecosystems.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

By regulation, NOAA can disapprove any activity considered incompatible with the mission of the NERRS. However, NOAA generally approves most requests to "grandfather" pre-existing uses, as long as they are compatible with the purpose of the reserve. Federal and state lands already in protected status can only be included in the NERRS if the managing entity commits to long-term, non-manipulative management policies consistent with NERRS guidelines.

TECHNICAL FEASIBILITY

Eighteen research reserves protecting approximately 267,000 acres of estuarine lands and waters have been established since the inception of the NERRS program. A wide range of research projects are conducted at these sites. These include physical, chemical and biological characterizations, studies of ecosystem processes, and studies designed to answer management and regulatory questions for the reserves and the coastal zone.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

Undesignated public lands which support injured resources and services exist throughout the spill area. Some of these lands are subject to ongoing or planned commercial and recreational activities which conflict with habitat requirements of injured species and scientific monitoring studies. Increased protection of these areas, via special designations, would ensure that restoration and monitoring programs would receive management priority.

INDIRECT EFFECTS

1) Species not targeted for restoration 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 resource development projects.

4) The operation of a research reserve should have minimal environmental impact since construction is usually kept to a minimum and research, especially when it involves 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 the restoration monitoring program.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Designation of a National Marine Sanctuary or ADF&G special area could achieve similar results.

LEGAL CONSIDERATIONS

1) Consistency with settlement: Recovery monitoring and protection of injured habitats is consistent with the terms of the settlement.

2) Agencies with management/regulatory authority: NOAA manages the overall program, but individual reserve units are managed by the states.

3) Permits required: Permits may be required for construction of upland facilities and for biological sampling. NOAA is also responsible for certifying that designation of the reserve is consistent with the state approved coastal zone management program.

4) NEPA compliance: 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. NOAA is then required to prepare an EIS.

5) Requirements for new legislative/regulatory actions: none

MEANS TO EVALUATE SUCCESS

The adequacy of the overall recovery monitoring program will be reviewed on a periodic basis. Benefits to recovering resources within the reserve should become apparent in the course of conducting monitoring and research activities.

REPRESENTATIVE COSTS

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.

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, are available for operation and management, including the design and implementation of an environmental monitoring program. However, annual operation and management costs can be significantly greater.

ADDITIONAL INFORMATION NEEDED

The Trustee Council must finalize the list of injured resources and services and then specify marine which both support these resources and services and are adversely impacted by human activities. Also, scientific data on habitats necessary for restoration of injured species needs to be summarized and applied to developing criteria for selecting lands and habitat types best suited to restore injured resources and services and are suitable to include as monitoring sites.

CITATIONS

National Estuarine Reserve Research System Regulations, 15 CFR Part 921.

NOAA. 1990. National Estuarine Research Reserve System Site Catalogue. Washington, D.C.

SUBOPTION E: Designate a Research Natural Area

TARGET RESOURCES AND SERVICES This option targets coastal and upland habitats and the biological communities and services supported by these habitats.

DESCRIPTION

It is the objective of this suboption to implement designation and development of one or more sites in Chugach National Forest as an RNA. 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. In addition, RNAs are managed to maintain the ecological integrity of study sites and could provide additional protection to recovering resources. RNAs could include coastal habitats and uplands linked to marine study sites. The ideal site will have a record of pre-spill biological data and will be suitable for detailed studies of the linkage between terrestrial and marine ecosystems.

The authority to establish Research Natural Areas (RNA) on Forest Service land is provided in CFR 251.23, which states that "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 or scientific interest or importance." Forest Service planning is required by regulation to include the establishment of RNAs.

IMPLEMENTATION ACTIONS

Prior to implementing this option, the Trustee Council must designate criteria for selecting and ranking lands for designation as special areas, based on the habitat requirements of injured species and requirements for implementing the overall recovery monitoring program.

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. To operate a site, grant monies can be obtained through the U.S. Forest Service National Competitive Research Initiative Grants Program.

TIME NEEDED TO IMPLEMENT

The time to implement an RNA designation is variable but can potentially be accomplished in two to three years.

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. RNAs also provide for research opportunities aimed at improved understanding and management of both coastal and upland habitats. RNAs also ensure a stable environment for research and monitoring through long-term protection of reserve resources, which can improve the rate of natural recovery. Reserves also increase public awareness and understanding of the need to protect vulnerable resources and provide suitable opportunities for public education and interpretation.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Existing Forest Service lands are managed according all relevant federal statutes and regulations as well as the following:

Forest Service Organic Administration Act of 1897 (16 USC 475)

Multiple Use-Sustained Yield Act of 1960 (16 USC 528-531)

Forest and Rangeland Renewable Resources Planning Act of 1974, as amended (16 USC 1601-1614)

Alaska National Interest Land Claims Act of 1980 (16 USC 3101)

1984 Chugach National Forest Land and Resource Management Plan

Most injured resources are afforded some protection under current state or federal laws. However, resources are generally managed on a species by species basis. Often, the management emphasis is on how much a particular resource can be used during a given season, rather than on ecosystem-level management. Research Natural Areas are managed to maintain ecological integrity and encourage research on coastal and upland ecosystems. They are essentially taken out of nultiple-use management.

RELATIONSHIPS WITH EXISTING/PLANNED USES FOR 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, not 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

RNAs are designated on a regular basis. 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 1984 Chugach National Forest Land and Resource Management Plan.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

Undesignated public lands which support injured resources and services exist throughout the spill area. Some of these lands are subject to ongoing or planned commercial and recreational activities which conflict with habitat requirements of injured species and scientific monitoring studies. Increased protection of these areas, via special designations, would ensure that restoration and monitoring programs would receive management priority.

INDIRECT EFFECTS

There need be no significant adverse environmental, socio-economic, and human health and safety effects associated with the designation of RNAs. 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 implementation of the recovery monitoring program.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Acquisition of private lands and inholdings and special designation of these lands could achieve similar objectives.

LEGAL CONSIDERATIONS

1) Consistency with settlement: Recovery monitoring and protection of injured habitats is consistent with the terms of the settlement.

2) Agencies with management/regulatory authority: The U.S. Forest Service would manage RNAs.

3) Permits required: 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.

4) NEPA compliance: The designation of an RNA is deemed a federal action and must be undertaken in a manner consistent

with NEPA. 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).

5) Requirements for new legislative/regulatory actions: none

MEANS TO EVALUATE SUCCESS

The effectiveness of recovery monitoring conducted on the RNA will be the principle measure 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

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. 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

The Trustee Council must finalize the list of injured resources and services. Also, scientific data on habitats necessary for restoration of injured species needs to be summarized and applied to developing criteria for selecting lands and habitat types best suited to restore injured resources and services and are suitable to include as monitoring sites.

CITATIONS

USDA (U.S. Department of Agriculture) Forest Service. 1984. Chugach National Forest Land and Resource Management Plan. USDA Forest Service, Alaska Region, Juneau, Alaska.

Glenn P. Juday, Alaska Ecological Reserves Coordination Office, University of Alaska Fairbanks, pers. comm.

SUBOPTION F: Designate a Portion of the Chugach National Forest as a National Recreation Area

APPROACH CATEGORY: Resource protection and acquisition

INJURED RESOURCES AND SERVICES Recreation, wilderness and intrinsic values, and injured biological resources relying on upland habitats.

SUMMARY

The Chugach National Forest provides significant opportunities for private and commercial recreation. Although the Chugach National Forest does not contain lands designated as a National Recreation Area (NRA), the National Forest System contains many areas of such designations. Management of an NRA emphasizes recreational values and the habitats needed to sustain recreational opportunities and ecological integrity. Changing management designations of all or part of the Chugach National Forest could alter management direction to favor recreational opportunities.

DESCRIPTION

Each National Recreation Area is established through Congressional action. Each has its own enabling legislation which establishes the management direction for the area. The general objectives for an NRA are to showcase recreation management and enhance recreation opportunities.

An NRA would provide a variety of recreation opportunities within a spectrum which includes developed sites, access and dispersed uses within what appears to be a natural, untrammeled landscape. The congressional designation of an area as a NRA would focus management of the land and water for recreation based activities. Visitors would be encouraged to practice minimum impact use techniques. Timber harvest, except to enhance recreation opportunities, would not occur. Minerals activity would be required to maintain the "wilderness atmosphere". But more often the area is withdrawn from mineral entry. Targeted resources and services would be maintained or enhanced.

IMPLEMENTATION ACTIONS

Provide the Alaska Congressional delegation with information that succinctly explains the potential benefits to injured resources and services of a National Recreation Area designation all or portions of Prince William Sound or other EVOS impacted areas.

Define the appropriate use of aquaculture and recreation facilities, i.e., cabins, trails, interpretive sites, etc.

Make available for public distribution information on National Recreation Area designation that may affect their current uses.

This include the potential impacts to subsistence lifestyles.

TIME NEEDED TO IMPLEMENT

National Recreation Area designation requires Congressional action. Definition of areas to be proposed for designation must take place. It would take a legislative proposal, positive committee action and recommendation and then a "yea" vote to complete the designation. At least one national Congressional session would be necessary to complete the legislative process. It is often the case that NRA proposals are attached as riders to legislation designating Federal Wilderness Areas.

MEANS TO IMPROVE RECOVERY

Injured species would be provided the benefit of fewer potentially aggravating management activities being conducted on lands, or in habitats, in which they complete at least part of their life cycle. The potential for additional recreation activities would be improved by increasing opportunities for developed, dispersed and primitive recreation.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Currently there are no designated National Recreation Areas within the EVOS impact area. Several agencies, from state and federal, manage the land involved and have various laws and regulations which can be implemented to effect a designated NRA or its equivalent. Otherwise lands under various jurisdictions can be managed for recreation opportunities.

Several land selections by both native village and regional corporations, and by the State of Alaska could potentially change current management strategy. Although the Native selections on the Chugach National Forest in the Nellie Juan River area have not been conveyed, several additions to the State Marine Park system are being managed by Alaska State Parks for primitive recreation. Marine park enabling legislation mandates maintenance of natural, cultural and scenic values. A management plan is being developed by the State for its Marine Parks.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Current management is consistent with the maintenance of a variety of recreation opportunities.

TECHNICAL FEASIBILITY

National Recreation Areas have been designated in the past and are technically feasible.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

The formal designation of the National Recreation Area insures that

current management strategy developed by the Forest Service or other agency will prevail over the long term. Long-term management for low-impact recreation, scenic and wilderness values will enhance (and certainly stabilize) injured species and resources which may depend upon that land base. With the potential for long-term and large-scale land disturbances reduced by "special area" designation, it can be assumed that natural ecosystem relationships will endure.

INDIRECT EFFECTS

1) Indirect environmental effects could include more rapid recovery of injured species through lessened disturbance.

2) The attraction of a National Recreation Area may bring more visitors. This may reduce recovery rates as more land is entered and impacted by a variety of activities.

3) Local businesses, travel agents and purveyors may see increased demand for primitive recreation within an NRA.

4) Native subsistence issues may become more apparent as the NRA designation and its effect on established are questioned.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

An NRA designation would inherently increase the need for management of the included resources. While this option lends an element of land uses protection through a restrictive management designation, it does not preclude active management of the included wildlife, fish and scenic resources. It does prevent the intrusion of, or modify the management of resource extraction activities such as timber harvest. Implementation of this option would affect implementation of all options which would take place on Chugach National Forest or other lands designated as an NRA.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

The development of an integrated public information and education program will accomplish many of the same goals as NRA designation, but the legal mandate for long-term management continuity is lost.

It should be noted here that other special area designations may be appropriate. One of these particularly applicable to Prince William Sound and the Alaska Penisula is the National Scenic Area. These areas by definition are "Areas that contain outstanding scenic characteristics, recreation values, and geologic, ecologic and cultural resources." As with Wilderness and National Recreation Areas, National Scenic Areas also require enabling legislation.

LEGAL CONSIDERATIONS

Consistency with the settlement: This option is consistent with

the terms of the settlement agreement aimed at restoring damaged services and injured natural resources.

Agencies with management/regulatory responsibilities: Under this option the Forest Service would be responsible for designation and management of the included area.

Permits required: Permits would be required for some activities within a designated management areas if these are standard procedures on adjacent National Forest Lands.

NEPA compliance: An environmental impact statement is part of the process of presentation of a proposal to the interested public and an evaluation of the impacts of wilderness designation. This process is guided by NEPA and the National Forest Management Act, as well as other regulations which are agency dependent.

Additional/new legislative or regulatory actions: The Chugach National Forest Plan has not designated areas for consideration as National Recreation Areas, although it has recommended the College Fjord-Nellie Juan Wilderness Study Area. Congressional action would be required to complete the process for designation as an NRA. No legislation is pending.

MEANS TO EVALUATE SUCCESS

REPRESENTATIVE COSTS

ADDITIONAL INFORMATION NEEDED

SUBOPTION G: Designate Portions of Federally Managed Lands as Wilderness Areas

APPROACH CATEGORY: Habitat Protection and Acquisition

INJURED RESOURCES AND SERVICES Target resources and services include recreation, wilderness and intrinsic values, and all injured species dependent on upland habitats.

SUMMARY

Existing wilderness areas within the spill zone include portions of the Katmai National Park and the Becharof National Wildlife Refuge. Wilderness study areas are included within the Chugach National Forest, Kenai Fjords National Park and Aniakchak National Monument and Preserve.

Management of wilderness emphasizes the preservation of pristine qualities and opportunities for non-mechanized recreation and is focused by both the Wilderness Act and ANILCA. ANILCA permits established uses to continue, provided they are consistent with management intent. Changing management designations of all or part of the federal land near the EVOS could modify management direction to favor undeveloped recreational opportunities and wilderness qualities.

DESCRIPTION

Wilderness would provide for the continuity of the primitive, untrammeled landscape. The congressional designation of the area as a wilderness would insure management as required by the National Wilderness Preservation Act and subsequent legislation. Wilderness visitors would be encouraged to use minimum impact use techniques. Timber harvest would not occur. Minerals activity would be required to maintain the "wilderness atmosphere". Targeted resources and services would be maintained or enhanced.

IMPLEMENTATION ACTIONS

Provide congressional delegation with information that succinctly explains the potential benefits to injured resources and services of a wilderness designation.

Explain the linkage between the Wilderness Act and Alaska National Interest Lands Conservation Act (ANILCA).

Make available for public distribution information on the wilderness designation that may affect their current uses. This include the potential impacts to subsistence lifestyles.

Direct the appropriate use of recreation facilities, i.e., cabins, and aquaculture.