DRAFT 7/21

Existing Regulatory Protection for Habitats and Resources:

APPLICABLE ON BOTH PUBLIC AND PRIVATE LANDS

Coastal Zone:	NOAA (OCRM): Coastal Zone Mgmt. Act of 1972, as amended (16 USC 1456) and Federal Consistency with Approved Coastal Mgmt. Program (15 CFR 930)
	OMB (DGC): AK Coastal Mgmt. Act of 1977 (AS 46.40) and Alaska Coastal Management Program (ACMP) regs. (6 AAC 80)
	Coastal Districts: Mgmt. plans & AMSA's consistent with Guidelines for District Coastal Mgmt. Plans (6 AAC 85)
Water Quality:	EPA: Clean Water Act of 1977 (CWA), Section 402 (33 USC 1251) & NPDES regs (40 CFR 122 & 125); CWA, Section 401, (33 USC 466) & State certification of activities requiring a federal license or permit (40 CFR 121)
	ADEC: Water quality standards (18 AAC 70); Wastewater & pollution disposal permits (AS 46.03.090, .100 & .110 and 18 AAC 72); and certification for other federal licenses and permits (18 AAC 15.180)
	See ACMP authorities
Water Use:	DNR: Water use permits, water rights and in-stream flow reservations outlined in Alaska Water Use Act (AS 46.15) and water mgmt. regs. (11 AAC 93)
Wetlands:	COE: CWA, Section 404 (33 USC 1344) & Regulatory programs of the COE (33 CFR 320-330); Section 10 of Rivers and Harbors Act of 1899 (33 USC 403) and permits for structures in or affecting navigable waters of the U.S. (33 CFR 322)
	EPA: CWA, Section 404 (33 USC 1344) & EPA's 404 guidelines (40 CFR 230)
	ADEC: CWA, Section 401 (33 USC 466); State certification of activities

	requiring a federal license or permit (40 CFR 121); Water quality standards (18 AAC 70); and certification for other federal licenses and permits (18 AAC 15.180)
	See ACMP authorities
Forest Management:	DNR: Alaska Forest Practices Act of 1990, as amended (AS 47.17) and draft regs on stream buffers (11 AAC 95) - State and private lands
	See ACMP authorities
Endangered Species:	FWS & NMFS: Endangered Species Act of 1973, (ESA) as amended (16 USC 1531); FWS regs (50 CFR 17); and NMFS regs (50 CFR 222)
	ADF&G: Endangered species protection regs (AS 16.20.185 & 195)
Marine Mammals:	FWS & NMFS: Marine Mammal Protection Act of 1972, as amended (16 USC 1361 et seq.); FWS regs (50 CFR 18); NMFS regs (50 CFR 216); and for endangered/threatened marine mammals;
	See ESA and associated regs (above)
Migratory Birds:	FWS: Migratory Bird Treaty Act of 1918, as amended (16 USC 703-712) and regs (50 CFR 13 & 21)
Bald Eagles:	FWS: Bald Eagle Protection Act of 1940, as amended (16 USC 668) and regs in (50 CFR 22)
Anadromous Streams:	ADF&G: Anadromous Fish Act (AS 16.05.870) and regs on anadromous waters (5 AAC 95.010)
	DNR: Alaska Forest Practices Act of 1990, as amended (AS 47.17) and draft regs (11 AAC 95)
Fishbearing Streams:	ADF&G: Fishway Act (AS 16.05.840)
	DNR: Alaska Forest Practices Act of 1990, as amended (AS 47.17) and draft regs (11 AAC 95)
Fish\Egg Transport:	ADF&G: Fish transport permit (5 AAC

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	41.005); ADF&G Genetic Policy
Collection of Fish and Game:	ADF&G: Scientific collection permit (5 AAC 92.033)
Archeol. Resources:	Federal: National Historic Preservation Act of 1966, as amended (16 USC 470 et seq.) and regs for Protection of Historic and Cultural Properties (36 CFR 800) (when Fed. funds/permits/ personnel involved on private land)
	DNR (SHPO): Alaska Historic Preservation Act (AS 41.35)

APPLICABLE ON PRIVATE LAND ONLY

Zoning Regulations:	DNR (Unorganized Borough) & Local (KPB, Seward, Homer, Cordova, Valdez, Whittier & KIB): Zoning district regulations (11 AAC 91); Zoning regulations in the Unorganized Borough (AS 38.05.037); Zoning of private lands within state parks (AS 41.21.025); Local zoning ordinances
Native Lands:	Multi: Section 22 (g) of Alaska Native Claims Settlement Act of 1972 (43 USC 1621) - compatibility with NWR regs and mgmt for native inholdings

APPLICABLE ON PUBLIC LANDS ONLY

State Parks:	DNR: Park use permits (11 AAC 12)
State Tidelands:	DNR: Land use permits & area mgmt. plans (11 AAC 58, 95 & 96)
State Uplands:	DNR: Land use permits & area mgmt. plans (11 AAC 58, 95 & 96)
ADF&G Special Areas:	ADF&G: Special area use permits & mgmt. plans (5 AAC 95.410-430, .900) (regs are applicable on some private lands within critical habitat areas)
FWS Land:	FWS: Alaska National Interest Land Claims Act of 1980 (ANILCA) (16 USC 3101) and regs in 36 CFR 13; National Wildlife Refuge Admin. Act of 1976 (16 USC 668); Migratory Bird Conservation Act of 1929 (16 USC 715);

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	Refuge management plans and special use permits
Forest Service Land:	USFS: Forest Service Organic Administration Act of 1897 (16 USC 475); ANILCA; Multiple Use-Sustained Yield Act of 1960 (16 USC 528-531); Forest and Rangeland Renewable Resources Planning Act of 1974, as amended (16 USC 1600-1687); National Forest Management Practices Act of 1976 (16 USC 1601-1614); Chugach National Forest Land and Resource Management Plan
BLM Land:	BLM: Federal Land Policy and Management Act of 1981 (16 USC 1701-1782); ANILCA; Land use permits & mgmt. plans
National Parks:	NPS: National Park Service Act of 1916 (16 USC 1); regs in 36 CFR 13; ANILCA; special use and scientific collecting permits
Archeol. Resources:	Multi: Archeological Resources Protection Act of 1979 (16 USC 470)
	DNR (SHPO): Regs for State parks (11 AAC 12.175), State lands (11 AAC 16)
Wilderness Areas:	Multiple Fed: Wilderness Act of 1964 (16 USC 1131-1136)

Barbara

RESTORATION OPTIONS AND SUBOPTIONS FOR FURTHER CONSIDERATION
4/24/92 DRAFT

Management of Human Uses

1. Archaeological resource protection

   a. create archeological site stewardship program involving local citizens

   b. increase agency field presence

   c. expand public education efforts

2. Intensify management of fish and shellfish

3. Increase management for fish and shellfish that previously did not require intensive management

4. Reduce disturbance at marine bird colonies and marine mammal haul-out sites and rubbing beaches

   a. educate tour and charter boat operators about need to reduce disturbance of injured species

   b. establish or expand designated buffer zones

   c. greater enforcement of State and Federal laws and increased field presence

5. Reduce harvest by redirecting sport-fishing pressure

   a. prepare and implement a fisheries management plan

   b. Public education to encourage voluntary conservation (e.g. catch and release)

Designate a portion of the Chugach National Forest as National Recreation Area or Wilderness Area

   a. redesignate as National Recreation Area

   b. redesignate as Wilderness Area

7. Increase management in parks and refuges (i.e. public lands)

   a. educate public about minimizing their impact on recovering resources

   b. increase field presence of management agencies in affected areas

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

   a. temporarily restrict or close harvests of injured species in the oil-spill area

   b. educate public to encourage voluntary reductions of commercial, sport and subsistence harvest levels

9. Minimize incidental take of marine birds by commercial fisheries

   a. temporarily modify commercial fishing regulations to avoid known concentrations of marine birds

   b. develop new technology or strategies for reducing encounters (mesh size, fishing depth, etc.)

Manipulation of Resources

10. Preservation of archaeological sites and artifacts

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

   a. supplement fry production (e.g. egg boxes and net pens for fry rearing)

   b. improve access to spawning areas (e.g. fish passes, remove instream barriers)

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

12. Creation of new recreation facilities

    a. replace recreational facilities

    b. construct new recreational facilities

13. Eliminate sources of persistent contamination of prey and spawning substrates

    a. eliminate sources of contaminated prey (e.g. site-manipulation to facilitate natural weathering, removal of oiled mussel beds)

    b. replace or rehabilitate oiled spawning substrates important for intertidal and subtidal species

14. Accelerate recovery of upper intertidal zone (test feasibility of natural recovery)

15. Supplement intertidal and subtidal substrates for spawning herring

16. Test feasibility of enhancing murre productivity

    a. enhance social stimuli (decoys and recorded calls)

    b. improve physical characteristics of nest sites

    c. reduce predator access

17. Eliminate introduced foxes from islands important to nesting marine birds

18. Replace fisheries harvest opportunities by establishing alternative salmon runs (which don't overlap with depleted runs)

    a. establish additional hatchery runs

    b. transplant hatchery reared fish to depleted areas

    c. use wild egg takes from non-injured streams to establish new runs

Habitat Protection and Acquisition

19. Update and expand the State's Anadromous Fish Stream Catalog

20. Establish an *Exxon Valdez* oil spill "special management area"
    a. amend AK Coastal Zone Management Act
    b. amend State and/or Federal land management plans
    c. State and/or Federal legislation

21. Acquire tidelands
    a. purchase title or rights
    b. protection without purchase

22. Designate protected marine areas
    a. State Marine Parks
    b. National Marine Sanctuary
    c. Estuarine Reserve
    d. other: modify management plans or policies

23. Acquire additional marine bird habitats
    a. purchase title or rights
    b. protection without purchase

24. Acquire "inholdings" within parks and refuges
    a. purchase title or rights
    b. protection without purchase

25. Protect or acquire upland forests and watersheds

    a. purchase title or rights

    b. protection without purchase

26. Acquire extended buffer strips adjacent to anadromous fish streams

    a. purchase title or rights

    b. protection without purchase

    c. amend Alaska Forest Practices Act

27. Designate and protect "benchmark" monitoring sites

    a. Estuarine Research Reserve

    b. Research Natural Area

    c. other

28. Acquire access to sport-fishing streams (and other recreation areas)

    a. purchase title or rights

    b. negotiate access without purchase

29. Establish or extend buffer zones for nesting birds

    a. recommend implementation of special agency management practices

    b. negotiate cooperative mechanisms for achieving similar management practices on private lands

Other Options

30. Test subsistence foods for hydrocarbon contamination

31. Develop comprehensive monitoring program

32. Endow a fund to support restoration activities

33. Develop integrated public information and education program

    a. develop program to provide and distribute up-dated information, and educational products

    b. construct interpretive and educational facilities

    c. enhance existing facilities

34. Establish a marine environmental institute

    a. construct new facility

    b. enhance existing institutions

    c. coordinate research in Prince William Sound

35. Replacement of archaeological artifacts

    a. identify institutions and individuals with artifacts from the spill area and offer to purchase specific pieces for the public

    b. investigate incidents of looting and vandalism and strive to regain possession of publicly owned artifacts

June 23, 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

June 23, 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

Opt#2.003 Ken Chalk

OPTION 2: Intensify management of fish and shellfish

APPROACH CATEGORY: Management of Human Uses

INJURED RESOURCES AND SERVICES: Pink and sockeye salmon, Dolly Varden, coastal cutthroat trout, Pacific herring, rockfish, and spot shrimp

PROPOSED ACTION

Develop and implement programs to upgrade and intensify management of injured fisheries resources throughout the oil-spill area.

SUMMARY

All of the resources discussed under this option were being managed for commercial, sport and subsistence uses prior to the oil spill. These same management strategies, which are still in use, are not adequate to protect injured stocks from further degradation or to restore them to pre-spill conditions.

Properly managing the human uses of fisheries resources for competing users is fundamental to the restoration of injured stocks to pre-spill levels. Intensive fisheries management could temporarily reduce human pressure on injured wild stocks or populations to speed their recovery. As a means of minimizing impacts on the fisheries, existing fisheries could be restricted or redirected to alternative sites. In the case of sockeye salmon, for example, one objective is to relieve pressure on what is anticipated to be small runs in the Kenai River system in the next several years, without shutting down other Upper Cook Inlet fisheries.

Salmon stocks impacted by the Exxon Valdez oil spill are heavily exploited in the commercial, sport and subsistence fisheries. These stocks can most effectively be restored through stock-specific management practices designed to reduce exploitation on impacted stocks. The stocks from areas heavily impacted by the spill are present in fisheries dominated by both hatchery and wild stocks from unaffected areas of the sound. The management of this mixed-stock fishery has historically been based on maintaining good temporal and spatial distribution of spawning escapement for groups of stocks in eight major fishing districts. The success of such an effort depends on a manager's ability to control stock-specific exploitation rates. Restoration based on stock-specific management of the fisheries for reduced exploitation of impacted stocks will require more accurate inseason catch stock composition than is

available under present management scenarios.

Fishery managers must also closely monitor the number of spawners returning to impacted streams so that harvest levels can be regulated to achieve desired escapement levels. They will need accurate, inseason escapement estimated to accomplish this. Such information is of vital importance if managers are to protect impacted stocks while directing fishing effort to harvest surplus fish.

Information collected during the Natural Resource Damage Assessment program documents injury to Dolly Varden and cutthroat trout in the oil spill area. Mortality rates of both were significantly higher at oiled sites than at control sites. There was also a significant reduction in the growth of cutthroat trout at oiled sites.

Dolly Varden and cutthroat trout are both important sport fish species which, along with salmon, halibut and rockfish, provide unique fishing opportunities. In light of the findings of the NRDA program the Alaska Department of Fish and Game began curtailing sport fishing opportunities in Prince William Sound. Reduced bag limits for both species were implemented in 1990. In 1992 an Emergency Order was issued that restricted all sport fishing from April 15 to July 1 at Eschamy and Green Island Creeks and prohibited the harvest of any cutthroat trout in oiled areas of western Prince William Sound.

Damage is known to have occurred to the eggs, larvae, and adult herring in Prince William Sound (PWS) due to the oil spill. The long term effect to the population is unknown at this time, but the damage assessment study continues and is summarizing damage information. The PWS population is still heavily exploited by a commercial fishery and provide a major prey source for almost all levels of the food chain, including damaged marine mammals, sea birds, and salmon. No action is currently being taken to protect potential stock specific damage by altering human use. More information and monitoring is necessary in order to fine tune stock specific fisheries management, to improve the accuracy of stock assessment tools, and to improve the population dynamics model.

DESCRIPTION

The development and implementation of comprehensive programs for intensifying management of these injured resources 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 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 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

One year will be required to develop and implement each management plan. It will be necessary to identify specific injured stocks and the extent of those injuries. Recovery, whether by natural means or through specific restoration actions, will generally depend on the severity of the injury, the capacity of the injured resources 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, 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, 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 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 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 77.695.
- 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

Since much of the research and management structure is already in place for salmon and herring, implementation of programs will be relatively painless. For Dolly Varden, cutthroat trout and bottomfish, it will be more difficult.

Considerable information is needed to develop management plans, including data on commercial, 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. Technology exists for estimating population size of Dolly Varden and cutthroat trout. 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.

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 this 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. Modeling work previously done for Dolly Varden and cutthroat trout predicts recovery time is halved when sport fishing was closed.

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 could be significant adverse effects on rockfish populations depending on the methods used to gather baseline information and monitoring of restoration efforts. Non-destructive, non-intrusive methods will be used where feasible.

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 plane.

RELATIONSHIP TO OTHER EVOS RESPONSE RESTORATION ACTIONS

Option 3 will increase management of rockfish and spot shrimp that previously did not require intensive management. That option calls for development of management plans to guide that increased management effort.

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 commercial, 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

Field activities including monitoring activities, travel and other support of field activities would be funded only during the field season. Data analysis, planning activities and administrative support would be funded full-time.

PINK SALMON

The budget would be $4,043,000 for 4 years.

SOCKEYE SALMON

The budget would be $813,000 for 5 years.

DOLLY VARDEN/CUTTHROAT TROUT

The budget would be $236,000 for 4 years.

PACIFIC HERRING

The budget would be $456,500 for 4 years.

ROCKFISH

The budget would be $531,000 for 4 years.

SPOT SHRIMP

The budget would be $530,000 for 2 years.

GRAND TOTAL $26,191,000

ADDITIONAL INFORMATION NEEDS

Intensive management of injured fish and shellfish resources will be difficult, especially in mixed-stock (i.e, wild and hatchery) fisheries. 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

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.

Opt#3.004

Ken Chalk

OPTION 3: Increase management for fish and shellfish that previously did not require intensive management

APPROACH CATEGORY: Management of Human Uses

INJURED RESOURCES AND SERVICES: Rockfish, spot shrimp

PROPOSED ACTION

The objective of this option is to develop and implement fishery management plans for rockfish and spot shrimp. 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, commercial fishing did not require comprehensive management plans for some fish and shellfish species. This was true for rockfish and spot shrimp as well as various species occupying similar habitats. Each were injured to some degree by the oil spill itself. 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. Overharvest could greatly exacerbate oil-spill injuries. Development and implementation of 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.

Rockfish is a term commonly used to describe populations of pelagic (offshore), demersal (bottom-dwelling/slope-dwelling) fish of the genus Sebastes as well as lingcod (genus Ophiodon) and sablefish (genus Anoplopoma). Bottomfish would better describe this assemblage of species which occupy similar habitats in the area affected by the Exxon Valdez oil spill.

Bottomfish tend to be late-maturing and slow-growing with strong homing tendencies. Pelagic rockfish mature at 8-11 years of age, demersal and slope rockfish at 14-18 years. Lingcod stocks are supported by a spawning event that occurs every 5-8 years. Recruitment to these populations is sporadic and juvenile mortality is thought to be high. Because of this complicated life history, substantial mortality occurs before sexual maturation. For these reasons bottom fish populations are highly susceptible to population perturbations and declines in bottomfish resources tend to be extremely long-lasting.

Spot shrimp are also relatively long-lived (7 to 9 years). Shrimp eggs and the early life history stages are known to be very sensitive to oil contamination. Injuries from the oil spill include the occurrence of gill lesions, decreases in recruitment, abundance and fecundity and an increase in the number of females either without eggs or with dead eggs.

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 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 we did what we said we would do.

TIME NEEDED TO IMPLEMENT

This option will require several years to identify specific injured stocks, document the extent of those injuries, design and implement management plans and monitor the recovery of those resources. Recovery, whether by natural means or through specific restoration actions, will generally depend on the severity of the injury, the capacity of the injured resources to recover, and the time necessary to establish a trend for recovery. At least several years of recovery monitoring are expected for both rockfish and spot shrimp.

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

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 77.695.

- 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.

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.

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. Non-

destructive, least-intrusive methods will be used where possible.

There will be socio-economic impacts to commercial, sport and subsistence users of rockfish and spot shrimp 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 plane.

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 commercial, sport and subsistence fishing could allow the populations to recover naturally. Partial closure will allow for natural recovery but the process will be slower. 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 rockfish and spot shrimp 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

Field activities, including, monitoring, travel and support of field activities would be funded only during the field season. Data analysis, planning activities and administrative support would be funded full-time.

Rockfish

The budget would be $593,000 per year for 5 years.

Spot Shrimp

The budget would be $418,000 per year for 3 years.

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

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.

June 23, 1992 Author: Karen Klinge Updated

OPTION 4: Reduce disturbance at marine bird colonies and marine mammal haul-out sites and rubbing beaches.

APPROACH CATEGORY Management of Human Uses

INJURED RESOURCES AND SERVICES

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

SUMMARY

Human disturbance can adversely affect the fitness and reproductive success of marine birds and mammals. Especially vulnerable are species that gather in large numbers and traditionally make use of small, discrete sites. Examples include colonies of common murres, which typically nest on cliffs, haul-out sites frequented by harbor seals or sea otters, and rubbing beaches used by killer whales. In the case of common murres, recent reports have indicated specific disturbance problems with the shooting of halibut landed by charter-boat operators in the Barren Islands (Nysewander pers com). The sound of the gunshots causes the murres to flush in a panic from the nesting cliffs, kicking eggs off the cliffs and leaving eggs and chicks vulnerable to avian predators. Problems such as these can be approached through the education of tour- and charter-boat operators and the fishing industry. Designation of buffer zones around particularly sensitive areas and stricter enforcement of harassment provisions in the Marine Mammal Protection Act and the Migratory Bird Treaty Act also are possibilities.

SUBOPTION A Educate tour- and charter-boat operators about the need for, and ways to, decrease disturbance near sensitive marine bird and mammal use areas.

TARGET RESOURCES AND SERVICES

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

DESCRIPTION

Educational materials would be created and distributed to tour- and charter-boat operators. In addition, representatives of the Trustee agencies would meet in person with tour- and charter companies at least once annually to provide information and discuss

trade-offs and opportunities. These aids and meetings could inform the operators, and the public in general, of the behavior of the birds and mammals at breeding colonies or in molting concentrations and the adverse effects that human disturbance have on the animals. They would also supply information on appropriate distances and other means of reducing human disturbance.

IMPLEMENTATION ACTIONS

Create and distribute brochures and posters on seabird colonies, marine bird molting concentrations and marine mammal haul-out sites and rubbing beaches which include discussions on the importance of these areas and the adverse effects of human disturbance.

Establish and conduct meetings with tour- and charter-boat companies, and appropriate interest groups, to provide information.

Create opportunities for cooperative efforts and partnerships with the tour- and charter-boat companies.

Develop monitoring program to document the success of the education program.

TIME NEEDED TO IMPLEMENT

The first two actions (brochures and posters, and meetings with appropriate companies/operators) could be accomplished in a 6 month period[1].

Developing cooperative efforts and partnerships would vary depending on the nature of the agreements.

MEANS TO IMPROVE RECOVERY

MURRES. Reduced disturbance would increase productivity of murre colonies by reducing predation of murre chicks and eggs; and by reducing egg loss which occurs when adults are flushed off of their narrow nesting ledges.

Predation of murre eggs and chicks is an important factor in determining the productivity of a nesting colony. Several studies have documented a positive relationship between predation levels and disturbance (Birkhead 1977). Chicks and eggs are especially vulnerable to predation when the nesting density of murres is low, and when breeding is asynchronous (Birkhead 1977).

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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.

HARLEQUIN DUCKS. Reduced human disturbance at harlequin duck breeding and molting concentration sites may increase productivity by allowing paired ducks to maintain their pair-bonds during the pre-nesting and nesting seasons; and reduce mortality associated with stressed molting birds.

Harlequin ducks congregate at the mouths of suitable nesting streams in May. During this time pairs fly to and from seawater in search of nests upstream. Disturbance at this time could prevent the pairs from nest searching. Molting periods are physiologically stressful for birds. There is concern that disturbing flocks of flightless birds could force them to expend excess energy and may cause them to leave areas with abundant food (NRDA data). This combination could result in greater mortality during this time period, or during the on-coming winter.

MARINE MAMMALS. Reduced human disturbance at marine mammal haul-out sites could lessen mortality of adults and pups, reducing additional stress on molting seals and otters, by reducing the potential of hypothermia in seals and otters, and by preventing human induced abandonment of harbor seal pups.

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. Harbor seals rely on haul-out sites for resting (and protection from hypothermia?) during the molt (CITE). Protective measures for harbor seal pupping areas should include mid-May to mid-July. Harbor seals molt throughout the summer with the peak of molt occurring between late July to September.

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 temperatures.

KILLER WHALES. The reason for beach rubbing by killer whales is unknown but it may be associated with removal of parasites, resting and socialization. In British Columbia, whales used a rubbing beach for less than 1 hour/day (Ford 1984), but other pods have been observed at rubbing beaches for several hours at a time (Briggs 1991). 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.

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 of 1918 (16 USC 703-712) protects murres and harlequin ducks from harassment.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

The steep bathimetry near nesting cliffs allow tour-boats to approach within a few feet. This provides excelent viewing and photo opportunities for their customers.

The tour-boat operators within Kenai Fjords National Park agreed several years ago to lessen disturbance of whales by curtailing "whale chasing" practices.

TECHNICAL FEASIBILITY

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

USFWS education campaign using posters and calendars etc... 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)

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

Murres. The Chiswell Islands located at the mouth of Resurrection Bay receive the most tour-boat visits of the injured colonies. Many of the tour boats are flat bottomed and are capable of approaching within 10 feet of the steep cliffs. Research in the Farallon Islands (California) have shown that the productivity and success of common murre colonies increase when disturbance is reduced (Ainley and Boekelheide 1990). Disturbance caused by boats appears to be reduced when the boats remain 100 meters away from the colony and do not exceed 5 miles/hour (Pyle, pers. comm).

Recent reports from researchers observing the Barren Islands bird colonies have indicated specific problems with the shooting of halibut landed by charter-boat operators in the Barren Islands. The sound of the gunshots causes the murres to flush in a panic from the nesting cliffs, kicking eggs off the cliffs and leaving eggs and chicks vulnerable to avian predators. Because chicks and

eggs are especially vulnerable to predation when the nesting density of murres is low, and when breeding is asynchronous, efforts to reduce disturbance may produce greater results early in the restoration process.

Harlequin ducks. Preliminary information from damage assessment studies on harlequin ducks indicate that disturbance caused by oil-spill cleanup work may have contributed to the poor reproductive success of harlequin ducks in Prince William Sound.

Harbor seals, and other pinnipeds, are known to be sensitive to disturbance from boats and airplanes. Johnson et al. (1989) describe the effects of different types of human disturbances on harbor seals at haul-out sites. In general, any aircraft, but especially helicopters, flying below 122 meters (400 feet) would cause harbor seals to stampede from haul-out sites, sometimes crushing pups in their panic and sometimes staying away from the haul-out sites for 2 hours or more. Moving boats were described as causing the seals to slowly enter the water when they were within 200 meters (655 feet), all harbor seals would enter the water when a boat was within 60 meters (200 feet). Osborne (1985) was cited as documenting the effects of recreational boats, including canoes, as the single largest cause of disturbance to harbor seals in Elkhorn Slough, California.

I have not yet found information to determine if continued disturbance is a problem at any of the known harbor seal haul-out sites within the oil spill area. However, increasing recreational and scientific activities within the oil-spill area could potentially increase the level of disturbance. Reducing disturbance is especially important during pupping season (mid-May to mid-July) and during molting which peaks between late July and September.

Sea otters. The irregularity of haul-out patterns of sea otters makes it unlikely that a chronic problem currently exists. More information is needed on the conditions which approaching aircraft or boats disturb otters from haul-out sites.

Killer Whales. At least one killer whale rubbing beach was oiled in 1989, and subsequent clean-up activities likely caused disturbance to the whales. However, at this time it is unknown whether continued disturbance is a problem at any known rubbing beach within the oil spill area. If so, people should be encouraged to avoid these areas when the whales are present.

INDIRECT EFFECTS

Indirect environmental effects could include increased populations of other seabirds such as puffins and auklets.

Indirect socio-economic effects would include a long-term gain in

viewing opportunities for tourists as the numbers of marine birds and marine mammals approach their pre-spill population levels. Increased populations to support subsistence harvests.

Restrictions on acceptable approach distances near marine bird colonies potentially may cause a modest change in the way tour-companies operate their tours. These restrictions are meant to be a cooperative effort between the agencies and private companies so that short-term business changes result in a long-term gain for both the marine birds and the private companies.

Effects on human health and safety. Risks to human safety would be reduced since boats would not approach so closely to the rocks.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

Preliminary results from the harlequin duck studies indicate that cleanup activities may have exacerbated the effects of the oil-spill which has caused reproductive failure of ducks within the oil-spill area. (TALK WITH SAM PATTEN)

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Option 22 considers officially designating protected marine areas. Some of these designations, such as the National Marine Sanctuary, allow for creating zones for different forms of human uses. Measures to reduce disturbance to marine birds and mammals potentially could be included within these protected areas.

Option 33 develops a comprehensive public information and education program. Information developed specifically to reduce disturbance to marine birds and mammals could be distributed through this program in addition to, or instead of through Option 4.

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, NMFS or ADF&G), and the Division of Water Management would need to be involved.

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

NEPA compliance. None.

Additional/new legislative or regulatory actions. None necessary.

The restricted use aspects of this suboption would be obtained through voluntary agreements between the appropriate agencies and the tour- and charter-boat operators.

MEANS TO EVALUATE SUCCESS

Censuses designed to monitor the population level of the injured species will indicate if the reduced disturbance is effective in helping the populations to recover.

Occassional on-board observers, if agreed upon by the parties involved in a cooperative agreement, would monitor compliance to the distances agreed upon in the memorandum of understanding.

REPRESENTATIVE COSTS

One thousand (1000) tri-fold, double sided, glossy brochures with 6 pictures would carry an initial cost of $2500.00 with additional printings costing approximately $100 per thousand. For 1000, 5.5 x 8.5, 8 sided glossy brochures the initial cost is $2700.00, additional printings would cost approximately $100. These costs assume that the printing company completes all design and layout work as well as printing.

One thousand (1000) 18 x 23 inch, 2 color, glossy, poster would cost approximately $1000.00 including typesetting, layout etc...

Costs to establish and conduct meetings with tour-boat and charter-boat operators...?

Costs associated with any cooperative agreement or partnership would be dependent on the terms of the agreements. Minimum costs would include travel and salaries of the agency personnel involved.

ADDITIONAL INFORMATION NEEDED

There is need to determine the specific areas and times in which birds and mammals are especially vulnerable to human disturbance. Information on ideal distances between bird colonies and boat, and other information related to noise levels is needed to effectively implement this option.

CITATIONS

Ainley, D.G. and R.J. Boekelheide. 1990. Seabirds of the Farallon Islands: ecology, structure, and dynamics of an upwelling system community. Stanford, California: Stanford University Press.

Biggs 1991.

Ford 1984.

Johnson, S.R., J.J. Burns, C.I. Malme and R.A. Davis. 1989. Synthesis of information on the effects of noise and disturbance on major haulout concentrations of Bering Sea pinnipeds. 267 pp.

Osborne, L. 1985. Population dynamics, behavior, and the effect of disturbance on haulout patterns of the harbor seal (*Phoca vitulina richardsi*). M.Sc. Thesis, University of California, Santa Cruz, Santa Cruz, California. 75 pp.

SUBOPTION B Increase the field presence of Trustee agencies to provide greater enforcement of Federal and State laws designed to reduce disturbance.

TARGET RESOURCES AND SERVICES

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

DESCRIPTION

Important breeding colonies and marine mammal haul-out sites are 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 marine mammals and birds from disturbance by humans. 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 wildlife areas and to provide information to the commercial, recreational, and subsistence users of the areas.

Develop monitoring program to document the success of these activities.

TIME NEEDED TO IMPLEMENT

Hiring and training personnel could take 6-9 months.

Acquire/provide transportation (patrol boat).

MEANS TO IMPROVE RECOVERY

MURRES. Reduced disturbance would increase productivity of murre colonies by reducing predation of murre chicks and eggs; and by reducing egg loss which occurs when adults are flushed off of their narrow nesting ledges.

Predation of murre eggs and chicks is a important factor in determining the productivity of a nesting colony. Several studies have documented a positive relationship between predation levels and disturbance (Birkhead 1977). Chicks and eggs are especially vulnerable to predation when the nesting density of murres is low, and when breeding is asynchronous (Birkhead 1977).

HARLEQUIN DUCKS. Reduced human disturbance at harlequin duck breeding and molting concentration sites may increase productivity by allowing paired ducks to maintain their pair-bonds during the pre-nesting and nesting seasons; and reduce mortality associated with stressed molting birds.

Harlequin ducks congregate at the mouths of suitable nesting streams in May. During this time pairs fly to and from seawater in search of nests upstream. Disturbance at this time could prevent the pairs from nest searching. Molting periods are physiologically stressful for both birds and mammals. There is concern that disturbing flocks of flightless birds could force them to expend excess energy and may cause them to leave areas with abundant food (NRDA data). This combination could result in greater mortality during this time period, or during the on-coming winter.

MARINE MAMMALS. Reduced human disturbance at marine mammal haul-out sites could lessen mortality of adults and pups by preventing human induced abandonment of harbor seal pups, reducing additional stress on molting seals and otters, and by reducing the potential of hypothermia in seals and otters.

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. Harbor seals rely on haul-out sites for resting (and protection from hypothermia?) during the molt (CITE). Protective measures for harbor seal pupping areas should include mid-May to mid-July. Harbor seals molt throughout the summer with the peak of molt occurring between late July to September.

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 temperatures.

KILLER WHALES. The reason for beach rubbing by killer whales is unknown but it may be associated with removal of parasites, resting and socialization. In British Columbia, whales used a rubbing beach for less than 1 hour/day (Ford 1984), but other pods have been observed at rubbing beaches for several hours at a time (Briggs 1991). 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.

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).

CONFLICTS WITH EXISTING/PLANNED USES OR MANAGEMENT

TECHNICAL FEASIBILITY

Increased field presence by the Trustee agencies is feasible. Personnel trained in law enforcement and knowledgeable about the species 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. Reduced disturbance could increase the overall productivity of injured species.

INDIRECT EFFECTS

Reduced disturbance through greater field presence/law enforcement may produce indirect environmental effects such as:

- increased populations of other seabirds such as puffins and auklets;
- increased populations of non-targeted marine mammals; and
- reduced vandalism of archaeological sites and recreation facilities.

Indirect socio-economic effects would include a long-term gain in viewing opportunities for Alaskans and tourists as the numbers of marine birds and marine mammals approach their pre-spill population levels.

Effects on human health and safety are minimal. There could be a reduction in safety risks since tour-boats would not approach so closely to the rocks.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

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, Increase management in Parks, Refuges and Forests, could provide the same level and type of protection as described in this suboption.

Option 22 considers officially designating protected marine areas. Some of these designations, such as the National Marine Sanctuary, allow for creating zones for different forms of human uses. Measures to reduce disturbance to marine birds and mammals potentially could be included within these protected 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

REPRESENTATIVE COSTS

There are approximately 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

SUBOPTION C Establish or expand designated buffer zones to reduce disturbance at marine mammal haul-out sites and rubbing beaches and at breeding colonies of marine birds.

Not reviewed

TARGET RESOURCES AND SERVICES

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

DESCRIPTION

This suboption considers situations where the existing land managers establish legal buffer zones around important habitat sites. This does not include changing the official designation of the management area, but may include changing or creating administrative policies associated with permitting use of the area.

IMPLEMENTATION ACTIONS

Determine current regulatory status at specific sites important to injured marine birds or mammals.

Review the District Coastal Zone Management Plan and any other appropriate management plan associated with the specific sites.

If zoning regulations are not adequate to reduce disturbance to marine mammals and birds, recommend modifications to the management plans.

If adequate zoning restrictions exist, or new regulations are installed, ensure adequate field presence (suboption B) to gain compliance.

TIME NEEDED TO IMPLEMENT

MEANS TO IMPROVE RECOVERY

MURRES. Reduced disturbance would increase productivity of murre colonies by reducing predation of murre chicks and eggs; and by reducing egg loss which occurs when adults are flushed off of their narrow nesting ledges.

Predation of murre eggs and chicks is an important factor in determining the productivity of a nesting colony. Several studies have documented a positive relationship between predation levels and disturbance. Chicks and eggs are especially vulnerable to predation when the nesting density of murres is low, and when breeding is asynchronous.

HARLEQUIN DUCKS. Reduced human disturbance at harlequin duck breeding and molting concentration sites may increase productivity by allowing paired ducks to maintain their pair-bonds during the pre-nesting and nesting seasons; and reduce mortality associated with stressed molting birds.

Harlequin ducks congregate at the mouths of suitable nesting streams in May. During this time pairs fly to and from seawater in search of nests upstream. Disturbance at this time could prevent the pairs from nest searching. Molting periods are physiologically stressful for both birds and mammals. There is concern that disturbing flocks of flightless birds could force them to expend excess energy and may cause them to leave areas with abundant food (NRDA data). This combination could result in greater mortality during this time period, or during the on-coming winter.

MARINE MAMMALS. Reduced human disturbance at marine mammal haul-out sites could lessen mortality of adults and pups, reducing additional stress on molting seals and otters, by reducing the potential of hypothermia in seals and otters, and by preventing human induced abandonment of harbor seal pups.

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. Harbor seals rely on haul-out sites for resting (and protection from hypothermia?) during the molt (CITE). Protective measures for harbor seal pupping areas should include mid-May to mid-July. Harbor seals molt throughout the summer with the peak of molt occurring between late July to September.

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 temperatures.

KILLER WHALES. The reason for beach rubbing by killer whales is unknown but it may be associated with removal of parasites, resting and socialization. In British Columbia, whales used a rubbing beach for less than 1 hour/day (Ford 1984), but other pods have been observed at rubbing beaches for several hours at a time (Briggs 1991). 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.

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

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

TECHNICAL FEASIBILITY

The feasibility of this type of management change will greatly depend on the current regulations and guidelines at each specific area, and on the ability of the managing agencies to change the restriction levels. In some cases, creating restrictions on certain types of uses may be beyond the legal capabilities of the agencies. Under those circumstances, considering a new designated status for the area may be appropriate. New designations are described in greater detail in Option 22.

Case history. The Farallon Island murre population has suffered a severe population decline due to egg-taking, human occupation and chronic oil pollution of the early and mid-1900s. The population began to recover but was then injured by high gill netting mortality and most recently from disturbance caused by abalone diving boats which used noisy air compressors. The Farallon

Islands have multiple designations. The islands are part of a National Wildlife Refuge which has contracted with Point Reyes Bird Observatory for some research and administration of the islands. The area is also a National Marine Sanctuary, and the state has jurisdiction of waters near the refuge.

The frequency and impact of the disturbance was well documented and the Refuge went to the California Department of Fish and Game with recommendations that would reduce the disturbance to the murre colonies. The CDFG created the Farallon Islands Ecological Reserve which allowed them to restrict boat access to 300 feet from shore at certain parts of the islands, reduce the speed of all boats within 1000 feet of the islands to 5 mph, and required noise reduction modifications on all air compressor systems. This process took approximately 1 year to implement.

A local example of administrative decisions to reduce disturbance would be the Forest Supervisor's ability to prohibit the use of certain coastal areas to camping. These restrictions could be recommended to the Chugach National Forest at locations near marine mammal haul-out sites.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

The Chiswell Islands located at the mouth of Resurrection Bay receive the most tour-boat visits of the injured colonies. Many of the tour boats are flat bottomed and are capable of approaching within 10 feet of the steep cliffs. Experience in the Farallon Islands have shown that the productivity and success of common murre colonies increase when disturbance is reduced (Ainley and Boekelheide 1990). Disturbance caused by boats appears to be reduced when the boats remain approximately 90 meters (300 feet) away from the colony, travel at less than 5 miles per hour and do not use loudspeakers near the cliffs (Pyle, pers. comm). John Martin of the Alaska Maritime National Wildlife Refuge believes that seabirds become acclimated to tour-boats and disturbance is less of a concern (Jones & Stokes report - talk with JOHN>).

Recent reports from researchers observing the Barren Islands bird colonies have indicated specific disturbance problems with the shooting of halibut landed by charter-boat operators in the Barren Islands. The sound of the gunshots causes the murres to flush in a panic from the nesting cliffs, kicking eggs off the cliffs and leaving eggs and chicks vulnerable to avian predators. Because chicks and eggs are especially vulnerable to predation when the nesting density of murres is low, and when breeding is asynchronous, efforts to reduce disturbance may produce greater results early in the restoration process.

Preliminary information on harlequin ducks indicate that disturbance caused by oil-spill response may have contributed to

the poor reproductive success of harlequin ducks in Prince William Sound.

Harbor seals, and other pinnipeds, are known to be sensitive to disturbance from boats and airplanes. Johnson et al. (1989) describe the effects of different types of human disturbances on harbor seals at haul-out sites. In general, any aircraft, but especially helicopters, flying below 122 meters (400 feet) would cause harbor seals to stampede from haul-out sites, sometimes crushing pups in their panic and sometimes staying away from the haul-out sites for 2 hours or more. Moving boats were described as causing the seals to slowly enter the water when they were within 200 meters, all harbor seals would enter the water when a boat was within 60 meters. Osborne (1985) was cited as documenting the effects of recreational boats, including canoes, as the single largest cause of disturbance to harbor seals in Elkhorn Slough, California.

At this time it is unknown whether continued disturbance is a problem at any of the known harbor seal haul-out sites within the oil spill area. However, increasing recreational and scientific activities within the oil-spill area could potentially increase the level of disturbance. Reducing disturbance is especially important during pupping season (mid-May to mid-July) and during molting which peaks between late July and September.

The irregularity of haul-out patterns of sea otters makes it unlikely that a chronic problem currently exists. More information is needed on the conditions which approaching aircraft or boats disturb otters from haul-out sites.

At least one killer whale rubbing beach was oiled in 1989, and subsequent clean-up activities certainly caused disturbance to the whales. However, at this time it is unknown whether continued disturbance is a problem at any known rubbing beach within the oil spill area. If so, people should be encouraged to avoid these areas when the whales are present.

INDIRECT EFFECTS

Creation of regulation which designates buffer zones may produce indirect environmental effects such as:

- increased populations of other seabirds such as puffins and auklets; and
- increased populations of non-targeted marine mammals.

Indirect socio-economic effects would include a long-term gain in viewing opportunities for tourists as the numbers of marine birds and marine mammals approach their pre-spill population levels. Tour companies could lose business if they are not permitted close access to areas where wildlife concentrate. In addition, a buffer zone which restricts boat use could have impacts on recreational

and commercial fishing - however this would depend on the specifics of the area, level of restriction and the time periods during which restrictions occur.

Effects on human health and safety are minimal. There could be a reduction in safety risks since tour-boats would not approach so closely to the rocks.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Options which recommend changing the designated status of an area could provide the same types of protection that is described here.

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), the Division of Water Management, and DEC (?) would need to be involved.

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

NEPA compliance.

Additional/new legislative or regulatory actions. None necessary.

MEANS TO EVALUATE SUCCESS

Monitoring the change in the disturbance levels can be done in conjunction with enforcement activities. Population monitoring should also show a change in productivity based on reduced disturbance.

REPRESENTATIVE COSTS

This would be highly variable depending on the nature of the process and if legislative action is required. Research will have to be funded to document the extent of disturbance and administrative costs will be accrued to modify plans etc...

ADDITIONAL INFORMATION NEEDED

The timing, frequency and impacts of disturbance will need to be documented before this option is justifiable.

CITATIONS

Opt#5.003

Ken Chalk

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

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.

SUBOPTION A Prepare and implement a Fisheries Management Plan to reduce sport-fishing pressure.

DESCRIPTION

The development and implementation of a Fisheries Management Plan 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

- determine if sport-fishing closures or catch-and-release programs are necessary to protect injured populations.
- 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

One year will be required to develop and implement a Management Plan. Periodic population assessments of recovery will be an important part of this plan. They are expected to require at least 3 more years. How long it takes for an injured resource to recover generally depends 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 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 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 77.695.
- 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. Some sport-fishing closures have already been implemented. Further closures may become necessary.

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 sport and subsistence users of these resources now that certain areas are closed to protect injured stocks. 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. Partial closure will allow for natural recovery but the process will be slower.

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).

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

Field activities including monitoring, travel and other support of field activities would be funded only during the field season. Data ananlysis, planning activities and administrative would be funded full-time.

The budget would be $236,000 per year for 4 years.

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.

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.

June 23, 1992 Author: Karen 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

July 2, 1992 Author: Ray Thompson

UPDATE FROM MAY 19 VERSION

OPTION 6: Designate a Portion of the Chugach National Forest as a National Recreation Area or Wilderness

APPROACH CATEGORY: Management of Human Uses

INJURED RESOURCES AND SERVICES

Recreation, Wilderness, salmon, coastal cutthroat trout, and Dolly Varden

SUMMARY

The waters of Prince William Sound are surrounded by the Chugach National Forest. The area is recognized as biologically rich and it provides a variety of resources, including significant opportunities for private and commercial recreation. Although the Chugach National Forest does not contain lands designated as National Recreation Areas or Wilderness, the National Forest System contains many areas of such designations. Management of national recreation areas emphasizes recreational values and the habitats needed to sustain recreational opportunities. Management of wilderness emphasizes the preservation of pristine qualities and opportunities for non-mechanized recreation. Within the Chugach National Forest, Congress* has designated the Nellie Juan-College Fjord Wilderness Study Area, but has never resolved its permanent status. The Study Area is currently being managed for its "wilderness character". Changing management designations of all or part of the Chugach National Forest could alter management direction to favor recreational opportunities and wilderness qualities.

* Section 704 of the Alaska National Interest Lands Conservation Act, 1980, established the 2.1 million acre Nellie Juan-College Fjord Wilderness Study Area.

SUB-OPTION A: Designate the Nellie Juan-College Fjord Wilderness Study Area as Wilderness

TARGET RESOURCES AND SERVICES

Wilderness; recreation; visual resources; anadromous fish; Harlequin duck; marbled murrelet; brown bear; river otters; subsistence.

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. Controls

on minerals activity and rehabilitation of past activities would be required to maintain or enhance 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 for Nellie Juan-College Fjord Wilderness Study Area.

The Alaska National Interest Lands Conservation Act(ANILCA)[December 2, 1980, P.L. 96-487] provides for designation of Federal Lands as Wilderness to be managed by the subject agency under the guidelines of the Wilderness Act[September 3, 1964, P.L. 88-577].

Insure the Chugach National Forest continues to manage the Study Area to maintain its wilderness character.

Make available for public distribution information on the wilderness designation that may affect their current uses. This include the potential impacts to subsistence lifestyles.

Manage for the appropriate use of recreation facilities, i.e., cabins, and aquaculture.

TIME NEEDED TO IMPLEMENT

Wilderness designation requires Congressional action. Since the area is already designated as a Wilderness Study Area(WSA), it would take a legislative proposal, positive committee action and recommendation and then a "yea" vote to complete the wilderness designation. At least one national Congressional session would be necessary to complete the legislative process. When it could be introduced is unknown.

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 not be impaired by introducing land management activities which have negative affect on the quality of primitive recreation opportunities.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

The Nellie Juan-College Fjord Wilderness Study Area is currently managed by the Chugach National Forest to maintain its primitive and wilderness character. 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 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 the wilderness character.

TECHNICAL FEASIBILITY

This sub-option is technically feasible. National legislation, including examples in Alaska, have dedicated lands to Wilderness uses.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

The formal designation of the Wilderness Study Area will insure that current management strategy of the Forest Service will prevail over the long term. Long-term management for 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 a wilderness designation, it can be assumed that natural ecosystem relationships will endure. Under ANILCA, low disturbance aquaculture, to include fish ladders and hatcheries, can be placed in or near a wilderness. As long as the Chugach manages the Wilderness Study area for its wilderness character then timing of legislation to formalize the Wilderness is less imperative. The Forest Service has no plans to modify current management.

INDIRECT EFFECTS

Indirect environmental effects could include more rapid recovery of injured species through lessened disturbance.

The attraction of an "advertised" wilderness may bring more visitors. This may reduce recovery rates as more land is entered and impacted by a variety of activities.

Local businesses, travel agents and purveyors may see increased demand for primitive recreation within a designated wilderness.

Forest Service management and presence would increase.

Native subsistence issues may become more apparent as the Wilderness designation and its effect on established uses are better understood by managers who intensify management of designated area(s).

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

While this option lends an element of land uses protection through a specialized management designation, it does not preclude active management of the included wildlife, fish and scenic resources. Wilderness designation and the subsequent management does not condone intrusion 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 lands designated as Wilderness.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

None of the other options would achieve the same results. Effective specialized management of the Chugach National Forest uplands in Western PWS would be initiated thereby increasing the management intensity [option 7] on the National Forest. The development of an integrated public information and education program [option 33] will accomplish many of the same goals as wilderness designation, but the legal mandate for long-term management continuity is lost.

LEGAL CONSIDERATIONS

Consistency with the Settlement: This sub-option is consistent with the terms of the settlement agreement aimed at restoring injured services and natural resources.

Agencies with management/regulatory responsibilities: Under this sub-option the Forest Service would be responsible for completing the wilderness designation process, and for management of the included area upon designation as a National Forest parcel within the Wilderness Preservation System.

Permits required: Permits would be required for some activities within a designated wilderness 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 NFMA [National Forest Management Act].

Additional/new legislative or regulatory actions: The Chugach National Forest Plan and accompanying EIS have proposed and evaluated a wilderness designation for the College Fjord-Nellie Juan Wilderness Study Area. The Chugach National Forest Supervisor has recommended the WSA for designation as Wilderness; this recommendation being subsequently approved by the Alaska Regional Forester. Congressional action is required to designate wilderness. No legislation is pending although the Forest Service would support such legislation.

MEANS TO EVALUATE SUCCESS

Congressional action completed, followed by Presidential signature and publication in the Federal Register would mean the Chugach National Forest would then manage a Wilderness in Western Prince William Sound. The Forest Service would then write the implementing regulations, make specific notification to the public as to the date the area would become [or had become] wilderness and begin the management process by writing a management plan.

REPRESENTATIVE COSTS

Processes which would have to be completed to implement management of a newly designated wilderness include management plan development (a four person team for six months), obtaining approval, publishing plan, distribution and implementation. One hundred thousand dollars would not be unreasonable for these processes. Boundary posting, map development and printing would be additional costs to the Forest Service

ADDITIONAL INFORMATION NEEDED

As this NEPA process moves along it will be necessary to follow the activities in Congress if legislation is introduced for the Nellie Juan-College Fjord Wilderness Study Area.

May 19, 1992 Author: Ray Thompson

OPTION 6: Designate a Portion of the Chugach National Forest as a National Recreation Area or Wilderness

APPROACH CATEGORY: Management of Human Uses

INJURED RESOURCES AND SERVICES

Recreation, fish including salmon, coastal cutthroat trout, and Dolly Varden

SUMMARY

The waters of Prince William Sound are surrounded by the Chugach National Forest. The area is recognized as biologically rich and it provides a variety of resources, including significant opportunities for private and commercial recreation. Although the Chugach National Forest does not contain lands designated as National Recreation Areas or Wilderness, the National Forest System contains many areas of such designations. Management of national recreation areas emphasizes recreational values and the habitats needed to sustain recreational opportunities. Management of wilderness emphasizes the preservation of pristine qualities and opportunities for non-mechanized recreation. Within the Chugach National Forest, Congress* has designated the Nellie Juan-College Fjord Wilderness Study Area, but has never resolved its permanent status. The Study Area is currently being managed for its "wilderness character". Changing management designations of all or part of the Chugach National Forest could alter management direction to favor recreational opportunities and wilderness qualities.

* Section 704 of the Alaska National Interest Lands Conservation Act, 1980, established the 2.1 million acre Nellie Juan-College Fjord Wilderness Study Area.

SUB-OPTION A: Designate the Nellie Juan-College Fjord Wilderness Study Area as Wilderness

TARGET RESOURCES AND SERVICES

Wilderness; recreation; visual resources; anadromous fish; Harlequin duck; marbled murrelet; brown bear; river otters; subsistence.

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 for Nellie Juan-College Fjord Wilderness Study Area.

Explain the linkage between the Wilderness Act and Alaska National Interest Lands Conservation Act(ANILCA).

Insure the Chugach National Forest continues to manage the Study Area to maintain its wilderness character.

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.

TIME NEEDED TO IMPLEMENT

Wilderness designation requires Congressional action. Since the area is already designated as a Wilderness Study Area(WSA), it would take a legislative proposal, positive committee action and recommendation and then a "yea" vote to complete the wilderness designation. At least one national Congressional session would be necessary to complete the legislative process. When it could be introduced is unknown.

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 not be impaired by introducing land management activities which have negative affect on the quality of primitive recreation opportunities.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

The Nellie Juan-College Fjord Wilderness Study Area is currently managed by the Chugach National Forest to maintain its primitive and wilderness character. 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 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.

RELATICNSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Current management is consistent with the maintenance of the wilderness character.

TECHNICAL FEASIBILITY

National legislation is required before formal wilderness designation is made.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

The formal designation of the Wilderness Study Area will insure that current management strategy of the Forest Service will prevail over the long term. Long-term management for 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 a wilderness designation, it can be assume that natural ecosystem relationships will endure. Under ANILCA, low disturbance aquaculture, to include fish ladders and hatcheries, can be placed in or near a wilderness. As long as the Chugach manages the Wilderness Study area for its wilderness character then timing of legislation to formalize the Wilderness is less imperative. The Forest Service has no plans to modify current management.

INDIRECT EFFECTS

Indirect environmental effects could include more rapid recovery of injured species through lessened disturbance.

The attraction of an "advertised" wilderness may bring more visitors. This may reduce recovery rates as more land is entered and impacted by a variety of activities.

Local businesses, travel agents and purveyors may see increased demand for primitive recreation within a designated wilderness.

Forest Service management and presence would increase. An indirect effect of wilderness designation is the perception of visitors that their health and safety needs would be more readily met.

Native subsistence issues may become more apparent as the Wilderness designation and its effect on established are questioned.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

Wilderness designation would inherently increase the need for management of the included resources. While this option lends and 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 lands designated as Wilderness.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

None of the other options would achieve the same results. Effective restrictive management of the Chugach National Forest uplands in PWS by increasing the management intensity [option 7] on the National Forest. The development of an integrated public information and education program [option 33] will accomplish many of the same goals as wilderness designation, but the legal mandate for long-term management continuity is lost.

LEGAL CONSIDERATIONS

Consistency with the settlement: This sub-option is consistent with the terms of the settlement agreement aimed at restoring injured services and natural resources.

Agencies with management/regulatory responsibilities: Under this sub-option the Forest Service would be responsible for completing the wilderness designation process, and for management of the included area upon designation as a National Forest parcel within the Wilderness Preservation System.

Permits required: Permits would be required for some activities within a designated wilderness if these are standard procedures on adjacent National Forest Lands. Congressional action is required to designate wilderness.

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 NFMA [National Forest Management Act].

Additional/new legislative or regulatory actions: The Chugach National Forest Plan and accompanying EIS have proposed and evaluated a wilderness designation for the College Fjord-Nellie Juan Wilderness Study Area. The Chugach National Forest Supervisor has recommended the WSA for designation as Wilderness; this recommendation being subsequently approved by the Alaska Regional Forester. Congressional action is now required to complete the process for designation as Wilderness, or to be designated under different authority. No legislation is pending.

MEANS TO EVALUATE SUCCESS

Congressional action completed, followed by Presidential signature and publication in the Federal Register would mean the Chugach National Forest would now manage a wilderness in Western Prince William Sound. The Forest Service would then write the implementing regulations, make specific notification to the public as to the date the area would become [or had become] wilderness and begin the management process by writing a management plan.

REPRESENTATIVE COSTS **** BEING DEVELOPED ****

ADDITIONAL INFORMATION NEEDED

As this NEPA process moves along it will be necessary to follow the activities in Congress. This is particularly important if the Nellie Juan-College Fjord is introduced into Congress as a new Wilderness Bill.

May 19, 1992 Author: Ray Thompson

OPTION 6: Designate a Portion of the Chugach National Forest as a National Recreation Area or Wilderness

APPROACH CATEGORY: Management of Human Uses

INJURED RESOURCES AND SERVICES

Recreation, Wilderness, salmon, coastal cutthroat trout, and Dolly Varden

SUMMARY

The waters of Prince William Sound are surrounded by the Chugach National Forest. The area is recognized as biologically rich. It provides a variety of resources, including significant opportunities for private and commercial recreation. Although the Chugach National Forest does not contain lands designated as a National Recreation Area or Wilderness, the National Forest System contains many areas of such designations. THE NATIONAL Park Service has designated portions of the Katmai National Monument as wilderness. This area on the Alaska Peninsula was impacted by the EVOS. Study areas within the National Park Service were also impacted. These are the *blank Blank* areas.

Management of a National Recreation Areas emphasizes recreational values and the habitats needed to sustain recreational opportunities and ecological integrity. Management of wilderness emphasizes the preservation of pristine environmental qualities and opportunities for non-mechanized recreation. Within the Chugach National Forest, Congress* has designated the Nellie Juan-College Fjord Wilderness Study Area, but has never resolved its permanent status. The Study Area is currently being managed for its "wilderness character". Changing management designations of all or part of the Chugach National Forest could alter management direction to favor recreational opportunities and wilderness qualities.

* Section 704 of the Alaska National Interest Lands Conservation Act, 1980, established the 2.1 million acre Nellie Juan-College Fjord Wilderness Study Area.

SUB-OPTION B: Designate a portion of the Chugach National Forest in the Prince William Sound area as a National Recreation Area.

TARGET RESOURCES AND SERVICES

Recreation; visual resources; anadromous fish; Harlequin duck; marbled murrelet; brown bear; river otters.

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.
A National Recreation Area 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. National Recreation Area 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 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.

Insure the Chugach National Forest continues to manage for the recreation opportunities present within the focus area(s).

Establish direction for other public lands on the Kenai and Alaska Peninsulas and Kodiak Island.

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.

Define the appropriate use of aquaculture and recreation facilities, i.e., cabins, trails, interpretive sites, etc.

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. When it could be introduced is unknown. As often is the case, NRA proposals are attached to Wilderness legislation as riders.

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 not be impaired by introducing land management activities which have negative affect on the quality of developed, dispersed and primitive recreation opportunities.

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 National Recreation Area or its equivalent. Otherwise lands under various juridictions 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 legislation is required before formal wilderness designation is made. Any agency or constituent to the agency can draft and suggest legislation for NRA designation.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

The formal designation of the National Recreation Area insures that current management strategy of 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. As long as the Chugach manages the Wilderness Study Area and surrounding areas within the Sound for low impact activities then timing of legislation to formalize a NRA is less imperative. This strategy would also be true of other management agencies. The Forest Service has no plans to modify current management.

INDIRECT EFFECTS

Indirect environmental effects could include more rapid recovery of injured species through lessened disturbance.

The attraction of an "advertised" National Recreation Area may bring more visitors. This may reduce recovery rates as more land is entered and impacted by a variety of activities.

Local businesses, travel agents and purveyors may see increased demand for primitive recreation within a designated NRA.

Respective agency management and presence would increase. An indirect effect of special area designation is the perception of visitors that their health and safety needs would be more readily met.

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

National Recreation Area 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

None of the other options would achieve the same results. Effective restrictive management of the Chugach National Forest uplands in PWS by increasing the management intensity [option 7] on the National Forest. The development of an integrated public information and education program [option 33] 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.

Within the Forest Service administrative designations such as Recreation Area, Scenic Area and Historic Districts are available for management to consider.

LEGAL CONSIDERATIONS

Consistency with the settlement: This sub-option is consistent with the terms of the settlement agreement aimed at restoring injured services and natural resources.

Agencies with management/regulatory responsibilities: Under this sub-option the Forest Service would be responsible for completing the wilderness designation process, and for management of the included area upon designation as a National Forest parcel within the Wilderness

Preservation System. Other agencies would have the same opportunities and responsibilities for land under their jurisdiction.

Permits required: Permits would be required for some activities within a designated management areas if these are standard procedures on adjacent National Forest Lands. Congressional action is required to designate wilderness.

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 NFMA [National Forest Management Act] as well as other state and federal regulations which are agency dependent.

Additional/new legislative or regulatory actions: The Chugach National Forest Plan has not designated aress for consideration as National Recreation Areas, although he has recommended the College Fjord-Nellie Juan Wilderness Study Area. Congressional action would be required to complete the process for designation as Wilderness, or to be designated under different authority. No legislation is pending.

MEANS TO EVALUATE SUCCESS

Congressional action completed, followed by Presidential signature and publication in the Federal Register would mean the Chugach National Forest would now manage an NRA in Western Prince William Sound. Other agencies could follow similar procedures and implement management of special areas within their jurisdictions. Each would then write the implementing regulations, make specific notification to the public as to the date the area would become [or had become] an NRA and begin the management process by writing a management plan.

REPRESENTATIVE COSTS **** BEING DEVELOPED ****

ADDITIONAL INFORMATION NEEDED

THe opportunities for State and Federal agencies to designate other Special management areas within their respective jurisdictions.

June 23, 1992 Author: Karen Klinge - Updated

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

11 June 23, 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 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.

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. 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 B discusses an education program which would encourage voluntary reductions in subsistence harvest. ~~The educational~~ products created for this suboption could also 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. Subsistence users within the oil spill area have already demonstrated their concern over the population status of certain species by reducing their harvest level so an educational program should be effective. In addition, this suboption can assist in restoring the subsistence service by ensuring that users are well informed of the recovery of the species.

be directed at

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 Harlequin Duck.

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 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 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 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

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

CITATIONS

June 23, 1992 Author: Karen Klinge

SUBOPTION B **~~Educate public to~~ encourage voluntary reductions of subsistence, commercial and sport harvest levels**

TARGET RESOURCES AND SERVICES

Sea otter, harbor seal, brown bear, river otter and harlequin duck, subsistence service

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 an 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 recovering 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. Likewise, it will be necessary to provide current information on the recovery of specific resources so that subsistence activities can return to their pre-spill status at the earliest date.

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 sea otters and harbor seals in the oil-spill area.

Brown bear harvests are regulated by Alaska Department of Fish and Game which establishes harvest limits by management area.

Harlequin ducks can only be hunted during waterfowl hunting seasons set by Alaska Department of Fish and Game. Last year, Alaska Department of Fish and Game 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

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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.

regulations can close specific areas to harvesting. These closures are made by the Alaska Department of Fish and Game Board of Game which meets bi-annually.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

The Alaska Department of Fish and Game currently has an education program for hunters and conducts periodic censuses to determine the 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 (ADF&G Subsistence Division census data).

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

INDIRECT EFFECTS

Indirect environmental effects could include a more rapid recovery of injured species (through lessened disturbance). Potentially, subsistence activity could shift to different species which would experience higher than normal harvest levels.

Greater awareness of subsistence users of the health of the harvested population would help to ensure the long-term health of the population.

Indirect socio-economic effects would include a reduced opportunity for village residents to carry out a 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.

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

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

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

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

In response to concerns over the quality of subsistence meats an Oil Spill Health Task Force was established.

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; however, specific trips to the oil-spill communities will be crucial to affect the subsistence harvest and service.

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 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

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

One or two people will need to make regular visits to the oil spill communities to discuss subsistence use and provide current information.

Personnel (1FTE/year):	$40,000
Travel: $500/trip x 5:	$ 2,500
250/trip x 5:	$ 1,250 (based on added travel costs from Kodiak or Valdez to villages - costs range from $80 - 500)
Per diem (40 days?):	$ 4,000
Educational program	100,000
Total	143,750

ADDITIONAL INFORMATION NEEDED

CITATIONS

Opt#9.003

Ken Chalk

OPTION 9: **Minimize incidental take of marine birds by commercial fisheries.**

APPROACH CATEGORY: **Management of Human Uses**

INJURED RESOURCES AND SERVICES: **Marine birds**

PROPOSED ACTION

Temporarily modify commercial fishing regulations to avoid known concentrations of birds

SUMMARY

Large numbers of marine birds are susceptible to being tangled and drowned in commercial fishing gillnets. Local, nearshore fisheries are thought to be the cause of the death of significant numbers of marine birds as evidenced with common murres in a halibut/croaker fishery in California and with marbled murrelets in a salmon gillnet fishery in British Columbia. Research on marine bird mortalities due to commercial fisheries in Alaska has been limited. Data from the National Marine Fisheries Service's observer program in 1990 suggested that the annual mortality from Prince William Sound drift gillnets was 836-2100 marine birds, most of which were marbled murrelets. This mortality is not high relative to the overall size of the murrelet population, but on a local basis it could slow the recovery from oil-related injuries. Management strategies, such as reducing hours of nighttime fishing during critical times in discrete areas, may reduce the mortality.

DESCRIPTION

The development and implementation of strategies to reduce the incidental mortality of marbled murrelets in drift gillnets 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 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 the geographic distributions of injured populations.

- identify and evaluate the extent of mortalities.

- modify commercial fishery management plans to address methods for reducing identified mortalities.

- 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

Two years will be required to

One year will be required to sample the commercial fishery for bird mortalities and one year to design and implement

MEANS TO IMPROVE RECOVERY

Fishing regulations will be modified as a means to minimize seabird mortalities. A monitoring program will be implemented to assess to effectiveness of the restoration action.

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 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 77.695.
- 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

Onboard fishery observers have been used for years to monitor mortalities due to commercial fisheries. No new techniques or strategies are anticipated.

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.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

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 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 the fishery resources when certain areas are closed to protect injured marine bird populations 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 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, 3 and 5 will increase management of fishery resources. These options call for development of management plans to guide that increased management effort.

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 commercial, sport and subsistence fishing could allow the populations to recover naturally. Partial closure of certain fishing areas will also allow the seabird populations to recover naturally but recovery will be slower. 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

The budget will be $103,000 per year for 2 years.

ADDITIONAL INFORMATION NEEDS

Data on the significance, level and distribution of annual driftnet mortalities is needed before an effective strategy to minimize such mortalities can be developed.

Mortalities of marbled murrelets by fishing at night is not well documented. Since birds roost at night, mortalities are almost certainly lower than during daylight fishing.

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.

CITATIONS

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

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

June 17, 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

SUBOPTION B Develop new technology or strategies for reducing encounters

TARGET RESOURCES AND SERVICES

Common murres, marbled murrelets and other marine birds

DESCRIPTION

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.

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:

- Establish a research advisory committee consisting of representatives of the U.S. Fish and Wildlife Service, U.S. Department of Commerce (National Marine Fisheries Service), Alaska Department of Fish and Game, University of Alaska Sea Grant Program and the fishing industry.

- Provide funds to the committee to be spent on:

  (1) research to document the extent of marine bird mortality in coastal gillnet fisheries in the area affected by Exxon Valdez oil spill;

  (2) research on new technologies or strategies for reducing encounters between marine birds and gillnets.

- Incorporate relevant methodologies to reduce encounters between marine birds and gillnets into State of Alaska fishing regulations.

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 on new technologies could commence. This research would also take several years, as any promising technology would need to be tested. 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.

Proposed changes to the regulations might take several years to incorporate, particularly if the changes are controversial. Generally, gear changes to reduce bycatch also reduce fishing efficiency, and any changes to fishing regulations that decrease fishing efficiency, are controversial.

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.

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.

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.

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 "Management of Human Uses" and "Manipulation of Resources" options addressing commercial fisheries, including:

Option 2 Intensify management of fish and shellfish

Option 3 Increase management for fish and shellfish that previously did not require it

Option 18 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:

Option 22 Designate protected marine areas

Option 29 Designate or extend buffer zones for nesting birds

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Option 22--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 research advisory council would be funded for part-time support, travel to meetings and clerical support. The annual cost would be on the order of $20,000.

The research budget to be administered by the advisory council would be $250,000 per year.

ADDITIONAL INFORMATION NEEDED

CITATIONS

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June 17, 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 preservation of the site values, and if so, which restorative activities are appropriate to the need. However, in many cases the injury data available from response records is not sufficiently detailed to reach an informed decision on treatment. If the Archeological Resource Protection ACT (ARPA) regulations are employed as a guide, individual, detailed assessments of injury are a first essential step in the restoration process. Once there is sufficient information, two basic categories of restorative treatment may be considered, physical repair or data recovery. These two types of restorative treatment are not mutually exclusive and they are often employed in conjunction. 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#11.003

Ken Chalk

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 well-established 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 and sockeye salmon in Prince William Sound.

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

Five years will be required to design and implement this Suboption including:

- surveying areas to identify sites for egg boxes
- capturing outmigrant fry and rear in net pens
- constructing egg boxes and conducting first egg take
- conducting annual egg takes
- recovery monitoring

Suboption B

Three years will be required to design and implement this Suboption including:

- surveying areas to identify opportunities, develop plans, and acquire landholdings
- constructing instream structures
- recovery monitoring

Suboption C

Six years will be required to design and implement this Suboption including:

- applying fertilizer annually and monitoring ecosystem effect
- recovery monitoring

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 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 77.695.
- 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

The budget for this Suboption will be $579,000 per year for 6 years.

Suboption B - Improve access to spawning areas

The budget for this Suboption will be $481,000 per year for 3 years.

Suboption C - Improve spawning and rearing habitat

The budget for this Suboption will be $800,000 per year for 6 years.

GRAND TOTAL $9,717,000

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

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.

June 17, 1992 Author: Ray Thompson

OPTION 12: Creation of New Recreation Facilities through replacement or construction

APPROACH CATEGORY: Manipulation of Resources

INJURED RESOURCES AND SERVICES: Recreation

SUMMARY

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

SUB-OPTION A: Replace and/or rehabilitate existing structures and services to enhance user experiences

TARGET RESOURCES AND SERVICES:

Recreation, visual resources, cultural resources, information services and interpretation services

DESCRIPTION

FEDERAL: Several federal land managers were impacted by the EVOS. This was evidenced during the evaluation of injury to resources and services on federal lands. These lands are administered within the National Forest System, the National Park System and the National Wildlife Refuge System. Actual recreation visitor use of lands and facilities declined to different degrees dependent upon the local affect of oil on the services provided by the three federal agencies. It is apparent that some direct and some subtle effect was noted on the following units.

Within the National Forest System the existing recreation use patterns, scenery and cultural resources were changed or impaired through oiling. Chugach National Forest use statistics for cabins in Prince William Sound indicate less occupancy immediately following the spill. Oiling and cleanup efforts have changed visual perspectives and peoples' perceptions of the Sound. The Spill has not only damaged cultural resources but cleanup has imparted knowledge to many people which has caused increased visitation and looting of cultural resource sites. The ability to manage by making more information available to users and interpreting it has not kept pace with the recreational and other use of these sites.

The National Park Service manages several units within the spill area. Kenai Fjords N.P. had damaged resources from oiled beaches. This and cleanup efforts changed visitor use patterns. Similarly injured but to differing degrees or are carrying perception of injury were Lake Clark National Park and Preserve, Katmai National Park and Preserve, and Aniakchak National Monument and Preserve.

The Fish and Wildlife Service manages several National Wildlife Refuges in the Oil Spill area. Although some distance from Prince William Sound, oiling did occur within the jurisdiction of the Alaska Peninsula NWR and the Kodiak NWR. Recreational aspects of visitor use changed during the spill and cleanup projects afterward.

STATE: Alaska has several areas designated for various purposes but which attract recreationists. State Historic Sites, Marine Parks, Recreation Areas and Recreation Sites each provides the visitor with unique opportunities to enjoy Alaskan outdoors. Many of these sites were directly impacted by the Oil Spill. Others were not accessible for a time during spill cleanup. Without efforts to interpret injury for the interested public it may be difficult to attract visitors. Visitors may perceive their destinations differently after the spill and may change use patterns. Several units of concern are Marine Parks in Western Prince William Sound.

IMPLEMENTATION ACTIONS

It is important for both the Federal and State agencies to have information on the type and degree of injury suffered by individual units as well as effects perceptions of injury may be having (have had) on users of recreation units and sites within the oiled area. The full impact to recreation activities and opportunities needs to be determined by the management agencies and damage assessment personnel.

Information on injury and the utility of sites for recreation activities needs to be developed and distributed to vendors. These vendors, including information offices of the agencies, would distribute the facts about oil spill related injury and how that injury may or may not affect user activities. Brochures, posters and pamphlets with photos and synopses of oil spill related impacts could provide this service. Design and development of remote sites which could expedite the dissemination of information would be a concurrent step.

Engage in meetings with recreational clubs and organizations to provide information. Develop and promote recreation opportunity guide within each agency, or as a partnership effort develop regional guides, i.e., Prince William Sound Recreation Opportunity Guide, or others. Meetings and contact with the user public would indicate the need for on-ground sites and facilities. A recreation guide would direct people to the developed facilities.

Video tapes on the evolution of the oil spill and related injuries within recreation areas, which provide focus for learning more about the actual effects would combine recreational opportunities with learning experiences. Remodeled facilities may be needed to use these tapes efficiently and effectively.

Identify facilities and sites damaged, destroyed or rendered unusable by the oil spill or cleanup.

Identify new sites needed to enhance recreation activities

As an interagency activity, with public participation, define the needed facilities and sites within the oil spill area and establish priorities for implementation of facility and site development plans.

TIME NEEDED TO IMPLEMENT

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

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

MEANS TO IMPROVE RECOVERY

A description of injury to recreation activities provides the basis upon which managers can build programs and facilities to enhance visitors' understanding of oil spill impacts. A successful approach for information dissemination is to do it on-site. This will require additional facilities and people as well as the information. This will enhance recovery of damages to recreation by providing information in a setting within the damaged area for a hands-on and look-see assessment by the individual persons. The provision of facilities and education on environmental awareness will enhance both the manager's capabilities and public knowledge for a commcn goal of sustained, sensitive, high-quality interaction with the environment.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

All activities under this option may be implemented under existing laws and regulations. Management decisions will be needed to implement actions. These acticns on federal land will need an environmental analysis and appropriate documentation. Permits of various kinds from both federal and state agencies may be required for any singular or group of activities.(see 12/03/90 Memorandum from Les Gara, State of Alaska,Assistant Attorney General, tc Stan Senner, Restoration Project Manager)

This memo outlines a variety of State and Federal permits and processes necessary for project implementation.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

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

TECHNICAL FEASIBILITY

Development of planned facilities and sites is feasible.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

The use of restoration emphasis to provide for enhanced recreation experiences is a valuable service to visitors of both federal and state lands within the spill area. Information developed by the various agencies and organizations concerned with oil spill impacts will have the greatest influence cn visitor behavior, attitudes and perceptions when it is presented cn-site. Visitors are attracted to areas when facilities are available for their use and enjoyment. Managers can better attend to the needs and demands of visitors when they have some control over their activities and the locations of those activities. Control of activities and dissemination of accurate and timely information is one of the best tools available to recreation and visitation managers. New and/or rehabilitated sites and facilities provides the manager focus for implementation of their education programs.

It is necessary to implement this activity concurrent with the beginnings of the restoration program. What is being done, its success and failures, timing and schedules are all important to the visitor and recreationist. Even with plans for reconstruction and/or rehabilitation of damaged sites and facilities in the making, it will take 1 to 2 years to complete an on-ground project.

INDIRECT EFFECTS

Environmental: It is perceived that the activities associated with site enhancement and rehabilitation will potentially add to the injury that already occurred in the area; cultural resources being a primary concern. It is also an expressed concern that better sites and facilities will draw more people into the area, further distracting from its 'pristine' nature.

Conversely the impacts of many people are more or less localized. This localization provides an opportunity for the manager to focus on the developed sites. This focus resulting in a better informed and more conscientious recreationist, who, in turn, makes less impact as an individual. Managed opportunities will, over time, result in long-term sustainable resource uses.

Socio-economic: Drawing on the above it is expected that managers will provide a socially valuable service through site and facility enhancement. Agencies will also provide opportunities for less developed recreation. The variety of users now in the oil spill area demand different services, but in the long run well placed developed sites may be of benefit to most users. It is certain that the development activity, whether it be rehabilitation, enhancement or construction will increase the economic activity within the spill area. This would come directly from the work associated with these processes and potential fees for user services, or indirectly from marine and air operations which would take visitors to the sites.

Human health and safety: Restored, rehabilitated, enhanced and newly constructed sites and areas would focus human activity. This focus would be managed by the agencies who would likely have more presence in the areas affected by the site work. This would have a direct affect on the visitors' perception of their immediate health and safety. Managed sites and maintained facilities are actively sought by visitors. Appropriate visitor information services at these sites and areas provides recreationists with information and services needed to enjoy the surroundings in a safe and environmentally sound manner.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

The value of facilities is for the focusing of information dissemination in an atmosphere that allows facilitation and coordination but doesn't distract from the message being given. With this in mind it is reasonable to consider development of facilities when it is expeditious for the presentation and understanding of information related to the area environment and its management. Options which consider the Management of Human Uses are more or less linked to the development of facilities. The development of other types of facilities requires coordination of the agencies, corporations and individuals which might be considering such

development. This certainly relates to any options in which development or intensive management of sites or areas is contemplated.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Other options which may have concurrent or similar activities are: 1B, 4C, 7B, 33B & C, 34A & B.

LEGAL CONSIDERATIONS

This sub-option is consistent with the terms of the settlement aimed at restoring natural resources and services within the spill area.

Agencies with management and/or regulatory responsibilities ar primarily the land-based agencies which are DNR, NPS, USFS and USFWS. All agencies may be involved in the development of this option. Other than the above the ADF&G, NOAA and NMFS would be included in planning and management of the sites and areas to complete , at least the information portion of management, if not part of the planning and siting activities.

Permits required include those necessary for construction as regulated by the state, borough or municipality as well as the agency upon which the facility or site development may be located. This would primarily include the land-based agencies named above.

All developments upon federally managed lands or water would require compliance with NEPA. Public participation in the consideration of effects of a development proposal and its alternatives, and of any decision made on the proposal is required.

No new or additional legislative or regulatory actions are contemplated.

MEANS TO EVALUATE SUCCESS

Monitoring of public and agency impressions and use statistics for any individual as well as the cumulative developments will be necessary to evaluate the success of development. The attitude of individuals toward injured resources and services may be sampled for information on programs and facilities. When people have become sensitive and considerate of injured resources and services and modified their behavior within the spill area so as to preclude further injury through their presence, then restoration through development of facilities and areas, may be called successful.

REPRESENTATIVE COSTS

[e.g., planning/legal, capital, real estate and development rights, operating/management, etc.]

Typical costs for developments such as camping sites with interpretive facilities and manned interpretation and education facilities are being developed.

ADDITIONAL INFORMATION NEEDED

DRAFT

June 22, 1992 Author: John Strand/Art Weiner

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

SUMMARY

APPROACH CATEGORY

Manipulation of Resources.

INJURED RESOURCES AND SERVICES

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

DESCRIPTION

It will be the objective of this option to determine the geographic extent of oiled mussel beds in Prince William Sound, the intensity of oil remaining in mussels and the underlaying organic mat. This study will determine and implement, if necessary, the most effective and least intrusive method of cleaning oiled mussel beds. The principle treatment proposed is partial removal of mussels and substrate to expose contaminated sediments to flushing and to the air. This treatment is designed to accelerate weathering and biodegradation. This study will also provide chemical data to assess the possible linkages of oiled mussel beds to harlequin ducks, oystercatchers, juvenile sea otters, juvenile and adult river otters, and other organisms.

The geographic extent and intensity of contamination also will be determined at locations outside Prince William Sound (Kenai and Alaska Peninsula, Kodiac region, Kenai Fjords, and the Katmai National Park Coastline).

IMPLEMENTATION ACTIONS

1) Samples of mussels, byssal substrates and sediments will be collected from 30-50 sites in Prince William Sound and from 5 sites on the Kenai and Alaska Peninsulas, the Kodiac region, Kenai Fjords and the Katmai National Park coastline. Potential study sites will be identified during the spring shoreline survey and by studies associated with harlequin ducks, oystercatchers, sea otters and river otters. Byssal mat samples will first be screened by ultraviolet analyses to determine geographic extent and relative intensities of contamination. Selected byssal mat substrate samples as well as selected mussel and sediment samples will then be analyzed by gas chromatography/mass spectrometry to determine

absolute concentrations of contamination and the relationship of contamination levels among the these three matrices. These results will also be compared with levels of contamination from several control sites.

2) At both oiled and control mussel beds, mussels and underlaying byssal thread substrates will be stripped-away. Stripping will occur perpendicular to the waterline. Mussels and substrate will be sampled at the time of stripping, 30 days later and at the end of the summer at varying distances form the stripping. Chemical analyses will be conducted to determine the rate at which petroleum hydrocarbons are eliminated. Biological recovery will be determined by measuring byssal thread production, general condition (dry tissue weight/shell volume) and reproductive condition (gonadal index). Additionally, stripped areas will be examined to determine stability of mussels at the edge of strips, the movement of adults into stripped areas, and the settling of juveniles on the strips.

TIME NEEDED TO IMPLEMENT

Much of the sampling to determine the geographic extent of oiled mussel beds within the spill zone can be done in 1992, however, it is not likely that chemical analyses (UV screening) of these samples will be available for interpretation until Spring 1993. Detailed chemical analyses (GC/MS) will not be available until Spring 1994. Results of studies to determine elimination of petroleum hydrocarbons from mussel beds (based on UV screening) where contaminated mussels and underlaying substrates were stripped away also will not be available until Spring 1993. Potential implementation of stripping on a wider scale within the spill zone, if required, would not be undertaken until Summer 1994.

MEANS TO IMPROVE RECOVERY

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

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

A measure of protection and management is afforded by the Coastal Zone Management Act of 1972 (Section 315, Public Law 92-583, as amended; 86 Stat. 1280 [U.S.C. 1461]) and the Alaska Coastal Management Act and Alaska Coastal Management Act Regulations (AS 46.40, 6 AAC 80 and 85).

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Knowledge of the levels of residual petroleum hydrocarbon contamination in intertidal habitats will be used to regulate subsistence gathering of mussels, clams and other shellfish.

Knowledge also gained by testing the feasibility of eliminating residual oil in mussel beds by stripping will be useful in making future decisions on whether or not it will be beneficial to physically or chemically (includes bioremediation) clean mussel beds and other biologically important habitats.

TECHNICAL FEASIBILITY

While methods are available to monitor the fate of petroleum hydrocarbons in sediments and biological components of intertidal habitats, the potential efficacy of stripping mussel beds to accelerate elimination of residual oil has not been tested.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

Intuitively, stripping of contaminated mussel beds should increase natural flushing of the beds. It should also increase weathering and microbial degradation of buried oil. As a result of this process, less oil should be available for bioaccumulation and transport up the food chain.

INDIRECT EFFECTS

While there will likely be no adverse socio-economic and human health and safety effects associated with stripping the mussel beds, there will be some environmental cost. There will be a direct loss of mussels, other invertebrates as well as seaweeds from the intertidal zone where stripping is implemented, but this loss will need to be weighed against the benefit of accelerating the rate at which contamination is eliminated from this habitat, and the benefit of decreasing the probability that potentially harmful petroleum hydrocarbon residues will be passed-up the food chain. The potential for such costs and benefits will be addressed in future project level environmental assessments or environmental impact statements.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

While this restoration option could be construed as a "response" activity, the U.S. Coast Guard and the Alaska State Department of Environmental Conservation ended clean-up of oiled shorelines in 1991. This is the only restoration option that considers additional clean-up, although Option 30 calls for the development of a testing program to test for the presence of petroleum hydrocarbon residues in subsistence foods including mussels and clams.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

There are no other options that propose direct restoration (manipulation) of intertidal sediments and mussel beds, although Option 14 also proposes to accelerate recovery of the intertidal zone. Option 14, however, focuses on accelerating recovery of the intertidal alga, *Fucus gardneri*. One proposed method to accelerate recovery of the *Fucus* community is through use of a trickle irrigation system which may or may not accelerate flushing of the intertidal zone.

LEGAL CONSIDERATIONS

The State of Alaska Department of Natural Resources has regulatory authority for all tidelands. The State of Alaska Department of Fish & Game manages fish and wildlife including nongame species. Both agencies require and issue permits in the intertidal zone. Other permits may be required by the U.S. Forest Service, National Park Service or the Alaska State Parks System, dependent upon the site(s) of the proposed feasibility studies.

MEANS TO EVALUATE SUCCESS

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

REPRESENTATIVE COSTS

As shown in TABLE 1, expected costs for Year 1 will be $582.00K. This amount will support the feasibility study and is based on costs presented in the Exxon Valdez Oil Spill 1992 Draft Work Plan (Exxon Valdez Oil Spill Trustees 1992). Costs for a second year assume that seven sites (5 sites in PWS, 2 sites elsewhere) will be revisited and mussel beds stripped. These costs are based on conversations with Jeep Rice of the Auke Bay Fisheries Lab.

ADDITIONAL INFORMATION NEEDED

None.

CITATIONS

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

TABLE 1. Projected costs of Implementing Option 13.

ITEM	$K	BASIS
Year 1 - Feasibilty Study		
Salaries		
Project Leader	29.00	5 man months over 1 year.
Other Scientist	45.00	10 man months over 1 year.
Technician	80.00	24 man months over 1 year.
Clerical Support	10.00	3.5 man months over 1 year.
Travel and Per Diem	35.00	Airfare to and from Juneau to Valdez for field team of 3, per diem for 2 months; per diem for second field team of 2 for 2 months.
Boat Charter	25.00	For 2 month field season.
Helicopter Charter	50.00	For 2 month field season.
Equipment/Supplies	18.00	Sampling gear.
Chemical Analyses	280.00	Includes 450-550 UV and 275 GC/MS analyses, QA, instrument maintenance, supplies, interpretation(1).
Peer Review	4.00	One week.
Publication	6.00	Report duplication, graphics support, editing, page charges (journal), mailing.
Sub-Total	$582.00	

(1) Detailed chemical analyses may not be complete until spring 1993.

Table 1. (continued)

ITEM	$4K	BASIS
Year 2 - Implementation of Stripping		
Salaries		
Project Leader	6.00	1 man month over 1 year.
Other Scientist	10.00	2 man month over 1 year.
Technician	14.00	4 man months over 1 year.
Clerical Support	3.00	1 man month over 1 year.
Travel and Per Diem	7.50	Airfare from Juneau to Valdez and return for field team of 3-includes per diem for 10 days, per diem for second field team of 2 for 5 days (two trips over 1 year).
Helicopter Charter	22.50	For three 5-day field trips.
Equipment/Supplies	5.00	Sampling gear.
Chemical Analyses	30.00	Provide for 50 UV and as many as 25 GC/MS analyses including QA, instrument maintenance, supplies and interpretation.
Peer review	4.00	One week.
Publication	6.00	Report duplication, graphics support, editing, page charges (journal), mailing.
Subtotal	$107.50	
Total	$689.50	

June 23, 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#15.002

Ken Chalk

OPTION 15: Supplement intertidal substrates for spawning herring

APPROACH CATEGORY: Manipulation of Resources

INJURED RESOURCES AND SERVICES: Pacific herring

PROPOSED ACTION

Supplement intertidal and subtidal substrates for 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. The use of both artificial and cultured marcoalgal substrates have been shown to significantly decrease herring egg mortalities and greatly increase population biomass.

DESCRIPTION

Supplementing intertidal and subtidal substrates for spawning herring will:

- reduce egg mortality and increase biomass of injured stocks.
- facilitate recovery of these populations to pre-spill conditions.
- 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 injured herring stocks and define their distribution.
- develop basic herring spawner biomass estimates for the injured stocks against which restoration actions will be measured.

- review scientific literature and consult with other restoration workers to evaluate the appropriateness of methods currently in use in other areas.

- design restoration actions most appropriate for the specific stocks to be restored.

- design and implement appropriate restoration strategies.

- monitor recovery of specific stocks to evaluate the effectiveness of restoration activities.

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

TIME NEEDED TO IMPLEMENT

This program will require several years to design, implement and monitor. First, it will be necessary to identify specific injured stocks and which substrates were injured either be oil or clean-up activities. Specific restoration methods will then be designed and implemented. Stocks will be monitored from egg deposition until at least one brood year is fully recruited to the spawning population, a minimum of four years. Substrate and population recovery will be monitored until they reach pre-spill conditions.

MEANS TO IMPROVE RECOVERY

Plant recovery will be enhanced by replanting with indigenous species. Injured herring populations will be protected by implementing a Herring Management Plan which will be developed under another Restoration Option.

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.

A 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 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 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 77.695.
- 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 have been used successfully in Russia for years (Benko, Yu. K., et al). Those techniques may be inappropriate for the spill-damaged areas and must be evaluated before large-scale use. 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

It has been demonstrated that the coefficient of survival of herring eggs to spawning age individuals is increased as much as 10 times on artificial spawning substrates.

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 baseline population information needed for this option.

A monitoring program to evaluate the effect that restoration activities have on herring populations is an integral part of this Restoration Option.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Complete closure of all commercial and subsistence fishing could allow the populations to recover naturally. Partial closures will allow for natural recovery but the recovery process will be slower.

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

Field activities including monitoring, travel and other support of field activities would be funded only during the field season. Data analysis and planning activities and administrative support would be funded full-time.

The budget would be $256,000 per year for 5 years.

ADDITIONAL INFORMATION NEEDS

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

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

Benko, Yu. K., Bogatkin, Yu. N. and R. K. Farkhutdinov, "Biological bases for the use of artificial spawning grounds for the reproduction of Okhotsk herring," Biol. Morya, No. 1, pp 56-61, January-February 1987.

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.

June 17, 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 nesting in colonies in such places as the Barren Islands. Careful monitoring of experimental and control sites is necessary to determine the effectiveness of these direct restoration techniques. Without intervention, the time to recovery is now estimated to be in the decades. 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.

<u>Potential Negative Effects:</u> 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 terns 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.

June 23, 1992 Author: Klinge/Gorbics

OPTION 17

APPROACH CATEGORY Manipulation of Resources

INJURED RESOURCES AND SERVICES Marine Birds

SUMMARY

Foxes are not indigenous to many of the islands of the Aleutian chain and Gulf of Alaska. Foxes were introduced on more than 400 islands to be raised and trapped for their furs. Introduced foxes 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") foxes on islands in the western Gulf of Alaska and in the Aleutians where such foxes 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 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 foxes 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 foxes from up to 4 islands per year for a total of approximately 20 islands.

TIME NEEDED TO IMPLEMENT

It would take approximately 5 years to complete the project.

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. Foxes are voracious predators of chicks and eggs. Foxes 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 form 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 used these devices since then despite repeated requests. Cyanide ejectors proved an invaluable backup to the elimination of trap-shy foxes in 1983.

Since predacides became highly restricted in 1972 and now are available only for emergency used 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 foxes 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.

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

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 foxes 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 foxes. They concluded that the larger and more aggressive red fox will outcompete the arctic ox by usurping dents 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 particular 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 nestings such as kittiwakes and murres are less susceptible to fox predation.

INDIRECT EFFECTS

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 foxes.

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

CITATIONS

Opt#18.003

Ken Chalk

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

Several years will be required to design and implement Suboptions A, B and C including:

- hatchery modification and/or egg take site preparation

- first-year egg take, incubation, rearing and stocking of fry

- second-year egg take, incubation, rearing and stocking of fry

Recovery monitoring will begin as the egg takes are completed. 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 77.695.
- 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

The budget for this Suboption will be $784,000 for one year.

Suboption B - Transplant hatchery-reared fish to depleted areas

The budget for this Suboption will be $472,000 per year for 2 years.

Suboption C - Establish new runs from wild egg takes

The budget for this Suboption will be $615,000 per year for 2 years.

GRAND TOTAL $2,859,000

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.

June 23, 1992 Author: Chris Swenson Updated

OPTION **Option 19: Update and Expand the State's Anadromous Stream Catalogue**

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

Updating the State Anadromous Waters Catalogue and Atlas for streams on public lands would increase protection of injured anadromous species, their habitat, species that feed on them, and the services provided by all of these. Anadromous streams listed in the catalogue are automatically afforded special 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 catalogue, 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. Since ongoing restoration studies are surveying streams on private lands, this option focusses on sending survey teams to streams on public (i.e., state and federal) lands within the spill area.

IMPLEMENTATION ACTIONS

1) Identify and prioritize public lands where an imminent threat or high potential for habitat degradation exists and anadromous fish data is incomplete or lacking

2) Stream survey teams collect fish distribution data

3) Data entered into the State Anadromous Waters Catalogue and Atlas

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 implementation option. The time for each step involved is as follows:

ID public lands where imminent threat exists - 1 month

ID areas with insufficient or absent stream data - 2 months

Survey team in field - Variable

Data entry into catalogue and atlas - 3 months

MEANS TO IMPROVE RECOVERY

Listing anadromous streams in the state catalogue will facilitate natural recovery of injured resources and services by providing protection against 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. ADF&G statutes regulate virtually all instream activities in anadromous waters which would damage stream habitat. The State Forest Practices Act requires that logging operations leave 100 foot riparian buffer zones around anadromous streams on state lands. In the case of unoiled streams supporting resources and services equivalent to those injured in the spill, the implementation of this option could guard against future habitat degradation which could retard the recovery of injured species.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Fish-bearing streams on public lands which are not included in the State Anadromous Waters Catalogue 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 USCA)
Chugach National Forest Land and Resource Management Plan

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

Organic Act of 1916 (***USC) and NPS management plans

National Wildlife Refuge Administration Act of *** (**USC) and refuge management plans

The above regulatory authorities provide a general level of

protection for wildlife, water quality and water use, but do not provide as much protection to anadromous fish, their spawning and rearing areas, or adjacent riparian habitat as the ADF&G statutes and (on state lands) 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 catalogue, and regulates subsequent uses and activities.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

There are several streams on public lands 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 are ongoing and present potential threats to anadromous species and their habitats. Regulation of these activities, via inclusion of anadromous streams in the state catalogue, could provide the protection necessary to facilitate restoration 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 (Restoration Project 47 in the 1992 Draft Work Plan) which will survey anadromous streams on private lands which are threatened by imminent development activities. Surveying streams on public 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 existing statutes or regulations provide a level of protection comparable to the ADF&G anadromous stream statute and the Alaska Forest Practices Act. Application of these management tools is the most effective option for protecting unsurveyed anadromous streams on public lands.

LEGAL CONSIDERATIONS

1) Consistency with settlement: Enhanced regulatory protection of injured resources and services and their equivalents is consistent with the term 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 helicoptors and setting up field camps on lands managed by federal agencies.

4) NEPA compliance: Since this represents an enhancement of ongoing state resource management practices and does not entail land acquisition, 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. Sample costs for one year of work are included below. Calculations assume that the implementing agency already has collection and sampling equipment such as egg pumps and backpack electroshockers.

Personnel

Project Leader:	HB III; 12 months	$70,000
Crew Leader:	HB I; 5 months	$23,000
Field Technician:	Tech III; 5 months	$17,000
Field Technician:	Tech III; 5 months	$17,000
Field Technician:	Tech III; 5 months	$17,000
Clerk Typist:	CT III; 6 months	$17,000

Travel

Staff travel and per diem:	$8,000

Contractual

Helicopter charter: 35 days	$84,000
Phone, fax, xerox, maps, repairs	$5,000

Supplies

Office and field supplies	$1,000
YEARLY COST:	$259,000

ADDITIONAL INFORMATION NEEDED

A determination of which public lands would most benefit from anadromous stream surveys is needed, although this issue could be addressed, in part, by the preliminary work associated with this option.

CITATIONS

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

OPTION 20 OUTLINE

Create EVOS Special Management Area

Suboption A: Amend AK Coastal Management Act

Description: The Alaska legislature could pass an amendment to the Alaska Coastal Management Act which designates an EVOS special management area and outlines appropriate management practices to achieve restoration objectives. These changes would automatically be incorporated in local management plans for coastal districts in the spill zone (i.e., Kodiak and Kenai Boroughs, Cordova, Valdez and Whittier). All state, federal and private coastal zone activities requiring permits would then be reviewed by the state for consistency with the act and coastal district plans.

Pros:

1) The action would provide consistent management guidelines across a designated management area.

2) The action would be relatively easy to oversee since all coastal zone consistency applications are reviewed by a single agency.

Cons:

1) Amendments are only enforceable when an agency or individual requires a permit for their activity; other types of activities would not be effectively managed.

2) Implementation of the act depends only on existing agency and local regulatory authorities and does not create new ones - which may or may not be necessary to achieve restoration objectives.

Suboption B: Amend State/Federal Management Plans

Description: A variety of state and federal management plans are already in existence throughout the spill area (e.g., ADNR's PWS management plan, the Forest Service's Chugach Forest management plan, and plans for areas managed by the National Park and Fish and Wildlife Services). These could be amended by the various agencies to create an EVOS special management area. The most effective strategy would be for all state and federal resource agencies to agree on a uniform set of management objectives and to incorporate these into their respective plans or draft a single, multi-agency document outlining mutual management practices.

Pros:

1) This action could be accomplished via an administrative process and would bypass the complexities of legislative action and land acquisition.

2) This suboption would provide a uniform set of management practices for all public lands within the designated management area.

Cons: 1) It could be very difficult for multiple agencies, with separate missions and authorities, to agree on a single set of management practices.

2) In general, a multi-agency management plan would only be applicable to public lands and would not provide authority for managing activities on private land.

Suboption C: State/Federal Legislation to Designate Mgmt. Area

Description: The state and federal governments could take joint legislative action to designate a special management area which included state and federal land. This would be a new approach to land protection and would involve multiple resource agencies working towards a common set of management and restoration goals.

Pros: 1) This suboption would provide a uniform set of management practices for all public lands within the designated management area.

Cons: 1) This suboption would only deal with public lands and would not provide authority for managing activities on private lands.

2) It could be very difficult for multiple agencies to agree on how to manage a single area, especially since the special management area would probably subsume areas which have historically been managed by a single agency.

3) This suboption would probably entail the creation of an additional layer of bureaucracy, which is generally not conducive to effective and expeditious action.

4) Execution of the suboption entails redesignating several state and federal management areas established by previous legislation, which could result in legal challenges.

June 23, 1992 Author: Chris Swenson Updated

OPTION Option 21: Acquire Tidelands

APPROACH CATEGORY Habitat Protection and Acquisition

INJURED RESOURCES AND SERVICES Tideland were among the areas most heavily damaged by the spill. Injured resources and services include intertidal habitats; plants and animals dependent on these areas for all or part of their life cycles such as shorebirds, waterfowl, intertidal invertebrates and fucus; intertidal archeological sites; subsistence, sport and commercial harvests; and aesthetic and recreational uses, such as birdwatching and beachcombing.

SUMMARY Most tidelands are in public ownership, but some are held by private parties or municipalities and have high fish and wildlife and public use values. Examples suggested by the public are the Valdez Duck Flats and Mud Bay, at Homer. Enhanced protection could be accomplished by acquiring fee title to the land and then placing it into special protective status via legislative or administrative action. Alternatively, there are non-purchase protection options that do not require acquisition of fee title. Either protection option could facilitate restoration by restricting human activities which are harmful to already injured species and habitats. In addition, certain low impact public uses, such as birdwatching, could be encouraged in these areas, thus restoring some lost recreational and aesthetic services.

SUBOPTION A Acquisition of fee title to privately or municipally owned tidelands

TARGET RESOURCES AND SERVICES This suboption potentially targets three groupings of resources and services:

1) oiled tidelands supporting resources and services directly injured by the spill

2) unoiled tidelands supporting injured resources and services (e.g., unoiled intertidal areas that provide habitat for injured migratory bird populations)

3) unoiled tidelands supporting resources and services equivalent to those injured by the spill

DESCRIPTION State and/or federal governments could acquire fee title to privately or municipally owned tidelands. 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 tideland 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.

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 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 highly variable. Variables include:

Which government agency does acquisition
Time to negotiate with landowner
If EA or EIS is required
Time for state vs. federal legislatures to act (if applicable)
Time needed for administrative action (if applicable)
Time to write/implement management plan

MEANS TO IMPROVE RECOVERY Public ownership and enhanced protection of oiled tidelands will facilitate natural recovery by restricting activities stressful to already damaged populations and habitats. In the case of unoiled tidelands 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 tidelands could also be managed to enhance low impact recreational opportunities such as birdwatching.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS Existing regulatory authorities applicable on private and municipal tidelands 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.)
Alaska Native Claims Settlement Act of 1972, section 22(g)
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 tidelands 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 Anchorage Coastal Wildlife Refuge is an example of a successful tidelands protection program in a populated area which also provides opportunities for multiple public uses, including wildlife viewing and hunting. Agencies also routinely take administrative actions, e.g., amending management plans, to update or refocus land management objectives.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE The spill area contains private and municipal tidelands which support significant resources and services. In some cases, these areas support multiple commercial and recreational uses which potentially conflict with the habitat requirements of shorebirds, waterfowl, marine invertebrates and other species which were either injured in the spill or are equivalent to injured species.

Acquisition and increased protection of such 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 potentially 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 and 29, which deal with acquisition of marine bird and mammal habitats, private inholdings within parks and refuges, and bird nesting areas. Tidelands potentially overlap with some or all of these areas.

OTHER OPTIONS THAT COULD ACHIEVE THIS OBJECTIVE There may be cases where the same objectives can be achieved by Suboption B of option 21 (below), which would enhance habitat protection through a variety of non-purchase alternatives. In addition, options 23, 24 and 29 could achieve the same objectives if, once these areas were acquired, they were given an adequate level of regulatory protection. 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 lead regulatory responsibilities over tidelands potentially include the Alaska Department's of Natural Resources and Fish & Game.

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 would be required in order to place public lands into special protective status if the acquired lands are not already inside a protected area.

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 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: Appears to be highly variable

ADDITIONAL INFORMATION NEEDED

Land acquisition processes, costs and timelines for state and federal agencies are needed.

Input from Trustee Council on specific tidelands eligible for acquisition and subsequent special designation. This must be based on a specification of habitat types and conditions required for the 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 three groupings of resources and services:

1) oiled tidelands supporting resources and services directly injured by the spill

2) unoiled tidelands supporting injured resources and services (e.g. unoiled intertidal areas that provide habitat for injured migratory bird populations

3) unoiled tidelands supporting resources and services equivalent to those injured by the spill

DESCRIPTION State and/or federal governments can enhance protection of tidelands 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. In addition, local coastal district management plans, under the Alaska Coastal Management Program, could provide additional tidelands protection and would not require any fee title purchases. 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.

An example of this sort of option might be the use of restoration funds to provide public access (e.g., a parking lot and boardwalk) to a municipally owned tideland area, in return for a legally binding agreement with the municipality not to develop the area in the future and to manage it in a manner consistent with restoration objectives.

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 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.

TIME NEEDED TO IMPLEMENT The time needed to implement this suboption should be less than for Suboption A but is still highly variable. In some cases, it could take less than a year.

Variables include:

Time needed for negotiations with landowners
Process for purchasing less than fee simple title (if applicable)
Process for executing administrative actions (if applicable)

MEANS TO IMPROVE RECOVERY Enhanced protection of oiled tidelands will facilitate natural recovery by restricting activities stressful to already damaged populations and habitats. In the case of unoiled tidelands 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 public services provided.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS Existing regulatory authorities applicable on private and municipal tidelands 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 16.05.870)
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 legal 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 is only enforceable 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 tidelands 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 and municipal tidelands which support significant resources and services. In some cases, there are multiple commercial and recreational uses of these areas which potentially conflict with the habitat requirements of shorebirds, waterfowl, marine invertebrates 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 public access, viewer education and tourism. The time needed to implement this option is highly variable, although in some cases it may take 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 23, 24 and 29, which deal with acquisition of marine bird and mammal habitats, private inholdings within parks and refuges, and bird nesting areas. Tidelands potentially overlap with some or all of these areas.

OTHER OPTIONS THAT COULD ACHIEVE THIS OBJECTIVE Suboption A of option 21 (below) could also enhance habitat protection through acquisition and special designation of lands. In addition, options 23, 24 and 29 could achieve the same objectives if, once these areas were acquired, they were given an adequate level of regulatory protection. 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 lead regulatory responsibilities over tidelands potentially include the Alaska Department's of Natural Resources and Fish & Game.

3) Permits required: No permits are required.

4) NEPA compliance: Since title to the tidelands would be retained by the private parties or municipalities, it is unlikely that an EIS would have to be prepared, although an EA may be necessary in some cases.

5) Requirements for new legislative/regulatory actions: In most cases, no such actions will be necessary.

6) Other: Complicating factors could include legal conflicts over ownership of avulsed 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)

Costs of enhancing compatible recreation opportunities; e.g., building and maintaining a parking lot, boardwalk & interpretive signs - $600,000 for Potter's Marsh Refuge facilities

TOTAL COST: highly variable

ADDITIONAL INFORMATION NEEDED

Input from the Trustee Council is needed on specific tidelands eligible for acquisition and subsequent special designation. This must be based on a specification of habitat types and conditions required for the restoration of injured species.

CITATIONS

485 Kim Sundberg, ADF&G, pers. comm.
486 Debby Clausen, ADF&G, pers. comm.
487 Dave Harkness, ADF&G, pers. comm.
488 Ray Thompson, USFS, pers. comm.
489 Steve Planchon, TNC, pers. comm.
490 TNC report
491 Jones and Stokes report
492 Restoration Framework document

updated ↓ not updated ↓ missing ↓

June 23, 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

Author: Sandy Rabinowitch

SUBOPTION C Designate National Marine Sanctuaries

#22 (c.) 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:

Environmental

Socio-economic

Human health and safety

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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SUBOPTION D Designate National Estuarine Reserves

TARGET RESOURCES AND SERVICES

DESCRIPTION

IMPLEMENTATION ACTIONS

TIME NEEDED TO IMPLEMENT

ADDITIONAL INFORMATION NEEDED

CITATIONS

SUBOPTION D Designate National Estuarine Reserves

TARGET RESOURCES AND SERVICES

See Option 27A

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) Ccnsistency 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

June 23, 1992 Author: Chris Swenson Updated

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

June 23, 1992 Author: Chris Swenson Updated

OPTION Option 24: Acquire Inholdings Within Parks and Refuges

APPROACH CATEGORY Habitat Protection and Acquisition

INJURED RESOURCES AND SERVICES Inholdings in existing state and federal protected lands include coastal, upland and marine areas which support any given combination of the resources and services injured by the spill.

SUMMARY State and federal lands under special protective status (e.g., parks, refuges, etc.) exist within the spill area and support several injured species and resources. Private inholdings within these conservation units are often not subject to the regulations which govern the management of these units. This situation makes it difficult for land management agencies to consistently regulate land uses and public activities. Two suboptions exist which could potentially solve this problem. First, inholdings containing key habitat types could be purchased and added to protected areas. Alternatively, there are several other protection options, such as conservation easements, which would leave the land in private ownership and provide varying levels of protection.

SUBOPTION A Acquisition of Fee Title to Inholdings

TARGET RESOURCES AND SERVICES This suboption potentially targets three groupings of resources and services:

1) oiled inholdings supporting resources and services directly injured by the spill

2) unoiled inholdings supporting resources and services directly injured by the spill (e.g., an unoiled coastal area which provides crucial habitat for a species of marine bird injured by the spill)

3) unoiled inholdings supporting resources and services equivalent to those injured by the spill

DESCRIPTION The federal or state government could acquire fee title to privately owned inholdings within lands managed by the Alaska Departments of Natural Resources and Fish and Game; the National Park Service; the Forest Service; or the Fish and Wildlife Service. The land would be managed by the appropriate agency to preserve and enhance injured resources and services.

IMPLEMENTATION ACTIONS Prior to implementing this option, the Trustee Council will have to select and rank candidate lands for purchase where there are willing sellers. Implementation of Trustee Council decisions will occur in three steps:

1) The appropriate agency will prepare a preliminary project proposal and go through a NEPA compliance process, which would probably entail preparation of an EA.

2) The appropriate agency 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.

TIME NEEDED TO IMPLEMENT The time needed to implement this option ranges from 6 months to several years. Variables include:

Time to negotiate with landowner
Time for federal or state land acquisition process
If an EA or EIS is required
Time to write/amend management plan

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 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 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 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

June 23, 1992 Author: Chris Swenson Updated

OPTION Option 25: Acquire Upland Forests and Watersheds

APPROACH CATEGORY Habitat Protection and Acquisition

INJURED RESOURCES AND SERVICES Upland forest resources and services injured by the spill include: harlequin ducks; marbled murrelets; river otters; anadromous fish; bald eagles; recreational uses; sport, commercial and subsistence harvest; and intrinsic values.

SUMMARY Increased protection of uplands could preserve and enhance injured and/or equivalent resources and services. Most uplands are in public ownership, but some are held by private parties or municipalities and have high fish and wildlife and public use values. Forested areas provide habitat for all the species listed above and support multiple human uses. In some cases, ongoing or imminent activities on private lands pose a threat of habitat disturbance which could retard recovery from spill injuries.

Restoration could be accomplished by acquiring fee title to the land and then placing it into special protective status. Activities detrimental to the natural recovery process could then be effectively regulated. In addition, public access and uses compatible with resource restoration objectives could also be enhanced. Alternatively, there are non-purchase protection options that do not require acquisition of fee title but still provide protection to injured resources and services through legally binding, voluntary agreements with private landowners.

SUBOPTION A Acquisition of fee title to privately owned uplands

TARGET RESOURCES AND SERVICES This suboption potentially targets two groupings of resources and services:

1) forested uplands and watersheds supporting resources and services directly injured by the spill

2) forested uplands and watersheds supporting resources and services equivalent to those injured by the spill

DESCRIPTION State and/or federal governments could acquire fee title to privately owned uplands. These lands would then be managed to preserve and enhance injured resources and services. These management objectives can be achieved by: a) legislative designation of the uplands as a protected area, e.g. a refuge or critical habitat area; or b) administrative actions such as amending resource agency area management plans or coastal district management plans. Also, upland inholdings within parks, refuges and other similarly protected areas automatically become part of that area upon purchase.

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

June 23, 1992 Author: Chris Swenson Updated

OPTION Option 26: Extend Buffer Strips Adjacent to Anadromous Streams

APPROACH CATEGORY Habitat Protection and Acquisition

INJURED RESOURCES AND SERVICES Anadromous streams and riparian habitat support many of the resources and services damaged by the spill, including: harlequin ducks; river otters; anadromous fish; bald eagles; recreational uses; sport, commercial and subsistence harvests; and intrinsic values.

SUMMARY Undisturbed riparian lands around anadromous streams are important natural buffers that protect the water quality of rivers and streams and provide food and cover for wildlife. Injured populations of anadromous fish, bald eagles, river otters and harlequin ducks depend on streams as feeding and/or reproductive habitat. These areas also have high intrinsic, recreational and sport fishing values in addition to supporting commercial and subsistence harvests.

The State Forest Practice Act of 1990 requires that logging operations leave buffer strips around anadromous and other fish-bearing streams on state and private lands, although reductions in buffer width can sometimes be authorized. Also, some smaller anadromous streams may not be protected by the act and, in other cases, the required buffers may not be wide enough to prevent disturbance of recovering species. Solutions 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 nct 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

reviewing the proposal, holding hearings and soliciting public comments.

4) The appropriate agency will enforce the amended statute (and any implementing regulations) and monitor its effectiveness in achieving restoration objectives.

TIME NEEDED TO IMPLEMENT The time needed to implement this option is at least one year, although controversial bills can take much longer. Variables include:

Time to draft initial proposed amendment
Negotiation time between state agencies
Public comment periods
If EA or EIS is required
Time for state legislatures to act on proposal
Whether amendments to regulations were also necessary
Time needed to amend state management plans

MEANS TO IMPROVE RECOVERY Increased statutory protection of riparian areas will facilitate natural recovery by restricting activities stressful to already damaged populations and habitats. 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.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS Existing regulatory authorities potentially applicable on state and 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)
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

These regulations can provide high levels of protection in certain cases, but 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. Statutory requirements for increased buffer zones would help to fill this gap by providing protection from logging for riparian habitats and their associated species.

RELATIONSHIP WITH EXISTING/PLANNED USES OR MANAGEMENT Increased government regulation of riparian areas could result in increased

restrictions on logging operations.

TECHNICAL FEASIBILITY This suboption is technically feasible. There is a well-defined legislative procedure for amending state statutes. However, given the controversial nature of the riparian buffer zones, the amendment process would probably not be completed quickly.

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 riparian areas which support injured species and could subject to logging in the near future.

Increased regulatory protection of riparian buffer zones could prevent further damage to the area, provided that agencies had the funding to maintain sufficient levels of monitoring and enforcement. Given that the acquisition process could take at least one year 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 problems.

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 habitats or land types.

OTHER OPTIONS THAT COULD ACHIEVE THIS OBJECTIVE

Suboptions A and B (above) of 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: Habitat restoration through legislative action is consistent with the terms of the settlement.

2) Agencies with management/regulatory responsibilities: Existing agency responsibilities do not conflict with the implementation of this suboption. Agencies with management authority over riparian areas potentially include the Alaska Departments of Natural Resources and Fish and Game; the U.S. Forest Service; the Fish and Wildlife Service; and the National Park Service.

3) Permits required: No permits are required.

4) NEPA compliance: Federal involvement in the restoration process may necessitate the preparation of an EA or EIS to assess the impacts of the statutory amendment.

5) Requirements for new legislative/regulatory actions: Legislative action is required to amend state statutes.

6) Other: Once a bill is submitted for legislative action, it is impossible for agencies to guarantee the nature of the final version that is passed. Accordingly, there is a risk that proposed amendments to the Forest Practices Act will not be passed as submitted or that additional amendments will be made which may or may not achieve restoration objectives.

MEANS TO EVALUATE SUCCESS The appropriate resource management agency will monitor how effectively the amendment has prevented activities harmful to injured resources and services.

REPRESENTATIVE COSTS

Staff time to prepare proposed amendment and justification and, possibly, to testify before the legislature -

NEPA compliance process (EA/EIS) -

Costs for additional agency management and monitoring of areas -

ADDITIONAL INFORMATION NEEDED

Prior to implementing this option, the Trustee Council will have to designate which streams require additional protection, specify the appropriate buffer width, and state the length of time such restrictions might be required.

CITATIONS

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

June 25, 1992 Author: John Strand

OPTION 27 - Designate and Protect "Benchmark" Monitoring Sites.

APPROACH CATEGORY Habitat protection and acquisition.

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

SUMMARY

A comprehensive monitoring plan has been suggested for consideration by the Trustees (Option 31). Integral to the comprehensive monitoring plan is the designation of discrete and permanent monitoring sites within the oil spill area. Permanent monitoring sites would be used to follow the recovery of injured habitats and species and also would allow for the establishment of a baseline environmental condition to use as a reference standard. These sites could include representative habitat types, unoiled control sites, oiled set-aside and oiled-treated sites. There are several designations appropriate for monitoring sites including National Estuarine Research Reserve (National Oceanic and Atmospheric Administration), Research Natural Area (U.S. Forest Service) and Long-Term Ecological Research site (National Science Foundation). The U.S. Forest Service is presently considering several Research Natural Areas in Alaska including one at Green Island in Prince William Sound.

SUBOPTION Designate National Estuarine Research Reserve Site(s).

TARGET RESOURCES AND SERVICES Marine and intertidal habitats and associated biota.

DESCRIPTION

It is the objective of this suboption to implement designation and development of one or more sites in the spill area as National Estuarine Research Reserves (NOAA 1990a). These sites would become "benchmark" monitoring sites and would be integral to the comprehensive monitoring program described in Restoration Option 31. Permanent monitoring sites would be used to assess recovery of natural resources injured by the oil spill, and would allow for the establishment of baseline environmental conditions to use as a reference standards. These sites could include representative habitat types, oiled-treated, oiled set-aside, and oiled-control study sites.

IMPLEMENTATION ACTIONS

A state may apply for Federal Government financial assistance for purposes of site selection, preparation of documents (draft management plan, environmental impact statement [EIS]) and the conduct of research necessary to complete site characterization. The process leading to designation includes the following steps:

1) The state initiates a proposal to the Federal Government to establish a site in a portion of a shared biogeographic region.

2) The state acquires site(s) upon approval of the Federal Government.

3) The Federal Government prepares an EIS.

4) The state completes a final management plan.

5) The governor of the state making application nominates candidate site(s).

6) A memorandum of understanding (MOU) detailing the state-Federal roles in research reserve management is signed by the state and Federal Governments.

7) The Federal Government "designates" site(s).

8) The state protects and operates site, conducts research and monitors, and provides interpretative and educational opportunities as specified in the management plan.

TIME NEEDED TO IMPLEMENT

The overall process generally takes three years.

MEANS TO IMPROVE RECOVERY

The intent of designation of one or more reserves is to facilitate further research and monitoring of injured resources. Reserves offer a measure of protection not realized outside of formal state or Federal designation. The reserve ensures a stable environment for research and monitoring through long-term protection of estuarine resources. Reserves provide for manipulative research opportunities aimed at improved understanding and management of estuarine areas. Although restoration of degraded areas is not a primary purpose of the System, such activities are permitted to improve the representative character and integrity of a site.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

The National Estuarine Reserve Research System (NERRS) was established under the Coastal Zone Management Act of 1972 (Section

315, as amended; 86 Stat. 1280 [16 U.S.C. 1461]) to address threats to the nation's estuaries. Individual reserves are managed by the states in partnership with NOAA. NOAA is responsible for designating the reserves and administering the overall NERRS program. The state operates/manages individual sites and provides staff on a cost sharing basis with NOAA.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

By regulation, NOAA can disapprove any activity considered incompatible with the mission of NERRS; but in practice, NOAA has typically approved most requests to "grandfather" pre-existing uses (e.g., hunting and fishing).

TECHNICAL FEASIBILITY

Eighteen National Estuarine Research Reserves protecting approximately 267,000 acres of estuarine lands and waters have been established in 13 coastal states since the inception of the program (NOAA 1990b). One additional site (Jobos Bay) has been established in Puerto Rico, and one site (Old Woman Creek) has been established on Lake Erie in Ohio. A wide range of research projects are conducted at the 18 existing sites. These include physical, chemical and biological characterizations, studies of ecosystem processes, and studies designed to answer management- and regulatory-related questions for the reserves and the coastal zone.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

Monitoring is necessary to assess the adequacy of natural recovery. Resources that are found to be recovering at an unacceptable rate may have to be reconsidered as candidates for restoration action. Likewise, resources that are found to be recovering faster than anticipated may allow for an early completion of a restoration action. Monitoring of important physical, chemical and biological properties will establish an environmental baseline for affected ecosystems. This baseline then can be used as a standard reference to evaluate the effects of future disturbances, e.g., earthquakes, oil spills. This standard also can be used to improve our ability to manage affected resources over the long-term.

Research reserves ensure a stable environment for research and monitoring through long-term protection of reserve resources. They also increase public awareness and understanding of the need to protect vulnerable resources and provide suitable opportunities for public education and interpretation.

INDIRECT EFFECTS

There need be no significant adverse environmental, socio-economic, and human health and safety effects associated with the designation of a research reserve, however, the potential for both adverse and

beneficial effects are the subject of an environmental impact statement that NOAA prepares. By the nature of NERRS, however, every effort is extended to protect the environment. Construction is usually kept to a minimum, research (even habitat manipulation) must not impact the representative ecological character and integrity of the reserve. Monitoring is conducted using non-destructive and the least intrusive methods available, where possible.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

The designation of research reserves could facilitate monitoring as described in Option 31.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Both Option 21 (Acquire Tidelands), Option 22 (Designate Protected Marine Areas), and Option 24 (Acquire "Inholdings" within Parks and Refuges) also could achieve this same objective.

LEGAL CONSIDERATIONS

NOAA manages the overall program, but individual units are managed by the states. The designation of a National Estuarine Research Reserve is deemed a federal action and must be undertaken in a manner ccnsistent with provisions of the:

1) National Environmental Policy Act of 1969, as amended. The state is required to provide all necessary information to NOAA concerning the environmental and socio-economic impacts associated with implementing the management plan and alternatives to the plan for the proposed site.

2) approved state coastal zone program as provided by section 1456 (c) (1) of the Coastal Zone Management Act of 1972 as amended. NOAA is responsible for certifying that designation of the reserve is consistent with the state approved coastal zone management program. The state is required to concur with or object to certification.

The designation of one or more research reserve sites is consistent with the provisions of the settlement that direct the Governments to jointly use natural damage recoveries for purposes of restoring, replacing, enhancing, rehabilitating or acquiring the equivalent of natural resources injured as a result of the oil spill.

MEANS TO EVALUATE SUCCESS

Monitoring the rate of recovery of injured species and/or habitats on the reserve site would be the principle means of evaluating success.

REPRESENTATIVE COSTS

The costs of designation will vary significantly by site; and for this reason, a detailed budget will not be attempted at this time. Instead, a summary of the allowable costs and/or matching funds available from the Federal Government (NOAA, Marine and Estuarine Management Division) will be used as a basis for estimating costs likely to be associated with designation.

Up to $100K in Federal funds can be provided for designation of the site. Of this amount, $25K can be used for site selection. An additional $40K of this amount can be used for development of a draft management plan and for collection of the information for preparation of the environmental impact statement. In reality, a state may spend an equal or greater amount in support of designation (Terrence Stevens, Padilla Bay National Estuarine Research Reserve, Mt. Vernon, WA., pers. comm.).

Post-site designation, Federal supplemental acquisition and development awards of $4.0M (land) and $1.5M (physical construction) also are available but must be matched by the state on a 50/50 basis. Again, costs of acquisition and development may greatly exceed the Federal contribution.

Federal funds up to $70K per year to be matched by the state on a 50/50 basis, also are available for operation and management, including the design and implementation of an environmental monitoring program. However, annual operation and management costs will undoubtedly be significantly greater. The assumption is that other sources of funding (e.g. grants) will be required.

ADDITIONAL INFORMATION NEEDED None.

CITATIONS

1) NOAA (National Oceanic and Atmospheric Administration). 1990a. National Estuarine Reserve Research System Program Regulations; Interim Final rule, 15 CFR Part 921, Federal Register 55 (141): 299940-29962, Monday July 23, 1990.

2) NOAA (National Oceanic and Atmospheric Administration). 1990b. National Estuarine Research Reserve System Site Catalogue. National Oceanic and Atmospheric Administration, Washington, D.C.

SUBOPTION B Designate Research Natural Area(s).

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

DESCRIPTION

It is the objective of this suboption to implement designation and development of one or more sites in the spill area as Research Natural Areas (RNA). These sites are established by the Chief of the U.S. Forest Service to illustrate or typify for research and educational purposes the important forest types within each region that have special or unique scientific interest and importance. RNAs could become integral to a comprehensive and integrated restoration monitoring plan and used to assess recovery of natural resources injured by the oil spill. Permanent RNAs will allow for the establishment of baseline environmental conditions to use as reference standards in assessing damages from future disturbances. RNAs could include but would not be limited to oiled, oiled-treated, oiled-untreated and unoiled-control intertidal habitats as well as contiguous beach fringe and uplands linked to marine study sites.

IMPLEMENTATION ACTIONS

Designation of an RNA is a two step process. First, the establishment of the RNA must be recommended by the regional forester in the appropriate national forest land and resource management plan. Second, an establishment record and designation order for the RNA is issued which amends the appropriate national forest land and resource management plan to be consistent with the management direction of the RNA identified in the establishment record and designation order. The forest supervisor then notifies the public of the amendment and mails copies of the designation order to all persons on the national forest land and resource management plan mailing list.

TIME NEEDED TO IMPLEMENT

Green Island Research was nominated as a RNA in 1984 during the development of the Chugach National Forest Land and Resource Management Plan. It still has not been officially designated although the Establishment Record and Designation Order for Green Island Natural Area has been submitted to the Regional Forester for his signature. In 1992, establishment records and designation orders will be submitted for signature on five of nine original RNAs (including Green Island) proposed in the Chugach National Forest Land and Resource Management Plan in 1984 (Glenn P. Juday, Alaska Ecological Reserve Coordination Office, University of Alaska Fairbanks, pers. comm.).

The 10-12 years since inclusion of the Green Island RNA in the Chugach National Forest Land and Resource Management Plan appears to be inordinately long given the requirements of the designation process, although in this case there were mitigating circumstances. Green Island was not visited for purposes of conducting scientific surveys until 1986. Development of input to the Establishment Record for Green Island Research Natural Area was also interrupted by the oil spill. Accordingly, the 10-12 years it has taken to designate Green Island as an RNA could easily be reduced to five or six years to designate future sites.

MEANS TO IMPROVE RECOVERY

The intent of designation of one or more RNAs is to facilitate long-term monitoring of recovery from the oil spill. The ideal site will have a record of pre-spill intertidal life and will be suitable for detailed studies of the linkage between terrestrial and marine ecosystems. The designation ensures a stable environment for research and monitoring through long-term protection. RNA's also provide for manipulative research opportunities aimed at improved understanding and management of both coastal and upland habitats.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

The authority to establish RNAs is provided the Chief of the Forest Service in 36 CFR 251.23. "The Chief of the Forest service shall establish a series of research natural areas, sufficient in number and size to illustrate adequately or typify for research or educational purposes, the important forest and range types in each forest region, as well as other plant communities that have special or unique characteristics of scientific interest or importance."

As provided in 36 CFR 219.25, forest planning is to include the establishment of RNAs. "Planning shall make provision for the identification of examples of important forest, shrubland, grassland, alpine, aquatic, and geologic types that have species or unique characteristics of scientific interest and importance and that are needed to complete the network of RNAs. Biotic, aquatic, and geologic types needed for the network shall be identified using a list provided by the Chief of the Forest Service."

To operate a site, grant monies can be obtained through the U.S. Forest Service National Competitive Research Initiative Grants Program (7 CFR 3200). Authority to administer this program is provided by Section 2(b) of The Act of August 4, 1965, as amended by Section 1615 of The Food, Agriculture, Conservation and Trade Act of 1990 (7 CFR 450). Monies can be used to "improve research capabilities in the agricultural, food and environmental sciences," "including long-term applied research problems."

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

RNAs as defined in 36 CFR 251.23 will be "retained in a virgin or unmodified condition except where measures are required to maintain the plant community which the area is intended to represent. Within areas designated by this regulation, occupancy under a special use permit is not allowed, nor the construction of permanent improvements permitted except improvements required in connection with their experimental use, unless authorized by the Chief of the Forest Service."

TECHNICAL FEASIBILITY

By the close of 1992, establishment records and designation orders will be submitted to the Forest Service for approval of five of nine RNAs proposed in the Chugach National Forest Land and Resource Management Plan of 1984.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

Monitoring will be implemented to follow the progress of both natural recovery and recovery associated with restoration. It also may be necessary to research basic processes affecting the rate of recovery of key species and habitats impacted by the oil spill. Monitoring important physical, chemical, and biological properties of the RNA will establish an environmental baseline for affected ecosystems. This baseline can be used as a reference standard to evaluate the effects of future disturbances, e.g., earthquakes, oil spills, etc.

INDIRECT EFFECTS

There need be no significant adverse environmental, socio-economic, and human health and safety effects associated with the designation of RNAs; however the potential for adverse as well as beneficial effects will be the subject of a National Environmental Policy Act review conducted at the program level by the Trustees, and at the site-specific level by the U.S. Forest Service. By the nature of the RNA program, every effort is extended to protect the environment. Construction is kept to a minimum and research (even manipulation) must not impact the representative ecological character and integrity of the site.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

The designation of an RNA could facilitate monitoring as described in Option 31 (Develop Comprehensive Monitoring Plan).

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Options 21 (Acquire Tidelands), Option 22 (Designate Protected Marine Areas), and Option 24 (Acquire "Inholdings" within Parks and Refuges) also could achieve this same objective.

LEGAL CONSIDERATIONS

The designation of a RNA is deemed a Federal action and must be undertaken in a manner consistent with the provisions of the National Environmental Policy Act of 1969. In the case of the proposed Green Island RNA, an analysis was included as part of the Final Environmental Impact Statement for the National Forest Land and Resource Management Plan (U.S. Forest Service 1984).

The U.S. Forest Service also would be responsible for certifying that designation is consistent with both the Coastal Zone Management Act of 1972, and state approved coastal zone management programs, if the RNA is sited in the coastal zone.

MEANS TO EVALUATE SUCCESS

In the context of restoration, monitoring and documenting recovery of injured resources on the RNA will be the principle means of evaluating success. Success of the program to meet other objectives of RNAs will be assessed at the time a renewal proposal for continued funding is received by the U.S. Forest Service.

REPRESENTATIVE COSTS

The costs of developing first-hand data (field documentation) that is used in preparing the Establishment Record for a proposed site ranges between $20K and $50K (Glenn P. Juday, Alaska Ecological Reserves Coordination Office, University of Alaska Fairbanks, pers. comm.). This estimate is based on the assumption of two visits to a remotely located site during the same field season by an interdisciplinary field team of 3-4 scientists and students. Preparation of the Establishment Record for each site (includes both field documentation data as well as data derived from the scientific literature) could cost an additional $50K. Once designated, it is realistic to assume that operational costs will run between $50-$100 per year, but could be more ($350-$500K) as in the case of the Long-Term Ecological Research sites supported by the National Science Foundation.

ADDITIONAL INFORMATION NEEDED None.

CITATIONS

1) USDA (U.S. Department of Agriculture) Forest Service. 1984. Chugach National Forest Land and Resource Management Plan. Administrative Document 127B. USDA Forest Service, Alaska Region, Juneau, Alaska.

SUBOPTION C Selection of Long-Term Ecological Research Site(s).

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

DESCRIPTION

It is the objective of this suboption to obtain support through the National Science Foundation (NSF) for one or more Long-Term Ecological Research sites (LTERs) which could be integral to the comprehensive monitoring program described in Restoration Option 31. With NSF support, permanent monitoring sites at oiled, oiled-treated, oiled-untreated and unoiled (control) locations within the spill zone could be selected to follow and better understand recovery of injured resources. LTER support also will allow for the establishment of baseline environmental conditions to use as reference standards when assessing damages from future disturbances.

A wide range of research projects are conducted at the existing seventeen LTERs (Brenneman 1989). Five core research areas have become the major program theme including:

1) pattern and control of primary production;

2) spatial and temporal distribution of populations selected to represent trophic structure;

3) pattern and control of organic matter accumulation in surface layers and sediments;

4) patterns of inorganic inputs and movements of nutrients through soils, groundwater and surface waters; and

5) patterns and frequency of site disturbance.

IMPLEMENTATION ACTIONS

The LTER Network is administered by the National Science Foundation. The selection of new sites is the subject of periodic competitions where special panels are created to peer review specific proposals to establish LTER sites (Franklin et al., 1990). Site selection is based on the quality of the proposals, not on their potential place within a larger network of sites. Nineteen sites have been funded as a result of four separate competitions since the inception of the program in 1977. Awards have usually been for five-year periods, after which sites must submit renewal proposals.

It should be understood that the NSF does not enter into the process to establish or ensure the physical integrity of a proposed

research site; that is, they are not concerned with ownership, site operation or management. Rather, the NSF is a granting agency whose mission through the LTER Network is to support long-term ecological research (John Vande Castle, LTER Network Office, University of Washington, pers. comm.).

TIME NEEDED TO IMPLEMENT

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

MEANS TO IMPROVE RECOVERY

The LTER System provides a stable environment for research and monitoring through long-term financial support. LTERS also support manipulative research aimed at a better understanding of ecosystem response to both natural and human disturbance.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Most sites are managed by agencies of the Federal Government or by academic institutions. Some LTERS are managed jointly by agencies of the Federal Government and academic institutions. As such they are protected by either or both Federal and state laws.

The authority of the National Science Foundation is defined in Chapter VI of Title 45, Code of Federal Regulations. Administrative requirements for NSFs' grants program is found in 45 CFR 600.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Because most sites were used for research and/or monitoring prior to their selection as LTERs, potential conflict with existing or planned uses or management is not viewed as a problem. Some sites were designated in order to study the long-term effects of human disturbance, and in this sense, existing use and/or management was "grandfathered."

TECHNICAL FEASIBILITY

There are seventeen sites in the current network of LTERs (Brenneman 1989). Sites in the system extend from Puerto Rico to northern Alaska and represent a broad diversity of environments and ecosystems. Included are agricultural, grassland, desert, forest, tundra, lake, stream, river, and coastal ecosystems. All sites are large enough to incorporate landscape mosaics, and the majority include human-manipulated as well as natural ecosystems.

Most present-day LTERs were operated as research sites by academic institutions and agencies of the Federal Government long before selection as LTERs. Some were established in the 1940's (e.g., H.J. Andrews Experimental Forest LTER Site); some date back to the early 1900's (e.g., Harvard Forest LTER Site; and others were established in the early 1980's, (e.g., North Inlet Marsh-Estuarine System LTER Site).

There are two sites in Alaska. The Arctic Tundra LTER Site is located in the Brooks Range and is operated by a consortium of six universities and the Marine Biological Laboratory at Woods Hole, MA. The Bonanza Creek Experimental Forest LTER Site is located near Fairbanks, Alaska and is operated the University of Alaska and the U.S. Forest Service.

Conspicuously absent from the LTER network is a coastal forest ecosystem site as can found in Prince William Sound.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

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

INDIRECT EFFECTS

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

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

The selection of an LTER could facilitate monitoring as described in Option 31 (Develop Comprehensive Monitoring Plan).

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Options 21 (acquire Tidelands), Option 22 (Designate Protected Marine Areas), and Option 24 (Acquire "Inholdings" within Parks and Refuges) also could achieve the same objective.

LEGAL CONSIDERATIONS

If a research site was established by a Federal Agency, the action would be considered a federal action and must be undertaken in a manner consistent with the provisions of the National Environmental Policy Act of 1969. The agency (Federal or state) also would be responsible for certifying that designation is consistent with both the Coastal Zone Management Act of 1972 and state approved coastal zone management programs.

To develop LTER support is consistent with the provisions of the settlement that direct the Governments to jointly use natural resource damage recoveries for purposes of restoring, replacing, enhancing, rehabilitating or acquiring the equivalent of natural resources injured as a result of the oil spill.

MEANS TO EVALUATE SUCCESS

Monitoring and documenting recovery of injured resources on the LTER is the principle means of evaluating success.

Funding for LTERs also expires in five years but can be renewed for five additional years. The review process is more lengthy the second time around due to the need to peer review a larger document (proposal). The renewal proposal will include research results compiled over the preceding five years. The review process also will include a site visit.

REPRESENTATIVE COSTS

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

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

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

ADDITIONAL INFORMATION NEEDED None.

CITATIONS

Brenneman, J. (editor) 1989. Long-Term Ecological Research in the United States, A Network of Research Sites. 5th Edition, Revised. Long-Term Ecological Research Network Office, College of Forestry Resources AR-10, University of Washington, Seattle, Washington.

Franklin, J.F., C.S. Bledsoe and J.T. Callahan. 1990. Contributions of the Long-Term Ecological Research Program. Bioscience 40 (7): 509-524.

June 23, 1992 Author: Chris Swenson Updated

OPTION Option 28: Acquire Access to Sport-Fishing and Recreational Areas

APPROACH CATEGORY Habitat Protection and Acquisition

INJURED RESOURCES AND SERVICES The spill injured anadromous fish populations and the recreational services they provided.

SUMMARY Anadromous fish species, such as cutthroat trout, and the recreation services provided by these fish were injured by the oil spill. Although most of the oil spill area is in private 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
Steve Planchon, TNC, pers. comm.
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

June 11, 1992 Author: Bruce Wright

OPTION 29: Establish or Extend Buffer Zones for Nesting Birds

APPROACH CATEGORY: Habitat Protection and Acquisition

INJURED RESOURCES AND SERVICES: Bald Eagle and Harlequin Duck (Habitat protection and extended buffer zones for murres and marbled murrelets will be addressed in options 23 and 25 respectively.)

SUMMARY: Most birds have specific nesting requirements. Actions which alter nesting habitat or disturb nesting birds may disrupt nesting thus reducing productivity and slowing recovery of injured species. During the period that bald eagles and harlequin ducks are recovering from the spill, a multi-zone land management scheme should be adopted on state and federal owned lands. Disruptive human activities which may impact nesting bald eagles and harlequin ducks would be prohibited.

SUBOPTION A: Recommend implementation of special agency management practices

TARGET RESOURCES AND SERVICES: Bald Eagles and Harlequin Ducks

DESCRIPTION

BALD EAGLES: Stalmaster (1987) describes three methods for protecting bald eagle nests:
(1) circular zoning; a concentric circle extends a specified distance around the nest inside of which human activities would be managed or excluded.
(2) territory zoning; a non-concentric area around a nest which includes additional habitat features required by nesting eagles.
(3) regional zoning; encompasses an area which includes active and non-active eagle nests (circular zones), important eagle habitat (territory zones) and potential bald eagle habitats allowing for recovery and expansion of the bald eagle population over the long term.

To protect bald eagle nesting habitat in the Tongass National Forest the United States Forest Service and United States Fish and Wildlife Service entered into a interagency agreement. The focus of the agreement was to establish a 100 meter radius circular zoning around bald eagle nesting trees whether the nests were active or not. Extended zones were necessary to prevent disturbances from blasting and repeated helicopter flights. The nest buffer zone is maintained even if the nest becomes unsuitable for use. This ensures protection of known nesting habitat (Sidle et al. 1986).

The use of 100 meter buffer zones in intensively developed areas may result in the "creation of small islands of habitat that will be insufficient to fully provide for future eagle habitat requirements" (USFWS Bald Eagle Management Recommendations). If circular zoning is to be used it should be large enough to screen noise and visual distractions associated with human activities. This may require a primary zone (100 meter) to protect the immediate nesting area and a secondary zone from 100 meter to 200 meter to protect the nesting tree from wind throw and other human and natural calamities which may damage the integrity of the primary nesting zone (Hodges 1982).

The 100 meter buffer zone has been in effect in southeast Alaska since 1969. Hodges (1982) determined that logging activities did not directly impact bald eagle nesting when they were protected by the 100 meter buffer zone. However, after five years windthrow reduced buffer zones by an average of 17 percent. To protect the integrity of the 100 meter buffer strip Corr (1974) recommended that a buffer zone of 200 meter radius be used in areas scheduled for timber harvest.

Of 3,850 nests surveyed in southeast Alaska, 92 percent occurred within 300 feet (91 m) of the shoreline, and the average distance from the nest to the shoreline was 120 feet (37 m) (Hodges and Robards 1982).

Bald eagles are closely associated with the intertidal areas in Prince William Sound (PWS). They use these areas for feeding and nesting almost exclusively within 200 meters of the beach (Phil Schempf, pers. comm. 1992).

In addition to circular zones around nests, maintaining contiguous areas of habitat would provide sites for perching, future nesting trees, and provide protection to areas where bald eagles often congregate to utilize abundant food sources such as herring and salmon spawning areas (Hensel and Troyer, 1964). The 1991 Tongass Land Management Plan Revision lists a land use designation alternative called beach fringe management zone. This zone is defined as 500 feet slope distance from mean high tide. The beach fringe management zone was introduced initially to protect bald eagles (Lowell Suring, pers. comm. 1992), and well over 95% of the bald eagle nests occur in this zone. In addition to protecting bald eagle habitat, a variety of other natural resources may benefit from establishing the protected zones including marine associated species, shorebirds, waterfowl, river otters, visual resources and cultural resources.

HARLEQUIN DUCKS: Patten and Crowley (1991) located harlequin duck nesting sites in PWS and found they were within 25 meters of streams or small tributaries to streams. The streams are evidently useful for feeding and avoiding predation, particularly when the young have hatched (Bellrose, 1980).

Some researchers consider harlequin ducks an indicator of pristine ecosystems partially because of their sensitivity to human disturbances. Cassirer and Groves (1990) observed harlequin broods more often on undisturbed streams away from human activities. Only 20-30 streams in all of Idaho have breeding harlequin ducks and these are the least impacted, most pristine streams (Cassirer, pers. comm. 1992, 208-443-2512). Cassirer and Groves (1990) proposed an interim recommendation of a 50 meter undisturbed riparian corridor with limited human activity during the breeding season to reduce impacts of timber harvesting.

Patten and Crowley (1991) tentatively recommended a 50 meter buffer strip along harlequin duck nesting streams in PWS. However, they indicated that disturbances associated with logging require a wider buffer strip.

Cassirer (pers. comm. 1992) has analyzed aerial photographs of clear cut and associated streams. She found that, in Idaho, clear cuts from approximately 50 meters from streams up to the stream banks did not have nesting harlequin ducks. However, some adjacent streams where clear cuts were at least 100 meters from the stream had breeding harlequin ducks. The streams with logging activity, including logging roads, within 50 meters of streams would not have harlequin duck breeding activity for more than 20 years after the initial cut. Cassirer is now recommending that logging activities not approach closer than 100 meters to expected harlequin duck nesting streams, and to exclude logging activities during the duck's nesting season.

IMPLEMENTATION ACTIONS

BALD EAGLES: The Trustees would recommend establishment of a multi-zone approach to protecting bald eagle nesting sites and habitat. The primary zone would be a concentric zone with a 100 meter radius around all bald eagle nests, including inactive nests. All human activity occurring within this zone would be approved by the appropriate land manager.

A secondary zone would be established from 100 meters to 200 meters from active and inactive bald eagle nests. Human activity within the secondary zone would be limited during the nesting season from February to September. All activity occurring during the nesting season in this zone would be approved by the appropriate land manager.

A beach fringe management zone would also be established. This zone is defined as 200 meter slope distance from mean high tide on all Federal and State lands within the oil spill zone. Areas adjacent to the oil spill, including rivers used by nesting eagles, would also be considered for inclusion in the beach fringe management zone to allow for continued production and

recruitment of bald eagles into adjacent oil impacted areas. The beach fringe management zone would be protected from long-term human disturbances such as logging, road building, field camps, and excessive aircraft activity. Fall and wintering communal feeding areas would also be included in the beach fringe management zone.

HARLEQUIN DUCKS: Trustees would recommend establishment of a 100 meter primary buffer strip along stream and tributaries to streams with potential harlequin duck nesting activity. Human activities would be minimized within this primary buffer strip so that pre-nesting and nesting harlequin ducks are not disturbed.

A secondary buffer strip would also be established which restricts disruptions to harlequin duck pre-nesting and nesting activities. The secondary buffer strip would restrict operations such as road building and timber harvests during the nesting season.

TIME NEEDED TO IMPLEMENT

Time needed to develop a cooperative agreement among the State and federal land managers and the Trustee Council could range from 3 to 6 months depending upon the nature of the agreement.

MEANS TO IMPROVE RECOVERY

BALD EAGLES: Reduced human disturbance would allow for increased chick production. Protection of all potential nesting habitat (beach fringe management zone) would permit offspring to locate a nesting site thus increasing the total breeding population in the impacted areas.

Bald eagles will often congregate in the fall and winter in areas with late salmon runs. These areas are important to the survival of the region's bald eagles which, unlike most Alaskan birds, usually don't migrate south for the winter.

HARLEQUIN DUCKS: Reduced human disturbance at harlequin duck breeding and molting sites may increase productivity by allowing paired ducks to maintain their pair-bonds during the pre-nesting and nesting seasons, and reduce mortality associated with stressed molting birds. Protection of breeding habitat may be essential for eventual recolonization of breeding harlequin ducks in western PWS (Patten and Crowley, 1991).

Harlequin ducks congregate at the mouths of suitable streams in May. During this time pairs fly from their intertidal feeding areas to upstream areas in search of nest sites. Disturbance at this time could prevent the pairs from searching and locating adequate nest sites.

Molting periods are physiologically stressful for harlequin ducks since they molt all their flight feathers at one time making them flightless for a few weeks. If the ducks are disturbed at this critical time they may be more susceptible to predation and increased mortality including hunting (Ian Goudie, pers. comm. 1992. Can. Wildl. Ser. 604-666-0143)

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

BALD EAGLES: In all states where it occurs, except Alaska, the bald eagle is classified as an endangered or threatened species and receives federal protection under the Endangered Species Act of 1973. Although the bald eagle in Alaska is classified as neither threatened nor endangered, the species is protected under the Bald Eagle Protection Act of 1940 (as amended) and the Migratory Bird Treaty Act. The Bald Eagle Protection Act makes it illegal to take, possess, disturb, or molest eagles, eagle parts, eggs or nests.

On National Forests in Alaska, protection measures for bald eagles and their nesting habitats are prescribed in the Memorandum of Understanding between the USDA Forest Service and the U.S. Fish and Wildlife Service. The Memorandum provides for the exclusion of all land-use activities within a buffer zone of 100 meter radius around all active and inactive bald eagle nests.

HARLEQUIN DUCKS: The Alaska Department of Fish and Game establishes waterfowl hunting regulations within Alaska. The harvest of harlequin ducks was restricted within PWS during the 1991 waterfowl hunting season to protect the resident birds.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

BALD EAGLES: Logging of the beach fringe would almost certainly impact bald eagles and their nesting habitat.

HARLEQUIN DUCKS: Throughout the pre-nesting period and early nesting time frames harlequin ducks are susceptible to a variety of human disturbances including activity associated with research of harlequin ducks and other species (Ian Goudie, pers. comm. 1992), logging and near shore boating activities.

Harlequin ducks are hunted during the regular waterfowl hunting season. However, the harlequin duck opening was postponed by 30 days in PWS and the eastern Kenai Peninsula during the 1991 season to protect the resident population.

Logging and associated activities would adversely impact harlequin duck nesting and nesting habitat.

TECHNICAL FEASIBILITY

BALD EAGLES: The 100 meter buffer zone has been in effect in southeast Alaska since 1969.

HARLEQUIN DUCKS: Current buffer strips of 28.8 meters are required along anadromous fish streams. However, 3 of the 5 streams where harlequin ducks were found nesting in 1991 were on very small tributaries. These were probably not protected as anadromous fish streams.

Cassirer (pers. comm. 1992) indicated 100 meter minimum buffer strips are being required along harlequin nesting streams in Idaho where timber harvesting and road building is occurring.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

BALD EAGLES: Hodges (1982) determined that logging activities did not directly impact bald eagle nesting if they were protected by the 100 meter buffer zone. However, after five years windthrow reduced buffer zones by an average of 17 percent. Use of the beach fringe management zone would help protect the nest buffer zone trees from windthrow.

As long as bald eagle nesting habitat is protected annual recruitment will potentially increase the population to levels seen prior to the oil spill.

HARLEQUIN DUCKS: Cassirer (pers. comm. 1992) has analyzed aerial photographs of clear cut and associated streams. She found that, in Idaho, clear cuts from approximately 50 meters from streams up to the stream banks did not have nesting harlequin ducks. However, some adjacent streams where clear cuts were at least 100 meters from the stream had breeding harlequin ducks. The streams with logging activity, including logging roads, within 50 meters of streams would not have harlequin duck breeding activity for more than 20 years after the initial cut. Streams with buffer strips of at least 100 meters have maintained harlequin duck breeding populations in Idaho.

INDIRECT EFFECTS

Establishment of buffer zones and buffer strips would offer some protection of a wide variety of other resources, many of which were impacted by the oil spill. Creation of the beach fringe management zone would act as sanctuary for the wildlife using that habitat including furbearers, river otters, bald eagles, shorebirds, bears, deer and a variety of other species. In addition nearshore marine habitats, many subsistence and cultural resources would be relatively protected.

Creation of stream buffer strips would offer protection for anadromous species including salmon and Dolly Varden which were injured by the oil spill. The stream buffer strips also afford travel corridors and cover for many species of birds and mammals.

Removal of buffer zones and buffer strips from timbering operation may increase the expense of the operation and lower the amount of timber taken from an area. This could impact the number of available timber harvesting jobs or eliminate some logging projects.

Bald eagles are important to the tourism trade. Maintaining this species at high numbers would have a positive effect on the PWS tourism industry.

Increased numbers of harlequin ducks would allow for a greater sport/subsistence harvest especially during the early portion of the season before wintering birds move into the area.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

BALD EAGLES: Disturbance to nesting bald eagles by oil clean up activities may have resulted in some nesting failures (Schempf and Bowman, 1991). Aircraft traffic associated with clean up and research efforts may have impacted bald eagle behavior and nesting success (Phil Schempf, pers. comm. 1992).

HARLEQUIN DUCKS: Preliminary results from the harlequin duck NRDA studies indicate that Response and some field studies exacerbated the effects of the oil spill. This probably resulted in increased nesting failures in western PWS (Patten, 1991).

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

Option 6 considers redesignating a portion of the Chugach National Forest as a National Recreation Area or Wilderness Area. These designations could protect bald eagle and harlequin duck habitat in PWS.

Option 7 would increase management and education efforts on public lands. These actions could reduce human activities near critical bald eagle and harlequin duck nesting habitats.

Option 8 to restrict or eliminate legal harvest of sea ducks could have a positive impact on the impacted harlequin ducks in western PWS and allow for additional recruitment from adjacent areas.

Harlequin ducks in western PWS continue to be injured by consuming contaminated prey, particularly mussels. Option 13 would help eliminate the contaminated prey possibly resulting in helping harlequin duck populations recovery in PWS.

Option 20 could result in establishing "special management areas" potentially resulting in protection of critical nesting habitat of bald eagles and harlequin ducks.

Harlequin ducks and bald eagles could benefit from purchase and protection of tidelands, marine areas, marine birds habitats, upland forests and watersheds (Options 21-25) since this could ultimately result in reduced human activity in these important areas.

Option 26 proposes to extend buffer strips adjacent to anadromous fish streams using a variety of approaches including purchase of title or rights, or amending the Alaska Forest Practices Act. Any of these measures has the potential to protecting important harlequin duck nesting habitat.

LEGAL CONSIDERATIONS

BALD EAGLES: The U.S. Fish and Wildlife Service has primary responsibility for protecting bald eagles under the Bald Eagle Protection Act of 1940 and Migratory Bird Treaty Act.

HARLEQUIN DUCKS: The Alaska Department of Fish and Game has primary responsibility for management of waterfowl and the waterfowl hunting regulations.

MEANS TO EVALUATE SUCCESS

Censuses designed to monitor the population levels of bald eagles and harlequin ducks in the oil impacted areas will indicate if the reduced disturbance, in conjunction with other restoration options, is effective in helping these bird populations to recover.

REPRESENTATIVE COSTS

Costs associated with developing special agency management practices would need to include travel and salaries of the agency personnel involved.

ADDITIONAL INFORMATION NEEDS

BALD EAGLES:

1. Maps depicting locations of bald eagle nest sites.

2. Identity of important bald eagle concentration sites.

3. List of lands requiring special agency management practices.

4. Population model for bald eagles in PWS.

HARLEQUIN DUCKS:

1. Determine conclusively harlequin duck nesting habitat requirements.

2. Determine the buffer zone size needed along streams where harlequin ducks nests that will adequately protect them from human and machinery disturbances associated with logging operations.

CITATIONS

Bald Eagle Management Recommendations. 1992. USFWS, Anchorage, Alaska. contact Gary Wheeler 271-2786.

Bellrose, F.C. 1980. Ducks, geese, and swans of North America. Stackpole Books. Harrisburg, PA.

Cassirer, E.F. and C.R. Groves. 1990. Distribution, habitat use and status of harlequin ducks (Histrionicus histrionicus) in northern Idaho, 1990. Nat. Her. Section, Nongame and Endg. Wildl. Prog., Bureau of Wildl. Idaho Dept. Fish and game.

Corr, P.O. 1974. Bald eagle (Haliaeetus leucocephalus alaskanus) nesting related to forestry in southeastern Alaska. M.S. thesis, Univ. Alaska, College. 144 pp.

Hensel, R.J. and W.A. Troyer. 1964. Nesting studies of the bald eagle in Alaska. Condor 66:282-86.

Hodges, J.I. 1982. Evaluation of the 100 meter protective zone for bald eagle nests in southeast Alaska. U.S. Dep. Interior, unpublished report. Juneau, Alaska. 11 pp.

Hodges, J.I.,and F.C. Robards. 1982. Observations of 3,850 bald eagle nests in southeast Alaska. Pages 37-54 in W.N. Ladd and P.F. Schempf (eds.) Proceedings of a Symposium and Workshop on Raptor Management and Biology in Alaska and Western Canada, February 17-20, 1981, Anchorage, Alaska. U.S. Dep. Interior, Fish and Wildl. Serv., Alaska Reg. Rep. Proc-82. Anchorage, Alaska. 335 pp.

Patten, S.M. and D.W. Crowley. 1991. Preliminary statue report of harlequin duck restoration project in PWS.
34 pp.

Patten, S.M., R. Gustin and T. Crowe. 1991. Injury assessment of hydrocarbon uptake by sea ducks in Prince William Sound and the Kodiak Archipelago, Alaska. NRDA Bird Study #11; Draft Preliminary Status Report. 50 pp.

23 June 1992 Author: Chris Swenson (updated)

SUBOPTION B Negotiate cooperative mechanisms for achieving similar management practices on private lands

TARGET RESOURCES AND SERVICES The spill injured bald eagles, harlequin ducks, recreational viewing opportunities, tourism, and sport and subsistence harvest.

DESCRIPTION State and/or federal governments can enhance protection of bird nesting habitats through management agreements with private landowners. A complete description of these protection options is beyond the scope of this document, but they could include the following: landowner contact and education; voluntary agreements with landowners; lease, license and cooperative management agreements; deed restrictions; and conservation easements or partial interests. For example, it is possible to purchase timber rights to a critical nesting area and leave the fee title to the land in private ownership. These options afford varying levels of protection and are appropriate in different situations. Implementing the most effective protection option will require considerable planning and negotiation with the landowner.

IMPLEMENTATION ACTIONS Prior to implementing this option, the Trustee Council will have to select and rank candidate lands for protection, and decide on the appropriate level of protection. Implementation of Trustee Council decisions will occur in a maximum of three steps:

1) The appropriate agency will contact the landowner and negotiate terms of non-purchase protection option.

2) The appropriate agency may go through a NEPA process, possibly generating an EA.

3) The appropriate agency will carry out monitoring and any additional management responsibilities.

TIME NEEDED TO IMPLEMENT The time needed to implement this suboption should be less than for Suboption A but is variable. Variables include:

Time for negotiations with landowners
Time needed for EA (if applicable)
Process for purchasing less than fee simple title (if applicable)

MEANS TO IMPROVE RECOVERY Enhanced protection of bird nesting habitats will facilitate natural recovery by restricting activities stressful to already damaged populations and habitats. In the case of 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

Note: This reads as a proposal. I am in the process of re-writing this option but I will be using much of the same information.
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EXXON/VALDEZ OIL SPILL RESTORATION
POTENTIAL RESTORATION OPTIONS

OPTION 30: Test Subsistence Foods For Hydrocarbon Contamination

APPROACH CATEGORY: Other Options

INJURED SERVICES: Subsistence uses of fish and wildlife resources.

SUMMARY
The goal of the project is to restore the subsistence uses of fish and wildlife damaged by the *Exxon/Valdez* Oil Spill. Samples of mussels and rockfish will be collected from the harvest areas of six impacted communities. Community representatives will assist in site selection, as well as collection of samples. Additionally, bile and blubber samples will be taken from five seals harvested for food by subsistence hunters in Prince William Sound. The samples will be analyzed for the presence of hydrocarbon contamination. The results of the tests, along with findings from other damage assessment and restoration studies, will be interpreted by the Oil Spill Health Task Force, and reported to the communities in an informational newsletter and community visits.

TARGET RESOURCES AND SERVICES
The target of the research is to restore the confidence of subsistence users in the safety of the subsistence resources. This will include monitoring the recovery of mussels, rockfish, and seals; communicating findings to subsistence harvesters; and integrating findings of other studies of spill related injuries into previously developed health advice.

DESCRIPTION
Subsistence uses of fish and wildlife resources are a vital natural resource service which were injured by the *Exxon Valdez* oil spill. For example, annual subsistence harvests in 10 communities in the first year after the spill, as measured in pounds useable weight per person, declined from 12 percent to 77 percent compared to pre-spill averages. Similar declines occurred in the breadth of resources used and participation in subsistence activities. In some communities, only limited recovery to pre-spill levels has occurred. For example, subsistence harvests in seven communities were measured for the second post-spill year. Harvests had increased in five of these communities compared to the year after

the spill, but the majority of these harvests remained below pre-spill levels. In the other two communities, Chenega Bay and Tatitlek in Prince William Sound, harvest levels showed no signs of recovery and remained about 60 percent or more below those before the spill.

A primary reason for continued relatively low levels of subsistence harvests are the communities' concerns about the long-term health effects of using resources from the spill area. To address this concern, studies which collected and tested subsistence foods for hydrocarbon contamination were conducted under the auspices of the Oil Spill Health Task Force in 1989, 1990, and 1991. The health advice communicated by the Task Force has been that most resources tested by the program, including finfish, marine mammals, deer, and ducks, had very low to background levels of hydrocarbons and are safe to eat. However, elevated levels of hydrocarbons were found in some marine invertebrates collected from oiled beaches. The Task Force has advised that using shellfish from such beaches represents an increased health risk. Consequently, the Task Force has recommended that subsistence users not harvest marine invertebrates from obviously contaminated beaches. Without long-term monitoring of such beaches, the Task Force has said that it is not possible to advise local communities about when this increased risk has declined or ended.

Directly related to this concern about subsistence food safety is the loss of confidence on the part of subsistence hunters and fishermen in their own abilities to determine if their traditional foods are safe to eat. The Task Force studies were designed to provide vital information to subsistence harvesters to augment their own abilities to judge whether subsistence resources are useable. As noted above, evidence suggests that the Task Force efforts to respond to this loss of confidence are incomplete. Further evidence is available from preliminary findings of research in oil spill communities jointly funded by the Division of Subsistence, ADF&G, and the U.S. Department of the Interior, Minerals Management Service. For example, the majority of households interviewed in April 1992 in Chenega Bay, Nanwalek (English Bay), and Ouzinkie reported that they felt that they had still not been adequately informed about the safety of using subsistence foods from the oil spill area. In each community, households expressed concerns about the long term heath effects of using some of these resources, especially shellfish. In public meetings conducted by the Oil Spill Health Task Force in five communities in June 1992, there also continued to be questions about long term health risks.

Adding to the challenge to communicate information has been the unavailability of findings from damage assessment studies. As this information becomes public, an important need is to integrate these findings with the health assessments from the Task Force and with subsistence harvesters' own observations. The findings from these studies are potentially a powerful source of information for subsistence harvesters to more fully understand current conditions

in their traditional harvest areas. However, injuries to subsistence uses are likely to remain as long as harvesters believe that they have not been fully informed about the condition of natural resources and habitats in the spill area. Consequently, this information must be communicated clearly and by methods appropriate to these communities.

In summary, injury to subsistence uses, as measured by harvest quantities, participation of subsistence activities, and confidence in the safety of using subsistence foods, remains. There continues to be a need to monitor selected resources and harvest areas for evidence that health risks associated with using resources from oiled areas have diminished. Further, as more information about natural resource injuries becomes available, there will an enhanced need to integrate these data with that already developed through the Oil Spill Health Task Force studies. Finally, the communication of information about study findings and injured resources to subsistence users needs to be continued and enhanced.

In response, the project would involve collection of samples of subsistence foods from the harvest areas of six communities, Chenega Bay, Tatitlek, Nanwalek/Port Graham, Ouzinkie, and Akhiok. The sampling sites would be selected in consultation with the communities. Two shellfish sites would be sampled at each community. This would allow us to return to at least one previously tested site for trend assessments, while still giving each community the option to add one site not previously tested. We would also collect rockfish samples near each community. Four samples would be taken from each fish and shellfish site during each sampling trip. It is necessary to test the fish and shellfish at different times of the year, because uptake and accumulation of hydrocarbons is influenced by temperature as well as the reproductive cycle. There should be four sampling trips over the course of the year, winter, spring, summer and fall. Community representatives should participate in all sample collecting.

In addition, bile and blubber samples would be taken from five harbor seals in Prince William Sound. These samples will come from seals harvested by subsistence hunters for food, in the company of a researcher. Both the biologist and the hunter will be asked to write an evaluation of the general health of each animal, including condition of the liver and other internal organs.

Site selection should be done by the Subsistence Division in consultation with the communities. Collection and testing of samples should be contracted out, with the exception of the taking of seal samples, which needs to be done by local subsistence hunters in cooperation with Alaska Department of Fish & Game personnel. Interpretation of the test results should be undertaken by the Oil Spill Health Task Force. Communication of the results and evaluation of the effectiveness of the program should be done by the Subsistence Division as the group with the expertise and community contacts.

Communication of the test results to residents of the impacted communities would require the production of four issues of a Subsistence Division newsletter. It is important that the findings of damage assessment and restoration studies be integrated into this communication effort. As this information is released it is likely to cause renewed concern among subsistence harvesters. It is not always possible to anticipate the effect a technical report, or the media accounts derived from it, will have in these communities. The newsletter will serve to put this information in context for subsistence users, following an evaluation of the information by the Oil Spill Health Task Force. It will also be important to follow distribution of the newsletter with community visits. These can involve informal visits to households and/or formal meetings. The purpose will be to enable a dialogue to develop between the researchers and the communities regarding the study findings.

If it is necessary to reduce the scale of the collection and testing components of the project, this could be done by narrowing the geographical area. Since Prince William Sound is the area that was generally the most heavily impacted, one would expect the resources there to show the most contamination over time. Therefore, if the levels of hydrocarbon contamination there are found to have returned to background levels or otherwise have diminished, it could be assumed that similar or even more reduced levels would occur on Kodiak and the Kenai Peninsula. However, this would probably be a less effective way of reassuring residents of Kodiak and the Kenai Peninsula, for two reasons. First, they would not have the direct involvement in sample collection that they would have otherwise, and secondly, they might not agree with the logic that the findings in Prince William Sound apply to their area.

IMPLEMENTATION ACTIONS

1) Collect samples
   - mussels
   - rockfish
   - harbor seals
2) Test samples
   - aromatic contaminant bioassay on flesh and blubber samples
   - bile florescence screening for hydrocarbon metabolites
3) Coordinate information from other restoration studies
4) Interpret test results and other restoration data
5) Report combined results to communities
   - newsletters
   - community meetings
   - village visits

TIME NEEDED TO IMPLEMENT

The program outlined here would take one year to implement. At the end of that time, the degree of recovery of the resources, as well as that of the subsistence economy, would be reevaluated, to determine whether the program should be continued. The confidence of the subsistence users in the safety of subsistence foods is likely to lag behind the recovery of the resources to some extent.

MEANS TO IMPROVE RECOVERY

By involving the communities in the monitoring of the recovery of the resources, and by bringing information concerning the safety of the resources back to the communities, it is anticipated that subsistence harvests will begin to approach pre-spill levels, and anxiety about their use will be reduced.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

The project will need to tap other restoration studies for additional data. Currently, no monitoring of hydrocarbon levels in subsistence use areas or health assessments of studies are taking place outside the Oil Spill Health Task Force forum.

TECHNICAL FEASIBILITY

The Division of Subsistence, under the auspices of oil spill response, and in cooperation with the Oil Spill Health Task Force, and its other member organizations, such as the National Oceanic and Atmospheric Administration and the Indian Health Service, successfully carried out a similar program for three years. The Task Force called together a Toxicological Expert Committee, which was able to formulate health advice for subsistence harvesters in the oil spill impact area. Through the Oil Spill Health Task Force newsletter, this information was communicated to the affected communities.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

As stated above, the Oil Spill Health Task Force has had some success in conveying the message that most subsistence foods are safe to eat. However, concern about long term effects remains. Also, as noted earlier, the lack of access to the damage assessment studies has created the impression in most communities that the task force did not base its conclusions on a complete assessment of all data. Now the potential exists for the damage assessment results to appear in a piecemeal fashion, often without context. There is a tendency on the part of the public to forget that the damages now being reported represent conditions that existed three years ago, and do not necessarily reflect present conditions.

Consequently, we need an opportunity to put the information from the damage assessment into context, and at the same time to empower the people in the impacted communities to make informed decisions. There is a need in these communities to actively participate in restoration of the environment. This project would provide for this involvement.

INDIRECT EFFECTS (BOTH BENEFICIAL AND ADVERSE)

ENVIRONMENTAL: We will be removing living animals from the environment, but in such small numbers as not to have an appreciable effect.

SOCIOECONOMIC: This project should have the effect of encouraging those who are so inclined to return to using more subsistence resources, which would lead to reduced reliance on commercially purchased foods. It would also restore the communities' abilities to pass on skills and knowledge associated with using subsistence foods.

A potentially adverse effect is that we run the risk of encouraging people to rely on expensive tests to determine the safety of their food supply, rather than their own powers of observation, gained over a lifetime of use of these resources, and bolstered by traditional knowledge. We hope to avoid this by reminding people that the harvesters are able to discern the difference between a sick animal and a healthy one, and can assess beach conditions as well.

HUMAN HEALTH AND SAFETY: If the project results in a return to greater use of subsistence foods, this could be beneficial for the physical and emotional health of community residents who have suffered from the increased reliance on store-bought food. This especially applies to the elders, who were the most used to subsistence resources, through a lifetime of reliance on locally harvested wild resources. Younger people will also be major beneficiaries in learning the skills necessary to live in these rural communities.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS
As outlined above, this project will coordinate and interpret for subsistence users, information from other response and restoration projects, as well as the damage assessment data now being reported.

In an attempt to avoid duplication of efforts, we are not proposing to do any further testing of ducks as part of this study. There is already a comprehensive study of harlequin ducks underway in Prince William Sound. We will be coordinating closely with the researchers involved in that study, and hope to integrate their findings into this project, and communicate the results to the impacted communities.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE
Option number 31 will develop a comprehensive monitoring program, however it will not have any community involvement, and there is no public communication element.

Option number 33 will develop an integrated public information program and education program. However, this project is not targeted at subsistence food safety, and does not involve any monitoring of resource recovery.

LEGAL CONSIDERATIONS

CONSISTENCY WITH SETTLEMENT

The project answers the need to continue to monitor the risks to human health from the oil spill. This is consistent with the goal of restoring human services of the natural resources damaged in the oil spill.

AGENCIES WITH MANAGEMENT/REGULATORY RESPONSIBILITIES

Alaska Department of Fish and Game has management and regulatory responsibility for shellfish and fish, including subsistence uses. NOAA/NMFS has management responsibility for harbor seals.

PERMITS REQUIRED

A scientific collection permit will need to be obtained from the Alaska Department of Fish and Game. We may not need a permit for the seal samples, if they are taken from seals killed by subsistence hunters for food.

NEPA COMPLIANCE: (leave blank)

ADDITIONAL/NEW LEGISLATIVE OR REGULATORY ACTIONS

This project will not necessitate any legislative or regulatory actions.

MEANS TO EVALUATE SUCCESS

The Division of Subsistence has been conducting annual household harvest surveys in all these communities since 1989. As part of the interviews, we collect information on the relative degrees of confidence in the safety of subsistence resources, and fear of contamination. This is both the result of specific questions on this topic, and of answers to open ended questions regarding changes in the subsistence harvest. The surveys will be continued in some communities for the next two years. In those communities where we are not conducting surveys, a brief questionnaire can be used to evaluate the degree of concern, if any, combined with informal visits to the community by researchers.

REPRESENTATIVE COSTS

In the past, we have used the National Marine Fisheries Service Laboratory in Seattle; they are a research facility and are not interested in continuing this type of testing. They charged $750 per flesh sample; we can probably expect a commercial lab to charge more. $1000 per sample is probably a reasonable estimate. Bile testing can be used as a screening method, if a lab can be contracted to run this test. It is a much less expensive test, costing roughly $100 per sample. This project would involve approximately 170 hydrocarbon tests (160 shellfish, 5 seal blubber and 5 fish, assuming only a small percentage of the fish show a bile metabolite level high enough to justify a flesh test), and 85 bile screen tests (80 fish and 5 seal).

There would be four collection trips to each community. Usually shellfish samples can be collected during a single tide cycle, assuming that sites are close enough together, so shellfish collection should only take one day in each community. The amount of time required to get bottomfish samples is more variable, and it sometimes takes two or three days to obtain the samples. An additional trip will be required for getting seal samples. This will probably require a researcher spending anywhere from three days to a week accompanying hunters from Chenega Bay. Ideally, all five seals would be taken on this one trip.

Four issues of a subsistence division newsletter, communicating the results of the tests to residents of the impacted communities will be produced. Past issues of the newsletter have cost roughly $1,000 each to produce, including typesetting, printing, labelling and postage. A minimum of two rounds of village visits would be necessary as well.

The Division of Subsistence would need a full time Subsistence Resource Specialist II to handle the coordination of information, village visits and writing of the newsletter.

ADDITIONAL INFORMATION NEEDED

For this project to be successful, it will be necessary to have access to data and results for both closed-out and continuing damage assessment and restoration studies.

DRAFT

May 18, 1992 Author: John Strand

OPTION 31: Develop Comprehensive Restoration Monitoring Program

APPROACH CATEGORY: Other

INJURED RESOURCES AND SERVICES: All

SUMMARY (ABSTRACT): There is need for a comprehensive and integrated monitoring strategy to assess recovery of injured natural resources and services in the oil-spill area. Monitoring is required to determine if and when injured resources and services return to their baseline conditions, to evaluate the effectiveness of restoration activities, to detect latent injuries and to reveal long-term trends in the health of ecosystems affected by the spill. Development of a monitoring plan will take one year and will be conducted in two phases. Phase 1., which focuses on development of a conceptual design, is intended to guide more detailed and technical planning in Phase 2. The proposed monitoring plan is consistent with existing law (e.g.; Natural Resource Damage Assessment Regulations found in the Comprehensive Environmental Response, Compensation, and Liability Act of 1980; and the National Environmental Policy Act of 1969 as amended). The proposed monitoring is also technically feasible and specific monitoring protocols for Prince William Sound and the Gulf of Alaska can be developed from earlier conducted response, damage assessment and restoration science studies. The duration of the monitoring program will depend on the severity of injury, the capacity of injured resources and services to recover, and the time required to establish a trend for recovery. Estimated costs of planning the proposed monitoring program will be $500K.

DESCRIPTION: It is the objective of this option to develop and implement a comprehensive and integrated restoration monitoring program that will follow the progress of natural recovery, evaluate the effectiveness of restoration activities, and to establish an ecological baseline from which future disturbances can be evaluated. Permanent monitoring sites could include representative habitat types, oiled, unoiled control, untreated set-aside, damage assessment, and EXXON study sites.

IMPLEMENTATION ACTIONS:

1) Design and implement monitoring to follow natural recovery of injured resources and services;

2) Design and implement monitoring to evaluate the effectiveness of restoration activities, identify where additional restoration activities may be appropriate, and determine when injury is delayed, and

3) Design and implement monitoring of other components to document long-term trends in the environmental health of the affected ecosystems.

TIME NEEDED TO IMPLEMENT: While some monitoring was conducted in 1990 and 1991, and additional monitoring will be conducted in 1992, implementation of the fully expanded and integrated monitoring program will not occur before the summer of 1993. Planning will occur over a period of essentially one year and be complete prior the beginning of the field season in May 1993. Planning will be conducted in two phases. In Phase 1, a conceptual design will be developed that addresses such issues as goals and objectives, what to monitor, what institutional models are required for management, what relationships need be established with other monitoring programs in the spill zone, and how can monitoring be funded over the long-term. The conceptual design will serve to guide more detailed, technical planning in Phase 2. This phase will specify the technical design for each monitoring component, create a data management system and quality assurance plan to handle all monitoring data, establish costs and develop a strategy for review and update of monitoring methods.

Once implemented, the duration of monitoring for either natural recovery or recovery following restoration will generally depend upon the severity of injury, the capacity of injured resources and services to recover, and the time necessary to establish a trend for recovery.

MEANS TO IMPROVE RECOVERY: Monitoring is necessary to assess the adequacy of natural recovery. Resources and associated services that are found to be recovering at an unacceptable rate may have to be reconsidered as candidates for restoration action. Likewise, resources and services that are found to be recovering faster than anticipated may allow for an early completion of a restoration action. Monitoring of important physical, chemical and biological properties will establish an environmental baseline for the affected ecosystems. This baseline then can be used as a standard reference to evaluate the effects of future disturbances, e.g., earthquakes and oil spills. This standard also could be used to assess the anticipated effects of human development and to improve our ability to manage affected resources and services over the long-term.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS: The inclusion of monitoring in a restoration plan is not a new concept. Monitoring of the Savannah River was one of five restoration projects implemented with funds obtained by the State of Georgia in litigation following the Amazon Venture oil spill (Brown 1989). "Monitoring the condition of the resource" also is cited as an example of an allowable restoration cost in the Department of Interior's proposed revisions to the Natural Resource Damage Assessment (NRDA) Regulations found in the Comprehensive

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

The proposed monitoring program also is consistent with the provisions of the National Environmental Policy Act of 1969 as amended, that requires several forms of monitoring including: implementation monitoring to assure the public that we did what we said; effectiveness monitoring to show that the proposed restoration options are achieving our intent; and validation monitoring to show that our management is resolving the issues overall.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT: The proposed monitoring program will be integrated with other monitoring programs in the spill area. The Prince William Sound Regional Citizens Advisory Council will soon design a program to monitor the potential effects of oil transport in Prince William Sound. It would be our intent to integrate the two programs where possible so as to avoid duplication of effort and to maximize use of logistics.

TECHNICAL FEASIBILITY: Most, if not all, proposed monitoring approaches will have their basis in the earlier conducted response, damage assessment, and restoration science studies. Additional monitoring approaches will be considered based on a proven ability to effectively document recovery following ecological disturbance. It is anticipated that each monitoring approach will be periodically reviewed and updated as monitoring results are reviewed and interpreted and new information is gained from the scientific literature.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE: Monitoring is an effective management tool and will significantly improve our ability to restore resources and services injured by the spill. Without monitoring, we have no way of evaluating the success of other proposed restoration options.

INDIRECT EFFECTS: There need be no significant adverse environmental, socio-economic, and human health and safety impacts associated with restoration monitoring activities, however, the potential for such impacts are the subject of an environmental impact statement that the Trustees will prepare. Where possible, only non-destructive and the least-intrusive monitoring approaches will be implemented. The only human health and safety issues contemplated are those associated with the requirement for investigators to work on the water or to travel to and from remote monitoring sites by boat, helicopter or float-plane. These risks, however, are considered to be minimal.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS: Implementation of a restoration monitoring program will provide the basis by which all other restoration options will be evaluated.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE: None.

LEGAL CONSIDERATIONS: As stated above, development and implementation of a restoration monitoring program is mandated by the National Environmental Policy Act of 1969 as amended.

Various agencies of the State of Alaska and the U.S. Government have regulatory and management oversight. The state of Alaska Department of Natural Resources has regulatory authority for all tide lands of the State. The state of Alaska Department of Fish & Game manages fish and wildlife including non-game species. With the assistance of the Alaska Department of Fish and Game, the National Marine Fisheries Service and the U.S. fish and Wildlife Service implement the provisions of the Marine Mammal protection Act. The U.S. Fish and Wildlife Service manage migratory birds.

Permits would be required for sampling of all biological materials.

MEANS TO EVALUATE SUCCESS: An annual assessment will be conducted to determine if plans, projects and related activities are implemented as designed and in compliance with the Restoration Plan, the Restoration Monitoring Plan and the National Environmental Policy Act of 1969 as amended.

REPRESENTATIVE COSTS: It is expected that an environmental consultant will be asked to assist the Trustees in developing a monitoring plan. As shown in Table 1, conceptual planning activities in Phase 1 will cost $154.00K. Developing detailed study plans in Phase 2 will cost an additional $342.25K.

ADDITIONAL INFORMATION NEEDED: None.

CITATIONS:

1) Brown, J.D. 1989. "Successful Natural Resource Damage Claim for a Coastal Oil Spill." In Proceedings of the 1989 Oil Spill Conference (Prevention, Behavior, Control, Cleanup). p. 293-296. American Petroleum Institute, Washington, D.C.

2) Department of the Interior. 1991. "43 CFR Part 11 - Natural Resource Damage Assessments; Notice of Proposed Rulemaking." Federal Register 56 (82) 19752-19773.

TABLE 1. Projected Costs of Implementing Option 31.

ITEM	$K	BASIS
PHASE 1 - Development of Conceptual Plan		
Project Administration		
Salaries		
Project Leader	6.25	1 man months over 1/2 year
Agency Scientists	13.75	3 man months over 1/2 year
Clerical Support	8.50	3 man months over 1/2 year
Travel	2.50	sub-contract reviews
Peer Review		
Outside	5.00	minimum of two reviewers
Agency	5.00	minimum of three reviewers
Sub-Contract	100.00	consultant services - design/implementation of workshop, preparation of conceptual plan.
Publication	7.50	conceptual plan
Supplies	5.50	paper, computer, mailing
Sub-Total	$154.00K	
PHASE 2 - Development of Detailed Protocols		
Project Administration		
Salaries		
Project Leader	18.75	3 man months over 1/2 year
Agency Scientists	55.00	1 man year over 1/2 year
Clerical Support	8.50	3 man months over 1/2 year
Travel	7.50	sub-contract reviews

TABLE 1 (continued)

ITEM	$K	BASIS
Peer Review		
Outside	10.00	minimum of 5 reviewers
Agency	10.00	minimum of 5 reviewers
Sub-Contract	200.00	consultant services - design/implementation of one or more workshops, preparation of detailed monitoring plan
Publication	25.00	monitoring plan
Supplies	7.50	paper, computer, mailing
Sub-Total	$342.25K	
Total	$496.25K	

June 17, 1992 Author: Stan Senner

OPTION 32, Endow a Fund to Support Restoration Activities

SUMMARY

APPROACH CATEGORY Other Options

INJURED RESOURCES AND SERVICES all

SUMMARY

SUBOPTION

TARGET RESOURCES AND SERVICES

DESCRIPTION

The purpose of an endowment is to produce income. Thus, in the context of the restoration program, an endowment is a means of providing long-term funding for a restoration program or projects. There are several major, interrelated issues that must be considered in developing the concept, and there there are a number of different ways to address each issue, depending on specific needs and goals. Here are examples of key issues and possible ways to address them:

(1) What programs or projects are to be supported?

The endowment can support only a limited program or projects of a certain type, or it can be the source of funds for the entire restoration program.

(2) How shall the fund be established and governed?

The endowment can be set up as a new private, independent foundation separate of the Trustees, one or more endowments can be established within appropriate existing institutions, or an endowment can be administered by the Trustees under the existing structure and program.

(3) How shall the money be invested and managed?

The endowment can be invested and managed to provide a perpetual, inflation-proof source of income, with only that income being allocated for projects, or both the prinicipal and investment income can be allocated as deemed appropriate. Spending of endowment income could begin immediately or be deferred until after the 10-year payout and completion of any expenditures of settlement funds not placed in the endowment.

(4) How much money will be invested and when or at what annual

rate?

All or only part of the settlement funds can be added to the endowment; if only part of the settlement funds are added to the endowment, the deposits can be spread over the 10-year payout or be made early or late in that period (any schedule is possible).

(5) Whom shall be eligible to apply for and receive funds from the endowment?

Grants from the endowment can support only agency projects or, on a competitive basis, be available to a full array of recipients, including public agencies, nonprofit organizations, academic institutions, etc.; alternatively, some portion of funds could be earmarked for agency projects and other portions for nonagency work.

Given the several choices for each issue, it is clear there are almost endless permutations of the endowment concept.

For illustrative purposes,two specific concepts are described below:

Private Foundation: (1) spending of endowment income would target long-term needs in a limited number of program areas (e.g., marine research and monitoring); (2) the fund would be established as an incorporated entity independent of the Trustee Council and have a board of directors with both public officials and private citizens as members; (3) the funds would be invested and managed to provide a perpetual, growing, inflation-proofed source of income and and only that income would be spent; (4) not all settlement monies necessarily would be invested in the endowment; and (5) endowment income potentially would be available on a competitive basis to public agencies, private organizations and corporations, academic institutions, etc.

Government Trust: (1) spending from the trust would support all projects carried out under the Restoration Plan; (2) the trust would be administered by the Trustee Council; (3) funds would be invested to provide growth, but the Trustee Council would retain the option of spending both the principal and investment income; (4) all settlement funds other than reimbursements to the governments would be deposited in the trust; and (5) a portion of funds are earmarked for agency research and management needs, with the balance available on a competitive basis to private organizations, academic institutions, etc.

IMPLEMENTATION ACTIONS

The following implementation actions are common to any endowment concept:

(1) review specific alternative concepts or models;
(2) resolve policy issues described above;
(3) draw up a charter and seek public comment;
(3) prepare documents as needed;
(4) develop program guidelines and grant-making procedures; and
(5) begin operations.

TIME NEEDED TO IMPLEMENT

The private foundation concept could require at least one year to implement, because of the needs to resolve various structural and programmatic issues, file various legal documents, name a board of directors, etc. The government trust concept could be implemented in a matter of months (after approval of a Restoration Plan), because it is only a variation on the current structure.

MEANS TO IMPROVE RECOVERY

An endowment, per se, is not a means to improve recovery. Recovery is achieved only through the projects supported by the endowment. An endowment, however, has the potential to prolong the funds available to support restoration projects beyond the 10 years of settlement payments.

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Not applicable.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

Not applicable.

TECHNICAL FEASIBILITY

There are a number of instances where enforcement actions, settlement of litigation, or mitigation of environmental impacts have resulted in the creation of endowments or trusts dedicated to a variety of objectives (Foster et al., 1989). Several examples follow: Within Alaska, The Kodiak Brown Bear Research and Habitat Maintenance Trust was established to help mitigate environmental impacts resulting from the Terror Lake Hydroelectric Project (LTN Group, 1992). The trust has both public and private trustees. The Virginia Environmental Endowment is an independent, permanent, grantmaking foundation established with funds from obtained through state and federal environmental enforcement actions. The Platte River Whooping Crane Trust in Nebraska resulted from the settlement of litigation over Platte River water rights; its three trustees represent the parties to that litigation.

POTENTIAL TO IMPROVE RECOVERY OF ENHANCE THE RESOURCE/SERVICE

The timing, rate, and size of deposits into an endowment determines how quickly and when funds will be available for allocation to

restoration projects. The more slowly that a fund is built up, the longer it will take before significant income is available for distribution. This, in turn, may pre-determine the choice and timing of the restoration options selected for implementation, especially for expensive actions such as land acquisition. For example, of all funds are deposited in an endowment and spending is limited to endowment income, then relatively small amounts of money would be available early.

INDIRECT EFFECTS

Depending on where the endowment would be housed administratively, there would be some long-term local economic benefits (e.g., jobs created, salaries spent in local stores, etc.). Any environmental or human health/safety issues are a function of when, where, and how much money is allocated from the endowment or trust, and are not issues arising from the mechanism itself.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

The endowment is a source of support for restoration actions.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

This option is unique.

LEGAL CONSIDERATIONS

There are a number of considerations here that will require analysis with respect to both federal and state law. The private foundation concept described above would require incorporation of a new private, independent, nonprofit corporation. It is not known whether legislation would be required. There would appear to be no need for environmental or other permits that concern activities in the field.

MEANS TO EVALUATE SUCCESS

The ultimate measure of success is whether the fund successfully serves as a source of support for a restoration program or projects. Another measure of success would be whether the investment and management strategy results in an increasing amount of money available for allocation.

REPRESENTATIVE COSTS

Regardless of the particular structure adopted, there will be start-up and operating costs. If the structure selected is a variation on the current structure, then current operating costs may be representative of the operating costs. If a private foundation is established, there would be start-up costs, mostly the time needed to analyze legal issues and prepare documents. Once operating, there would be on-going expenses, such as the costs

of convening and informing a board of directors, administering the fund (including investment fees), paying an executive director and small support staff, and paying program staff commensurate with annual grant expenditures. Foster et al. (1989) suggest that there needs to be one program officer for every grant category involving expenditures of $1 million or more annually. One survey reported a median value of 10.1% for "charitable administrative expenses" as a percent of grants (Council on Foundations, 1990).

ADDITIONAL INFORMATION NEEDED

Analysis of legal issues, especially federal versus state.

CITATIONS

Council on Foundations. 1990. 1990 foundation management report. Council on Foundations, Washington, DC. [this is in the RPWG files]

Foster, C.H.W., J.E. Bodovitz, and F. Foster-Simons. 1989. Establishing the fund for Alaska: the procedural, program, and legal options. Feasibility report and Appendix. The World Wildlife Fund (U.S.) and The Conservation Foundation. Washington, DC. [this is in the RPWG files]

LTN Group (The). 1992. Analysis of Program Options and Priorities. The Kodiak Brown Bear Research and Habitat Maintenance Trust. Anchorage, AK. [this is in the RPWG files]

Contacts

see materials from Council on Foundations; also The Conservation Foundation, which commissioned the study by Foster et al. (cited above).

June 17, 1992 Author: Sanford P. Rabinowitch

OPTION

#33 Develop integrated public information and education 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

OPTION: 34 Establish a Marine Environmental Institute

APPROACH CATEGORY Other .

INJURED RESOURCES AND SERVICES All

SUMMARY

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

DESCRIPTION

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

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

A major resource management effort would be based at the Institute. The goal of this program would be to develop baseline information

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

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

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

IMPLEMENTATION ACTIONS

1. Impanel a team of marine scientists, environmental educators, marine aquarium specialists and science administrators to develop the concept in detail and establish site and design selection criteria.

2. Survey the oil spill affected area, choose and acquire a site.

3. Hire a team of consultants to prepare an architectural design and master plan.

4. Acquire the necessary building permits.

5. Select a contractor and build the institute.

TIME NEEDED TO IMPLEMENT

One year for site selection. Two years for planning and design. Two to three years for construction. One year to equip and staff the facility.

MEANS TO IMPROVE RECOVERY

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

PROTECTION AND MANAGEMENT UNDER EXISTING LAWS

Management to be determined.

RELATIONSHIPS WITH EXISTING/PLANNED USES OR MANAGEMENT

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

TECHNICAL FEASIBILITY

Technical feasibility of the concept has been demonstrated in other areas, e.g., University of Miami/Miami Seaquarium, Stanford University/Monterey Aquarium, etc. A potential sites for this facility has already been identified in Seward.

POTENTIAL TO IMPROVE RECOVERY OR ENHANCE THE RESOURCE/SERVICE

Recovery monitoring provides information on the recovery status of injured resources and services. Information from the monitoring program is essential to successful direct restoration design and implementation. Environmental education programs developed and implemented by the institute would help to minimize additional impacts on injured resources and services.

INDIRECT EFFECTS

There would be no adverse impacts upon injured resources or services. The institute would have a significant socio-economic impact upon the local community and region. The institute would probably attract numerous tourists, Alaska residents and school

children with consequent impacts on the local economy and the regional read system. Staff would require housing as well as urban infrastructure support.

RELATIONSHIP TO OTHER EVOS RESPONSE/RESTORATION ACTIONS

The institute could provide technical support and facilities for restoration feasibility studies and the monitoring program. Data from research programs would be made available to restoration scientists and resource managers.

OTHER OPTIONS THAT COULD ACHIEVE THIS SAME OBJECTIVE

None

LEGAL CONSIDERATIONS

Permitting

MEANS TO EVALUATE SUCCESS

Assessment of research and environmental education programs by peer reviewers. Annual visitation figures.

REPRESENTATIVE COSTS

Site selection, planning and design.....$ 2 million
Site acquisition and construction.....$40 million

ADDITIONAL INFORMATION NEEDED

CITATIONS

June 17, 1992 Author: Sanford P. Rabinowitch

OPTION

#35 (a) Replacement of archaeological artifacts

APPROACH CATEGORY

Other options

INJURED RESOURCES AND SERVICES

Archaeological sites and artifacts

SUMMARY

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

SUBOPTION

Investigate incidents of looting and vandalism and strive to regain possession of publicly owned artifacts

TARGET RESOURCES AND SERVICES

Archaeological sites and artifacts

DESCRIPTION

This option would identify institutions (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

<u>Environmental</u>

None anticipated

<u>Socio-economic</u>

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