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Linda Comeri

July 1, 1990
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TO:

Linda Comeau

271-2467

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RWG
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Brian/Sandy:

Not sure what the cutoff date for comments on the draft progress report is. I got conflicting reports from your office yesterday. I'm about halfway through the report and left it at home so i don't have access to it during the day today, but Wahisngton's comments thus far are that:

1. On page 6, second paragraph: CERCLA itself does not define restoration. Therefore the words "under CERCLA" should be deleted. It should also be noted here that since the Trustees are not necessarily following the regulations, the definition of restoration in the regulations may be illuminating, but is not binding. It would be helpful to the reader to cite the pertinent section of the regulations, 43 C.F.R. Section 11.14.

2. I have the same general comments as Martha Fox regarding the listing of far-out restoration options and the detail into which the report goes regarding public comment. The whole report goes against the grain of the privilege accorded the government's deliberative process, but if it washes politically, more power to you!

I will finish reading the report tonight and send comments to you tomorrow or pass them on to the Management Team by telephone at its meeting tomorrow.

Gina

United States
Environmental Protection
Agency

Region 10
1200 Sixth Avenue
Seattle WA 98101

Alaska
Idaho
Oregon
Washington

EPA

CONFIDENTIAL
ATTORNEY/CLIENT
COMMUNICATION

Reply to
Attn of: SO-125

7/9/90

MEMORANDUM

SUBJECT: Comments on Draft Restoration Progress Report

FROM: Martha Fox

TO: Michael Rylko for John Armstrong

My one major comment on the Draft Report concerns Chapter VI and the matrix of potential restoration approaches. Some of the potential approaches that the RPWG proposes to evaluate - while related to the goals of restoration - appear to me to be legally questionable as bases for obtaining natural resources damages. Examples include establishment of new marine parks/sanctuaries, elimination of high-seas gillnet fisheries, acquisition of polar bear denning and walrus mating and calving areas, and designation of PWS as a National Monument.

I have not, as yet, discussed this with Brian Ross or Jim Nicoll and other members of the legal team. At this point, I do not see a problem with including these alternatives in the matrix for purposes of the progress report. However, I do think, particularly given the limited resources of the RPWG, that there should be some assessment of the legal viability of potential restoration approaches before time and money is spent evaluating them.

07. 16. 90 09:51AM NPS—ARO—257—2607 P01

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Brain —
For the file,
these were Heather's
comments via
Sorry
Steve

FAX TRANSMITTA
NATIONAL PARK SER
OFFICE OF OIL SPILL CO
2525 GAMBELL STR
ANCHORAGE, ALASKA
(907) 257-2526

TO: Jane P.

FROM: Sandy Rabinowitch

DATE: 7/16 9:45

RECIPIENT'S FAX # 271-2467

SENDER'S FAX # (907) 257-2523

COMMENTS: Call me @ 257-2653 w/ questions. There is one that we should talk about at least.
Be here at 1:30 today

NUMBER OF PAGES TO FOLLOW: 18

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FAX TRANSMITTAL
NATIONAL PARK SERVICE
OFFICE OF OIL SPILL COORDINATION
2525 GAMBELL STREET
ANCHORAGE, ALASKA 99503
(907) 257-2526

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NUMBER OF PAGES TO FOLLOW: 18

DRAFT

RESTORATION Planning

FOLLOWING THE

EXXON VALDEZ OIL SPILL

July 1990 Progress Report

DRAFT

COPY 8

Prepared by the

Restoration Planning Work Group

Alaska Departments of Fish and Game, Natural Resources, and Environmental Conservation;
U.S. Departments of Agriculture, Commerce, and Interior;
and the U.S. Environmental Protection Agency

Restoration is one component of an overall process. Combined with response and damage assessment, these efforts seek to minimize adverse impacts, compensate the public for natural resource injury, and provide for the recovery of natural resources and their uses.

Response activities include the initial emergency measures to contain the spilled oil and minimize adverse impacts, as well as the subsequent efforts to clean-up oil from the spill area. The magnitude of and circumstances surrounding the *Exxon Valdez* oil spill resulted in relatively little of the spilled oil being contained. Consequently, cleanup activity focused primarily on removing oil from the shoreline areas affected by the spill. At the time of this report, more than one year after the *Exxon Valdez* ran aground, cleanup efforts continue.

State and federal agencies initiated approximately 72 scientific studies soon after the oil spill to determine the amount of damage. This damage assessment process, which continues in 1990, is designed to quantify the specific resource injuries and determine their corresponding monetary values. This includes the monetary valuation of reduction in uses that the natural resources can provide ("lost use" value), as well as the costs of activities that will be necessary to restore the ecosystem and its uses to pre-spill conditions. Claims for these damages will be presented to the responsible parties, and under federal law the monies received are to be used for restoration.

Definition of Restoration

Restoration culminates the spill response and damage assessment process by planning for and implementing activities to restore the condition and uses of the affected natural resources.

Restoration is specifically defined under CERCLA and the NRDA regulations as follows:

> "Restoration" or "rehabilitation" means actions undertaken to return an injured resource to its baseline condition, as measured in terms of the injured resource's physical, chemical, or biological properties or the services it previously provided...

Restoration actions fall into three categories: direct restoration, replacement, and acquisition of equivalent resources.

- "Direct restoration" refers to measures taken, usually on-site, to directly rehabilitate an injured resource.
- "Replacement" refers to substituting one resource for an injured resource of the same type.
- "Acquisition of equivalent resources" means to purchase or otherwise protect resources that are the same or substantially similar to the injured resources in terms of ecological values, functions, or uses.

groups, Alaska Native corporations, public land managers, environmental interest groups, and the timber and tourism industries. All panel sessions included opportunities for questions and comments from the public, and an extended public comment session took place at the end of the symposium.

Restoration concepts and ideas discussed at the symposium can be grouped into three categories: broad restoration approaches and philosophies; recommendations on public participation and the restoration planning process; and ideas addressing restoration of specific resources (i.e., fisheries, mammals, cultural resources, etc.). However, there was consensus among speakers and attendees that more specific comments on restoration can not be given without public access to natural resource damage assessment results. Major points from the symposium discussion are summarized below.

Broad Restoration Approaches and Philosophies

Most speakers called for a holistic, ecosystem approach to restoration. Without consideration of the ecosystem as a whole, there is a danger that ignorance, misunderstanding, or politics could inappropriately dictate how restoration monies are ultimately used. A variety of subtle or long-term effects could be missed entirely.

Many speakers called for an assessment of the oil spill in terms of cumulative effects, including both short and long term, with a long-term monitoring effort as follow-up research on any restoration effort. An environmental trust fund was suggested by many as a way to ensure a funding source for long-term ongoing research and monitoring activity. This was seen as critical for addressing the perception that many impacts may be subtle or long-term and therefore may not be apparent through the relatively short-term studies being conducted under the NRDA regulations.

Many symposium participants expressed a strong preference for the use of restoration funds within the spill area or, at a minimum, within the state. In addition, the need to use native stocks and species in any rehabilitation efforts was stressed.

One speaker strongly recommended that restoration be limited to the physical removal of oil, and that nothing else should be done so that nature could take its course. This speaker was concerned about the possibility of doing more harm than good through human intervention, while emphasizing the ability of the marine environment to recover naturally.

Many viewed the oil spill and its restoration as providing the opportunity for raising public awareness which should result in increased efforts toward oil spill prevention measures as well as highlight the need for changes in national energy policies and laws. There was consensus about the need for increased environmental education and natural resource interpretation to encourage better protection of those resources that were damaged by the spill. A specific idea was to establish a public restoration interpretive center. One commentor stressed that the public needs to be informed of the complexities of ecosystem relationships and the slow processes of recovery, and that this educational effort should be a continual and integral part of the restoration process.

Public Participation and the Planning Process

In general, many felt that the public participation process needs to be refined relative to past examples in the state of Alaska where it was unsuccessful. The process itself should be as simple and flexible as possible, and not become overly bureaucratic. Speakers urged that the restoration process should foster cooperation and trust among scientists, government agencies, and the public. In this sense, public participation was seen as an essential aspect of restoration planning, crucial to recognizing differences in social and cultural values throughout the spill area.

Several people suggested the formation of a citizen advisory committee to oversee public involvement. It was recommended that local input should be encouraged so that local knowledge of the affected area is not overlooked. The need for Native interests to be met in the public process was also emphasized.

Many speakers expressed frustration that most natural resource damage assessment information was not available to the public. Further, conflicting information which was made available to the public regarding the extent of damage was counterproductive. Several commentors explained that the public cannot be expected to get involved without adequate information. It was recommended that the media be utilized to better inform the public about the restoration effort

Finally, several commented that the advertising for and public awareness of this symposium was inadequate. One suggestion was that this type of public forum should be held during non-business hours to encourage maximum public involvement. A public meeting following the publication of the symposium proceedings was also suggested.

Specific Restoration Ideas

While one speaker strongly recommended that restoration actions be limited to the physical removal of oil, others supported an active restoration effort and presented ideas regarding specific resources.

Several ideas involved the rehabilitation of habitat. For example, beach rye grass could be reestablished in coastal areas affected by oil and cleanup activity, both for habitat and to help stabilize erosion. Actions to enhance an existing fishery might involve rehabilitation of habitat through increasing habitat complexity (addition of spawning channels) or fertilization to enhance food supply. Active habitat restoration for birds might include enhancing bird brood-rearing through improvement of food sources and manipulation of habitat to increase nesting sites. One specific recommendation to enhance the island nesting habitat of the common murre was to reduce predators, specifically foxes, that had been introduced in past years as part of the fur trade.

In addition to habitat rehabilitation, efforts to accelerate recolonization may be appropriate for some species. It was stressed that recovery of the habitat must be assessed before species replacement occurs. An example of recolonization efforts is the use of hatchery/aquaculture techniques to help

- Continue to clean beaches and areas of impact; however, use research information to identify most efficient methods along with the least toxic method. (Homer*)
- Remove loads of garbage from Exxon and volunteer cleanup sites. (Homer*)
- Areas must be cleaned up; upset when biologists and Exxon say everything is OK. (Homer*)
- Clean up all bays that trap and hold oil such as Herring and Marsha Bays on Knight Island, Nuka Island Passage and Knight Island Passage. Conduct physical removal and replacement of heavily oiled beaches and further use of bioremediation. (Seward*)

Natural Resource Damage Assessment

Many people were also concerned about damage assessment activities.

- Restoration planning is premature given the lack of data from the damage assessment studies. (Cordova, Homer, Anchorage)
- Concern that government agencies do not have enough money to do adequate damage assessment. (Cordova)
- Concern that Exxon's damage assessment activi[illegible] moni[illegible]d to assure quality. (Cordova)
- Support/implement fishery studies for the Ken[illegible]ch have been cancelled from the NRDA program. ([illegible])
- Guarantee that assessment damage and research information be available to the public so that restoration can be planned accordingly. (Homer*)

Monitor, Research

Several comments were received on restoration options in the form of monitoring and research.

- Set aside ecosystem areas, establish long-term monitoring for base information, allow no public use. Fund long-term monitoring and research. (Seward, Cordova, Valdez, Homer, Kodiak)
- Establish a trust fund for long term restoration, recovery, acquisition and enhancement projects. (Homer, Kodiak, Whittier)
- Involve local people in monitoring to restore trust. (Whittier)
- Need in-the-field research/monitoring vessels to combine research, recovery, restoration, and prevention. (Homer)
- Study effects of boat distance from seal haulout/pupping areas, from eagles, etc.; then educate the public. (Valdez)

CHAPTER III
TECHNICAL WORKSHOP

To gather scientific input for the restoration planning process, a technical workshop was held April 3-5, 1990, in Anchorage, Alaska. The three-day workshop provided the first opportunity for a general exchange of ideas on restoration among scientists and resource managers. Due to the necessity of discussing litigation-related damage assessment information, this workshop was closed to the public.

Participants in this workshop included members of the RPWG, federal and state resource managers, investigators conducting damage assessment studies, and technical experts from academic institutions or the private sector. These technical experts were selected based on their experience in restoration of natural resources or their specific knowledge of a particular resource (e.g., marine mammals). Most participants had direct experience with these resources in Alaska.

Results of Workshop

Workshop participants identified potential restoration projects and discussed these ideas in terms of effectiveness, feasibility, and applicability to the spill area. An overview of available damage assessment results helped guide the discussions.

The workshop was divided into six sessions: coastal habitat, fish and shellfish, birds, terrestrial and marine mammals, cultural resources, and recreational resources. Each of the sessions discussed restoration alternatives which might be effective in addressing possible injuries to particular resources. The groups were instructed to identify a broad range of restoration options. Chapter VI (Development of Restoration Options) incorporates the restoration alternatives discussed at the technical workshop.

~~To address scientific uncertainties about specific restoration options,~~ Workshop participants developed a list of potential feasibility studies or demonstration projects. These studies were designed to evaluate candidate restoration alternatives for their likely effectiveness, feasibility, and applicability to the spill area. Projects which were subsequently initiated during the summer of 1990 are described in Chapter V (Feasibility Studies).

In addition, workshop participants identified other information needs that are fundamental to the development of a comprehensive restoration plan. ~~The additional information needs identified by each session are summarized below.~~

rest of section deleted

CHAPTER V
FEASIBILITY STUDIES

Restoration feasibility studies are a means to establish feasibility in cases for which there is uncertainty of success or benefit, given the particular species and environment within the oil-spill area. Such studies can also help determine the cost of implementing full-scale restoration projects and help evaluate associated environmental impacts and benefits.

Many ideas for restoration projects have been suggested—and continue to be suggested—as a result of public participation and technical consultations. Evaluating these ideas will be a long and involved process, and it is important to move quickly to test promising methods for which the technical feasibility is in question.

Five Restoration Feasibility Studies are currently in progress. The factors considered in selecting these studies included: (1) relationship to natural resource damage assessment studies and injured natural resources, (2) identified public concern, (3) the need to initiate a study promptly, (4) the ability to implement a study in the summer of 1990, (5) reasonable likelihood of success, and (6) cost relative to the amount available for feasibility studies. Of the five Restoration Feasibility Studies, three concern restoration of intertidal and supratidal shoreline communities, one addresses upland habitats used by wildlife affected by the spill, and one identifies lands, habitats, and resources that represent at least potential opportunities for the acquisition of equivalent resources. The 1990 restoration feasibility studies are summarized below, and ~~are described~~ will be described in more detail in the 1990 State/Federal Natural Resources Damage Assessment Plan for the *Exxon Valdez* Oil Spill. Note that these five feasibility studies may not reflect the mix of restoration projects that will be recommended in a restoration plan.

important!

Restoration Feasibility Study Number 1: Reestablishment of *Fucus* sp. in Rocky Intertidal Ecosystems.

The marine alga, *Fucus* sp., is a critical structural component of the intertidal ecosystem on rocky shores. Qualitative evidence indicates that it was damaged by both the spilled oil and cleanup efforts. If the natural recovery of *Fucus* sp. can be enhanced through the dispersal of seeds or transplants, it will benefit the associated flora and fauna on intertidal rocky shores. This study involves both laboratory and field tests to develop and demonstrate the feasibility of a *Fucus* sp. restoration project. The U.S. Environmental Protection Agency is the lead agency.

CHAPTER VI
DEVELOPMENT OF RESTORATION OPTIONS

Development of a plan to "restore, replace, or acquire the equivalent" of the natural resources and services injured by the oil spill requires consideration of a wide range of alternative field projects, management actions, and resource acquisitions. The goal of such a plan will be to restore injured resources and services to their baseline—in other words, pre-spill—conditions.

Until now, the goal of the restoration planning process has been to identify the widest possible array of alternatives, based on suggestions from the public, ~~the advice of damage assessment investigators~~ and technical experts, and the literature. Although RPWG will continue to invite ideas about restoration alternatives throughout the planning process, we now can begin to organize the ideas suggested to date and to gather the information necessary to evaluate them.

To that end, RPWG has developed a series of summary tables, or matrices, that portray potential restoration alternatives in relation to categories of potentially injured resources. Although the matrices are broadly inclusive, they do not cover suggestions that are unrelated to the goals of the restoration program (e.g., ideas for legislation pertaining to future oil spills). Also, for convenience, many individual recommendations have been combined into single alternatives, and there is considerable overlap among the various items and matrices.

The potential restoration alternatives are presented largely without regard to geography, because most options are potentially applicable to more than one site or geographic area. In general, direct restoration projects would be implemented on-site, at one or more localities within the oil-spill area. In contrast, projects which replace or acquire equivalent resources may take place outside the spill area.

Matrices are provided for each category of potentially injured resource: coastal habitats, fish and shellfish, birds, mammals, cultural resources, recreation. A final matrix includes potential restoration approaches that may apply to multiple resource categories.

The cells of the matrices have been left blank. Readers are encouraged to use these matrices to help organize their own thinking about potential restoration alternatives. Suggestions about additional options and other ways to evaluate them are welcome and invited. Future reports will include evaluations of the cells in the matrices.

COASTAL HABITATS

Matrix of Potential Restoration Approaches

	Categories of Injured Resources									
	Supratidal Zone					Intertidal Zone				
	Rocky, exposed	Rocky, sheltered	Estuarine, salt marsh (incl. marsh)	Coarse-textured cobble/ pebble	Fine-textured cobble/ pebble	Rocky, exposed	Rocky, sheltered	Estuarine, salt marsh (incl. marsh)	Coarse-textured cobble/ pebble	Fine-textured cobble/ pebble
Hasten natural recovery of communities and ecosystems by transplanting or "reseeding" flora/fauna										
Increase primary productivity in plant communities by fertilizing intertidal/supratidal habitats										
delete / Improve conditions for re-establishing vegetation by removal of residual oil through low-impact substrate aeration techniques (e.g., raking)										
Long-term research/monitoring program on such topics as residual oil in the environment, rates of natural recovery, and the character of subsequent ecosystems										
Acquisition/protection of upland areas to protect adjacent coastal habitats from degradation										
Control of erosion by placement of rip-rap, re-establishing vegetation, and other methods										
Change management practices at selected sites/habitats (e.g., temporarily restrict access)										
delete / Physically replace substrates contaminated by residual oil										
Establish new marine parks/sanctuaries										

COASTAL HABITATS

Matrix of Potential Restoration Approaches

Potential Restoration Approaches	Categories of Injured Resources				
	Subtidal Zone				
	Rocky, exposed	Rocky, sheltered	Estuarine, shell-bed (incl. marsh)	Coarse-sediment cobble/ pebble	Fine-sediment cobble/ pebble
Hasten natural recovery of communities and ecosystems by transplanting or "reseeding" flora/fauna					
Increase primary productivity in plant communities by fertilizing intertidal/supratidal habitats					
Improve conditions for re-establishing vegetation by removal of residual oil through low-impact substrate aeration techniques (e.g., raking)	delete				
Long-term research/monitoring program on such topics as residual oil in the environment, rates of natural recovery, and the character of subsequent ecosystems					
Acquisition/protection of upland areas to protect adjacent coastal habitats from degradation					
Control of erosion by placement of rip-rap, re-establishing vegetation, and other methods					
Change management practices at selected sites/habitats (e.g., temporarily restrict access)					
Physically replace substrates contaminated by residual oil	delete				
Establish new marine parks/sanctuaries					

FISH AND SHELLFISH

Matrix of Potential Restoration Approaches

Potential Restoration Approaches	Categories of Injured Resources								
	Salmon								
	Eggs	Juveniles	Adults	Herring	Sport fish	Groundfish	Rockfish	Shrimp and crab	Bivalves
Construct new hatcheries and/or expand existing hatcheries to provide additional fish for stocking programs									
Improve productivity in stream/lake habitats by construction of fishways, fertilization of lakes, and other means of enhancement									
Enhance wild stocks/populations rather than hatchery stock through placement of egg boxes and other means of enhancement									
Preserve gene pools and local populations through "ocean ranching"									
Improve resource assessments to enable better management decisions									
Identify and catalog individual stocks to enable more targeted management actions									
Catalog and protect spawning habitats									
delete Clean/supplement spawning substrates									
Close, restrict, or shift fisheries to speed natural recoveries									
Redirect fisheries efforts to alternative species									
Restrict high-seas interceptions to provide more spatiotemporal control over fish mortality									

MAMMALS

Matrix of Potential Restoration Approaches

Potential Restoration Approaches	Categories of Injured Resources							
	Humpback Whales	Killer Whales	Steller's Sea Lions	Harbor Seals	Sea Otters	Sitka black-tailed deer	Bears, brown and black	River Otter and Mink
Supplement winter-season foods for stressed animals feeding in intertidal habitats (e.g., provide rockweed for deer)								
Preserve areas that support foraging habitat (e.g., mussel beds and eelgrass for sea otters)								
Acquire/protect habitats in uplands (e.g., old-growth forest), and along streamsides and coastal perimeter								
Acquire/protect important habitats such as haulout/rookery sites and whale "rubbing" beaches								
Establish new wildlife refuges, sanctuaries, and viewing areas								
Protect marine mammals by buying back limited-entry gillnet permits								
Establish international wildlife rehabilitation/public education center								
Reduce human-use impacts/conflicts through management changes (e.g., closures of fishing, trapping seasons)								
Conduct long-term monitoring/research program on such topics as causes of decline in sea lion population								
Conduct long-term monitoring/research program on small mammals								
Minimize disturbance/illegal shooting through public education and law enforcement								
Translocations to augment populations within and outside of oil-spill area								
Establish mobile veterinary pathology unit								
Reduce entanglement/marine debris problems and expand stranding/entanglement response network (a rescue operation)								
Eliminate high-sea gillnet fisheries and the resulting incidental mortality to marine mammals								
Restrict/eliminate legal harvest of marine/terrestrial mammals								
Acquire/protect alternative sites such as polar bear denning areas and walrus mating and calving areas								

Far off in-kind replacement why here?? Did we delete.

CULTURAL RESOURCES

Matrix of Potential Restoration Approaches

Potential Restoration Approaches	Categories of Injured Resources					
	Subsistence hunting	Subsistence fishing incl shellfish	Archaeological or historical sites	Burial sites	Public trust in government	Public perception about the environment
Protect cultural sites from erosion or other degradation using environmentally-compatible techniques (e.g., stabilize sites by revegetation)						
Inventory beach and upland sites for cultural resources						
Develop techniques to remove oil residue from artifacts for which radiocarbon dating is needed						
Improve enforcement of historic preservation laws						
Return artifacts removed by archaeologists or clean-up workers						
Conduct inventory/produce brochure with photographs of artifacts originating from oil-spill area that are now in museum collections						
Implement a "site steward" program that employs local residents to watch over/protect cultural sites						
Return privately-owned Native artifacts to public collections						
Increase public education/law enforcement to reduce vandalism and looting of historical, archaeological, and burial sites						
Provide information about status/quality of subsistence resources (e.g., regarding contaminant levels in shellfish)						
Provide local laboratory to which subsistence users can bring tissues for contaminants analyses						
Encourage hands-on public participation in implementing selected restoration projects in the field						
Help develop economic base for rural village residents (including analysis of subsistence economies)						

RECREATION

Matrix of Potential Restoration Approaches

Potential Restoration Approaches	Categories of Injured Resources						
			Sport Fishing				
	Marine	Freshwater	Salmon	Trout / char	Halibut	Rockfish	Shellfish
Provide alternative destinations (e.g., public-use cabins, camp sites) for recreation users							
Acquire private "inholdings" within publicly-managed lands (e.g., parks, refuges, forests)							
Acquire strategic sites/public access within blocks of privately-owned land and along coasts/rivers							
Acquire development rights, easements, etc. (less than fee-simple title) on private lands							
delete / Implement special oil clean-up program for prime recreation sites and within units of the National Wilderness Preservation System — Use Restore							
Revise public lands management plans with respect to resource development and other activities that may further degrade recreational resources							
Enhance public understanding by interpreting the oil spill and present state of the environment							
Acquire/protect "threatened" wilderness/recreation areas within and outside of Alaska							
Establish new parks, refuges, and other protected areas							
Discourage increased use of sites/areas where pre-spill uses were low or where continued use of oiled sites would slow recoveries							
Enhance management capacity/revise regulations in response to increased awareness of recreational opportunities following oil spill publicity and clean up							
Develop unified, factual tourism/public information program (within state agencies and between state-private interests)							
Publish brochure to educate recreational boaters about environmental protection							
Construct/maintain interpretive facilities in oil-spill communities, perhaps associated with state or federal conservation units (e.g., Kenai Fjords National Park, Kachemak Bay State Park)							

RECREATION

Matrix of Potential Restoration Approaches

Potential Restoration Approaches	Categories of Injured Resources						
	Hunting				Boating		
	Deer	Bear	Waterfowl	Trapping	Pleasure (power / sail)	Kayaks and canoes	Charters, tour boats, etc.
...vide alternative destinations (e.g., public-use ...ins, camp sites) for recreation users							
...re private "inholdings" within publicly-managed ... (e.g., parks, refuges, forests)							
...re strategic sites/public access within blocks of ...-owned land and along coasts/rivers							
...e development rights, easements, etc. (less than ...ple title) on private lands							
...nt special oil clean-up program for prime ...on sites and within units of the National ...s Preservation System delete							
...blic lands management plans with respect to ... development and other activities that may ...grade recreational resources							
... public understanding by interpreting the oil ... present state of the environment							
...ect "threatened" wilderness/recreation ...in and outside of Alaska							
... parks, refuges, and other protected ...							
... increased use of sites/areas where pre-spill ... low or where continued use of oiled sites ... recoveries							
...agement capacity/revise regulations in ... increased awareness of recreational ... following oil spill publicity and clean up							
..., factual tourism/public information ...within state agencies and between ... interests)							
...re to educate recreational boaters about ... protection							
...ain interpretive facilities in oil-spill ...ntage associated with state or federal ... (e.g., Kenai Fjords National Park, ...State Park)							

RECREATION

Matrix of Potential Restoration Approaches

Potential Restoration Approaches	Categories of Injured Resources						
	Camping		General Outdoor / Natural History				
	Public-use cabins/ sites	Low-impact	Hiking and climbing	Berry picking, picnicking, etc.	Photography	Nature study	Existence values
Provide alternative destinations (e.g., public-use cabins, camp sites) for recreation users							
Acquire private "inholdings" within publicly-managed lands (e.g., parks, refuges, forests)							
Acquire strategic sites/public access within blocks of privately-owned land and along coasts/rivers							
Acquire development rights, easements, etc. (less than fee-simple title) on private lands							
delete Implement special oil clean-up program for prime recreation sites and within units of the National Wilderness Preservation System	delete						
Revise public lands management plans with respect to resource development and other activities that may further degrade recreational resources							
Enhance public understanding by interpreting the oil spill and present state of the environment							
Acquire/protect "threatened" wilderness/recreation areas within and outside of Alaska							
Establish new parks, refuges, and other protected areas							
Discourage increased use of sites/areas where pre-spill uses were low or where continued use of oiled sites would slow recoveries							
Enhance management capacity/revise regulations in response to increased awareness of recreational opportunities following oil spill publicity and clean up							
Develop unified, factual tourism/public information program (within state agencies and between state-private interests)							
Publish brochure to educate recreational boaters about environmental protection							
Construct/maintain interpretive facilities in oil-spill communities, perhaps associated with state or federal conservation units (e.g., Kenai Fjords National Park, Kachemak Bay State Park)							

MULTIPLE RESOURCE APPROACHES

Matrix of Potential Restoration Approaches

Potential Restoration Approaches	Coastal Habitat	Fish and Shellfish	Birds	Mammals	Cultural Resources	Recreation
...back Bristol Bay oil leases						
...ire timber, oil, and other industries to provide restoration plans before resource extraction						
...nt future oil spills through stronger regulations and improved planning						
...ng capacity to respond to/clean up future spills, both small and large						
...ce future marine oil spills during the production by stopping offshore/coastal drilling						
...clude development of oil resources in the Arctic National Wildlife Refuge						
...nt forests to make up for the voluminous paperwork caused by the oil spill						
...restation programs wherever logging has occurred (e.g., Afognak Island)						
...ify and clean up old community and military dump sites						
...ate use of plastics and clean up plastic debris in marine environment						
...ve mine tailing and clean up mining and logging debris						
...ent future oil spills and related impacts by reducing energy consumption through improved ...ency and conservation						
...t oil-spill communities with environmentally-sound waste disposal and waste recycling ...rams						
...vide garbage tenders for at-sea collection of waste materials						
..."net operating losses" (NOLS) of timber sales and change laws to disallow NOLS						
...chase development rights or provide tax incentives for not logging/developing private lands						
...ase timber rights within state and federal protected areas and in buffer strips along streams ...the coast	delete					
...w management plans to assess the appropriateness of multiple land use designations						
...ct logging, mining, fishing, hunting, and hydroelectric developments to reduce cumulative ...cts to the environment						
...w "glacier ice" industry for possible management changes						
...blish trust fund to support long-term research/monitoring						
...blish trust fund to support future needs for land/habitat acquisition						
...blish trust fund to support long-term and future needs in restoration and enhancement						
...blish fund to support the mitigation of losses of wetland habitats						
...blish Long-Term Ecological Research sites (a program sponsored by the National Science ...Foundation) and provide funds to support research/monitoring at those sites						
...ance and support facilities/institutions in oil-spill communities that can carry out or provide ...ical support for monitoring/research programs						
...port and equip fleet of marine vessels to conduct research/monitoring activities and ...pond to remote oil spills						

CHAPTER VII
FUTURE RESTORATION PLANNING ACTIVITIES

This report is the first in a series of ~~what are anticipated to be annual progress~~ progress reports. Future reports will document our ongoing efforts as described below.

Public Participation

The RPWG recognizes that more public outreach is necessary and has considered several ideas to expand this effort. These include a specific effort to incorporate Native interests and ideas about restoration, visits to smaller communities for informal meetings, creation of one or more public advisory committees, publication of a restoration newsletter, producing and distributing short public information video tapes explaining the restoration process, and additional scoping meetings in Canada and the lower 48 states.

Feasibility Projects

In the summer of 1991, an increased number of restoration feasibility projects is expected. Promising 1990 studies could be continued or expanded. Some projects might be tested in a wider geographic area, including areas outside of Prince William Sound.

Technical Workshops/ Peer Review Process

Additional technical workshops will be held with key scientists to develop restoration feasibility projects for 1991 and to develop an overall monitoring plan to evaluate restoration and recovery. A scientific peer review process will be designed and integrated into these efforts to ensure effective and efficient progress toward a restoration plan.

RPWG CC

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OFFICE OF OCEANOGRAPHY AND MARINE ASSESSMENT
ROCKVILLE, MARYLAND 20852

JUL 13 1990

Mr. Conrad Klevano, Director
Alaska Restoration Task Force Office
U.S. Environmental Protection Agency
Washington, DC 20460

Dear Conrad,

The Restoration Planning Work Group has done a good job of laying out a wide range of restoration alternatives for the area affected by the EXXON VALDEZ oil spill in its June 1990 Progress Report. Clearly much work remains to be done to determine the feasibility and cost-effectiveness of any of these alternatives.

The Work Group has laid out a systematic approach to address this challenge through its proposed literature search, planned technical meetings, pilot projects, and public outreach efforts. However, a schedule of restoration planning and implementation activities would be useful to include in the report. A discussion of alternative arrangements, both short- and long-term, for financing restoration projects would also help. Finally, the report does not make clear to its readers the scientific uncertainties and other problems of implementing and evaluating restoration projects.

Our specific comments, mostly editorial, are enclosed.

Sincerely,

Chuck Ehler

Charles N. Ehler
Director

Enclosure

Comments on Draft Restoration Progress Report

Pg. 6, 1st paragraph:
The last sentence of this paragraph could be read to imply that the public will be compensated for natural resource injury (i.e., paid money), in addition to the restoration of the injured resources. This sentence should be re-written as follows: "... these efforts seek to minimize adverse impacts and compensate the public for natural resource injury by restoring the injured resources and the services they provide."

Pg. 8, 1st paragraph:
Put a period after the words "responsible parties" in the last sentence and delete "or the state and federal governments."

Pg. 12, last paragraph:
Walrus do not use the area affected by the spill. It's misleading to refer to this public comment without at least a footnote. Walrus habitat restoration is also included in the mammal matrix on page 51.

Pg 28:
The third bullet under information needs for coastal habitats should be deleted. It suggests that we need to spend money to distinguish between the effects of oil and the effects of the cleanup on coastal habitats. We question this premise since injuries from both should be part of the damage claim. There would have been no cleanup injuries if the oil hadn't been spilled.

Pg. 39, last paragraph:
The word "seeds" should not be used in the third sentence. *Fucus* propagates through cell division and/or spores. If the word "seeds" was used for non-scientific readers, we believe most people would understand "spores."

Pg. 41, 2nd paragraph:
Most of the potential 1991 feasibility studies (except nos. 4 and 7) overlap with on-going damage assessment studies and should be coordinated with the Management and Legal (Economic) Teams of the Natural Resource Damage Assessment Program before being initiated to avoid duplication.

Pgs. 44-56:
Some of the suggestions in the matrices on these pages could not qualify as "restoration" alternatives. However, since the document makes no attempt to screen the public comments, we are not commenting on these at this time. The screening can and should come later.

pg. 57:
The "Multiple Resource Approaches" matrix seems to be a catch-all for some of the more eccentric restoration proposals. Most of the suggested approaches do not qualify as restoration, no matter how broadly that word is interpreted. We propose deleting this matrix since it gives respectability to suggestions that are already described elsewhere in the text. If the public thinks the natural resource trustee agencies will automatically consider any suggestion, no matter how far fetched, we all lose credibility.

RPWG CC

MEMORANDUM

SUBJECT: REVIEW OF DRAFT RESTORATION PROGRESS REPORT

FROM: Royal J. Nadeau
Environmental Response Branch

TO: Conrad Klevano, Director
Alaska Restoration Task Force Office

Conrad, thank you for the opportunity to review and comment on the first progress report from the Restoration Planning Workgroup in Anchorage.

Those of us that have been involved in similiar tasks in the past certainly appreciate the complexities and monumental effort that has gone into this effort. The Workgroup is to be commented. However, their work has just begun. It is with this thought in mind that I will address and comment on this report.

CHAPTER TWO PUBLIC PARTICIPATION AND THE PLANNING PROCESS

It appears that the Workgroup has solicited and received ideas, concepts and comments from all possible public and special interest groups that feel that they were impacted some way or another by the Exxon Valdez oil spill. Unfortunately, having to satisfy the interests of each of these groups, in my viewpoint, is nearly impossible although a noble intention. Most important and foremost, is to let these groups know that their interests are being known and will be considered to the most extent possible through the community process. For the Nepco 140 oil spill in 1976, the primary organization in charge of producing the report went to the governing bodies of each township affected by the spill for their input in addition to conducting public meetings on the outcome of the studies. An important point to bear in mind is differences in perspectives in what restoration means to people. Those technically oriented will gravitate to trying to address the ecological/ environmental issues of restoration. I emphasize that these studies are only a small part of the total restorative concept that people may have. In fact, an important and perhaps most important is how Alaskans perceive the restorative process. How about the concept that Alaskans have about their social and economic condition following the spill? Will their perception of the oil industry ever return to pre-spill conditions? I raise these questions to tickle the Workgroup to possibLy be ready to draw inferences or deductions from their overall efforts. In Alaska where the social and economic condition of the people is so closely tied to the condition of the environment, I cannot think of addressing one without looking at the other. I think that the comments expressed in Chapter Two reflect that premise.

CHAPTER THREE Technical Workshop

Many of the projects/information needs set forth in this chapter sound like general items that someone (or agency) has wanted to know for years. They decided that now is as good a time as any to dragged them of the closet and give it another go at funding. The Workgroup will have to establish some stringent funding criteria to determine which of these information needs is most critical for evaluating the restorative process. These criteria should be determined ASAP for funding the technical studies especially to avoid the political influence so often present when funding becomes available.

CHAPTER SIX Development of Restorative Options

This is beyond a doubt the substance of the report as the universe of restoration possibilities is presented. It reflects the ingenuity and innovation of the workgroup plus all those that are interested in seeing the environment of Prince William Sound and the Gulf of Alaska return to its pre-spill environmental condition. The list of factors to consider in evaluating potential restoration alternatives are well chosen. Eventually a numerical value may be considered in order to rank the options presented in the matrix for funding or action. Again performing such a ranking will enhance the Workgroups findings and acceptance by their constituents.

OVERVIEW

If you consider restoration as one gigantic remedial process, some of it man-induced; most of it natural, then you have to include man as part of the total system that has been affected. Therefore, it is important to maintain the human focus which the Workgroup seems to be aware of in this report. As more and more technical information becomes available from the feasibility studies, the human aspect could easily be de-emphasized. Strong and persistent efforts must be exerted to avoid de-humanization.

Again, thank you for opportunity to respond.

RPwG
CC

United States
Environmental Protection
Agency

Region 10
1200 Sixth Avenue
Seattle WA 98101

Alaska
Idaho
Oregon
Washington

EPA

JUL 09 1990

MEMORANDUM

Subject: July 1990 Draft Restoration Planning Progress Report

From: John Armstrong Michael Rylko FOR

To: Brian Ross, EPA Restoration Planning Team Leader

I have attached all of the comments that I have received to date from Region 10 personnel regarding the current draft Restoration Planning Report. We can talk about these more when I see you this week. Good luck with things until then!

United States
Environmental Protection
Agency

Region 10
1200 Sixth Avenue
Seattle WA 98101

Alaska
Idaho
Oregon
Washington

EPA

CONFIDENTIAL
ATTORNEY/CLIENT
COMMUNICATION

Reply to
Attn of: SO-125

7/9/90

MEMORANDUM

SUBJECT: Comments on Draft Restoration Progress Report

FROM: Martha Fox

TO: Michael Rylko for Tom Armstrong

My one major comment on the Draft Report concerns Chapter VI and the matrix of potential restoration approaches. Some of the potential approaches that the RPWG proposes to evaluate - while related to the goals of restoration - appear to me to be legally questionable as bases for obtaining natural resources damages. Examples include establishment of new marine parks/sanctuaries, elimination of high-seas gillnet fisheries, acquisition of polar bear denning and walrus mating and calving areas, and designation of PWS as a National Monument.

I have not, as yet, discussed this with Brian Ross or Jim Nicoll and other members of the legal team. At this point, I do not see a problem with including these alternatives in the matrix for purposes of the progress report. However, I do think, particularly given the limited resources of the RPWG, that there should be some assessment of the legal viability of potential restoration approaches before time and money is spent evaluating them.

7/9/90

Comments on the Draft Report
Restoration following the Exxon Valdez Oil Spill
July 1990 Progress Report

Specific Comments

p. 7 - Explain how the Restoration Planning Work Group (RPWG) makes decisions - i.e., majority vote, concensus...The RPWG looks like it has a lot of members from the state of Alaska, and that these members might "control" the group.

p. 9 - Second sentence - Explain how the RPWG is "continuing to identify ways to incorporate public comments and concerns into the planning process."

p. 39 - Second to last sentence on the page - I thought the laboratory part of the Fucus sp. study has been dropped.

p. 43 - Third to last sentence - Please give an example of how the reader might "use these matrices to help organize their own thinking about potential restoration alternatives." How does the RPWG plan to use these matrices?

p. 59 - Suggest rewording the first sentence in the section headed Technical Workshops/Peer Review Process.

General Comments

I suggest adding a figure or flow diagram showing how the restoration process will work. This diagram would show the order and ties between public involvement and input to damage assessment study results, feasibility studies, monitoring, actual restoration, and so on.

I don't believe the report is clear in showing how public involvement and input or comments will actually ever be used. Are we merely informing the public and giving them a chance to talk or are we going to actively evaluate and prioritize each option or suggestion they give us. I believe the July 1990 draft report should address this.

Finally, how and when will decisions be made as to what restoration approaches are actually going to be implemented.

5744
6665

U.S. EPA REGION 10

NEW FAX NUMBER

WATER
DIVISION

FAX: (206) 442-0165
FTS 399-0165

TO CONFIRM YOUR FAX CALL:
(206) 442-1086
FTS 399-1086

TO: Brian Ross

PHONE NUMBER: 907 271-2461

CITY, STATE / REGION:

FAX NUMBER: 907-271-2467

FROM: John Armstrong

PHONE NUMBER: 399-1368

CITY, STATE / REGION:

TOTAL PAGES: [illegible] 5

ADDITIONAL REGION 10 FAX NUMBERS:

Should be 4 (not 5)

RPWG CC

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10

June 30, 1990

REPLY TO ATTN OF: Restoration Planning Office

MEMORANDUM

SUBJECT: Transmittal of Draft Restoration Progress Report

FROM: Brian Ross for Restoration Planning Work Group

TO: Brian/Stan/Work Group Members —
I would like to commend the group for the excellent job on the report. It logically lays out the process and gives a world of ideas for those individuals that want to become involved. Please pass my "congrats" to the Group for this job well done. We'll keep trying here, too! Conrad

attac you review the
Progr Spill: July 1990
Resto o date under the
meet al public scoping
study e 1990 feasibility
resto ceived regarding
resou options for the
repo e discussed in the

report is due July. finalization of this
your review. Work Group members are available to meet with you in Anchorage or Juneau ime available for
to answer any questions you may have, or to help develop a consolidated set of comments for revising the report as efficiently as possible. We understand that a Management Team meeting may be held on July 10 or 11; if necessary we can be available to work with you at that time. Should there be any questions in the interim, please contact your agency's Work Group member directly, or call the Restoration Planning Office at (907) 271-2461.

ATTACHMENT

cc: RPWG members

CHAPTER III
TECHNICAL WORKSHOP

To gather scientific input for the restoration planning process, a technical workshop was held April 3-5, 1990, in Anchorage, Alaska. The three-day workshop provided the first opportunity for a general exchange of ideas on restoration among scientists and resource managers. Due to the necessity of discussing litigation-related damage assessment information, this workshop was closed to the public.

Participants in this workshop included members of the RPWG, federal and state resource managers, investigators conducting damage assessment studies, and technical experts from academic institutions or the private sector. These technical experts were selected based on their experience in restoration of natural resources or their specific knowledge of a particular resource (e.g., marine mammals). Most participants had direct experience with these resources in Alaska.

Results of Workshop

Workshop participants identified potential restoration projects and discussed these ideas in terms of effectiveness, feasibility, and applicability to the spill area. An overview of available damage assessment results helped guide the discussions.

The workshop was divided into six s
shellfish, birds, terrestrial and marine
recreational resources. Each of the sess
tives which might be effective in addres
resources. The groups were instructed t
tion options. Chapter VI (Development o
the restoration alternatives discussed at

We need a copy of the overview.

Council

To address scientific uncertainties about
shop participants developed a list of pot
stration projects. These studies were de
ration alternatives for their likely effecti
to the spill area. Projects which were
summer of 1990 are described in Chapt

What has been done to acquire the needed information identified. Identifying these needs in data indicates some weakness in case against Exxon

In addition, workshop participants ide
are fundamental to the development of a comprehensive restoration plan. The additional information needs identified by each session are summarized below.

Many of these needs will assist in identifying a monitoring program.

cipants in each
tural resource
future restora-

and species of
unavailable at
was also inad-
ling, ecological
attributable to
mmunities and

species affected by the spill. Specific information needs to address these unknowns include:

- Area and proportion of Prince William Sound shorelines composed of sandy beaches, cobble beaches and rocky shores in relation to distribution and degree of oiling.
- Clean-up options (no clean-up efforts, hot water rinse, cold water rinse, bioremediation) used for each of the three habitat types (supratidal, intertidal, and subtidal), and proportion of each shoreline type exposed to each cleanup technique.
- Direct effects of exposure to oil and whether these effects can be distinguished from the effects of the clean-up efforts. Monitoring of Prince William Sound shorelines for long-term effects including the effects of both oil and clean-up efforts.
- Effects of clean-up on *Fucus* and proportion of the population which was exposed to oil and to various clean-up methods.
- Amount and concentration of oil that reached subtidal sediments within Prince William Sound; specific benthic communities within those sediments are likely to be sensitive to petroleum hydrocarbons; rates of natural recovery.
- Areal extent and exposure of supratidal marshes to oil.
- Land status/habitat overlay to synthesize all information relative to existing and proposed land use, management and ownership, wildlife and fisheries habitats, recreational use and cultural resources. Information should be assembled and presented in a GIS-type format.

CHAPTER V
FEASIBILITY STUDIES

Restoration feasibility studies are a means to establish feasibility in cases for which there is uncertainty of success or benefit, given the particular species and environment within the oil-spill area. Such studies can also help determine the cost of implementing full-scale restoration projects and help evaluate associated environmental impacts and benefits.

Many ideas for restoration projects have been suggested—and continue to be st
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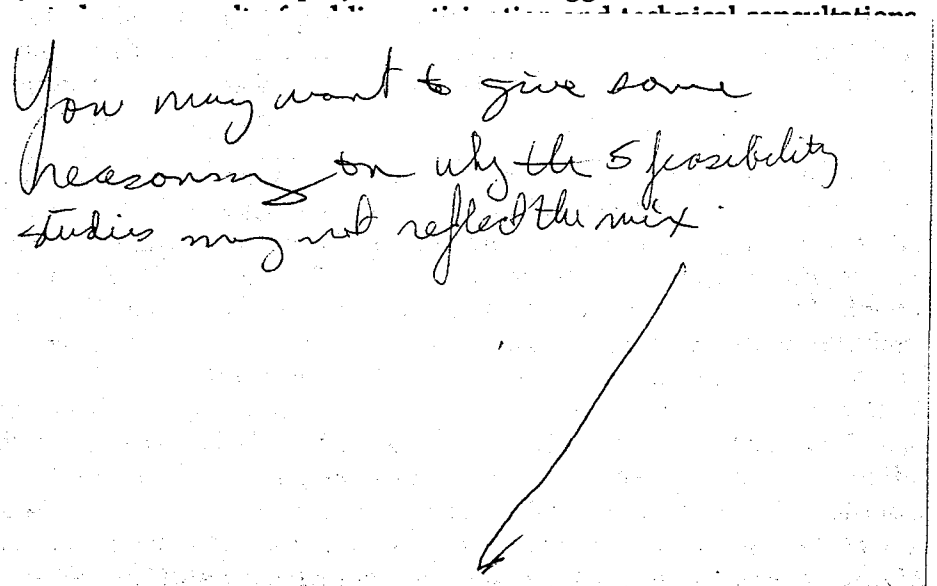

Spill. Note that these five feasibility studies may not reflect the mix of restoration projects that will be recommended in a restoration plan.

Restoration Feasibility Study Number 1: Reestablishment of *Fucus* sp. in Rocky Intertidal Ecosystems.

The marine alga, *Fucus* sp., is a critical structural component of the intertidal ecosystem on rocky shores. Qualitative evidence indicates that it was damaged by both the spilled oil and cleanup efforts. If the natural recovery of *Fucus* sp. can be enhanced through the dispersal of seeds or transplants, it will benefit the associated flora and fauna on intertidal rocky shores. This study involves both laboratory and field tests to develop and demonstrate the feasibility of a *Fucus* sp. restoration project. The U.S. Environmental Protection Agency is the lead agency.

CHAPTER VI
DEVELOPMENT OF RESTORATION OPTIONS

In the matrix — an option in all the categories is the - let nature do it - or a "do nothing approach" - Even though this is discussed briefly from a monitoring point of view, it has to appear as an option.

...process, we now can begin to ... the ideas suggested to date and to gather the information necessary to evaluate them.

To that end, RPWG has developed a series of summary tables, or matrices, that portray potential restoration alternatives in relation to categories of potentially injured resources. Although the matrices are broadly inclusive, they do not cover suggestions that are unrelated to the goals of the restoration program (e.g., ideas for legislation pertaining to future oil spills). Also, for convenience, many individual recommendations have been combined into single alternatives, and there is considerable overlap among the various items and matrices.

The potential restoration alternatives are presented largely without regard to geography, because most options are potentially applicable to more than one site or geographic area. In general, direct restoration projects would be implemented on-site, at one or more localities within the oil-spill area. In contrast, projects which replace or acquire equivalent resources may take place outside the spill area.

Matrices are provided for each category of potentially injured resource: coastal habitats, fish and shellfish, birds, mammals, cultural resources, recreation. A final matrix includes potential restoration approaches that may apply to multiple resource categories.

The cells of the matrices have been left blank. Readers are encouraged to use these matrices to help organize their own thinking about potential restoration alternatives. Suggestions about additional options and other ways to evaluate them are welcome and invited. Future reports will include evaluations of the cells in the matrices.

PAGE NO.

July 10, 1990

PREPARED BY

DATE

(DOA, D.C.)

Bill Opfer / Comments on Draft Restoration Report

- Report might generate more questions than it answers.

~~Example:~~

- How well is it tied into damage assessment process. No plan is presented. Questionable on putting this out as a public doc.

- Damage assessment & restoration plan - a few more words in this document -

- Chapter 5 - Feasibility Studies - questions about what may be funded.

No legal problems from USDA-OGC.

executive

Charles Openchowski
RPWG
CC

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OMEP

July 6, 1990

Alaska Restoration Task Force Office

OFFICE OF WATER

MEMORANDUM

SUBJECT: Review of Draft Restoration Progress Report

FROM: Conrad Kleveno, Director
Alaska Restoration Task Force Office

TO: Washington Policy Group
Interagency Technical Workgroup

Enclosed is a draft of "Restoration Following the Exxon Valdez Oil Spill: July 1990 Progress Report", prepared by the Restoration Planning Workgroup in Anchorage. This report summarizes the activities carried out to date under the Restoration Planning Project, including the Restoration Symposium, local public scoping meetings, the technical workshop, the initial literature review, and the 1990 feasibility study projects. The report also documents public comments received regarding restoration options and approaches, and provides matrices of these options for the resources potentially injured by the spill. No data from NRDA studies are discussed in the report.

Currently, this draft is being reviewed by the Trustee Council's management and legal teams. It is my understanding that the Trustee Council's target date for finalization of this report is mid-July. In order to incorporate all Trustee agency viewpoints and to facilitate production of the report, I ask that you forward your comments to me by phone at (245-3911) or by fax (382-6294) by the close of business on July 9. One of my staff will hand carry your comments to the Restoration Planning Workgroup and Management team for their meeting on July 11.

Thank you for your quick attention to this critical report. Task force members are available to talk with you and answer any questions you may have. Please feel free to call me at 245-3911 or Ruth Yender at 245-4370.

Attachments

CHAPTER I
INTRODUCTION

The March 24, 1989, grounding of the tanker *Exxon Valdez* in Alaska's Prince William Sound caused the largest oil spill in U.S. history. A slick containing about 11 million gallons of North Slope crude oil covered the western portion of the Sound and moved for over 500 linear miles along Cook Inlet and the northern Gulf of Alaska. Over 1,000 miles of shoreline were moderately to heavily coated. The spill damaged areas extremely rich in natural resources. It injured fish, birds, mammals, intertidal plants and animals and their associated habitats. The area's important archaeological and historical resources, not widely known about before the spill, also were damaged as a result of oiling, cleanup activities and subsequent incidents of vandalism. The oil also affected recreational areas including state and national forests, refuges, and parks.

Soon after the spill occurred, President Bush and Alaska Governor Cowper declared the goal that the ecology and economies of Prince William Sound and the Gulf of Alaska be fully restored. Full restoration of these natural resources and the services they provide is in turn the responsibility of the federal and state agencies which manage and protect them on behalf of the public. As authorized by federal law, the state and federal governments intend to present claims to the responsible parties for the injuries caused to natural resources and their uses. The funds received from these claims must be used to restore the natural resources and services injured by the spill.

Response, Damage Assessment, and Restoration

Federal law guides actions undertaken by federal and state governments following the *Exxon Valdez* oil spill. Section 107(f) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Section 311(f) of the Federal Water Pollution Control Act (Clean Water Act) provide for federal and state officials to act as trustees of natural resources and to pursue recovery of damages for injury to those resources.

CERCLA applies to spills of hazardous substances other than oil, while the Clean Water Act applies to oil spills. Both laws are supplemented by the Natural Resource Damage Assessment (NRDA) regulations, which set out a suggested, but not mandatory, process for determining proper compensation to the public for injury to natural resources. CERCLA, the Clean Water Act and the NRDA regulations provide the structure for the response, damage assessment, and restoration activities following the *Exxon Valdez* oil spill.

Restoration is one component of an overall process. Combined with response and damage assessment, these efforts seek to minimize adverse impacts, compensate the public for natural resource injury, and provide for the recovery of natural resources and their uses.

Response activities include the initial emergency measures to contain the spilled oil and minimize adverse impacts, as well as the subsequent efforts to clean up oil from the spill area. The magnitude of and circumstances surrounding the *Exxon Valdez* oil spill resulted in relatively little of the spilled oil being contained. Consequently, cleanup activity focused primarily on removing oil from the shoreline areas affected by the spill. At the time of this report, more than one year after the *Exxon Valdez* ran aground, cleanup efforts continue.

State and federal agencies initiated approximately sixty scientific studies soon after the oil spill to determine the amount of damage. This damage assessment process, which continues in 1990, is designed to quantify the specific resource injuries and determine their corresponding monetary values. This includes the monetary valuation of reduction in uses that the natural resources can provide ("lost use" value), as well as the costs of activities that will be necessary to restore the ecosystem and its uses to pre-spill conditions. Claims for these damages will be presented to the responsible parties, and under federal law the monies received are to be used for restoration, replacement or acquisition of equivalent natural resources. diff't words

Definition of Restoration

Restoration culminates the spill response and damage assessment process by planning for and implementing activities to restore the condition and uses of the affected natural resources.

Restoration is specifically defined under ~~CERCLA and~~ the NRDA regulations as follows:

> "Restoration" or "rehabilitation" means actions undertaken to return an injured resource to its baseline condition, as measured in terms of the injured resource's physical, chemical, or biological properties or the services it previously provided...

Restoration actions fall into three categories: direct restoration, replacement, and acquisition of equivalent resources.

- "Direct restoration" refers to measures taken, usually on-site, to directly rehabilitate an injured resource.
- "Replacement" refers to substituting one resource for an injured resource of the same type.
- "Acquisition of equivalent resources" means to purchase or otherwise protect resources that are the same or substantially similar to the injured resources in terms of ecological values, functions, or uses.

* we need to say that we're not bound to these definitions (even tho' it is quite useful & relevant) because we're not decided to use NRDA process for sure — earlier reference on p. 5 is not sufficient, in my opinion.

here do not track the NRDA regs the definitions — ? where do they come from? ② are they binding?

It is important to understand that a full damage assessment is not yet complete. The Restoration Planning Work Group, therefore, is developing the broadest possible list of potential restoration activities for resources that may have been injured. Once the damage assessment process is complete, appropriate activities will be recommended and incorporated in a detailed restoration plan. Such a plan can be implemented only when restoration funds become available from the responsible parties or the state and federal governments.

This progress report describes the restoration planning activities that have occurred to date. The public is encouraged to comment on this report and to share suggestions for restoration alternatives with the RPWG. Additional reports will be prepared throughout this process. Comments and questions should be addressed to:

Oil Spill Restoration Planning Work Group

437 E Street, Suite 301

Anchorage, Alaska 99501

(907) 271-2461

In late 1989, an interagency Restoration Planning Work Group (RPWG) was established to develop and coordinate restoration planning activities for the *Exxon Valdez* oil spill.

The goal of the restoration planning effort is to identify appropriate measures that can be taken to restore the ecological health and uses of natural resources affected by the *Exxon Valdez* oil spill. Specific objectives include:

- Identify or develop technically feasible restoration options for natural resources and services potentially affected by the oil spill.
- Incorporate an "ecosystem approach" to restoration (i.e., where appropriate, broadly focus on recovery of ecosystems, rather than on individual components).
- Determine the nature and pace of natural recovery of injured resources, and identify where direct restoration measures may be appropriate.
- Identify the costs associated with implementing feasible restoration measures, in support of the overall natural resource damage assessment process.
- Encourage, provide for, and be responsive to public participation and review during the restoration planning process.

The RPWG includes representatives of the following agencies:

Alaska Department of Fish and Game (ADFG)

Alaska Department of Natural Resources (ADNR)

Alaska Department of Environmental Conservation (ADEC)

U.S. Environmental Protection Agency (EPA)

U.S. Department of Agriculture (DOA)

U.S. Department of Commerce (DOC)

U.S. Department of Interior (DOI)

(RPWG Members are listed in Appendix A)

Nancy Jones RPWG CC

- Purchase or buy-back permanent logging rights for habitat protection of salmon streams. (Homer*)
- Create an Iliamna Wildlife Refuge by purchasing conservation easements on private Native land. (Anchorage)
- Protect marbled murrelets by purchasing lands adjacent to Kachemak Bay that are proposed for logging in the immediate future. (Homer*)
- Purchase wetlands and development rights adjacent to the Kenai River and complete inventory and mapping of wetlands adjacent to the river. (Soldotna*)
- Acquisition most cost-effective option; if oil remains, restoration and replacement activities are likely to be a waste of money. (Cordova)
- Skeptical that there are many direct restoration projects that can be done. There is loss of intrinsic values, use and habitat which must be balanced. (Anchorage)
- Acquire haulout/rookery areas for sea lions and seals. (Cordova, Homer)
- Acquire and protect otter and mink denning areas which require more than streamside habitat. (Valdez)
- Research, acquire, and protect nesting and roosting habitat for lesser and greater yellowlegs, great blue herons, marbled murrelets and yellow billed loons. (Valdez)
- Acquire private lands where there are seabird colonies. (Homer)
- Research and acquire migratory bird habitat along the Pacific flyway including an international effort to protect habitat in South American countries. (Homer)
- Consolidate Middleton Island for acquisition. (Homer)
- To restore the wilderness experience, acquire new, unspoiled areas. (Homer)
- Retain upland old growth for deer so further loss of their food base does not occur. (Anchorage)
- Allow a tax write off in return for a conservation easement; call it a net operating loss. Require the spiller to purchase the easement soon after the spill. (Anchorage)
- Establish national and international protected wetlands for birds. (Homer*)
- Provide major funding for Save the Rainforest International. (Homer*)
- Acquire Gull Island in Kachemak Bay for management by the USFWS to protect murres. (Homer*)

Fish and Shellfish

Before the oil spill, lower precision in fisheries management data was adequate for setting harvest and escapement levels. Post-oil spill, however, the added stress on species and uncertainty introduced by the spill have created the need for more precise management information. Specific information needs addressed in the fish and shellfish section include:

- Distinction between wild and hatchery stocks of adult pink salmon.
- Better real-time harvest data, escapement estimates and stock abundance information for salmon.
- Refinement of fish stock identification techniques such as otolith analysis and more rapid analysis of coded-wire tag data.
- Herring stock identification to separate stocks within Prince William Sound and outer Kenai/lower Cook Inlet.
- Inventory of herring spawning substrates/localities.
- Hydro-acoustic biomass estimates of resident herring stocks.
- Expanded escapement enumeration for commercial species of salmon in relation to oiled streams (would involve additional air and ground surveys).
- Basic biological information on rockfish; e.g., tagging fish on reefs and port sampling to provide population estimates. Need age-size database to identify recruitment rates.
- Trawl assessments of groundfish stocks.
- Petroleum hydrocarbon residuals contamination in clams and other shellfish.
- Better inventories of dolly varden and cutthroat trout population in streams throughout the oil-spill area.

Information Needs

These information needs are listed as developed by the participants in each workshop session. Many are being addressed by the natural resource damage assessment process. Others could be addressed by future restoration feasibility studies.

Coastal Habitats

Quantitative information on habitat types, communities, and species of Prince William Sound affected by the oil spill was generally unavailable at the time of the technical workshop. Available information was also inadequate to provide quantitative estimates of the degree of oiling, ecological effects caused by exposure to oil, possible ecological effects attributable to clean-up efforts and natural recovery rates of habitats, communities and species affected by the spill. Specific information needs to address these unknowns include:

- Area and proportion of Prince William Sound shorelines composed of sandy beaches, cobble beaches and rocky shores in relation to distribution and degree of oiling.
- Clean-up options (no clean-up efforts, hot water rinse, cold water rinse, bioremediation) used for each of the three habitat types (supratidal, intertidal, and subtidal), and proportion of each shoreline type exposed to each cleanup technique.
- Direct effects of exposure to oil and whether these effects can be distinguished from the effects of the clean-up efforts. Monitoring of Prince William Sound shorelines for long-term effects including the effects of both oil and clean-up efforts.
- Effects of clean-up on *Fucus* and proportion of the population which was exposed to oil and to various clean-up methods.
- Amount and concentration of oil that reached subtidal sediments within Prince William Sound; specific benthic communities within those sediments are likely to be sensitive to petroleum hydrocarbons; rates of natural recovery.
- Areal extent and exposure of supratidal marshes to oil.
- Land status/habitat overlay to synthesize all information relative to existing and proposed land use, management and ownership, wildlife and fisheries habitats, recreational use and cultural resources. Information should be assembled and presented in a GIS-type format.

RPWG
CC

DEPARTMENT OF JUSTICE
7600 SAND POINT WAY NE
SEATTLE, WA 98115

COMM (206) 526-6076 FAX (206) 526-6542
FTS 392-6075 FAX 392-6542

DATE: JULY 10, 1990
TIME: 10:30 PM PST

TO: BRIAN BOSS
COUNTY PROSECUTOR

FROM: JIM NICOLL/VICTORIA VEAL

TOTAL NUMBER OF PAGES INCLUDING THIS COVER SHEET: 2

RECIPIENT'S FAX NUMBER: FTS 868-2447

RECIPIENT'S PHONE NUMBER: _____

COMMENTS:

NOTE: IF YOU DO NOT RECEIVE ALL OF THE PAGES PLEASE CALL AS SOON AS POSSIBLE.

Handout from Mgmt Team mtg 7-11-90

Brian/Sandy:

Not sure what the cutoff date for comments on the draft progress report is. I got conflicting reports from your office yesterday. I'm about halfway through the report and left it at home so i don't have access to it during the day today, but Wahisngton's comments thus far are that:

1. On page 6, second paragraph: CERCLA itself does not define restoration. Therefore the words "under CERCLA" should be deleted. It should also be noted here that since the Trustees are not necessarily following the regulations, the definition of restoration in the regulations may be illuminating, but is not binding. It would be helpful to the reader to cite the pertinent section of the regulations, 43 C.F.R. Section 11.14.

2. I have the same general comments as Martha Fox regarding the listing of far-out restoration options and the detail into which the report goes regarding public comment. The whole report goes against the grain of the privilege accorded the government's deliberative process, but if it washes politically, more power to you!

I will finish reading the report tonight and send comments to you tomorrow or pass them on to the Management Team by telephone at its meeting tomorrow.

Gina

Another comment from Gary Fisher

Ch 3 - Tech wksp - [redacted] ? about info needs as holes in NRDA, concern that it may give Exxon ammunition.

[Answer - see p. 28 @ top. add line that items are not ranked, or comprehensive.]

Gina - Lit Review likes p. 35 + list of lit, but not pp 36+37.

But not fatal.

Cecil. Said she would be glad to explain any comments that are unclear or discuss them. Feel free to call her (FTS 208-3811.) I'd be happy to call her for any clarification if you'd like. - Ruth (FTS 245-4370) RWC CC

Comments from Cecil Hoffman, Department of Interior
(FTS 208-3811) as taken by Ruth Yender, ARTFO (FTS 245-4370)

In general, good format, good editing

Page 5:

4th sentence: Missing verb
6th sentence: Strike "...not widely known about before the spill," No point in saying this and could be misleading. Especially since the ones people are most concerned about were well known to the natives, could be taken wrongly.

Page 7:

Box: Should be "U.S. Department of the Interior (DOI)"
Some people very sensitive about the "the."

Page 8:

Last sentence in first paragraph:
At minimum strike "...or the state and federal governments."
or perhaps simply end sentence after word "available."

As currently written, this sentence implies obligation on the part of state and federal governments for restoration funds. State and federal governments actually have neither the obligation nor authority. There is no place for such money to come from.

Page 10:

1st paragraph under "Broad Restoration Approaches and Philosophies"
1st sentence: Strike "politics" and perhaps try to find a better way to describe what are trying to say than conveyed with "ignorance, misunderstanding." Try to state more positively.

Shouldn't say "politics" in a federal public document plus it's not really what you're trying to say, implies is pejorative, "politics" is also the democratic way. "inappropriately" should cover some of what were trying to capture with "politics."

She assumes what we really mean is lack of appropriate science and technology.

For the rest of this public participation section, in general:

We need some kind of disclaimer or caveat that these recommendations come from the public and the public can't be expected to know what the authorities are, i.e., that no such authority may exist. Otherwise, we could get flailed with this

later.

She recommends making clear these are the comments the way we heard them, and are not colored by what might be used or needed to carry them out. i.e. where authorities are missing, need to reflect this throughout, especially with a potentially lay audience. Needed is important word because may convey needs to legislators, etc.

Page 11:

3rd paragraph, last sentence: Missing period. Also, rephrase to avoid using "media being utilized" - implies propaganda, perhaps instead use: better outreach, writing, ...

Page 12:

3rd paragraph, 2nd sentence: This sentence doesn't say very much and is alarming (especially the "changes in management policies" part). Makes it sound as if people are just trying to use this occasion to reduce logging, etc. Should tie this more to why it is in the table, standing alone it is unclear what is meant. Emphasize: resource **management policies - changes that will enhance resoration, not just because people don't like the way things are being done.**

Page 29

Last bullet - Should capitalize "Dolly Varden" unless is a convention you've established and it is okay with Fish and Wildlife.

Page 35

This chapter doesn't start out very well.
The first sentence of first paragraph is not accurate, and in any case, not a good way to start.
2nd and 3rd paragraphs better describe what chapter is about.
Recommends moving 2nd and 3rd paragraphs up, and striking 1st sentence of current 1st paragraph.

Page 37

Last paragraph: "'grey' literature" - is not a common term, especially for general public. Perhaps should define it and refer to ("grey" literature) afterwards in parenthesis.

Page 39

1st paragraph, 1st sentence: Implies restoration is a line of work that is commonly done - instead should tie it into this spill rather than starting with a general sentence. Example: "... were determined to ..."

?

NOTE FROM RUTH: [I LOST HER HERE - ~~AAA~~ DO YOU WANT ME TO GET CLARIFICATION ON THIS ONE?]

Page 39

Paragraph 3

#(4) - needs rephrasing - currently sounds like we just wanted to look like we were doing something. Make reference to short/brief field season, ability to complete (sounds too political) ["Too close to the truth for comfort?"]

Should #'s (3) and (4) be combined? If not, distinction needs to be clearer.

Page 46

Left column, 2nd box from bottom:

Need to recast, could be subject to interpretation we could, in time, be accused of trying to substitute for things easier or cheaper to do.

(Example: Trout too difficult, expensive, fragile - so will restore flounder)

Need to add rider as in box above -

Example: "Redirect fisheries efforts to alternative species ... to let target species rest/replenish itself." or /.. to allow recovery of target species."

Page 58

Box, last bullet: Strike as a bullet and incorporate in text in following paragraph to deemphasize.

A common argument get into regarding cleanups is including cost-benefit considerations too early in the process. Appears currently as if cost of restoration is as strong a factor as other things - as a bullet - calls too much attention to cost.

Box should include just scientific and technical factors considered in decision-making. & bring up economic considerations later - in paragraph.

Page 58:

Last paragraph, last sentence:

Not true as stated - not a good way to say this - Should not the amount of restoration to money.

Restoration plan is provided to judge when award is made.

As currently stated, is out of phase (just as bullet in box was)

- ~~Compresses~~ Current wording compresses process in a way alarming to lay public. Doesn't describe/reflect process well. Won't happen that way - so wrong to imply it would.

* Award will affect the actual restoration - but ~~award~~ will not affect the combination of studies in restoration plan.

Will have recommendations, then get award.

KPWG CC

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10

June 30, 1990

MASTER FOR REVISIONS 7-12-90

REPLY TO ATTN OF: Restoration Planning Office

MEMORANDUM

SUBJECT: Transmittal of Draft Restoration Progress Report

FROM: Restoration Planning Work Group

TO: Management Team,
Legal Team

The Restoration Planning Work Group is pleased to submit for you review the attached draft report, "Restoration Following the Exxon Valdez Oil Spill: July 1990 Progress Report." This report summarizes the activities carried out to date under the Restoration Planning Project, including the Restoration Symopsium, local public scoping meetings, the technical workshop, the initial literature review, and the 1990 feasibility study projects. The report also documents public comments received regarding restoration options and approaches, and provides matrices of these options for the resources potentially injured by the spill. No data from NRDA studies are discussed in the report.

It is our understanding that the Trustee Council's target date for finalization of this report is mid-July. We recognize that this will necessarily limit the time available for your review. Work Group members are available to meet with you in Anchorage or Juneau to answer any questions you may have, or to help develop a consolidated set of comments for revising the report as efficiently as possible. We understand that a Management Team meeting may be held on July 10 or 11; if necessary we can be available to work with you at that time. Should there be any questions in the interim, please contact your agency's Work Group member directly, or call the Restoration Planning Office at (907) 271-2461.

ATTACHMENT

cc: RPWG members

✓ John
✓ Stan
✓ Sandy

✓ Conrad
✓ Nancy
✓ Ceci Hoffman
✓ Opencheowski
✓ Nadeau (several only)

✓ Bud Ehler

DRAFT

RPWG CC

RESTORATION PLANNING FOLLOWING THE *EXXON VALDEZ* OIL SPILL

July 1990 Progress Report

DRAFT

Prepared by the

Restoration Planning Work Group

Alaska Departments of Fish and Game, Natural Resources, and Environmental Conservation;
U.S. Departments of Agriculture, Commerce, and Interior;
and the U.S. Environmental Protection Agency

TABLE OF CONTENTS

CHAPTER I
INTRODUCTION

The March 24, 1989 grounding of the tanker *Exxon Valdez* in Alaska's Prince William Sound caused the largest oil spill in U.S. history. A slick containing about 11 million gallons of North Slope crude oil covered the western portion of the Sound and moved for over 500 linear miles along Cook Inlet and the northern Gulf of Alaska. Over 1,000 miles of shoreline were moderately to heavily coated. The spill damaged areas extremely rich in natural resources. It injured fish, birds, mammals, intertidal plants and animals and their associated habitats. The area's important archaeological and historical resources, not widely known about before the spill, also were damaged as a result of oiling, cleanup activities and subsequent incidents of vandalism. The oil also affected recreational areas including state and national forests, refuges, and parks.

Soon after the spill occurred, President Bush and Alaska Governor Cowper declared the goal that the ecology and economies of Prince William Sound and the Gulf of Alaska be fully restored. Full restoration of these natural resources and the services they provide is in turn the responsibility of the federal and state agencies which manage and protect them on behalf of the public. As authorized by federal law, the state and federal governments intend to present claims to the responsible parties for the injuries caused to natural resources and their uses. The funds received from these claims must be used to restore the natural resources and services injured by the spill.

Response, Damage Assessment, and Restoration

Federal law guides actions undertaken by federal and state governments following the *Exxon Valdez* oil spill. Section 107(f) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Section 311(f) of the Federal Water Pollution Control Act (Clean Water Act) provide for federal and state officials to act as trustees of natural resources and to pursue recovery of damages for injury to those resources.

CERCLA applies to spills of hazardous substances other than oil, while the Clean Water Act applies to oil spills. Both laws are supplemented by the Natural Resource Damage Assessment (NRDA) regulations, which set out a suggested, but not mandatory, process for determining proper compensation to the public for injury to natural resources. CERCLA, the Clean Water Act, and the NRDA regulations provide the structure for the response, damage assessment, and restoration activities following the *Exxon Valdez* oil spill.

Restoration is one component of an overall process. Combined with response and damage assessment, these efforts seek to minimize adverse impacts, compensate the public for natural resource injury, and provide for the recovery of natural resources and their uses. Response activities include the initial emergency measures to contain the spilled oil and minimize adverse impacts, as well as the subsequent efforts to clean-up oil from the spill area. The magnitude of and circumstances surrounding the *Exxon Valdez* oil spill resulted in relatively little of the spilled oil being contained. Consequently, cleanup activity focused primarily on removing oil from the shoreline areas affected by the spill. At the time of this report, more than one year after the *Exxon Valdez* ran aground, cleanup efforts continue.

State and federal agencies initiated approximately sixty scientific studies soon after the oil spill to determine the amount of damage. This damage assessment process, which continues in 1990, is designed to quantify the specific resource injuries and determine their corresponding monetary values. This includes the monetary valuation of reduction in uses that the natural resources can provide ("lost use" value), as well as the costs of activities that will be necessary to restore the ecosystem and its uses to pre-spill conditions. Claims for these damages will be presented to the responsible parties, and under federal law the monies received are to be used for restoration, replacement or acquisition of equivalent natural resources.

Definition of Restoration

Restoration culminates the spill response and damage assessment process by planning for and implementing activities to restore the condition and uses of the affected natural resources.

Restoration is specifically defined under CERCLA and the NRDA regulations as follows:

> "Restoration" or "rehabilitation" means actions undertaken to return an injured resource to its baseline condition, as measured in terms of the injured resource's physical, chemical, or biological properties or the services it previously provided...

Restoration actions fall into three categories: direct restoration, replacement, and acquisition of equivalent resources:

- "Direct restoration" refers to measures taken, usually on-site, to directly rehabilitate an injured resource.
- "Replacement" refers to substituting one resource for an injured resource of the same type.
- "Acquisition of equivalent resources" means to purchase or otherwise protect resources that are the same or substantially similar to the injured resources in terms of ecological values, functions, or uses.

In late 1989, an interagency Restoration Planning Work Group (RPWG) was established to develop and coordinate restoration planning activities for the *Exxon Valdez* oil spill.

The goal of the restoration planning effort is to identify appropriate measures that can be taken to restore the ecological health and uses of natural resources affected by the *Exxon Valdez* oil spill. Specific objectives include:

- Identify or develop technically feasible restoration options for natural resources and services potentially affected by the oil spill.
- Incorporate an "ecosystem approach" to restoration (i.e., where appropriate, broadly focus on recovery of ecosystems, rather than on individual components).
- Determine the nature and pace of natural recovery of injured resources, and identify where direct restoration measures may be appropriate.
- Identify the costs associated with implementing feasible restoration measures, in support of the overall natural resource damage assessment process.
- Encourage, provide for, and be responsive to public participation and review during the restoration planning process.

The RPWG Includes representatives of the following agencies:

Alaska Department of Fish and Game (ADFG)

Alaska Department of Natural Resources (ADNR)

Alaska Department of Environmental Conservation (ADEC)

U.S. Environmental Protection Agency (EPA)

U.S. Department of Agriculture (DOA)

U.S. Department of Commerce (DOC)

U.S. Department of Interior (DOI)

(RPWG Members are listed in Appendix A)

Restoration planning leads toward implementation of an approved restoration plan.

It is important to understand that a full damage assessment is not yet complete. The Restoration Planning Work Group, therefore, is developing the broadest possible list of potential restoration activities for resources that may have been injured. Once the damage assessment process is complete, appropriate activities will be recommended and incorporated in a detailed restoration plan. Such a plan can be implemented only when restoration funds become available from the responsible parties or the state and federal governments.)

This progress report describes the restoration planning activities that have occurred to date. The public is encouraged to comment on this report and to share suggestions for restoration alternatives with the RPWG. Additional reports will be prepared throughout this process. Comments and questions should be addressed to:

Oil Spill Restoration Planning Work Group

437 E Street, Suite 301

Anchorage, Alaska 99501

(907) 271-2461

CHAPTER II
PUBLIC PARTICIPATION

The need to involve the public in identifying restoration opportunities became apparent soon after the spill. The RPWG began planning a variety of public activities and is continuing to identify ways to incorporate public comments and concerns into the planning process. A free public restoration symposium in March, 1990, was organized by the RPWG as the first opportunity for the public and experts from Alaska and the lower 48 to express their views about what a restoration plan should entail. The proceedings from the symposium, containing the complete text of speakers' presentations, have been published separately and are available from the RPWG.

Soon after the symposium, the RPWG initiated public scoping meetings in communities that were directly affected by the *Exxon Valdez* oil spill. The first communities visited were Cordova, Valdez, Whittier, Homer, Kodiak, Seward, Anchorage, and Kenai-Soldotna. The RPWG is planning to hold additional community scoping meetings with smaller coastal communities as well as further discussions with citizens and local interest groups. A limited number of meetings outside of Alaska are also being planned.

The following sections synthesize the symposium and summarize the public scoping meetings and other comments received to date.

Synthesis of Public Symposium

The Oil Spill Restoration Symposium was held on March 26-27, 1990, in Anchorage, Alaska. The symposium began with introductory statements by Dennis Kelso, Commissioner of the Alaska Department of Environmental Conservation, and Tom Dunne, Acting Regional Administrator of the U.S. Environmental Protection Agency. These opening remarks described the restoration planning process and its objectives. Three keynote speakers addressed the symposium on legal issues of the damage assessment and restoration process, experiences with restoration of non-marine ecosystems, and public participation in the planning process. A final keynote speaker provided an overview of restoration concepts.

Panel discussions comprised the bulk of the symposium. Sessions addressed direct and indirect restoration of six types of resources: coastal habitats, fisheries, marine and terrestrial mammals, birds, cultural resources, and recreation. Panelists included experts on restoration ecology in each of these six resource types, as well as representatives from various resource user

groups, Alaska Native corporations, public land managers, environmental interest groups, and the timber and tourism industries. All panel sessions included opportunities for questions and comments from the public, and an extended public comment session took place at the end of the symposium.

Restoration concepts and ideas discussed at the symposium can be grouped into three categories: broad restoration approaches and philosophies; recommendations on public participation and the restoration planning process; and ideas addressing restoration of specific resources (i.e., fisheries, mammals, cultural resources, etc.). However, there was consensus among speakers and attendees that more specific comments on restoration can not be given without public access to natural resource damage assessment results. Major points from the symposium discussion are summarized below.

Broad Restoration Approaches and Philosophies

Most speakers called for a holistic, ecosystem approach to restoration. Without consideration of the ecosystem as a whole, there is a danger that ignorance, misunderstanding, or politics could inappropriately dictate how restoration monies are ultimately used. A variety of subtle or long-term effects could be missed entirely.

Many speakers called for an assessment of the oil spill in terms of cumulative effects, including both short and long term, with a long-term monitoring effort as follow-up research on any restoration effort. An environmental trust fund was suggested by many as a way to ensure a funding source for long-term ongoing research and monitoring activity. This was seen as critical for addressing the perception that many impacts may be subtle or long-term and therefore may not be apparent through the relatively short-term studies being conducted under the NRDA regulations.

Many symposium participants expressed a strong preference for the use of restoration funds within the spill area or, at a minimum, within the state. In addition, the need to use native stocks and species in any rehabilitation efforts was stressed.

One speaker strongly recommended that restoration be limited to the physical removal of oil, and that nothing else should be done so that nature could take its course. This speaker was concerned about the possibility of doing more harm than good through human intervention, while emphasizing the ability of the marine environment to recover naturally.

Many viewed the oil spill and its restoration as providing the opportunity for raising public awareness which should result in increased efforts toward oil spill prevention measures as well as highlight the need for changes in national energy policies and laws. There was consensus about the need for increased environmental education and natural resource interpretation to encourage better protection of those resources that were damaged by the spill. A specific idea was to establish a public restoration interpretive center. One commentor stressed that the public needs to be informed of the complexities of ecosystem relationships and the slow processes of recovery, and that this educational effort should be a continual and integral part of the restoration process.

Public Participation and the Planning Process

In general, many felt that the public participation process needs to be refined relative to past examples in the state of Alaska where it was unsuccessful. The process itself should be as simple and flexible as possible, and not become overly bureaucratic. Speakers urged that the restoration process should foster cooperation and trust among scientists, government agencies, and the public. In this sense, public participation was seen as an essential aspect of restoration planning, crucial to recognizing differences in social and cultural values throughout the spill area.

Several people suggested the formation of a citizen advisory committee to oversee public involvement. It was recommended that local input should be encouraged so that local knowledge of the affected area is not overlooked. The need for ~~Native interests~~ to be met in the public process was also emphasized.

Many speakers expressed frustration that most ~~natural resource damage assessment~~ information was not available to the public. Further, conflicting information which was made available to the public regarding the extent of damage was counterproductive. Several commentors explained that the public can not be expected to get involved without adequate information. It was recommended that the media be ~~utilized to better~~ inform the public about the restoration effort.

Finally, several commented that the advertising for and public awareness of this symposium was inadequate. One ~~suggestion was that this type of~~ public forum should be held during non-business hours to encourage maximum public involvement. A public meeting following the publication of the symposium proceedings was also suggested.

Specific Restoration Ideas

While one speaker strongly recommended that restoration actions be limited to the physical removal of oil, others supported an active restoration effort and presented ideas regarding specific resources.

Several ideas involved the rehabilitation of habitat. For example, beach rye grass could be reestablished in coastal areas affected by oil and cleanup activity, both for habitat and to help stabilize erosion. Actions to enhance an existing fishery might involve rehabilitation of habitat through increasing habitat complexity (addition of spawning channels) or fertilization to enhance food supply. Active habitat restoration for birds might include enhancing bird brood-rearing through improvement of food sources and manipulation of habitat, ~~to increase nesting sites.~~ One specific recommendation to enhance the island nesting habitat of ~~the common murre~~ was to reduce predators, specifically foxes, that had been introduced in past years as part of the fur trade.

In addition to habitat rehabilitation, efforts to accelerate recolonization may be appropriate for some species. It was stressed that recovery of the habitat must be assessed before species replacement occurs. An example of recolonization efforts is the use of hatchery/aquaculture techniques to help

preserve unique wild populations of fish and shellfish. Reestablishing seabird colonies by reintroducing species in affected areas was also suggested. However, relocation of some marine mammal species, particularly pinnipeds, was recommended against due to past experience showing that these marine mammals often attempt to return to the areas from which they were removed. Some noted that Prince William Sound may be well suited to natural species recolonization due to close surrounding populations.

Most speakers agreed that minimizing further disturbance, particularly from human activities, was important for restoration of all injured resources and uses. This idea applied to bird nesting and brood-rearing sites as well as marine mammal rookeries and haulouts. Many felt that restoration funds should be spent to increase enforcement of existing laws prohibiting human disturbance due to hunting or poaching, violations of buffer distances, or illegal fishing practices. Someone questioned whether local resource users will accept any changes in hunting and fishing policies that might result from restoration efforts. Many agreed that promoting non-harmful fishing methods both in Alaska and on a national and international level was important.

Most recreational use of the oil spill area is closely related to natural resources. Therefore, most speakers on the topic of recreation called for active restoration of recreational services through natural resource restoration. A common theme was the need for protection of the land and changes in management policies. It was stressed that unified guidance was needed for Alaska tourism, since the public is getting mixed signals relative to the extent of damages from the oil spill.

Archaeological sites need protection from direct destruction during cleanup and restoration activities, as well as possible stabilization through traditional archaeological restoration techniques, which should be compatible with the surrounding natural environment. In general, all speakers agreed that sensitive cultural resources should be restored only with the maximum coordination with Native land managers and village representatives. Also, there is a strong need to address subsistence issues, including obtaining more information on subsistence as an economy.

Almost all speakers agreed that a good way to help speed recovery for many resources would be through land protection. Most referenced direct acquisition of critical or important habitat, particularly in the case of marine mammals and birds. This included preserving shoreline buffer strips for bird nesting sites, protection of breeding habitat, and protection of historically-used marine mammal rookeries. Most often this option was being applied to restoration in terms of acquisition of equivalent resources (that is, those resources not directly affected by the oil spill), such as the protection of northern sea lion populations and walrus mating and calving areas. One recommendation called for the preservation of wetlands adjacent to the Kenai River, which is a prime salmon-producing river currently threatened with development. Many alternatives for this type of habitat protection

were mentioned including direct acquisition, purchase of timber rights or oil lease options, and establishment of new wilderness areas, conservation easements, cooperative land management agreements, and habitat conservation tax credits. Establishment of a rotating fund similar to that used by The Nature Conservancy was supported by many participants. Experts in land management stressed that these options may have social and economic impacts which must also be assessed. Most attendees agreed that land acquisition outside the state of Alaska should be a last resort. The use of some type of endowment fund to support long-term enhancement of natural resources was also supported.

Summary of Local Public Scoping Meetings and Written Comments

The public scoping meetings were held in the larger communities directly affected by the oil spill. The purpose of the meetings was to introduce the restoration planning process to the public and to solicit comments and ideas on options for restoration of damaged natural resources from the *Exxon Valdez* oil spill.

Presentations were made by members of the RPWG on the legal framework for restoration. Descriptions and examples were given of the three basic categories of restoration: restore, replace, or acquire the equivalent resources.

Initial Public Scoping Meetings

Meeting Places	Dates	Attendance
Seward	April 16	4
Cordova	April 17	9
Kenai/Soldotna	April 17	7
Homer	April 18	14
Valdez	April 18	6
Anchorage	May 17	16
Kodiak	May 21	8
Whittier	May 31	9
	TOTAL	73

Summary of Public Comments

This summary includes comments voiced at the scoping meetings, and written comments received from the public during the period from April through June, 1990. Many of the comments apply to more than one of the three categories. Communities where the comment was made are indicated following the comment in parentheses. An asterisk (*) following the community name indicates that it was a written comment.

Prevention

Several suggestions centered around prevention as a restoration alternative.

- Restoration funds should be used for prevention of future oil spills. (all towns)
- Install a satellite communications system for research vessels to quickly direct the vessels to remote spills. (Homer)
- Establish a legislative action trust fund. (Kodiak)
- Establish a harbor authority to regulate and monitor vessels.. (Anchorage)
- Provide public education for all ages about laws and regulations of oil exploration and transportation so that everyone understands the pitfalls prior to another accident. This will support informed voting and lobbying and thus further prevention of oil disasters. (Homer*)

Cleanup

Many people remained concerned about oil spill cleanup activities.

- Conduct special cleanups in pristine areas which minimize the impact on the beaches and enhance natural restoration. (Homer)
- Fund local research on cleanup and restoration techniques. (Homer)
- Clean and restore recreation areas that have been scheduled for no treatment. (Whittier)
- Restoration should not begin until clean up is finished to local and land manager standards. (Whittier)
- Determine effects of oil and effectiveness of different clean up techniques in different ecosystems as a first step. (Anchorage)
- Discontinue removal of oil injured sea otters and birds; let them die in peace. (Homer*)
- Stop the use of Inipol fertilizer. (Kodiak, Homer*)
- Do less disruptive cleaning of previously untouched coastlines. (Homer*)

- Continue to clean beaches and areas of impact; however, use research information to identify most efficient methods along with the least toxic method. (Homer*)
- Remove loads of garbage from Exxon and volunteer cleanup sites. (Homer*)
- Areas must be cleaned up; upset when biologists and Exxon say everything is OK. (Homer*)
- Clean up all bays that trap and hold oil such as Herring and Marsha Bays on Knight Island, Nuka Island Passage and Knight Island Passage. Conduct physical removal and replacement of heavily oiled beaches and further use of bioremediation. (Seward*)

Natural Resource Damage Assessment

Many people were also concerned about damage assessment activities.

- Restoration planning is premature given the lack of data from the damage assessment studies. (Cordova, Homer, Anchorage)
- Concern that government agencies do not have enough money to do adequate damage assessment. (Cordova)
- Concern that Exxon's damage assessment activities be monitored to assure quality. (Cordova)
- Support/implement fishery studies for the Kenai Peninsula which have been cancelled from the NRDA program. (Homer)
- Guarantee that assessment damage and research information be available to the public so that restoration can be planned accordingly. (Homer*)

Monitor, Research

Several comments were received on restoration options in the form of monitoring and research.

- Set aside ecosystem areas, establish long-term monitoring for base information, allow no public use. Fund long-term monitoring and research. (Seward, Cordova, Valdez, Homer, Kodiak)
- Establish a trust fund for long-term restoration, recovery, acquisition and enhancement projects. (Homer, Kodiak, Whittier)
- Involve local people in monitoring to restore trust. (Whittier)
- Need in-the-field research/monitoring vessels to combine research, recovery, restoration, and prevention. (Homer)
- Study effects of boat distance from seal haulout/pupping areas, from eagles, etc.; then educate the public. (Valdez)

- Fund research on whales, Dall's and harbor porpoises, and on the impacts of hatchery fish on wild stocks. (Valdez)
- Fund research on impacts of fishing and oil on sea lions and to identify the cause of sea lion population decline. (Homer)
- Concern with subsistence lifestyle impacts; make monitoring information more available. (Kodiak)
- Conduct river otter research for outer coast of Kenai Peninsula and Islands. (Homer*)
- Study salmon internal organs for crude oil toxicity. (Homer*)
- Study the ocean floor where dispersants were used. (Homer*)
- The Prince William Sound Science Center can provide useful input for restoration in its role as a research and information center. (Cordova*)
- Cook Inlet Salmon Association wants to see loss of fish rearing habitat quantified to the maximum extent possible and see these areas restored to their historic fish production levels and environmental state. (Homer*)
- Inspections and studies should be conducted over ~~very~~ small affected areas to get accurate information. Make individual studies of mollusks and herring.
- ~~Include~~ backwater marshes and lagoons. (Port William*)
- Proposed formation of an international wildlife rehabilitation center in the ~~southern~~ Gulf of Alaska. (Anchorage*)
- Continue studies on impacts to sockeye salmon in Cook Inlet. Concerned that much of the damage to fisheries resources may go unobserved. Fisheries, both commercial and sport, are the backbone of Alaska's economy and lifestyle. (Soldotna*)

Natural Recovery

Three comments were received on natural recovery.

- People may not be able to accept John Teal's comment "that the best thing we can do to restore coastal habitats is to do nothing." (Cordova)
- Avoid physical restoration; better to leave the Sound alone. Do not establish permanent research stations and boat moorings which would increase public use. (Valdez)
- Natural processes will largely be responsible for restoration; it will take decades. Do not be deceived into believing that restoration can be substantially accelerated through the expenditure of large amounts of money. Oil clean up has largely been a cosmetic activity; technology not available to clean up oil present in water column or on subtidal substrates. (Fairbanks*)

Management Changes

A large number of comments focused on changes that can be made by agencies using their land/habitat management and regulatory authorities.

- Limit human use where in competition with wildlife for reduced number of non-oiled beaches. (Cordova, Valdez, Anchorage)
- Limit use of previous low recreational use areas such as the outer coast of the Kenai Peninsula. Discourage use through tourism boards. (Homer*)
- Cleanup activities have introduced many to the beauty of the Sound and may lead to increased use which could have bigger long-term impact than the spill. (Cordova)
- Provide increased protection of archaeological sites now that so many have been discovered. Return artifacts removed by Exxon archaeologists. (Kodiak)
- Be careful not to increase impact with replacement projects such as building new public use cabins in non-oiled areas. (Anchorage)
- Support tree planting efforts in areas which have been or will be logged; for example, Afognak Island. (Homer)
- Replant forest to make up for *Exxon Valdez* paperwork.
- Harvest seaweed in non-oiled areas and supply to deer in oiled areas. (Whittier)
- Remove introduced predators at bird rookeries to enhance recovery of these colonies. (Homer)
- Manage recreation to reduce human impacts such as expansion of existing facilities rather than construction of new facilities. (Homer)
- Change fish and game regulations to curtail human use impacts on the Sound. (Valdez)
- The Alaska Department of Fish & Game should shift terminology from consumptive use/harvest; shut down fishing seasons in the Sound for at least two to three years; close the river otter/mink trapping season. (Valdez)
- Restoration work should begin this year; by the time lawsuits are settled, it may be too late to take effective actions. (Anchorage)
- Purchase some of the limited entry permits to reduce use. (Anchorage)
- Buy back gill net permits to enhance fisheries and protect marine mammals. (Cordova)
- Protect humpback and orca "rubbing" beaches on Perry and Knight Island. (Valdez)
- Designate the Sound as a national monument. (Valdez)

- Stop development of the Arctic National Wildlife Refuge. (Homer*)
- Stop offshore and coastal drilling. (Homer*)
- Sacrifice some areas to heavy use so that other areas could be preserved. (Valdez)
- Limit additional commercial development in the Sound; it is already overused. However, there was concern on how to accomplish this while finding some way to provide more economic opportunities to the Native communities. (Valdez)
- Protect timbered slopes to protect marbled murrelet nesting areas. (Homer)
- Provide funding to State Parks for management of tourists and increased recreational awareness due to increased knowledge of area following spill and cleanup. (Homer*)
- Keep National Park Service office open to provide information on Katmai. (Kodiak)
- Prohibit state land sales in Iliamna area to create wildlife refuge. (Anchorage)
- Restrict logging, mining, fishing in Prince William Sound. (Anchorage)
- Keep areas such as Passage Canal and Port Wells as a stocking, natural area for the more damaged adjacent areas. Close or limit drag fishing. (Anchorage).
- Ban hydroelectric development at Nellie Juan. (Whittier)
- Require logging and oil companies to provide restoration plans before conducting their activities. (Whittier)
- View the vast Gulf of Alaska as a limited resource to be protected. (Homer*)
- Discourage mountain bike use in the outer coast of the Kenai Peninsula. (Homer*)
- Discontinue selling lumber to Japan for use as computer paper. (Homer*)
- Discontinue forest destruction for the benefit of few; monopolizing of resources should become less profitable. (Homer*)
- Support legislative action for :

    1. Statutory state and federal habitat protection such as critical habitat legislation, marine and estuarine sanctuary and wilderness legislation

    2. Restrictions on development activities that could have a negative impact on the recovery of habitat and wildlife populations in oil affected areas. (Valdez*)

- Agency survey work should be organized in small, efficient teams to avoid distress of wildlife. Consult local, knowledgeable residents on injury information, safety, and operations advice. (Port Williams, Kodiak*)
- Provide immediate and complete restoration to set net sites in the Sound, especially Main Bay; complete restoration of bird rookeries in the Sound and the Barren Islands. (Seward*)

Public Information

Initial comments on this subject focused on tourism, subsistence, and fishing.

- Dispel fears for tourists and subsistence users by providing information on contamination or lack of contamination: direct mail to registered voters, work with state tourism groups and outside magazines. (Kodiak)
- Provide substantial funds for the Seafood Marketing Institute to redevelop damaged market. (Homer*)
- Mail information flyer to all area residents. (Cordova)
- Make the literature review available to local libraries; acquire the most relevant publications. (Valdez)
- Keep the public fully informed of what is involved in restoration of the areas affected by the spill. Stress the complexity of the ecosystem relationships affected by the spill, the slow processes of recovery and the need to closely monitor the changes that will be taking place over time. Important for this to be an integral part of the restoration plan. This will assure continued public interest and pressure for protection of the natural environment from future spills. (Fairbanks*)
- Recover fish markets devastated by the Exxon spill. (Homer*)
- A unified tourism information program is needed; the various tourism and chambers of commerce should work together. DEC and ADF&G information has been damaging to tourist perceptions in Shuyak Island area; wants authenticated information, not rumors. (Port Williams, Kodiak*)
- Fear of tainted meat and other foods is rampant; no response has been received in request to sample analysis. Agencies need to contact affected residents. (Port Williams, Kodiak*)

Hatchery and Enhancement Programs

Considerable interest in hatchery and fishery enhancement was expressed.

- Favor commercial species to help restore economic activities. (Cordova)
- Construct new salmon hatcheries and do enhancement projects such

as fertilization. (Homer*)

- Expand existing hatcheries to prevent further impacts to wilderness. (Homer)
- Stream enhancement work is needed in areas where salmon fry are dying. Bring closed state hatcheries on line for replacement. (Kodiak)
- Where wild stocks have been affected, do not add hatchery stocks, use available wild-stock enhancement techniques. (Homer)
- Direct replacement efforts towards halibut and black cod. (Whittier)
- Reestablish fish and wildlife to affected areas using NRDA information and services of governmental and private conservation groups. (Homer*)
- Continue maintenance and operation of the Fisheries Rehabilitation, Enhancement and Development (FRED) Division projects in Outer Kenai Peninsula area. These facilities can be used as well for incubation and reintroduction of salmon fry and smolt to areas that have become barren due to oil in the intertidal areas and salmon spawning beds. (Homer*)
- Did not favor hatcheries due to negative impacts to wild fish and cost of hatchery programs. (Cordova, Valdez)
- Fund the Paint River fish ladder and stocking program. (Homer*)
- Fund the Chalatna Lake Stocking Program. (Anchorage*)

Facilities

There was interest to use/develop facilities that will serve restoration needs.

- Fund underutilized facilities such as the Institute of Marine Sciences instead of new facilities such as the Prince William Sound Science Center. (Seward)
- Enhance existing facilities to further oceanographic research. Enhance or create educational institution and public ocean information centers. (Homer)
- Establish a local laboratory where subsistence users can bring tissues for analysis at an affordable price. (Kodiak)

Education

Public education regarding oil spill restoration was considered to be a high priority.

- Public trust in the oil industry and resource agencies should be restored; suggestions were: management changes for resources and ad campaigns to show the public what is actually happening. (Seward)

- Public education such as forums about oil spills, environmental protection and energy conservation run by paid volunteer coordinators in spill areas; hire a contractor to go to schools. (Seward, Homer)
- Fund production of a Prince William Sound Conservation Alliance brochure to educate boaters on environmental protection. (Valdez)
- Expand oil spill curriculum developed in Cordova to include restoration and prevention information. (Valdez)
- Provide library materials. (Kodiak)
- Provide "talking" guides and flyers to tour boat operators to explain to visitors the importance of maintaining distance from wildlife. This would reduce pressure on captains to take people closer to wildlife. (Valdez)
- Publish a booklet "50 Simple Things You Can Do to Save the Sound." (Valdez)
- Proposal by the Pratt Museum to fund a traveling exhibit "Darkened Waters" for display in the lower 48 to support the conservation ethic message. (Homer*)

Local Hire

Interest was expressed to hire local people in restoration efforts.

- Use local hire on projects to help restore psychological damage incurred. (Seward)
- Use of Native personnel to clean oil from beaches on or near the culturally significant areas Chugach Native Corporation has identified. (Wasilla*)

Acquisition

A diversity of viewpoints was voiced regarding potential acquisition of resources.

- Acquire development rights along the Kenai River to retain its fisheries productivity and map the Kenai River drainage for baseline management information. (Kenai)
- Acquire timber rights in the Sound and Kodiak; there are willing sellers. Action should be taken soon before valuable tracks are gone. (Cordova, Kodiak, Anchorage)
- Acquire timber rights: 300+ foot buffer zone around streams and areas visible from the coast; buy inholdings or timber rights which are within the state and national parks; buy net operating losses of timber sales; support a change in the law to prevent further sale of NOL's. (Homer)

- Purchase or buy-back permanent logging rights for habitat protection of salmon streams. (Homer*)
- Create an Iliamna Wildlife Refuge by purchasing conservation easements on private Native land. (Anchorage)
- Protect marbled murrelets by purchasing lands adjacent to Kachemak Bay that are proposed for logging in the immediate future. (Homer*)
- Purchase wetlands and development rights adjacent to the Kenai River and complete inventory and mapping of wetlands adjacent to the river. (Soldotna*)
- Acquisition most cost-effective option; if oil remains, restoration and replacement activities are likely to be a waste of money. (Cordova)
- Skeptical that there are many direct restoration projects that can be done. There is loss of intrinsic values, use and habitat which must be balanced. (Anchorage)
- Acquire haulout/rookery areas for sea lions and seals. (Cordova, Homer)
- Acquire and protect otter and mink denning areas which require more than streamside habitat. (Valdez)
- Research, acquire, and protect nesting and roosting habitat for lesser and greater yellowlegs, great blue herons, marbled murrelets and yellow-billed loons. (Valdez)
- Acquire private lands where there are seabird colonies. (Homer)
- Research and acquire migratory bird habitat along the Pacific flyway including an international effort to protect habitat in South American countries. (Homer)
- Consolidate Middleton Island for acquisition. (Homer)
- To restore the wilderness experience, acquire new, unspoiled areas. (Homer)
- Retain upland old growth for deer so further loss of their food base does not occur. (Anchorage)
- Allow a tax write off in return for a conservation easement; call it a net operating loss. Require the spiller to purchase the easement soon after the spill. (Anchorage)
- Establish national and international protected wetlands for birds. (Homer*)
- Provide major funding for Save the Rainforest International. (Homer*)
- Acquire Gull Island in Kachemak Bay for management by the USFWS to protect murres. (Homer*)

- Support habitat acquisition through purchases from private and state land owners. (Valdez*)
- Acquire lands within PWS and set aside as wildlife refuges, especially in bird and sea lion rookeries. Give protection status to Barren Island group, Gore Point, Ruggles Island and Cape Fairfield. (Seward*)

Other Sources of Contamination

There was interest in seeing removal of chronic contaminants from the environment because it may aid restoration in the oil spill area.

- Remove mine tailings and mining and logging debris in and around the Sound. (Cordova)
- Inventory and clean old dump and military sites. (Kodiak)
- Eliminate use of plastics. Clean up plastics. (Cordova, Homer)
- Concern with gradual decline in environmental quality in the Sound from marine pollution such as dumping of oil, fuel and garbage from boats. Use restoration funds to: educate skippers, provide garbage tenders for at-seas collection, fund towns to recycle (particularly oil), set up small local response teams to deal with small spills. Several participants felt that prevention of further damage was a key component of restoration so the natural healing capacity of local ecosystems would be enhanced. (Valdez)
- Provide financial assistance to communities for waste disposal facilities. (Valdez, Homer, Anchorage, Kodiak)
- Research more efficient ways to use energy. (Valdez)

Funding

A diversity of viewpoints were voiced concerning potential use of public monies.

- Agencies should match restoration funds to operate monitoring programs which would be run in a cooperative format by agencies or through a contractor. (Seward)
- Resource agencies should spend money now and obtain reimbursement from damage assessment funds when available. (Anchorage)
- Buy back Bristol Bay oil leases with federal monies received from lease sales rather than from restoration funds. (Anchorage)
- Tax on state and oil producers as potential restoration funding source. (Anchorage)
- Use funds in affected areas only. (Kenai)
- Manage trust fund so funds will be available 20 to 50 years from now when coastal habitats are healthy enough to support restoration activities. (Cordova)

- Concern that state lawsuit monies be applied to restoration. (Anchorage)
- Litigants will be far apart on monetary value; best to settle out of court and get on with restoration. (Anchorage)
- Set up a fund for mitigation of wetlands in the affected zones. (Kenai)
- Guarantee that the restoration is regenerating itself with interest or the money will be gone in 6 months. (Homer*)
- The Prince William Sound Conservation Alliance supports restricting expenditures of restoration monies to:
  1. restoration and/or protection in oil impact area
  2. restoration and/or protection outside the of the area for species which depend on oil impact area
  3. assessment and research of resident or migratory species using impact zone
  4. educational displays to inform public about effects of oil on the marine environment and prevention (Valdez*)
- The Prince William Sound Conservation Alliance opposes use of funds for construction or development projects such as mooring buoys, tent platforms, marine parks facilities, land based research stations, hatcheries in undeveloped oil affected areas. (Valdez*)
- Give natural weathering and recovery time to complete "cleanup" of oil and reestablishment of the primary producing organisms. Support a restoration endowment fund to assure the long-term availability of monies dedicated to enhancement of the natural environment affected by the spill. This will provide for extending the availability of restoration funds over the time period required for recovery from the spill. (Fairbanks*)

Public Involvement

A number of options for public involvement strategies were recommended.

- Meet and review recommendations with the Regional Planning Teams. (Kenai, Whittier)
- Local advisory boards should include different interest groups; let the groups submit lists of recommended representatives; select carefully based on references. (Valdez)
- Environmentally based financial/economic restoration would benefit an entire community. (Kodiak)
- Meetings should be set up in Native villages. Village people are primary users who depend on natural resources as part of their economy. Important to get their ideas for restoration and for restoration to assist in economic diversification. (Anchorage, Whittier)

- Have more discussion of environmental issues in coastal communities. (Homer*)
- Contact landowners, business operators and residents located in the Sound itself. (Cordova*)
- The restoration process has a high potential to run awry due to lack of mandated citizen and industry advisory process. This work group is a valid attempt to gain input it will be interesting to see if the ultimate actions taken reflect this input. (Anchorage*)
- Oil spill restoration should be coordinated with local and Native peoples. These people should have as much or more input and decision-making power as "professionals." It is the RPWG's responsibility to seek out this comment. (Anchorage*)
- Concern that Trustees are inaccessible. (Kodiak)
- Concern that politics rather than science will guide decisions. (Anchorage)

CHAPTER III
TECHNICAL WORKSHOP

To gather scientific input for the restoration planning process, a technical workshop was held April 3-5, 1990, in Anchorage, Alaska. The three-day workshop provided the first opportunity for a general exchange of ideas on restoration among scientists and resource managers. Due to the necessity of discussing litigation-related damage assessment information, this workshop was closed to the public.

Participants in this workshop included members of the RPWG, federal and state resource managers, investigators conducting damage assessment studies, and technical experts from academic institutions ~~or the private sector~~. These technical experts were selected based on their experience in restoration of natural resources or their ~~specific~~ knowledge of a particular resource (e.g., marine mammals). Most participants had direct experience with these resources in Alaska.

Results of Workshop

Workshop participants identified potential restoration projects and discussed these ideas in terms of effectiveness, feasibility, and applicability to the spill area. An overview of available damage assessment results helped guide the discussions.

The workshop was divided into six sessions: coastal habitat, fish and shellfish, birds, terrestrial and marine mammals, cultural resources, and recreational resources. Each of the sessions discussed restoration alternatives which might be effective in addressing ~~possible~~ injuries to particular resources. The groups were instructed to identify a broad range of restoration options. Chapter VI (Development of Restoration Options) ~~incorporates~~ the restoration alternatives discussed at the technical workshop.

To address scientific uncertainties about specific restoration options, workshop participants developed a list of potential feasibility studies or demonstration projects. These studies were designed to evaluate candidate restoration alternatives for their likely effectiveness, feasibility, and applicability to the spill area. Projects which were subsequently initiated during the summer of 1990 are described in Chapter V (Feasibility Studies).

In addition, workshop participants identified other information needs that ~~are fundamental~~ to the development of a comprehensive restoration plan. ~~The additional information needs identified by each session are summarized below.~~

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Information Needs

These information needs are listed as developed by the participants in each workshop session. Many are being addressed by the natural resource damage assessment process. Others could be addressed by future restoration feasibility studies.

Coastal Habitats

Quantitative information on habitat types, communities, and species of Prince William Sound affected by the oil spill was generally unavailable at the time of the technical workshop. Available information was also inadequate to provide quantitative estimates of the degree of oiling, ecological effects caused by exposure to oil, possible ecological effects attributable to clean-up efforts and natural recovery rates of habitats, communities and species affected by the spill. Specific information needs to address these unknowns include:

- Area and proportion of Prince William Sound shorelines composed of sandy beaches, cobble beaches and rocky shores in relation to distribution and degree of oiling.
- Clean-up options (no clean-up efforts, hot water rinse, cold water rinse, bioremediation) used for each of the three habitat types (supratidal, intertidal, and subtidal), and proportion of each shoreline type exposed to each cleanup technique.
- Direct effects of exposure to oil and whether these effects can be distinguished from the effects of the clean-up efforts. Monitoring of Prince William Sound shorelines for long-term effects including the effects of both oil and clean-up efforts.
- Effects of clean-up on *Fucus* and proportion of the population which was exposed to oil and to various clean-up methods.
- Amount and concentration of oil that reached subtidal sediments within Prince William Sound; specific benthic communities within those sediments are likely to be sensitive to petroleum hydrocarbons; rates of natural recovery.
- Areal extent and exposure of supratidal marshes to oil.
- Land status/habitat overlay to synthesize all information relative to existing and proposed land use, management and ownership, wildlife and fisheries habitats, recreational use and cultural resources. Information should be assembled and presented in a GIS-type format.

Fish and Shellfish

Before the oil spill, lower precision in fisheries management data was adequate for setting harvest and escapement levels. Post-oil spill, however, the added stress on species and uncertainty introduced by the spill have created the need for more precise management information. Specific information needs addressed in the fish and shellfish section include:

- Distinction between wild and hatchery stocks of adult pink salmon.
- Better real-time harvest data, escapement estimates and stock abundance information for salmon.
- Refinement of fish stock identification techniques such as otolith analysis and more rapid analysis of coded-wire tag data.
- Herring stock identification to separate stocks within Prince William Sound and outer Kenai/lower Cook Inlet.
- Inventory of herring spawning substrates/localities.
- Hydro-acoustic biomass estimates of resident herring stocks.
- Expanded escapement enumeration for commercial species of salmon in relation to oiled streams (would involve additional air and ground surveys).
- Basic biological information on rockfish; e.g., tagging fish on reefs and port sampling to provide population estimates. Need age-size database to identify recruitment rates.
- Trawl assessments of groundfish stocks.
- Petroleum hydrocarbon residuals contamination in clams and other shellfish.
- Better inventories of dolly varden and cutthroat trout population in streams throughout the oil-spill area.

Birds

Participants in this session emphasized the need for better information on bird population strength and trends, productivity, critical life stage habits and habitats, food availability, and amounts of residual petroleum hydrocarbon contamination. Specific interests included:

- Breeding habitat requirements for the marbled murrelet in the oil-spill area.
- Status of sea duck populations, with emphasis on the harlequin duck. Specific needs include population and harvest-level estimates, and confirmation of breeding habitats, nest sites, winter distribution and site fidelity.
- Availability and distribution of forage fish for seabirds in Prince William Sound, including sandlance, herring, and other intertidal non-commercial forage species.
- Status of the Smith Island parakeet auklet population - the only parakeet auklet colony in Prince William Sound.
- Population monitoring of pigeon guillemots and alcids on Smith Island.
- Magnitude of bird mortality associated with the nearshore gillnet or seine fisheries in oil-spill area.
- Annual food habits and requirements of the bald eagle.
- Overwintering requirements and immigration patterns of the common murre.
- Productivity of marine and shore birds in Prince William Sound and elsewhere.
- Relationship of winter and migrant populations of yellow-billed loons in Prince William Sound to Alaska and world populations; including Prince William Sound winter/migrants breeding sites.
- Location and number of great blue heron rookeries.
- Sea bird colonies currently on privately-owned lands that may be purchased to provide public education opportunities (e.g., Gull Island near Homer).
- Hydrocarbon analysis of 1987 sea duck samples from Valdez Arm (completion of a USFWS project on contaminants due to chronic pollution).
- Winter feeding habits of peregrine falcon.
- Causes of long-term declines in marine bird populations (e.g., black-legged kittiwakes) in Prince William Sound.

Mammals

The participants in the mammal technical working group agreed that much of the basic biology (reproductive rate, habitat use, residency, forage species, stock identity, etc.) was unknown for Prince William Sound mammals, both aquatic and terrestrial. It was also agreed that the toxicity of oil to a particular species and the long-term sublethal effects of ingested oil on reproductive and other physiological functions were unknown or not completely understood. The specific information needs identified in this session were:

- Population modeling to derive an accurate estimate of the proportion of the Prince William Sound sea otter population affected by the oil spill.
- Expansion of individual identification capabilities (fluke and dorsal fin catalogs) to facilitate studies of residency, habitat use, reproductive rates, and stock identity of both humpback and killer whales.
- Biopsy sampling for stock identification of humpback and killer whales (to determine resident versus transient groups).
- Availability of forage fish (e.g., sandlance and herring) and other prey for humpback and killer whales.
- Causes of pre-spill decline in sea lion population and the relative contribution of the oil spill to the declining trend.
- Sea lion stock identification.
- Frequency and importance of use of marsh vegetation and beach grasses by sitka deer and black bear in relation to availability of salt marsh habitat.
- Potential delayed effects of oiling on black bears.
- Total populations of river otter and mink in affected areas and their habitat use, reproductive potential, and food habits.
- Effects of oil ingestion on mink reproduction.

Cultural Resources

Cultural resource values are poorly understood in the oil spill area. Pre-spill archaeological surveys of sites and artifacts are few. Consequently, at the time of this session, there was insufficient data to allow the formulation of restoration needs. Participants did however identify a number of more generic or qualitative issues that need to be addressed, such as:

- More extensive and complete surveys to help resolve conflicts that have arisen, such as: the completeness and accuracy of shoreline status surveys by Exxon; the ability of resource surveys to garner proper information to identify site significance; and the ability of the site surveys to meet minimum requirements to develop a proper damage assessment.
- Degree of oil contamination of artifacts. Effect of oil on the ability to determine age of artifacts. Ability to remove oil contamination.
- Extent to which oil has been carried by storm surges and damaged the vegetative cover, thereby creating instability and increased erosion.
- Increased vandalism resulting from clean-up worker access to cultural sites.
- Losses to cultural heritage values. Lost opportunities to use local cultural sites on a contemporary basis.
- Identify ways to restore "faith" in the subsistence environment.
- Reliability of fly-by shoreline videotaping of vegetation for sites subject to high erosion and therefore possible increased site vandalism and loss of integrity.

Recreation

Because relatively little information about injury to recreational resources was available from 1989 NRDA studies, the nature and extent of recreational loss was not estimated. The following informational needs, then, were considered critical for restoration planning:

- People's values and perceptions about the oil spill and the area. Must look at users, potential users, and "armchair" users.
- Numbers and patterns of recreational uses in the oil-spill area.
- Effects on recreation opportunity spectrum.
- Quality of recreational experience: address the issue of trading high value/low volume tourism for high volume/low value tourism.
- Value of recreational opportunity translated into consumer surplus.
- Land status/acquisition opportunities with respect to ecological/recreational/cultural values.
- Effects of spill on small versus large operators in tourism/recreation industry.
- Present and future land use plans by land management agencies and private land holders.
- Distribution and nature of public-use facilities and opportunities in relation to oil spill.

CHAPTER IV
LITERATURE REVIEW

Current literature listings are routinely maintained by agencies with responsibilities for oil spill cleanup actions. Effort has also gone into reviewing restoration-related literature. The last major effort at reviewing the state of the art in oil spill restoration was a conference sponsored by Exxon in 1981. It appears that relatively little research on oil spill restoration techniques has been conducted in the last several years. A preliminary computerized literature search focusing on potential ecological restoration techniques is one of the first activities being conducted by the RPWG. We are also planning to conduct a computerized search of literature on restoration of cultural and recreational resources.

This chapter summarizes our initial literature review effort. Appendix B lists the most pertinent references identified. A report listing all identified references, with abstracts, will be available from the RPWG.

Purpose

A review of scientific literature is one of the first steps in any environmental planning effort. Relevant literature supports the planning process by identifying approaches that have potential for success, as well as actions to avoid. Although it is expected that relatively few "off the shelf" oil spill restoration techniques will be identified for sub-Arctic application, it is recognized that a variety of approaches to restoration have been developed to address different types of environmental disturbances. Some of these may be useful to consider for restoration following the *Exxon Valdez* oil spill.

Search Criteria

Literature searches sort computerized databases. Each database contains references from several different publications. Sorting is done by specifying subject identifiers or "keywords". Only references containing the chosen keywords are listed. Databases searched and keywords used in this initial literature search are shown in the following tables.

LITERATURE DATABASES SEARCHED

Databases	Dates of references included
Aquatic Science Abstracts	1978-1989
BIOSIS Previews	1969-1990
Environmental Bibliography	1974-1989
ENVIROLINE	1970-1989
Pollution Abstracts	1970-1990
NTIS	1964-1990

INITIAL SUBJECT IDENTIFIERS AND KEYWORDS

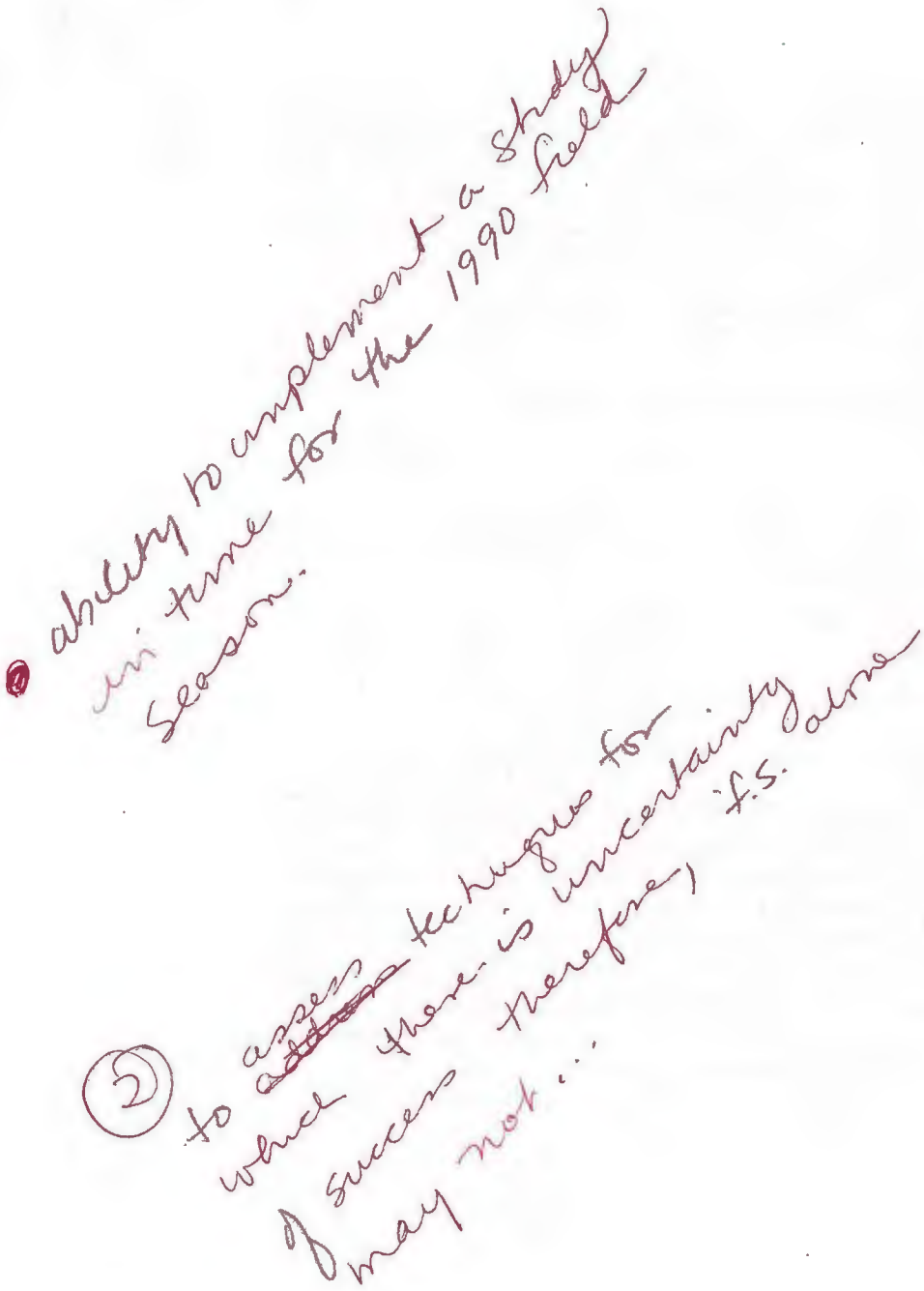
- Oil, crude oil, petroleum, fuel oil, gasoline, or oil spill
- Restore, establish, reestablish, replant, rehabilitate, create, build, mitigate, or construct(ion)
- Recover(y) or succession
- Ecologic effect, ecologic impact, biological impact, aquatic impact, terrestrial impact, environmental impact, or environmental effect
- Marine, estuarine, salt marsh, ocean, beach, shore, tidal, subtidal, intertidal, or reef
- Reservoir, lake, stream, marsh, river, wetland, or freshwater
- Habitat, seagrass, eelgrass, algae, macroalgae

After deleting citations that were not directly relevant, the computerized literature search produced a list of approximately 450 publications. The RPWG then reviewed these titles and abstracts, and identified approximately 120 of the most relevant publications for acquisition and detailed review. These documents are listed in Appendix B.

Publications were considered relevant by the RPWG to the extent that they addressed the following issues:

- Potential for applicability to sub-arctic conditions
- Potential benefits to resources that may have been damaged by the *Exxon Valdez* spill
- Creation of new aquatic habitat (by dredge and fill techniques, construction of artificial reefs, etc.)
- Success of organisms grown in or transplanted to oil-contaminated substrates
- Toxicity of hydrocarbons in the aquatic environment
- Approaches and techniques for long-term monitoring studies

Early indications are that surprisingly little has changed in terms of the state-of-the-art in oil spill restoration knowledge since 1981. However, the search conducted to date is only a preliminary one, and environmental restoration is a growing field. Consequently, literature review will be a continuing aspect of the restoration planning process. Future effort will include expanded reviews of all areas including the accessible "grey" literature. It is important that current restoration literature reviews be maintained to support the ability to react appropriately to future oil spills, as well as aid restoration planning for the *Exxon Valdez* oil spill.


ability to complement a study
in time for the 1990 field
season.
(2) to assess techniques for
which there is uncertainty
of success therefore, F.S. aims
may not...

CHAPTER V
FEASIBILITY STUDIES

Restoration feasibility studies are a means to establish feasibility in cases for which there is uncertainty of success or benefit, given the particular species and environment within the oil-spill area. Such studies can also help determine the cost of implementing full-scale restoration projects and help evaluate associated environmental impacts and benefits.

Many ideas for restoration projects have been suggested—and continue to be suggested—as a result of public participation and technical consultations. Evaluating these ideas will be a long and involved process, and it is important to move quickly to test promising methods for which the technical feasibility is in question.

Five Restoration Feasibility Studies are currently in progress. The factors considered in selecting these studies included: (1) relationship to natural resource damage assessment studies and injured natural resources, (2) identified public concern, (3) the need to initiate a study promptly, (4) the ability to implement a study in the summer of 1990, (5) reasonable likelihood of success, and (6) cost relative to the amount available for feasibility studies. Of the five Restoration Feasibility Studies, three concern restoration of intertidal and supratidal shoreline communities, one addresses upland habitats used by wildlife affected by the spill, and one identifies lands, habitats, and resources that represent at least potential opportunities for the acquisition of equivalent resources. The 1990 restoration feasibility studies are summarized below, and are described in more detail in the 1990 State/Federal Natural Resources Damage Assessment Plan for the *Exxon Valdez* Oil Spill. (Note that these five feasibility studies may not reflect the mix of restoration projects that will be recommended in a restoration plan.)

Restoration Feasibility Study Number 1: Reestablishment of *Fucus* sp. in Rocky Intertidal Ecosystems.

The marine alga, *Fucus* sp., is a critical structural component of the intertidal ecosystem on rocky shores. Qualitative evidence indicates that it was damaged by both the spilled oil and cleanup efforts. If the natural recovery of *Fucus* sp. can be enhanced through the dispersal of seeds or transplants, it will benefit the associated flora and fauna on intertidal rocky shores. This study involves both laboratory and field tests to develop and demonstrate the feasibility of a *Fucus* sp. restoration project. The U.S. Environmental Protection Agency is the lead agency.

Restoration Feasibility Study Number 2: Reestablishment of Critical Fauna in Rocky Intertidal Ecosystems.

Certain faunal species are key components of intertidal rocky ecosystems. Examples include grazers, such as limpets (e.g., *Diadora*), and predators, such as starfish (e.g., *Nucella*). Recolonization rates for these types of species and for the alga, *Fucus* sp., may limit the natural rates of recovery for entire communities. This feasibility study will compare the rates of recovery in communities with and without such species as limpets, and will evaluate techniques for enhancing recolonization rates. The U.S. Forest Service is the lead agency.

Restoration Feasibility Study Number 3: Identification of Potential Sites for Stabilization and Restoration with Beach Wildrye.

Beach wildrye (*Elymus mollis*) was affected by both spilled oil and cleanup activities, and is extremely important in the prevention of erosion in the coastal environment. Erosion can lead to the destabilization and degradation of cultural and recreational sites and wildlife habitats. There are well established techniques for restoring rye grasses on coastal dune systems. This study will identify sites at which damage has occurred and restoration activities appear to be feasible. The Alaska Department of Natural Resources is the lead agency.

Restoration Feasibility Study Number 4: Identification of Upland Habitats Used by Wildlife Affected by the Oil Spill.

A variety of marine birds, waterfowl, and other bird and mammalian species were killed by the spill or injured by contamination of their prey and habitats. Many of these species are dependent on aquatic or intertidal habitats for such activities as feeding and resting, but they also use upland habitats in forests, along streams, or above tree line. Through the public scoping process and technical consultations, many people have suggested that protection of upland habitats from further degradation may be an important way to help wildlife recover from the effects of the oil spill. This study will explore the linkages between wildlife affected by the oil spill and upland habitats, focusing in 1990 on marbled murrelets (*Brachyramphus marmoratus*) and harlequin ducks (*Histrionicus histrionicus*). The U.S. Fish and Wildlife Service and the Alaska Department of Fish and Game are the lead agencies.

Restoration Feasibility Study Number 5: Land Status, Uses, and Management Plans in Relation to Natural Resources and Services.

Through the scoping process, members of the public have suggested a wide variety of projects to acquire the equivalent of injured resources. Examples are the acquisition of timber or development rights, conservation easements, recreational and cultural sites, inholdings within state and federal areas, and buffer strips along streams and coasts. Habitat protection may also be the best means of providing for the long-term restoration of wildlife populations. To begin identifying and evaluating potential restoration projects of this type, this study will summarize existing information about the status, uses, and management plans of both public and private lands. The Alaska Department of Natural Resources is the lead agency.

Three Restoration Technical Support Projects are also being carried out in 1990. The first project supports development of detailed plans for potential feasibility studies in 1991, including, but not limited to: (1) monitoring "natural" recoveries, (2) pink salmon stock identification, (3) herring stock identification/spawning site inventory, (4) artificial reefs for fish and shellfish, (5) alternative recreation sites and facilities, (6) historic sites and artifacts, and (7) availability of forage fish. A second Restoration Technical Support Project develops and implements a peer reviewer process to improve the scientific quality of feasibility studies and potential restoration projects. The third and final support project assesses and summarizes beach segment survey data to identify sites for potential feasibility studies and restoration projects.

Results from restoration feasibility studies will be made available to the public through subsequent progress reports. Implementation of any feasibility studies in 1991 is subject to the availability of funds.

CHAPTER VI
DEVELOPMENT OF RESTORATION OPTIONS

Development of a plan to "restore, replace, or acquire the equivalent" of the natural resources and services injured by the oil spill requires consideration of a wide range of alternative field projects, management actions, and resource acquisitions. The goal of such a plan will be to restore injured resources and services to their baseline—in other words, pre-spill—conditions.

Until now, the goal of the restoration planning process has been to identify the widest possible array of alternatives, based on suggestions from the public, the advice of damage assessment investigators and technical experts, and the literature. Although RPWG will continue to invite ideas about restoration alternatives throughout the planning process, we now can begin to organize the ideas suggested to date and to gather the information necessary to evaluate them.

To that end, RPWG has developed a series of summary tables, or matrices, that portray potential restoration alternatives in relation to categories of potentially injured resources. Although the matrices are broadly inclusive, they do not cover suggestions that are unrelated to the goals of the restoration program (e.g., ideas for legislation pertaining to future oil spills). Also, for convenience, many individual recommendations have been combined into single alternatives, and there is considerable overlap among the various items and matrices.

The potential restoration alternatives are presented largely without regard to geography, because most options are potentially applicable to more than one site or geographic area. In general, direct restoration projects would be implemented on-site, at one or more localities within the oil-spill area. In contrast, projects which replace or acquire equivalent resources may take place outside the spill area.

Matrices are provided for each category of potentially injured resource: coastal habitats, fish and shellfish, birds, mammals, cultural resources, recreation. A final matrix includes potential restoration approaches that may apply to multiple resource categories.

The cells of the matrices have been left blank. Readers are encouraged to use these matrices to help organize their own thinking about potential restoration alternatives. Suggestions about additional options and other ways to evaluate them are welcome and invited. Future reports will include evaluations of the cells in the matrices.

COASTAL HABITATS

Matrix of Potential Restoration Approaches

	Categories of Injured Resources									
	Supratidal Zone					Intertidal Zone				
	Rocky, exposed	Rocky, sheltered	Estuarine, sheltered (incl. marsh)	Coarse-textured cobbles/pebbles	Fine-textured cobbles/pebbles	Rocky, exposed	Rocky, sheltered	Estuarine, sheltered (incl. marsh)	Coarse-textured cobbles/pebbles	Fine-textured cobbles/pebbles
Hasten natural recovery of communities and ecosystems by transplanting or "reseeding" flora/fauna										
Increase primary productivity in plant communities by fertilizing intertidal/supratidal habitats										
Improve conditions for re-establishing vegetation by removal of residual oil through low-impact substrate aeration techniques (e.g., raking)										
Long-term research/monitoring program on such topics as residual oil in the environment, rates of natural recovery, and the character of subsequent ecosystems										
Acquisition/protection of upland areas to protect adjacent coastal habitats from degradation										
Control of erosion by placement of rip-rap, re-establishing vegetation, and other methods										
Change management practices at selected sites/habitats (e.g., temporarily restrict access)										
Physically replace substrates contaminated by residual oil										
Establish new marine parks/sanctuaries										

COASTAL HABITATS

Matrix of Potential Restoration Approaches

Potential Restoration Approaches	Categories of Injured Resources				
	Subtidal Zone				
	Rocky, exposed	Rocky, sheltered	Estuarine, sheltered (incl. marsh)	Coarse-textured cobbles/pebbles	Fine-textured cobbles/pebbles
Hasten natural recovery of communities and ecosystems by transplanting or "reseeding" flora/fauna					
Increase primary productivity in plant communities by fertilizing intertidal/supratidal habitats					
Improve conditions for re-establishing vegetation by removal of residual oil through low-impact substrate aeration techniques (e.g., raking)					
Long-term research/monitoring program on such topics as residual oil in the environment, rates of natural recovery, and the character of subsequent ecosystems					
Acquisition/protection of upland areas to protect adjacent coastal habitats from degradation					
Control of erosion by placement of rip-rap, re-establishing vegetation, and other methods					
Change management practices at selected sites/habitats (e.g., temporarily restrict access)					
Physically replace substrates contaminated by residual oil					
Establish new marine parks/sanctuaries					

FISH AND SHELLFISH

Matrix of Potential Restoration Approaches

Potential Restoration Approaches	Categories of Injured Resources								
	Salmon								
	Eggs	Juveniles	Adults	Herring	Sport fish	Groundfish	Rockfish	Shrimp and crab	Bivalves
Construct new hatcheries and/or expand existing hatcheries to provide additional fish for stocking programs									
Improve productivity in stream/lake habitats by construction of fishways, fertilization of lakes, and other means of enhancement									
Enhance wild stocks/populations rather than hatchery stock through placement of egg boxes and other means of enhancement									
Preserve gene pools and local populations through "ocean ranching"									
Improve resource assessments to enable better management decisions									
Identify and catalog individual stocks to enable more targeted management actions									
Catalog and protect spawning habitats									
Clean/supplement spawning substrates									
Close, restrict, or shift fisheries to speed natural recoveries									
Redirect fisheries efforts to alternative species									
Restrict high-seas interceptions to provide more spatiotemporal control over fish mortality									

FISH AND SHELLFISH

Matrix of Potential Restoration Approaches

Potential Restoration Approaches	Categories of Injured Resources								
	Salmon								
	Eggs	Juveniles	Adults	Herring	Sport fish	Groundfish	Rockfish	Shrimp and crab	Bivalves
Increase public relations and quality assurance efforts to redevelop damaged markets									
Change management emphases/practices (e.g., target "terminal" fisheries)									
Construct artificial habitat structures									
Continue monitoring oil-spill impacts as needed to guide management efforts									
Conduct long-term research/monitoring program									
Protect upland habitats (e.g., timbered slopes) to maintain water quality in streams and nearshore habitats									
Acquire development rights and map baseline management information on fisheries habitats in and along rivers									
Mariculture and shore/intertidal habitat enhancements									
Transplants to augment natural recoveries									
Control predators on fish eggs and juveniles									
Buy back limited entry fishing permits to reduce pressure on resources									

BIRDS

Matrix of Potential Restoration Approaches

Potential Restoration Approaches	Categories of Injured Resources						
					Waterfowl		
	Loons	Grebes	Shearwaters and petrels	Cormorants	Sea ducks	Mergansers	Other waterfowl
Augment natural reproduction through captive breeding (as a source of eggs or young), fostering and related techniques							
Provide artificial nest sites/substrates to enhance productivity or redirect nest activities to alternative sites							
Mariculture of shellfish to supplement prey base							
Stabilize eroded beach/supratidal nest habitats							
Restrict hunting and reduce illegal taking of eggs and adult birds							
Eliminate introduced predators (e.g., foxes) from islands that are or were important for ground-nesting birds							
Minimize disturbance from tour boats, fishermen, researchers, and others through public education and law enforcement							
Reduce chronic oil pollution associated with boats, harbors, and the transportation of petroleum							
Eliminate high-seas gillnet fisheries and the resulting incidental mortality to birds							
Restrict near-shore gillnet fisheries to minimize conflicts with bird populations							
Reduce/prevent water pollution from ~~mining~~ that can directly or indirectly harm birds (e.g., reduce prey abundance)							
Protect from logging timbered slopes, streamsides, and coastal perimeters that serve as nesting/resting habitats							
Protect from logging watershed areas necessary to maintain water quality and habitats that sustain the avian prey base							
Acquire nesting habitats and colony sites							
Acquire stopover/wintering habitats in the Pacific flyway							
Protect wetland habitats important to migratory birds nationally and internationally							
Conduct long-term research/monitoring program on bird populations, ecology, and prey							

BIRDS

Matrix of Potential Restoration Approaches

Potential Restoration Approaches	Categories of Injured Resources				
	Raptors		Shorebirds		
	Bald eagle	Peregrine falcon, Peale's	Black oyster-catcher	Sandpipers	Gulls
Augment natural reproduction through captive breeding (as a source of eggs or young), fostering and related techniques					
Provide artificial nest sites/substrates to enhance productivity or redirect nest activities to alternative sites					
Mariculture of shellfish to supplement prey base					
Stabilize eroded beach/supratidal nest habitats					
Restrict hunting and reduce illegal taking of eggs and adult birds					
Eliminate introduced predators (e.g., foxes) from islands that are or were important for ground-nesting birds					
Minimize disturbance from tour boats, fishermen, researchers, and others through public education and law enforcement					
Reduce chronic oil pollution associated with boats, harbors, and the transportation of petroleum					
Eliminate high-seas gillnet fisheries and the resulting incidental mortality to birds					
Restrict near-shore gillnet fisheries to minimize conflicts with bird populations					
Reduce/prevent water pollution from mining that can directly or indirectly harm birds (e.g., reduce prey abundance)					
Protect from logging timbered slopes, streamsides, and coastal perimeters that serve as nesting/resting habitats					
Protect from logging watershed areas necessary to maintain water quality and habitats that sustain the avian prey base					
Acquire nesting habitats and colony sites					
Acquire stopover/wintering habitats in the Pacific flyway					
Protect wetland habitats important to migratory birds nationally and internationally					
Conduct long-term research/monitoring program on bird populations, ecology, and prey					

BIRDS
Matrix of Potential Restoration Approaches

Potential Restoration Approaches	Categories of Injured Resources					
	Alcids					
	Common Murre	Puffins	Pigeon guillemot	Murrelets (Brachyramphus only)	Other alcids	OTHER ~~Land birds, primarily passerines~~
Augment natural reproduction through captive breeding (as a source of eggs or young), fostering and related techniques						
Provide artificial nest sites/substrates to enhance productivity or redirect nest activities to alternative sites						
Mariculture of shellfish to supplement prey base						
Stabilize eroded beach/supratidal nest habitats						
Restrict hunting and reduce illegal taking of eggs and adult birds						
Eliminate introduced predators (e.g., foxes) from islands that are or were important for ground-nesting birds						
Minimize disturbance from tour boats, fishermen, researchers, and others through public education and law enforcement						
Reduce chronic oil pollution associated with boats, harbors, and the transportation of petroleum						
Eliminate high-seas gillnet fisheries and the resulting incidental mortality to birds						
Restrict near-shore gillnet fisheries to minimize conflicts with bird populations						
Reduce/prevent water pollution from mining that can directly or indirectly harm birds (e.g., reduce prey abundance)						
Protect from logging timbered slopes, streamsides, and coastal perimeters that serve as nesting/resting habitats						
Protect from logging watershed areas necessary to maintain water quality and habitats that sustain the avian prey base						
Acquire nesting habitats and colony sites						
Acquire stopover/wintering habitats in the Pacific flyway						
Protect wetland habitats important to migratory birds nationally and internationally						
Conduct long-term research/monitoring program on bird populations, ecology, and prey						

MAMMALS

Matrix of Potential Restoration Approaches

Potential Restoration Approaches	Categories of Injured Resources							
	Humpback Whales	Killer Whales	Steller's Sea Lions	Harbor Seals	Sea Otters	Sitka black-tailed deer	Bears, brown and black	River Otter and Mink
Supplement winter-season foods for stressed animals feeding in intertidal habitats (e.g., provide rockweed for deer)								
Preserve areas that support foraging habitat (e.g., mussel beds and eelgrass for sea otters)								
Acquire/protect habitats in uplands (e.g., old-growth forest), and along streamsides and coastal perimeter								
Acquire/protect important habitats such as haulout/rookery sites and whale "rubbing" beaches								
Establish new wildlife refuges, sanctuaries, and viewing areas								
Protect marine mammals by buying back limited-entry gillnet permits								
Establish international wildlife rehabilitation/public education center								
Reduce human-use impacts/conflicts through management changes (e.g., closures of fishing, trapping seasons)								
Conduct long-term monitoring/research program on such topics as causes of decline in sea lion population								
Conduct long-term monitoring/research program on small mammals								
Minimize disturbance/illegal shooting through public education and law enforcement								
Translocations to augment populations within and outside of oil-spill area								
Establish mobile veterinary pathology unit								
Reduce entanglement/marine debris problems and expand stranding/entanglement response network (a rescue operation)								
Eliminate high-sea gillnet fisheries and the resulting incidental mortality to marine mammals								
Restrict/eliminate legal harvest of marine/terrestrial mammals								
Acquire/protect alternative sites such as polar bear denning areas and walrus mating and calving areas								

CULTURAL RESOURCES

Matrix of Potential Restoration Approaches

Potential Restoration Approaches	Categories of Injured Resources					
	Subsistence hunting	Subsistence fishing, incl. shellfish	Archaeological or historical sites	Burial sites	Public trust in government	Public perceptions about the environment
Protect cultural sites from erosion or other degradation using environmentally-compatible techniques (e.g., stabilize sites by revegetation)						
Inventory beach and upland sites for cultural resources						
Develop techniques to remove oil residue from artifacts for which radiocarbon dating is needed						
Improve enforcement of historic preservation laws						
Return artifacts removed by archaeologists or clean-up workers						
Conduct inventory/produce brochure with photographs of artifacts originating from oil-spill area that are now in museum collections						
Implement a "site steward" program that employs local residents to watch over/protect cultural sites						
Return privately-owned Native artifacts to public collections						
Increase public education/law enforcement to reduce vandalism and looting of historical, archaeological, and burial sites						
Provide information about status/quality of subsistence resources (e.g., regarding contaminant levels in shellfish)						
Provide local laboratory to which subsistence users can bring tissues for contaminants analyses						
Encourage hands-on public participation in implementing selected restoration projects in the field						
Help develop economic base for rural village residents (including analysis of subsistence economies)						

CULTURAL RESOURCES

Matrix of Potential Restoration Approaches

Potential Restoration Approaches	Categories of Injured Resources					
	Subsistence hunting	Subsistence fishing, incl. shellfish	Archaeological or historical sites	Burial sites	Public trust in government	Public perceptions about the environment
Buy back limited entry fishing permits and redistribute to local residents						
Involve local residents in restoration/monitoring projects						
Host a potlatch for people in affected rural villages						
Sponsor symbolic observance of restoration project (e.g., a public event or monument)						
Public education program to interpret the oil spill, the status of the environment, and restoration						
Education program to inform public and foster discussion about oil and the environment (e.g., what are the laws and issues?)						
Support museum exhibits to interpret the oil spill, the status of the environment, and restoration						
Publish booklet with suggestions about what individuals can do to benefit the environment affected by the oil spill (e.g., recycle marine boat oil)						
Develop/expand oil-spill curriculum materials for schools to include restoration program						
Assist in establishing interpretive museums/projects in rural villages						
Encourage oral history and video tape projects concerning regional/local history and traditions						
Develop cooperative agreements/management plans for cultural resources involving the state, university, and Native communities						
Designate Prince William Sound as a National Monument						

RECREATION

Matrix of Potential Restoration Approaches

Potential Restoration Approaches	Categories of Injured Resources						
	Sport Fishing						
	Marine	Freshwater	Salmon	Trout / char	Halibut	Rockfish	Shellfish
Provide alternative destinations (e.g., public-use cabins, camp sites) for recreation users							
Acquire private "inholdings" within publicly-managed lands (e.g., parks, refuges, forests)							
Acquire strategic sites/public access within blocks of privately-owned land and along coasts/rivers							
Acquire development rights, easements, etc. (less than fee-simple title) on private lands							
Implement special oil clean-up program for prime recreation sites and within units of the National Wilderness Preservation System							
Revise public lands management plans with respect to resource development and other activities that may further degrade recreational resources							
Enhance public understanding by interpreting the oil spill and present state of the environment							
Acquire/protect "threatened" wilderness/recreation areas within and outside of Alaska							
Establish new parks, refuges, and other protected areas							
Discourage increased use of sites/areas where pre-spill uses were low or where continued use of oiled sites would slow recoveries							
Enhance management capacity/revise regulations in response to increased awareness of recreational opportunities following oil spill publicity and clean up							
Develop unified, factual tourism/public information program (within state agencies and between state-private interests)							
Publish brochure to educate recreational boaters about environmental protection							
Construct/maintain interpretive facilities in oil-spill communities, perhaps associated with state or federal conservation units (e.g., Kenai Fjords National Park, Kachemak Bay State Park)							

RECREATION

Matrix of Potential Restoration Approaches

Potential Restoration Approaches	Categories of Injured Resources						
	Hunting				Boating		
	Deer	Bear	Waterfowl	Trapping	Pleasure (power / sail)	Kayaks and canoes	Charters, tour boats, etc.
Provide alternative destinations (e.g., public-use cabins, camp sites) for recreation users							
Acquire private "inholdings" within publicly-managed lands (e.g., parks, refuges, forests)							
Acquire strategic sites/public access within blocks of privately-owned land and along coasts/rivers							
Acquire development rights, easements, etc. (less than fee-simple title) on private lands							
Implement special oil clean-up program for prime recreation sites and within units of the National Wilderness Preservation System							
Revise public lands management plans with respect to resource development and other activities that may further degrade recreational resources							
Enhance public understanding by interpreting the oil spill and present state of the environment							
Acquire/protect "threatened" wilderness/recreation areas within and outside of Alaska							
Establish new parks, refuges, and other protected areas							
Discourage increased use of sites/areas where pre-spill uses were low or where continued use of oiled sites would slow recoveries							
Enhance management capacity/revise regulations in response to increased awareness of recreational opportunities following oil spill publicity and clean up							
Develop unified, factual tourism/public information program (within state agencies and between state-private interests)							
Publish brochure to educate recreational boaters about environmental protection							
Construct/maintain interpretive facilities in oil-spill communities, perhaps associated with state or federal conservation units (e.g., Kenai Fjords National Park, Kachemak Bay State Park)							

RECREATION

Matrix of Potential Restoration Approaches

Potential Restoration Approaches	Categories of Injured Resources						
	Camping		General Outdoor / Natural History				
	Public-use cabins / sites	Low-impact	Hiking and climbing	Berry picking, picnicking, etc.	Photography	Nature study	Existence values
Provide alternative destinations (e.g., public-use cabins, camp sites) for recreation users							
Acquire private "inholdings" within publicly-managed lands (e.g., parks, refuges, forests)							
Acquire strategic sites/public access within blocks of privately-owned land and along coasts/rivers							
Acquire development rights, easements, etc. (less than fee-simple title) on private lands							
Implement special oil clean-up program for prime recreation sites and within units of the National Wilderness Preservation System							
Revise public lands management plans with respect to resource development and other activities that may further degrade recreational resources							
Enhance public understanding by interpreting the oil spill and present state of the environment							
Acquire/protect "threatened" wilderness/recreation areas within and outside of Alaska							
Establish new parks, refuges, and other protected areas							
Discourage increased use of sites/areas where pre-spill uses were low or where continued use of oiled sites would slow recoveries							
Enhance management capacity/revise regulations in response to increased awareness of recreational opportunities following oil spill publicity and clean up							
Develop unified, factual tourism/public information program (within state agencies and between state-private interests)							
Publish brochure to educate recreational boaters about environmental protection							
Construct/maintain interpretive facilities in oil-spill communities, perhaps associated with state or federal conservation units (e.g., Kenai Fjords National Park, Kachemak Bay State Park)							

MULTIPLE RESOURCE APPROACHES

Matrix of Potential Restoration Approaches

Potential Restoration Approaches	Coastal habitat	Fish and Shellfish	Birds	Mammals	Cultural Resources	Recreation
Buy back Bristol Bay oil leases						
Require timber, oil, and other industries to provide restoration plans before resource extraction begins						
Prevent future oil spills through stronger regulations and improved planning						
Improve capacity to respond to/clean up future spills, both small and large						
Prevent future marine oil spills during the production by stopping offshore/coastal drilling						
Preclude development of oil resources in the Arctic National Wildlife Refuge						
Replant forests to make up for the voluminous paperwork caused by the oil spill						
Reforestation programs wherever logging has occurred (e.g., Afognak Island)						
Inventory and clean up old community and military dump sites						
Eliminate use of plastics and clean up plastic debris in marine environment						
Remove mine tailing and clean up mining and logging debris						
Prevent future oil spills and related impacts by reducing energy consumption through improved efficiency and conservation						
Assist oil-spill communities with environmentally-sound waste disposal and waste recycling programs						
Provide garbage tenders for at-sea collection of waste materials						
Buy "net operating losses" (NOLS) of timber sales and change laws to disallow NOLS						
Purchase development rights or provide tax incentives for not logging/developing private lands						
Acquire timber rights within state and federal protected areas and in buffer strips along streams and the coast						
Review management plans to assess the appropriateness of multiple land use designations						
Restrict logging, mining, fishing, hunting, and hydroelectric developments to reduce cumulative effects to the environment						
Review "glacier ice" industry for possible management changes						
Establish trust fund to support long-term research/monitoring						
Establish trust fund to support future needs for land/habitat acquisition						
Establish trust fund to support long-term and future needs in restoration and enhancement						
Establish fund to support the mitigation of losses of wetland habitats						
Establish Long-Term Ecological Research sites (a program sponsored by the National Science Foundation) and provide funds to support research/monitoring at those sites						
Enhance and support facilities/institutions in oil-spill communities that can carry out or provide logistical support for monitoring/research programs						
Support and equip fleet of marine vessels to conduct research/monitoring activities and respond to remote oil spills						

Before a restoration alternative can be recommended as a part of a restoration plan, a variety of factors must be evaluated and weighed. A preliminary list of possible considerations is presented in the table below.

Preliminary List of Factors to Consider in Evaluating Potential Restoration Alternatives

- What is the degree and extent of injury to natural resources or services?
- What is the degree and rate of natural recovery?
- Is the restoration alternative linked to injured natural resources or services?
- Is the restoration alternative technically feasible (i.e., is there a reasonable chance of success in an acceptable time period)?
- Will the restoration alternative result in net environmental benefit?
- What does the restoration alternative cost?

Evaluation of the basic factors presented in this table will yield a universe of potential restoration projects that are responsive to the injuries from the spill, appropriate under the law, feasible, and cost effective. Ultimately, however, the alternatives recommended in a restoration plan must also take into account broader considerations. For example, does a potential project benefit single resources or multiple resources and ecosystems? How quickly must a project be implemented to be worthwhile? What are the interests, needs, and priorities of the public, and how does a restoration alternative affect people living in or using the affected areas? Finally, the amount of money available for restoration will strongly influence the combination of projects recommended in a restoration plan.

CHAPTER VII
FUTURE RESTORATION PLANNING ACTIVITIES

This report is the first in a series of ~~what are anticipated to be annual~~ progress reports. Future reports will document our ongoing efforts as described below.

Public Participation

The RPWG recognizes ~~that more~~ public outreach is necessary and has considered several ideas to expand this effort. These include a specific effort to incorporate Native interests and ideas about restoration, visits to smaller communities for ~~informal~~ meetings, creation of ~~one or more~~ public advisory committees, publication of a restoration newsletter, producing and distributing short public information video tapes explaining the restoration process, and additional ~~scoping~~ meetings ~~in Canada~~ and the ~~lower 48~~ states.

Feasibility Projects

In the summer of 1991, an increased number of restoration feasibility projects is expected. Promising 1990 studies could be continued or expanded. Some projects might be tested in a wider geographic area, including areas outside of Prince William Sound.

Technical Workshops/ Peer Review Process

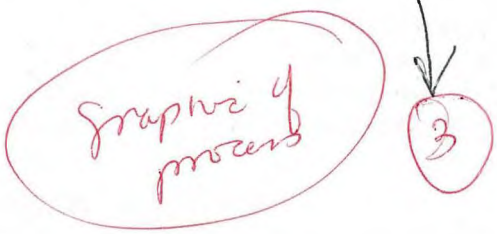
Additional technical workshops will be held with key scientists to develop restoration feasibility projects for 1991, and to develop an overall monitoring plan to evaluate restoration and recovery. A scientific peer review process will be designed and integrated into these efforts to ensure effective and efficient progress toward a restoration plan.

Literature Review

These efforts will continue throughout the restoration planning process, including further identification and acquisition of pertinent literature for review.

Development of a Final Restoration Plan

All of the activities outlined above will lead to development of a final restoration plan. Such a plan could be implemented only when restoration funds become available from the responsible parties or the state and federal governments.



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These efforts will expand the
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~~identify book for~~ info on cult +
Rec. Res. ; as well.

APPENDIX A

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Chap VII

SAVE

(1) Public participation is fundamental to developing a successful restoration plan. Therefore, RPWP will ~~has considered several methods to~~ continue and expand its efforts to involve the public in the planning process. ~~For example,~~ Additional public scoping meetings will ~~involve~~ be held ~~and include~~ specifically to encourage the participation of Alaskan Natives. Other possibilities include:

Start at //

(2) RF studies will continue to be an important means of evaluating ~~potential restoration options~~ alternatives ~~that are~~ identified thru the restoration plan process. For example, one of the 1990 TSP is designed to identify 1991 RFS. Pending ~~funds~~ availability of funds, these studies will conducted during next years' field season. Studies proposed; ...

Future efforts of the RPWG

(3) The final plan will take into account results from the NRDA, other technical input ~~and~~ ~~from the public~~ comments ~~com~~ ~~comments~~ and concerns received from the public.

~~A simplified process~~ The figure on the opposite page shows the general process.

~~to address techniques for which there is uncertainty of success therefore they f.s. alone~~

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There will be additional opportunities for public com

APPENDIX B

Appendix B

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