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Apr 19, 1993

TO: Matt McMillan
FROM: M. Kavanaugh

SUBJECT: Sector descriptions

IMPLAN's classification system is based on systems defined by the Bureau of Economic Analysis (BEA-Department of Commerce) and the Standard Industrial Classification (SIC) used by the Office of Management and Budget (OMB). The analysis is conducted using 528 industries and the results are aggregated into ten sectors. In SIC nemenclature the sectors are collections of Groups. The SIC assigns a 2-digit number to every Group. Within a Group are 3-digit and 4-digit Industries.

1. Agriculture, Forestry and Fishing - These businesses engage in agricultural production, forestry, commercial fishing, hunting and trapping and related services. Agricultural production firms produce crops and livestock. Forestry firms operate timber tracts, tree farms, forest nurseries or perform forestry services. Fishing, hunting and trapping covers commercial fishing, fish hatcheries, fish and game preserves and commercial hunting and trapping. This sector includes SIC groups 01 to 10.

2. Mining - These businesses extract minerals occurring naturally. Mining includes quarries, wells, milling and other preparations commonly done at mine site. This sector includes SIC groups 11 to 14.

3- Construction - These businesses build new work, additions, alterations and repairs. This sector includes SIC groups 15 to 17. (The SIC reserves 18&19).

4. Manufacturing - These businesses mechanically or chemically transform materials or substances into new products. The materials and substances are produced by other sectors (e.g., agricultural, forests and fisheries) or other manufacturers. This sector includes SIC groups 20 to 39.

5. Transportation, communication and utilities - These businesses provide to the public or to other businesses passenger and freight transportation, communication services, electricity, gas, steam, water or sanitary services. The U.S. Postal Service is included here. This sector includes SIC groups 40 to 49.

6. Trade - These businesses retail merchandise to households or wholesale it to retailers; other wholesalers; to other businesses; or act as agents or brokers in buying or selling goods. This sector includes SIC groups 50 to 59.

7. Finance, Insurance and Real Estate (FIRE) - These businesses engaged in the fields of finance, insurance and real

estate. This sector includes SIC groups 60 to 67. (The SIC reserves 68&69).

8. Services - These businesses provide a variety of services for individuals, businesses, governments, and other organizations. Examples include hotels, amusements, health, legal, engineering and other professional services. This sector includes SIC groups 70 to 89.

9. Government - This sector includes the legislative, judicial, administrative and regulatory activities of Federal, State, local and international governments. Government-owned businesses are classified according to the activity in which they are engaged. This sector includes SIC industry groups 90 to 97.

10. Misc. Special Services - These cannot be classified in any other industry.

Apr 19, 1993

TO: Matt McMillen
FROM: M. Kavanaugh

SUBJECT: Significance of modeling results

IMPLAN's data is from the 1990 U.S. Census, the U.S. Department of Labor and the Bureau of Economic Analysis of the U.S, Department of Commerce. Although the data comes from sampling, the results approximate the characteristics of the population. The Census, for example, uses a 1 in 6 sample. That is, although the Census counts everyone, one in every six persons answers additional questions including those about employment. Repeating the sampling changes the results. Probability theory shows that the results of the repeated sampling vary around the population value in a normal distribution.

The purpose of sampling is to make statements about the population. Since a sampled value varies randomly with repeated sampling (e.g., person A gets the long form rather than person B) it is fair to ask how accurate is the sampled value. Probability theory shows that for a normal distribution 95% of the sampled estimates are within (plus or minus) 1.96 standard deviations of the population characteristic. In other words, a value greater than plus or minus 1.96 standard deviations is not the result of a random event (i.e., the result of one person receiving the form rather than another person).

These considerations suggest assessing the significance of the modeling results by reference to the standard deviation of the underlying data. The impact procedure: first, samples baseline regional employment; then, spends the civil settlement; then, calculates regional employment. A significant change occurs if the two employment estimates differ by roughly two standard deviations. Alternatively, assume employment changes are assessed by sampling employment before and after the spending of the civil settlement. The two estimates do not differ significantly if they are within two standard deviations. Any change in sampled employment could be attributed to a random factor such as one person receiving the form rather than another.

The standard deviation for 1990 employment in the boroughs of Anchorage, Kenai, Kodiak and Valdez-Cordova is 684. A significant change in regional employment is an increase or decrease of 1368. Any change between zero and 1368 could be the result of sampling not of settlement spending.

Table 2
IMPLAN Inputs
10 yr annual 1990$ (000)

	1	2	3	4	5
Admin	$544	$2,176	$3,267	$3,811	$3,811
FG	50%	50%	50%	50%	50%
SLG	50%	50%	50%	50%	50%
Monitor	$2,722	$2,722	$3,811	$4,356	$5,445
FG	33%	33%	33%	33%	33%
SLG	34%	34%	34%	34%	34%
UNIV	33%	33%	33%	33%	33%
Restore	$0	$0	$8,534	$13,612	$17,968
SLG			33%	33%	33%
FISH			34%	34%	34%
CONSTRUCT			33%	33%	33%
Spr	$0	$0	$0	$5,445	$8,167
SLG				100%	100%
Habitat	$0	$49,547	$40,635	$27,224	$19,058
REAL ESTATE		0.4%	0.3%	0.3%	0.5%
FORESTRY		70%	76%	96%	96%
HOUSEHOLDS		30%	23%	3%	4%
yield	$1,791	$0	$0	$0	$0
BANKS	100%				
respend	$0	$33,259	$26,249	$14,959	$10,478
SECURITIES		23%	25%	32%	32%
CONSTRUCT		24%	27%	33%	32%
S.SERVICES		23%	25%	32%	32%
HOUSEHOLDS		30%	23%	3%	4%

The dollar value change is determined by: the lump sum amount of the remaining funds; the percent allocation each category receives of the remaining funds; a deflator to turn the settlement's 1993 dollars into IMPLAN's 1990 dollars; and a factor that turns the lump sum amount into an annual amount. The amount and the allocation are from the Summary p.4, 29 respectively. The change in the fixed-weight price index changes the 1993 amounts into 1990 amounts. The spending occurs over a ten year period; see the Summary p. 4, 30, 37. These computations are in Table 1.

The last task prepares inputs for IMPLAN. This involves taking the annualized, 1990 dollar allocation and distributing it over industries. Although the distribution is straightforward three comments follow. Table 2 gives the results.

The first comment involves Section 7(i) on ANCSA that requires the sharing of proceeds from timber sales by one Native Corporation with the other Native Corporations. Accordingly, spending from the proceeds is less than the amount received from habitat purchase.

The second comment notes that most habitat purchases are from stocks of commercial timberland. This is based on "Analysis of Habitat Protection Acquisition Alternatives in Draft Restoration Plan." Timberland purchases reduce economic activity more than purchases of non-commercial land for two reasons. First, timberland provides regional employment, non-commercial land does not. Second, spending the funds received from habitat acquisitions increases employment if the spending occurs within the region. The sharing requirements of ANCSA represent a strong leakage from the regional economy. Proceeds from non-commercial land are not shared and are more likely to remain in the regional economy.

The third comment involves the endowment. Impact analysis involves a demand change and a multiplier matrix. The dollar value of an endowment's corpus is different from the demand change for bank output. Service sector output is difficult to measure and measuring bank output is no exception. For this analysis bank output is the endowment's yield. The yield is determined by applying a 3.5% risk-free rate to the endowment where the risk-free rate is the rate on 90 day U.S. Treasury bills.

Table 1
Alaska Restoration Planning Alternatives Allocation
(percent)

	1	2	3	4	5
Admin	1.00%	4.00%	6.00%	7.00%	7.00%
Monitor	5.00%	5.00%	7.00%	8.00%	10.00%
Restore	0.00%	0.00%	12.00%	25.00%	25.00%
Habitat	0.00%	91.00%	75.00%	50.00%	45.00%
SPR	0.00%	0.00%	0.00%	10.00%	13.00%
Balance	94.00%	0.00%	0.00%	0.00%	0.00%
	100.00%	100.00%	100.00%	100.00%	100.00%

Source: Draft Exxon Valdez Oil Spill Restoration Plan
Summary of Alternatives for Public Comment
p.22

Alaska Restoration Planning Alternatives Allocation
(000) 1992$

	1	2	3	4	5
Admin	$8,100	$24,400	$48,600	$48,700	$48,700
Monitor	$40,500	$40,500	$48,700	$48,600	$81,000
Restore	$0	$0	$72,900	$195,000	$201,800
Habitat	$0	$685,100	$487,500	$305,000	$413,500
Acquire	$0	$8,000	$1,800	$1,000	$1,000
Commercial	$0	$535,000	$548,000	$394,000	$205,000
Non-com	$0	$194,100	$107,000	$10,000	$7,500
SPR	$0	$0	$0	$81,000	$81,000
Balance	$678,400	$0	$0	$0	$0
	$810,000	$810,000	$810,000	$810,000	$810,000

$810 million available for restoration from
Draft Exxon Valdez Oil Spill Restoration Plan
Summary of Alternatives for Public Comment p.4

Alaska Restoration Planning Alternatives Allocation
(000) 1982$

	1	2	3	4	5
Admin	$8,445	$21,779	$32,668	$36,115	$36,115
Monitor	$27,224	$27,224	$33,115	$43,558	$54,447
Restore	$0	$0	$55,836	$139,119	$170,676
Habitat	$0	$495,408	$408,005	$272,888	$130,665
Acquire	$0	$1,705	$1,834	$663	$663
Commercial	$0	$347,212	$311,808	$266,417	$132,976
Non-com.	$0	$146,473	$66,505	$5,668	$6,804
SPR	$0	$0	$0	$54,447	$51,871
Balance	$611,808	$0	$0	$0	$0
total	$644,471	$644,471	$644,471	$644,471	$644,471

This table restates the allocation in 1982$,
the year on which IMPLAN is based. The restatement uses
the fixed-weight price index.

Alaska Restoration Planning Alternatives Allocation
Annual for 10 yrs. (000) 1982$

	1	2	3	4	5
Admin	$844	$2,178	$3,267	$3,611	$3,611
Monitor	$2,722	$2,722	$3,611	$4,356	$5,445
Restore	$0	$0	$5,584	$13,912	$17,068
Habitat	$0	$49,547	$40,595	$27,284	$13,065
Acquire	$0	$170	$184	$66	$66
Commercial	$0	$34,721	$31,161	$26,642	$13,298
Non-com.	$0	$14,647	$6,651	$566	$680
SPR	$0	$0	$0	$5,445	$5,187
Balance	$61,160	$0	$0	$0	$0
total	$64,447	$64,447	$64,447	$64,447	$64,447

IMPLAN requires annual inputs and gives results as
annual changes
Civil settlement is paid over a ten yr period p.4
Funds will be spent over a ten year period p.20, 27

Apr 21, 1993

TO: Matt McMillen
FROM: M. Kavanaugh

SUBJECT: Industries with initial changed final demand

IMPLAN is a demand-driven model. It combines user-supplied changes in final demand with a multiplier matrix to provide information about regional changes in income and employment. While the multiplier matrix incorporates the structural, technological and trade related information, the user must supply the information about the final demand change.

The necessary information about the final demand changes are: which commodity or industry has the demand change and the dollar value of the change. The industry involved is important since the multiplier matrix reflects the strengths of inter-industry linkages and linkages vary in strength across industries. The dollar value gives the change's strength.

The "Draft Exxon Valdez Oil Spill Restoration Plan Summary of Alternatives for Public Comment" (Summary) distributes the dollars from the civil settlement over six categories: administration and public information, monitoring and research, general restoration, habitat protection, spill prevention and response and balance. Unfortunately, these categories are not IMPLAN industries. So, spending must be translated into IMPLAN industries.

The translations are:

Administration and public information - Federal and State and local government

Monitoring and research - Federal and state and local government and universities

General restoration - State and local government, private fisheries and construction

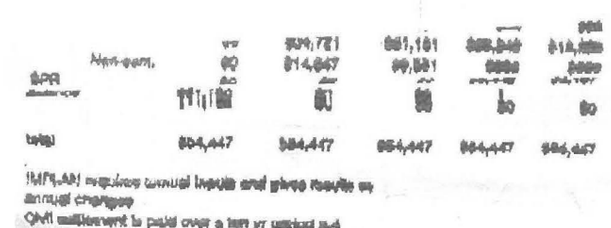
Spill prevention and response - State and local government

Habitat protection - Forestry, real estate, households

Balance - Banking

Respending of Habitat Protection - Securities, social services, construction, households

The last category "Respending of Habitat Protection" does not appear in the Summary. It is part of the modeling exercise. Habitat purchases put dollars in the hands of resource owners. This category specifies a spending pattern for these funds that saves/invests part (securities, construction) and consumes part (social services).



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

(907) 278-8012

TO: Stephen Zimmerman
Protected Species Chief
National Marine Fisheries
9109 Mendenhall Mall Road, Suite 6
Juneau, AK 99801

FROM: Ray Thompson
Restoration Planning Work Group

SUBJECT: Section 7 Consultation for the Exxon Valdez Oil Spill Area

I am requesting the subject Endangered Species Act consultation for the area defined on the enclosed map (page 10) entitled: THE EXXON VALDEZ OIL SPILL AREA GENERAL LAND STATUS, SOUTHCENTRAL ALASKA, dated 3/31/93. This area is defined to facilitate the development of a long-term Restoration Plan and Environmental Impact Statement (EIS) for the restoration of oil spill injured resources and services. The draft alternatives for the Plan and EIS are found on Page 4 of the Draft EVOS Restoration Plan brochure.

The Restoration Planning Work Group is preparing the Draft Restoration Plan which is scheduled for public distribution in late June this year. The Draft EIS is being prepared under contract by Walcoff and Associates, 635 Slaters Lane, Suite 400, Alexandria, VA 22314; (703) 684-5588. The Draft EIS will be distributed to the public along with the Draft Plan. It is best if we could have your response by 4/26/93.

Carol Paquette of Walcoff and Ray Thompson of RPWG (907) 278-8012 will be your contacts.

CC: Ken Rice
Carol Paquette

Enclosure

RESTORATION PLANNING WORK GROUP
EXXON VALDEZ OIL SPILL OFFICE
645 "G" STREET
ANCHORAGE, ALASKA 99501
(907) 278-8012

TO: Ms. Carol Paquette
Walcoff & Associates
635 Slaters Lane, Suite 400
Alexandria, VA 22314

April 16, 1993

FROM: Ray Thompson

SUBJECT: Draft Restoration Plan Chapters I, III, IV and VI

The enclosed draft chapters of the Restoration Plan are to be used only as they are - early drafts which have only had some internal review and comment from RPWG members. Each should be helpful as we begin to compile the various chapters of both the DEIS and Draft Plan.

On Friday, April 23, I will be gathering the RPWG comments on your chapters 1-3. I appreciate the copy of the latest chapter (3) which I got from Ken Rice. This was distributed to our Work Group today. I have not read the draft but it appears that the injury discussion will fit well with what we are doing. Since we have significantly revised chapter III of the Plan, it remains to be seen how these EIS and Plan chapters will mesh.

Plan chapter II has yet to be written. Chapter V will be written soon and will display the information found in the Alternative section of the Information Brochure. I will make these chapters available as they are drafted.

On another subject I have requested Endangered Species Act, Section 7 consultation from the US Fish and Wildlife Service and NOAA, National Marine Fisheries. I expect a preliminary response by 4/23/93. I will keep you informed of progress on this issue.

I am also enclosing the latest draft of the options. These summaries are being reviewed by RPWG. If you have questions or comment I would appreciate them soon.

enclosures

cc: Rice

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

TO: RPWG

4/12/93

FROM: Ray and Veronica

SUBJECT: Draft of Restoration Plan Chapter I, INTRODUCTION

This Draft has been prepared for your review and comment. Either of us would like to hear from you as soon as you have the chance to read it.

Thanks for this opportunity to give you more important work to do.

RESTORATION PLAN
DRAFT

Draft Exxon Valdez Oil Spill Restoration Plan

I. INTRODUCTION

DRAFT

A. Purpose of Document

In 1989, the *Exxon Valdez* oil spill contaminated thousands of miles of Alaska's coastline. It killed birds, mammals, and fish, and damaged other resources. In 1991, Exxon agreed to pay the United States and the State of Alaska $900 million over a period of ten years to restore resources and human uses injured by the spill.

The *Exxon Valdez* Restoration Plan will provide long-term guidance for restoring resources and human uses injured by the oil spill. Once the Restoration Plan is adopted, it may be changed in response to new information about the injuries and recovery, new technologies, or other changing conditions.

The National Environmental Policy Act requires that an Environmental Impact Statement be part of any significant federal action such as the restoration program. In addition to including information found here, the Draft Environmental Impact Statement will analyze the impacts of these alternatives on the physical, biological, social, and economic aspects of the environment. It will help the Trustee Council and the public understand the consequences of alternative ways of restoring injuries caused by the spill.

Alternatives present different approaches to restoration. These may range from doing nothing, a no action alternative, to doing all that is known to be useful for restoring resources and services injured by the spill. Each alternative presented for analysis, emphasizes different categories of restoration activities. These activities are uniquely responsive to the issues by defining the policies, or management direction, for each issue. The grouping of policies characterizes the restoration options included in each alternative, and how that alternative will effect injured resources and services.

Restoration actions that are effective have been combined into general restoration options. The general restoration options include a number of specific projects or activities. The implementation of each project effects the resource or service upon which it focuses differently. A general analysis of option and alternative effects accompanies this document, whereas the analysis of specific project effects will be made when the project is to be implemented.

The Trustee Council invites you to express your opinion about the best way to restore resources and human uses injured by the *Exxon Valdez* oil spill. Because many people are busy during the summer, a summary of the Draft Restoration Plan was released in April and discussed at public meetings. The summary is included in this document as a newsprint brochure. By going through the Draft Restoration Plan and completing the

response form on page 8 of the enclosed brochure, you will have a chance to tell us what you like and dislike about alternative ways to help the animals, plants, and people injured by the spill. You can also make recommendations about ideas we may have overlooked. We would appreciate receiving your comments as soon as possible. We will use all comments received by **August 6, 1993,** to prepare a Final Restoration Plan for your review.

The information you provide will be used to prepare a Final Restoration Plan that will be presented to the public this fall. The final plan may contain parts of several of the alternatives presented here plus new information you provide.

B. Background

1. History of the oil spill

Shortly after midnight on March 24, 1989, the T/V *Exxon Valdez* ran aground on Bligh Reef in Prince William Sound spilling 11 million gallons of North Slope crude oil. This was the largest oil spill in United States history. All through the spring, the oil moved along the coastline of Alaska contaminating the shoreline of Prince William Sound, the Kenai Peninsula, lower Cook Inlet, the Kodiak Archipelago, and the Alaska Peninsula. Portions of 1,200 miles of coastline were oiled, including part of one National Forest, four National Wildlife Refuges, three National Parks, five State Parks, four State Critical Habitat Areas, and one State Game Sanctuary. Oil eventually reached shorelines nearly 600 miles southwest of Bligh Reef (Figure ____).

Response. During 1989, efforts focused on containing and cleaning up the spill and rescuing oiled wildlife. Skimmer ships were sent throughout the spill zone to remove oil from the water. Booms were positioned to keep oil from reaching important commercial salmon hatcheries in Prince William Sound and Kodiak. A fleet of fishing vessels known as the "Mosquito Fleet" played an important role in protecting these hatcheries, in corralling oil to assist the skimmer ships, and in capturing and transporting oiled wildlife to rehabilitation centers. Exxon began a beach cleanup under the direction of the U.S. Coast Guard with input from Federal and State agencies and local communities on the areas that should receive priority for clean up. Several thousand workers cleaned shorelines, using techniques ranging from cleaning rocks by hand to high pressure hot-water washing. Fertilizers were applied to some oiled shorelines to increase the activity of oil-metabolizing bacteria in a procedure known as bioremediation.

When the anticipation of deteriorating weather brought an end to clean-up work in the fall of 1989, a large amount of oil remained on the shorelines. Although winter storms proved extremely effective in cleaning many beaches, spring shoreline surveys indicated that much work remained to be done in 1990. Crews operating from boats and helicopters cleaned oiled shorelines in Prince William Sound, along the Kenai and Alaska Peninsulas, and on the Kodiak Archipelago. Manual pick up of remaining oil was the principal method

used during 1990, but bioremediation and relocation of oiled berms to the active surf zone were also used in some areas. A shoreline survey and limited clean-up work took place during 1991.

The most recent shoreline survey occurred in 1992. Crews visited 81 sites, excluding Kodiak and sites set aside for monitoring natural recovery. They reported that an estimated 7 miles of shorelines surveyed are still oiled to some degree (Figure _____). Another shoreline survey is planned for 1993.

Natural Resource Damage Assessment. During the first summer after the spill, the State and Federal Trustee agencies planned and mobilized the Natural Resource Damage Assessment field studies to determine the nature and extent of the injuries that were being sustained in the spill area. Even with the rapid deployment of studies, some opportunities to gather injury data were irretrievably lost during the early weeks of the spill due to the complexity and volume of the work at hand and the scarcity of available resources. Shortly after the spill, a legal framework was established and expert peer reviewers were retained to provide independent scientific review of ongoing and planned studies and assist with synthesis of results. Most damage assessment field studies were completed during 1991, although some laboratory data analyses are still underway. In the latter part of 1989, the Trustee agencies, with the assistance of the Environmental Protection Agency, initiated restoration planning activities to identify restoration alternatives and procedures and to implement restoration technical and feasibility studies and projects.

2. Settlements

On October 8, 1991, the U.S. District Court approved an agreement that settled the claims of the United States and the State of Alaska against Exxon for various criminal violations and for recovery of civil damages resulting from the oil spill.

The Criminal Plea Agreement. As part of the criminal plea agreement, the court fined Exxon $250 million -- the largest fine ever imposed for an environmental crime. Of this amount, $125 million were forgiven due to their cooperation with the governments during the cleanup, timely payment of many private claims, and environmental precautions taken since the oil spill. Of the remaining $125 million, $50 million each were paid to the United States and the State of Alaska. The state and federal governments separately manage these $50 million payments. The remaining $25 million were paid into the North American Wetlands Conservation Fund, and into the Victims of Crime Act Account.

Funds from the criminal plea agreement are not under the authority of the Trustee Council and are not considered by this plan. However, they must be used exclusively for restoration activities, within the State of Alaska, relating to the *Exxon Valdez* oil spill.

Civil Settlement and Restoration Fund. In the civil settlement, Exxon agreed to pay the United States and the State of Alaska $900 million over a period of 10 years. Funds must be deposited each year beginning December 1991 and ending September 2001. The use of the civil settlement funds is the subject of this plan.

Rules for spending the civil settlement funds are as follows:

- Settlement funds must be used "...for the purposes of restoring, replacing, enhancing, or acquiring the equivalent of **natural resources** injured as a result of the Oil Spill and the reduced or lost **services** provided by such resources..." (except for reimbursements to the state and federal governments in settlement of past costs).

- Settlement funds must be spent on restoration of natural resources in Alaska unless the Trustees unanimously agree that spending funds outside of the state is necessary for effective restoration.

- All decisions made by the Trustee Council (such as spending settlement funds) must be made by unanimous consent.

The settlement defines **natural resources** as the land, fish, wildlife, biota, air, water, ground water, drinking water supplies, and other such resources belonging to or managed by the state or federal governments. Examples of natural resources are birds, fish, mammals, subtidal plants and animals, and archaeological resources.

In addition to restoring natural resources, funds may be used to restore reduced or lost **services (human uses)** provided by injured natural resources. For example, subsistence, commercial fishing, and recreation including sport fishing, sport hunting, camping, and boating are services that were damaged by injuries to fish and wildlife. Other injured services include commercial tourism, and the enjoyment that people receive from undisturbed wild areas.

3. Post-settlement Trustee Organization

A council of six federal and state trustees was established to administer the $900-million civil settlement to restore resources and services injured by the oil spill.

State of Alaska Trustees

- Commissioner of the Department of Environmental Conservation
- Commissioner of the Department of Fish and Game
- Alaska Attorney General

Federal Trustees

- Secretary of the U.S. Department of the Interior
- Secretary of the U.S. Department of Agriculture
- Administrator of the National Oceanic and Atmospheric Administration, U.S. Department of Commerce

The Federal Trustees have appointed their lead representative in Alaska to serve on the Trustee Council.

The Trustee Council uses funds from the civil settlement for activities to restore injured resources and services. It *does not* manage fish and wildlife resources or make land-use decisions. Fish and game management decisions or land-use decisions are made by fish and game boards, or by appropriate federal or state agencies. The Trustee Council may make recommendations to state and federal agencies, provide funds for state and federal management, or fund research to provide information to those agencies or other groups. The Trustee Council may also purchase private land or private property rights.

4. Trustee Activity Since the Settlement

The table below shows uses and commitments of civil settlement funds to date. It shows that of the $900 million civil settlement, approximately $610 to $630 million remain for funding restoration activities.

The Civil Settlement Funds as of March 1993
Figures in Millions of Dollars

Past Payments	Past Reimbursements, Deductions, Withdrawals & Commitments
$240 million: • $200.1 million in 1991 and 1992. • $39.9 credited to Exxon for cleanup costs after January 1, 1991.	$198.2 million: • $107.5 to reimburse the federal and state governments for past damage assessment, clean-up, litigation, response, and restoration expenses; • $19.5 for the 1992 work plan; • $31.3 for the 1993 work plan (including $7.5 for Kachemak Bay purchase); and • $39.9 credited to Exxon for cleanup costs after January 1, 1991.
Future Payments	**Future Commitments**
$660 million by 2001	An unknown amount, probably between $70 and $90 million will reimburse the governments for past expenses.
	Total remaining for restoration **Approximately $610 - $630 million**
Total Payments	**Total Expenses**
$900 million	$900 million

Each year the Trustee Council adopts an Annual Work Plan, which is a mix of restoration activities to be funded that year. Just over $50 million has been committed to annual work plans for 1992 and 1993. Of that amount, $7.5 million was set aside for habitat protection. An Annual Work Plan for 1994 is being developed concurrently with the Restoration Plan.

Once the Restoration Plan is adopted, the Annual Work Plan will be a principal means of implementation. In the future, Annual Work Plans will be based on the policies and spending guidelines of the plan, future public comments, and changing restoration needs.

5. The Planning Process

The restoration planning process has used the results of many scientific studies, meetings, and symposia conducted during the four years that have elapsed since the oil spill. These include:

- Natural Resource Damage Assessment Studies, 1989-1992
- Restoration Science Studies, 1990-1992
- Technical Workshop, 1990
- Public Symposium, 1990
- Restoration Planning Progress Report, 1990
- Public meetings, 1990-1993
- Restoration Framework and Supplement, 1992
- *Exxon Valdez* Oil Spill Symposium, 1993

Information presented here will be developed further and presented for public review and comment in the Draft Restoration Plan and Draft Environmental Impact Statement to be published in June 1993. A Final Restoration Plan and Final Environmental Impact Statement will be released in late Fall 1993.

6. Public Involvement

The importance of public participation in the restoration process was recognized during the Exxon settlement and is an integral part of the agreement between the State and Federal governments. The Memorandum of Agreement (MOA) approved by the court on August 28, 1991, specifies that:

> "...the Trustees shall agree to an organizational structure for decision making under this MOA and shall establish procedures providing for meaningful public participation in the injury assessment and restoration process, which shall include establishment of a public advisory group to advise the Trustees..."

In December 1991 the Trustee Council decided that public meetings and be held and public comments solicited on a public participation program. This process began in January 1992 with meetings held in Homer, Seward, Valdez, Cordova, Chenega Bay, Kodiak, Juneau, Anchorage and Fairbanks. Comments received were evaluated for recommendations to the Trustee Council regarding the role, structure, and operating procedures for the public advisory group. A second series of meetings were held in April and May 1992 on the Restoration Framework.

The restoration planning and scoping process has generated a wide array of issues and concerns regarding the restoration of resources and services in the oil-spill area. The following list summarizes the issues for guiding development of the Restoration Plan:

- Injured resources and services vary in level of injury, rate of recovery, location, and value to ecosystem and humans. What priority or weight should be given to these factors in determining priorities for restoration options?

- What level of information, either from new or continuing damage assessment studies, including socio-economic studies, is necessary to evaluate the need for and effectiveness of present and future restoration?

- What level of monitoring or research is appropriate to determine the rate of recovery, health, and management of injured species, ecosystems, and services?

- How will habitat protection mechanisms (such as special management designations, land acquisition and others) for public and private land and water be integrated into an overall restoration program?

- What information should be distributed to the public and how should it be disseminated?

- if there is a need for scientific, recreational or other facilities, where, how, and when should they be constructed?

- What are the effects of restoration activities on local economies and subsistence?

- What are the appropriate restoration strategies for restoring or enhancing both injured and noninjured resources and services?

- What are the opportunities and appropriateness for long-term funding of programs through endowments?

- How will restoration funds be managed and allocated?

- Should restoration activities be evaluated concurrently or hierarchically?

The Trustee Council has established a Public Advisory Group to advise it on all decisions relating to injury assessment, restoration activities, or other use of settlement funds. It consists of 17 voting members appointed to represent the following interests: aquaculture, commercial fishing, commercial tourism, conservation, environmental, forest products, local government, Native landowner, recreation users, science/academic, sport hunting and fishing, subsistence, and five public-at-large members. The first term of the Public Advisory Group began October 15, 1992.

C. Environmental Compliance

1. Relationship of the National Environmental Policy Act of 1969 (NEPA) to the draft Restoration Plan

The Trustees meet the requirements of NEPA by:

a. integrating NEPA requirements into planning and decision making;

b. fully considering the impact of their actions on the physical, biological, social, and economic aspects of the environment;

c. involving interested and affected agencies, governments, organizations, and individuals in planning and decisionmaking; and

d. conducting and documenting environmental analyses and subsequent decisions appropriately, efficiently, and cost effectively.

The draft Restoration Plan describes alternative actions which can be taken by the Trustees to effect restoration of injured natural resources and services. Each alternative action integrates a mix of restoration, enhancement, replacement and acquisition of equivalent resource or service options.

The draft Environmental Impact Statement analyzes in detail **a.** through **d.** above for each of the alternative actions. Each alternative describes a different desired future condition for the cumulative and individual resources and services injured by the oil spill, whose current condition is defined by injury and status of recovery.

2. NEPA compliance for specific restoration actions

The effects of restoration actions, defined as a suite of options by alternative, are cumulatively and individually described in the draft EIS. The effects of restoration actions specific to an injured resource or service at a defined location will be disclosed in a site-specific environmental analysis. These specific project proposals will be submitted annually as components of annual work plans. Prior to the implementation of any action, the responsible agency will analyze its effects, prepare the documentation and decision. The level of effects analysis and method of documentation depends upon the significance of the effects discovered during the analysis. An analysis may reveal significant effects and an EIS could be required, or there could be lesser effects or none at all. In the later case a categorical exclusion from further analysis may be appropriate.

3. Other legal and regulatory requirements

In responding to the effects of any alternative the Trustees will meet the letter and intent of all appropriate laws, regulations, treaties, settlement agreements or memorandums of understanding, and executive orders applicable to the implementation of restoration option(s) included in the alternatives. Once projects, which implement restoration options, are approved by the Trustees, the implementing agency has the mandate under NEPA to consult with interested and affected agencies, governments, organizations, and public as stated in 1.**c.** above. Consultation will be required annually as new work plans are developed and implemented.

Revision of the restoration plan may be required when new options do not meet established evaluation criteria. Significant revisions would be done by amending the plan. The effects of the amendment would be analyzed using NEPA guidelines.

TO: RPWG members

From: Sanford P. Rabinowitch, RPWG

Subject: Review of Chapter III: Draft Restoration Plan

Date: April 13, 1993

Attached is version two of Chapter III, now 9 pages instead of 70 and Appendix ___ "Injury Tables and Natural Resource Damage Assessment and Restoration Studies."

In my absence I recommend comments be sent to Bob Loeffler.

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Chapter III - Injury

The *Exxon Valdez* oil spill occurred in March, just before the most biologically active season of the year. It affected the migration of birds, and the primary breeding season for most species of birds, mammals, fish, and marine invertebrates in the spill's path. Much of southcentral Alaska's intricate coastline was oiled, frequently with devastating impact to intertidal and shallow subtidal resources. It also affected human use of the spill area, including subsistence, recreation, commercial fishing, and other uses. Some resources and services remain exposed to oil persisting below high tide.

Oil affected each resource and use differently. For some resources, the population measurably declined. By measurably declined, we mean a measurable decline in abundance that will persist for more than one generation. For example, an estimated 3,500 to 5,000 sea otters were killed by the spill, and the population will not recover for many generations. Other species were killed or otherwise injured by the spill, but the injury did not measurably lower the overall population. Deaths by individual animals or sublethal injuries, which do not result in death, may not be reflected in a lower population because the natural variability of the species may mask the injury, or the resource may have some mechanism to compensate for the injury.

Some species, such as marbled murrelets, pigeon guillemots, and harbor seals were declining before the spill. Their rate of decline was accelerated by the spill, but other factors such as variations in climatic conditions, habitat loss, or increased competition for food may also influence long-term trends in the health and populations of these and other species.

The spill also directly affected human uses of the spill area including commercial fishing, commercial tourism, recreation, passive use, and subsistence. The nature and extent of the injury varied by user group and by area of use. Table 3.1 summarizes injuries caused by the spill.

Table 3.1
Resources and Services Injured by the Oil Spill

RESOURCES			SERVICES (Human Uses)
Population Decline	Injured, but No Population Decline	Other	
Black oystercatcher Common murre Harbor seal Harlequin duck Intertidal organisms Marbled murrelet Pigeon guillemot Sea otter Sockeye salmon Subtidal organisms	Bald eagle * Cutthroat trout * Dolly Varden * Killer whale Pacific herring * Pink salmon River otter Rockfish	Air, water, and sediments Archaeological resources Designated wilderness areas	Commercial fishing Commercial tourism Passive use Recreation including sport fishing, sport hunting, and other recreation use Subsistence

* For these species, the Trustees' scientists have considerable disagreement over the conclusions to be drawn from the results of the damage assessment studies.

What Was Injured By the Spill and Is It Recovering?

MAMMALS

HARBOR SEALS: The oil spill caused population declines and sublethal injuries in harbor seals. Many were directly oiled and an estimated 345 died. Oil residues found in seal bile were 5 to 6 times higher in oiled areas than unoiled areas in 1990. The population was declining prior to the oil spill which makes it difficult to determine the effects of the spill. There are some recent indications that the population may be stabilizing, but there is no indication of any increase.

KILLER WHALES: Population decline and other injuries have been documented in one of the pods (extended family group) in the oil spill area. There is debate about whether the oil spill caused these injuries. Thirteen whales out of 36 in one whale pod in Prince William Sound are missing and presumed dead. Circumstantial evidence links the whale disappearance to the oil spill. Additionally, several adult males have collapsed dorsal fins and social disruption of family units has been observed. In that pod, no new births were recorded in 1989 or 1990; one birth was recorded in 1991; and two births were recorded in 1992. These births suggest that the pod is beginning to recover.

RIVER OTTERS: There are differences in some indicators of health, feeding habits, and other aspects of river otter biology between oiled and unoiled areas. These differences may indicate an effect of the spill. Lacking prespill data and a measure of the population, there is great uncertainty about the nature of the injury. River otters feed in the intertidal and shallow subtidal areas and may still be exposed to oil persisting in the environment.

SEA OTTERS: The oil spill caused population declines and sublethal injuries in sea otters. It is estimated that 3,500 to 5,000 otters died. The total sea otter population in the Gulf of Alaska is estimated at around 20,000. Surveys in 1989, 1990 and 1991 showed measurable differences in population and survival rates between oiled and unoiled areas. In 1992, lower juvenile survival rates and higher than normal numbers of dead, prime-age otters indicate that the populations in Prince William Sound continue to be stressed. Sea otters feed in the lower intertidal and subtidal areas and may still be exposed to oil persisting in the environment. Little or no evidence of recovery has been detected.

BIRDS

BALD EAGLES: A minimum of 200 to 300 eagles were estimated to have been killed by the spill. However, because population census techniques are not accurate enough to detect population changes this small, no measurable population decline has been recorded. Productivity in Prince William Sound was disrupted in 1989, but returned to normal in 1990. Exposure to oil and some sublethal injuries were found in 1989 and 1990, but no continuing effects were observed on populations. Bald eagles are recovering, and may have recovered, from the effects of the oil spill.

BLACK OYSTERCATCHERS: The oil spill caused population declines and sublethal injuries in black oystercatchers. In 1989, smaller eggs and lighter weight chicks were found in oiled areas. Black oystercatchers feed in the intertidal areas and may still be exposed to oil persisting in the environment. The population is recovering although evidence of sublethal injuries persisted in

1992.

COMMON MURRES: The oil spill caused population declines and sublethal injuries at murre colonies within the oil spill area. In 1989, between 175,000 to 300,000 murres were killed. Measurable impacts on populations were recorded in 1989, 1990 and 1991. Breeding was still inhibited in some colonies in the Gulf of Alaska in 1992. The degree of recovery varies between colonies and some colonies show little evidence of recovery.

HARLEQUIN DUCKS: The oil spill caused population declines and sublethal injuries in harlequin ducks. In 1989, approximately 400 birds were killed. In the three years since the oil spill, it appears that harlequin ducks still are not successfully breeding in oiled areas of Prince William Sound. Harlequin ducks feed in the intertidal and shallow subtidal areas and may still be exposed to oil persisting in the environment.

MARBLED MURRELETS: The oil spill caused population declines, but it is unknown if there were sublethal injuries. It is estimated that 8,000 to 12,000 birds died. Measurable population effects were recorded in 1989, 1990 and 1991 as a result of the oil spill. In 1989, oil contamination was found in livers of adult birds. Marbled murrelet populations were declining prior to the oil spill. In 1992, recovery was uncertain and no signs of an increasing population have been observed, but the decline may have stabilized.

PIGEON GUILLEMOTS: The oil spill caused population declines in pigeon guillemots. In 1989, between 1,500 to 3,000 birds were estimated to have been killed. In 1989, oil contamination was found in birds and on eggs. The recovery status in 1992 is uncertain. There is no evidence of an increase in the population. Pigeon guillemot populations were declining prior to the spill.

FISH

CUTTHROAT TROUT AND DOLLY VARDEN: The oil spill caused sublethal injuries and possibly population declines in these two species. Between 1989 and 1991, survival and growth in adult populations in oiled areas differed from those in unoiled areas. This difference persisted even though indications of exposure to oil decreased over these years. The persistence of different rates of survival and growth may have been due to continuing injury to the food base. However, scientists disagree as to whether these differences in survival and growth existed before the spill. It is unknown whether these species are recovering.

PACIFIC HERRING: The oil spill caused sublethal injuries to Pacific herring. It is presently unknown whether these injuries will result in a population decline. Measurable differences in egg mortality between oiled and unoiled areas were found in 1989. Eggs and larvae were injured or killed in 1989 and, to a lesser extent, in 1990. In 1991 there were no differences between oiled and unoiled areas. Injuries to the 1989 year class may result in reduced recruitment to the adult population. If so, an adult population decline will not become apparent until 1993. Overall recovery status is unknown.

PINK SALMON: The oil spill caused sublethal injuries to wild stock populations, and there is debate on whether the wild stock population has declined. Abnormal fry were observed in 1989 and egg mortality continued to be higher than expected in 1990 and 1991. The debate about

population declines focuses on whether the observed injuries will result in reduced adult returns. Reduced growth of juveniles, which correlates with reduced survival, was found in 1989 and 1991. In 1992, there was continued evidence of sublethal injuries. Overall recovery status is unknown.

ROCKFISH: The oil spill caused at least sublethal injuries; however, it is unknown whether or not population declines also occurred. Twenty dead fish were found in 1989, but only a few were in condition to be analyzed. Those analyzed showed exposure to oil with some sublethal injuries. Closures to salmon fisheries increased the fishing pressure on rockfish and the increasing catch may be affecting the population. It is unknown if the population has recovered from sublethal injuries, or from any population decline.

SOCKEYE SALMON: Kenai River and Red Lake sockeye salmon stocks both suffered population declines as well as sublethal injuries. Smolt survival continues to be poor in both systems due to overescapements that occurred at Red Lake in 1989 and in the Kenai system in 1987, 1988, and 1989. In 1992, the estimated number of Kenai River smolt was only 3% of average. As a result of overescapement, adult returns are expected to be low in 1994 and successive years. Overall recovery status is unknown.

COASTAL HABITAT

COASTAL HABITAT - INTERTIDAL ZONE: The oil spill caused population declines and sublethal injuries in the populations of plants and animals that live in the area between low and high tide. The lower intertidal and, to some extent, the mid intertidal zones are recovering. However, in the upper intertidal zone, some species have not recovered, and oil persists in and under mussel beds. Intertidal organisms were affected by both oiling and clean-up, particularly the high pressure hot water washing. Recovery varies by species largely based on their position within the intertidal zone.

COASTAL HABITAT - SUBTIDAL ZONE: The oil spill caused population declines and sublethal injuries in the populations of plants and animals found below low tide. Eelgrass and some species of algae appear to be recovering. Amphipods in eelgrass beds recovered to pre-spill densities in 1991. Leather stars and helmet crabs showed little sign of recovery through 1991. Overall recovery is variable by species.

OTHER SPECIES STUDIED

In addition to the resources described other species were studied as part of the damage assessment process but are not believed to have suffered notable injuries. These include sea lions, brown bears, Sitka black-tailed deer, black-legged kittiwakes, some sea birds, crab, shrimp, and many others.

OTHER NATURAL RESOURCES

ARCHAEOLOGICAL RESOURCES: Twenty-four archaeological sites are known to have been harmed by oiling, clean-up activities, or looting and vandalism linked to the oil spill. An additional 113 sites are estimated to have been similarly affected. Injuries attributed to increased looting and vandalism linked to the oil spill are still occurring. Archaeological sites and artifacts cannot

recover. They are finite, non-renewable resources.

DESIGNATED WILDERNESS AREAS: Many miles of coastlines were oiled in designated wilderness areas and wilderness study areas. Some oil remains embedded in the sediments of these areas. Until oil is completely removed or degrades naturally, injuries to these areas will continue.

SERVICES (HUMAN USES)

COMMERCIAL FISHING: During 1989, emergency commercial fishery closures were ordered throughout the spill area. Closures affected salmon, herring, crab, shrimp, rockfish, and sablefish. The 1989 closures resulted in sockeye overescapement in the Kenai River and in the Red Lake system (Kodiak Island). In 1990, a portion of Prince William Sound was closed to shrimp fishing. Spill-related sockeye overescapement is anticipated to result in low adult returns in 1994 and 1995. This may result in closure or harvest restrictions during these and, perhaps, subsequent years. Injuries and recovery status of rockfish, pink salmon, shellfish and herring are uncertain.

COMMERCIAL TOURISM: Although the nature and extent of injury varied, approximately 43 percent of the tourism businesses surveyed in 1990 felt they had been significantly affected by the oil spill. Millions of dollars were lost in 1989 due to reduced visitor spending in Southcentral and Southwest Alaska. By 1990, only 12 percent felt that their businesses were affected by the spill.

PASSIVE USE: In 1991, over 90% of those surveyed nation-wide were aware of the oil spill. Over 50% believed that the oil spill was the largest environmental accident caused by humans anywhere in the world. There was also a perception that the value of wild areas had diminished. Some respondents reported that their perception of lost value was recovering as they sensed some recovery was occurring. The feelings of others have not changed as they did not believe recovery was occurring.

RECREATION: The nature and extent of injury varied by user group and by area of use. About one quarter of respondents to a recreation survey in 1992 reported no change in their recreation experience, but others reported avoiding the spill area, reduced wildlife sightings, residual oil and more people. They also reported changes in their perception of recreation opportunities in terms of increased vulnerability to future oil spills, erosion of wilderness, a sense of permanent change, and concern about long-term ecological effects. However, some respondents reported a sense of optimism. There are indications that declines in recreation activities reported in 1989 appear to have reversed in 1990, but there is no evidence that they have returned to prespill levels.

RECREATION - SPORT FISHING AND HUNTING: Between 1989 and 1990, a decline in sport fishing (number of anglers, fishing trips and fishing days) was recorded for Prince William Sound, Cook Inlet, and the Kenai Peninsula. In 1992, an emergency order restricting cutthroat trout fishing was issued for western Prince William Sound due to low adult returns. The closure is expected to continue at least through 1993. Sport hunting of harlequin ducks was reduced by restrictions imposed in 1991 and 1992 in response to damage assessment studies. It is likely that these restrictions will continue until the species shows signs of recovery. Kenai River sockeye overescapements may severely affect sport fishing as early as 1994.

SUBSISTENCE: Subsistence harvests of fish and wildlife in 9 of 15 villages surveyed declined from 4 to 78 percent in 1989 when compared to prespill averages. Seven of the 15 villages show continued decline in use in 1990 and 1991. This decline was particularly noticeable in the Prince William Sound villages of Chenega and Tatitlek. In 1989, chemical analysis indicated that most resources tested, including fish, marine mammals, deer, and ducks, were safe to eat, but that shellfish from oiled beaches should not be eaten. However, villagers believe that contamination of subsistence food sources continues to be dangerous to their health and that some subsistence species continue to decline.

NATURAL RECOVERY

Table 3.2 presents estimated natural recovery rates for injured biological resources. Predicting the amount of time needed for a species to recover is extremely difficult. Scientists often use models based on factors such as population numbers and growth rates. However, for many of the injured biological resources, the background information was not available to develop these predictive models. For those resources, peer reviewers and agency scientists based their estimates on the best available information.

For example, for black oystercatchers there have been no studies to determine a population growth rate anywhere within the species' range. In this case, the experts are forced to rely on information from a related species, the Eurasian oystercatcher, to estimate a recovery time. Under certain circumstances, a population of Eurasian oystercatchers would be capable of growing at 6.25% annually . If the injured black oystercatcher population grows at the same rate, it could recover to prespill numbers in 15 years. The amount of time could be considerably less if the growth rate is higher, or if animals from adjacent areas move to the oiled area. On the other hand, the recovery time could be considerably longer if the growth rate is less than that of the Eurasian oystercatcher, or if the habitat quality is low. Where oil persists in the environment, habitat quality is likely to be low.

Recovery estimates for services are not provided in the Table 3.2. Recovery is linked, in part, to the resources that support the service, and can vary widely between user groups.

ESTIMATED NATURAL RECOVERY RATES OF INJURED BIOLOGICAL RESOURCES. These estimates contain a great deal of uncertainty. For some species there is substantial disagreement within the scientific community. The estimates are likely to change as recovery continues, more information is provided through monitoring, and scientists learn more about the species.

Table 3.2
Estimated Natural Recovery Rates of Injured Biological Resources

	Resources	Natural Recovery Estimates (Yrs. from 1989)	Comments
	Black oystercatcher	15 to 30 years	Recovering.
	Common murre	50 to 120 years	Recovery varies by colony.
	Harbor seal	Unknown	In decline before spill. Population may have stabilized.
	Harlequin duck	10 to 50 years	Still no reproduction within oiled areas studied in Prince William Sound.
	Intertidal organisms	10 to 25 years	Recovery estimates are combined for all organisms in the upper intertidal zone. Recovery in lower and mid-intertidal zones is expected to be faster than that in the upper intertidal zone.
	Marbled murrelet	Unknown	In decline before spill. Estimates vary widely on when the population may stabilize. It may be stable now, or may take about 50 years to stabilize at lower population size.
	Pigeon guillemot	Unknown	In decline before spill. Probably still declining. Should stabilize in less than 50 years.
	Sea otter	15 to 40 years	Population stable, but not recovering.
	Sockeye salmon	10 to 50 years	Estimates are for attaining a 10-year average similar to prespill populations for Kenai River and Red Lake sockeye salmon.
	Subtidal organisms	Less than 10 years	Recovering in most places.
	Bald eagle	4 to 6 years	Back to prespill population between 1993 and 1995.
	Cutthroat trout	10 to 20 years	
	Dolly Varden	10 to 20 years	
	Killer whale	10 to 20 years	Estimates are for the injured pod to return to its prespill size. Currently recovering.
	Pacific herring	Unknown	Population decline may be documented after 1993.
	Pink salmon	Less than 20 years	Estimates represent recovery of wild stocks to a population level that may be less than 100% of the prespill population.
	River otter	Unknown	Injury and actual population size are difficult to assess.
	Rockfish	Unknown	

ADDITIONAL INFORMATION

For additional technical information regarding injury and information about natural resource damage assessment and restoration studies see appendix _____.

APPENDIX ___

INJURY TABLES
&
NATURAL RESOURCE DAMAGE ASSESSMENT AND RESTORATION STUDIES

TABLE X Resources: Summary of Results of Injury Assessment Studies Done After the *Exxon Valdez* Oil Spill

Resource	Description of Injury			Status of Recovery in December, 1992		Geographic Extent of Injury (a)				Comments/Discussion
	Oil Spill Mortality (total mortality estimate)(b)	Decline in Population after the spill	Evidence of Sublethal or Chronic Effects	Current Population Status	Evidence of Continuing Sublethal or Chronic Effects	PWS	Kenai	Kodiak	Alaska Penin.	
MARINE MAMMALS										
Harbor Seals (c)	YES (200)	YES	YES	POSSIBLY STABLE, BUT NOT RECOVERING (a)	UNKNOWN	YES	YES (d)	UNKNOWN	UNKNOWN	Many seals were directly oiled . There was a measurable difference in populations between oiled and unoiled areas in PWS in 1989 and 1990. Population was declining prior to the spill and no recovery evident in 1992. Oil residues found in seal bile were 5 to 6 times higher in oiled areas than unoiled areas in 1990.
Humpback Whales	NO	NO	NO	(e)	(e)	(e)	(e)	(e)	(e)	Other than fewer animals being observed in Knight Island Passage in summer 1989, which did not persist in 1990, the oil spill did not have a measurable impact on the north Pacific population of humpback whales.
Killer Whales	YES (13)	YES	UNKNOWN	RECOVERING	UNKNOWN	YES	UNKNOWN	UNKNOWN	UNKNOWN	13 Adult whales of the 36 in AB pod are missing and presumed dead. The AB pod has grown by 2 whales since 1990. Circumstantial evidence links whale disappearance to oiling.
Sea Lions (c)	UNKNOWN	UNKNOWN	NO	CONTINUING DECLINE	(e)	(e)	(e)	(e)	(e)	Several sea lions were observed with oiled pelts and oil residues were found in some tissues. It was not possible to determine population effects or cause of death of carcasses recovered. Sea lion populations were declining prior to the oil spill.

a) There may have been an unequal distribution of injury within each region, see map for location of regions;
b) Adjusted for carcasses not found, not reported, scavenged, or otherwise lost;
c) Population may have been declining prior to the spill;
d) Based on recovery of dead animals from this region of the spill zone;
e) If no injury was detected or known, no assessment of recovery could be made;
f) Total body count, not adjusted for carcasses not found.

Resource	Description of Injury			Status of Recovery in December, 1992		Geographic Extent of Injury (a)				Comments/Discussion
	Oil Spill Mortality (total mortality estimate)(b)	Decline in Population after the spill	Evidence of Sublethal or Chronic Effects	Current Population Status	Evidence of Continuing Sublethal or Chronic Effects	PWS	Kenai	Kodiak	Alaska Penin.	
Sea Otters	YES (3,500 TO 5,000)	YES	YES	STABLE, BUT NOT RECOVERING	YES, POSSIBLY	YES	YES	YES (d)	YES (d)	Post-spill surveys showed measurable difference in populations and survival between oiled and unoiled areas in 1989, 1990 and 1991. Survey data have not established a significant recovery. Prime-age animals were still found on beaches in 1989, 1990 and 1991. Carcasses of sea otters feed in the lower intertidal and subtidal areas and may still be exposed to hydrocarbons in the environment.
TERRESTRIAL MAMMALS										
Black Bear	NO	UNKNOWN	UNKNOWN	(e)	(e)	(e)	(e)	(e)	(e)	No field studies were done.
Brown Bear	NO	NO	NO	(e)	(e)	(e)	(e)	(e)	(e)	Hydrocarbon exposure was documented on Alaska Peninsula in 1989 including high hydrocarbon levels in the bile of one dead cub. Brown bear feed in the intertidal zone and may still be exposed to hydrocarbons in the environment.
River Otters	YES (NUMBER UNKNOWN)	UNKNOWN	YES	UNKNOWN	YES	YES	UNKNOWN	UNKNOWN	UNKNOWN	Exposure to hydrocarbons and sub-lethal effects were determined, but no effects were established on population. Sub-lethal indicators of possible oil exposure remained in 1991. River otters feed in the intertidal and shallow subtidal areas and may be still be exposed to hydrocarbons in the environment.
Sitka Black-tailed Deer	NO	NO	NO	(e)	(e)	(e)	(e)	(e)	(e)	Elevated hydrocarbons were found in tissues in some deer in 1989.

a) There may have been an unequal distribution of injury within each region, see map for location of regions;
b) Adjusted for carcasses not found, not reported, scavenged, or otherwise lost;
c) Population may have been declining prior to the spill;
d) Based on recovery of dead animals from this region of the spill zone;
e) If no injury was detected or known, no assessment of recovery could be made;
f) Total body count, not adjusted for carcasses not found.

Resource	Description of Injury			Status of Recovery in December, 1992		Geographic Extent of Injury (a)				Comments/Discussion
	Oil Spill Mortality (total mortality estimate)(b)	Decline in Population after the spill	Evidence of Sublethal or Chronic Effects	Current Population Status	Evidence of Continuing Sublethal or Chronic Effects	PWS	Kenai	Kodiak	Alaska Penin.	
BIRDS										
Bald Eagles	YES (614-902)	YES	YES	RECOVERING	UNKNOWN	YES	YES	YES (d)	YES(d)	Productivity in PWS was disrupted in 1989, but returned to normal in 1990. Exposure to hydrocarbons and some sub-lethal effects were found in 1989 and 1990, but no continuing effects were observed on populations.
Black-legged Kittiwakes	YES (NUMBER UNKNOWN)	NO	NO	NO CHANGE	NO	YES	YES (d)	YES (d)	YES (d)	Total reproductive success in oiled and unoiled areas of PWS has declined since 1989. Hydrocarbon contaminated tissues were detected in 1989. Hydrocarbon contaminated stomach contents were detected in 1989 and 1990. This species is known for great natural variation and reproductive failure may be unrelated to the oil spill.
Black Oyster-catchers	YES (129 ADULTS; UNKNOWN FOR CHICKS (f)	YES	YES	RECOVERING	YES	YES	YES (d)	YES (d)	YES (d)	Differences in egg size between oiled and unoiled areas were found in 1989. Exposure to hydrocarbons and some sublethal effects were determined. Populations declined more in oiled areas than unoiled areas in post-spill surveys in 1989, 1990 and 1991. Black oystercatchers feed in the intertidal areas and may be still be exposed to hydrocarbons in the environment.
Common Murres	YES (175,000 to 300,000)	YES	YES	DEGREE OF RECOVERY VARIES IN COLONY	YES	NO	YES	YES	YES	Measurable impacts on populations were recorded in 1989, 1990 and 1991. Breeding is still inhibited in some colonies in the Gulf of Alaska.

a) There may have been an unequal distribution of injury within each region, see map for location of regions;
b) Adjusted for carcasses not found, not reported, scavenged, or otherwise lost;
c) Population may have been declining prior to the spill;
d) Based on recovery of dead animals from this region of the spill zone;
e) If no injury was detected or known, no assessment of recovery could be made;
f) Total body count, not adjusted for carcasses not found.

Resource	Description of Injury			Status of Recovery in December, 1992		Geographic Extent of Injury (a)				Comments/Discussion
	Oil Spill Mortality (total mortality estimate)(b)	Decline in Population after the spill	Evidence of Sublethal or Chronic Effects	Current Population Status	Evidence of Continuing Sublethal or Chronic Effects	PWS	Kenai	Kodiak	Alaska Penin.	
Glaucous-winged gulls	YES (NUMBER UNKNOWN)	NOT DETECTED	NO	NO CHANGE	NO	YES (d)	YES (d)	YES (d)	YES (d)	While dead birds were recovered in 1989, there is no evidence of a population level impact when compared to historic (1972, 1973) population levels.
Harlequin Ducks	YES (423)	YES	YES	STABLE OR CONTINUING DECLINE	YES	YES	YES (d)	YES (d)	YES (d)	Post-spill samples showed hydrocarbon contamination and poor body conditions. Surveys in 1990-1992 indicated population declines and near total reproductive failure. Harlequin ducks feed in the intertidal and shallow subtidal areas and may still be exposed to hydrocarbons in the environment.
Marbled Murrelets (c)	YES (8,000 TO 12,000)	YES	UNKNOWN	STABLE OR CONTINUING DECLINE	UNKNOWN	YES	YES (d)	YES (d)	YES (d)	Measurable population effects on were recorded in 1989, 1990 and 1991. Marbled murrelet populations were declining prior to the spill. Hydrocarbon contamination was found in livers of adult birds.
Peale's Peregrine Falcons	UNKNOWN	UNKNOWN	NO	(e)	(e)	(e)	(e)	(e)	(e)	When compared to 1985 surveys a reduction in population and lower than expected productivity was measured in 1989 in the PWS. Cause of these changes are unknown.
Pigeon Guillemots (c)	YES (1,500 TO 3,000)	YES	NO	STABLE OR CONTINUING DECLINE	UNKNOWN	YES	YES (d)	YES (d)	YES (d)	Pigeon guillemot populations were declining prior to the spill. Hydrocarbon contamination was found in birds and, externally, on eggs.
Storm Petrels	YES (NUMBER UNKNOWN)	NO	AWAITING RESULTS	NO CHANGE	UNKNOWN	YES (d)	YES (d)	YES (d)	YES (d)	Few carcasses were recovered in 1989 although petrels ingested oil and transferred oil to their eggs. Reproduction was normal in 1989.

(a) There may have been an unequal distribution of injury within each region, see map for location of regions;
(b) Adjusted for carcasses not found, not reported, scavenged, or otherwise lost;
(c) Population may have been declining prior to the spill;
(d) Based on recovery of dead animals from this region of the spill zone;
(e) If no injury was detected or known, no assessment of recovery could be made;
(f) Total body count, not adjusted for carcasses not found.

Resource	Description of Injury			Status of Recovery in December, 1992		Geographic Extent of Injury (a)				Comments/Discussion
	Oil Spill Mortality (total mortality estimate)(b)	Decline in Population after the spill	Evidence of Sublethal or Chronic Effects	Current Population Status	Evidence of Continuing Sublethal or Chronic Effects	PWS	Kenai	Kodiak	Alaska Penin.	
Other Seabirds	YES (375,000-435,000)	VARIES BY SPECIES	UNKNOWN	VARIES BY SPECIES	UNKNOWN	YES (d)	YES (d)	YES (d)	YES (d)	Seabird recovery has not been studied. Species collected dead in 1989 include common, yellow-billed, pacific, red-throated loon; red-necked and horned grebe; northern fulmar; sooty and short-tailed shearwater; double-crested, pelagic, and red-faced cormorant; herring and mew gull; arctic and Aleutian tern; Kittlitz's and ancient murrelet; Cassin's, least, parakeet, and rhinoceros auklet; and horned and tufted puffin.
Other Sea Ducks	YES (875) (b)	NO	UNKNOWN	UNKNOWN	UNKNOWN	YES	YES (d)	YES (d)	YES (d)	Species collected dead in 1989 include Stellar's, king and common eider; white-winged, surf and black scoter; oldsquaw; bufflehead; common and Barrow's goldeneye; and common and red-breasted merganser. Sea ducks tend to feed in the intertidal and shallow subtidal areas which were most heavily impacted by oil.
Other Shorebirds	YES (NUMBER UNKNOWN)	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	YES	YES (d)	YES (d)	YES (d)	Species collected dead in 1989 include golden plover; lesser yellowlegs; semipalmated, western, least and Baird's sandpiper; surfbird; short-billed dowitcher; common snipe; red and red-necked phalarope.
Other Birds	YES (NUMBER UNKNOWN)	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	YES (d)	YES (d)	YES (d)	YES (d)	Species collected dead in 1989 include emperor and Canada goose; brant; mallard; northern pintail; green-winged teal; greater and lesser scaup; ruddy duck; great blue heron; long-tailed jaeger; willow ptarmigan; great-horned owl; Stellar's jay; magpie; common raven; northwestern crow; robin; varied and hermit thrush; yellow warbler; pine grosbeak; savannah and golden-crowned sparrow; white-winged crossbill.

a) There may have been an unequal distribution of injury within each region, see map for location of regions;
b) Adjusted for carcasses not found, not reported, scavenged, or otherwise lost;
c) Population may have been declining prior to the spill;
d) Based on recovery of dead animals from this region of the spill zone;
e) If no injury was detected or known, no assessment of recovery could be made;
f) Total body count, not adjusted for carcasses not found.

Resource	Description of Injury			Status of Recovery in December, 1992		Geographic Extent of Injury (a)				Comments/Discussion
	Oil Spill Mortality (total mortality estimate)(b)	Decline in Population after the spill	Evidence of Sublethal or Chronic Effects	Current Population Status	Evidence of Continuing Sublethal or Chronic Effects	PWS	Kenai	Kodiak	Alaska Penin.	
FISH										
Cutthroat Trout	YES, SEE COMMENTS	POSSIBLY	YES	STABLE, BUT NOT RECOVERING	UNKNOWN	YES	UNKNOWN	UNKNOWN	UNKNOWN	Differences in survival and growth between anadromous adult populations in the oiled and unoiled areas persisted in 1991 despite the decrease in exposure indicators. This could be due to continuing injury to the food base.
Dolly Varden	YES, SEE COMMENTS	POSSIBLY	YES	STABLE, BUT NOT RECOVERING	UNKNOWN	YES	UNKNOWN	UNKNOWN	UNKNOWN	Differences in survival between anadromous adult populations in the oiled and unoiled areas persisted in 1991 despite the decrease in exposure indicators. This could be due to continuing injury to the food base.
Pacific Herring	YES, TO EGGS AND LARVAE	UNKNOWN	YES	UNKNOWN	NO	YES	UNKNOWN	UNKNOWN	UNKNOWN	Measurable difference in egg counts between oiled and unoiled areas were found in 1989 and 1990. Lethal and sublethal effects on eggs and larvae were evident in 1989 and to a lesser extent in 1990; in 1991 there were no differences between oiled and unoiled areas. It is possible that the 1989 year class was injured and could result in reduced recruitment to the fishery.
Pink Salmon (Wild) (c)	YES, TO EGGS	POSSIBLY	YES	SEE COMMENTS	YES	YES	UNKNOWN	UNKNOWN	UNKNOWN	There was initial egg mortalituy in 1989. Egg mortality continued to be high in 1991, possibly due to genetic damage to spawners. Abnormal fry were observed in 1989. Reduced growth of juveniles was found in the marine environment, which can be correlated with reduced survival.

a) There may have been an unequal distribution of injury within each region, see map for location of regions;
b) Adjusted for carcasses not found, not reported, scavenged, or otherwise lost;
c) Population may have been declining prior to the spill;
d) Based on recovery of dead animals from this region of the spill zone;
e) If no injury was detected or known, no assessment of recovery could be made;
f) Total body count, not adjusted for carcasses not found.

Resource	Description of Injury			Status of Recovery in December, 1992		Geographic Extent of Injury (a)				Comments/Discussion
	Oil Spill Mortality (total mortality estimate)(b)	Decline in Population after the spill	Evidence of Sublethal or Chronic Effects	Current Population Status	Evidence of Continuing Sublethal or Chronic Effects	PWS	Kenai	Kodiak	Alaska Penin.	
Rockfish	YES (20) (f)	UNKNOWN	YES	UNKNOWN	UNKNOWN	YES	YES	UNKNOWN	UNKNOWN	Few dead fish were found in 1989 in condition to be analyzed. Exposure to hydrocarbons with some sub-lethal effects were determined in those fish, but no effects established on the population. Closures to salmon fisheries increased fishing pressures on rockfish which may be impacting population.
Sockeye Salmon	UNKNOWN	YES	YES	SEE COMMENTS	YES	UNKNOWN	YES	YES	NO	Smolt survival continues to be poor in the Red Lake and Kenai River systems due to overescapements in Red Lake in 1989, and in the Kenai River in 1987, 1988, 1989. As a result, future adult returns are expected to be low in 1994 and successive years. Trophic structures of Kenai and Skilak Lakes have been altered by overescapement.
SHELLFISH										
Clam	YES (NUMBER UNKNOWN)	UNKNOWN	POSSIBLY, FINAL ANALYSES PENDING	UNKNOWN	UNKNOWN	YES	YES	YES	YES	Native littleneck and butter clams were impacted by both oiling and clean-up, particularly high pressure, hot water washing. Littleneck clams transplanted to oiled areas in 1990 grew significantly less than those transplanted to unoiled sites. Reduced growth recorded at oiled sites in 1989 but not 1991.
Crab (Dungeness)	UNKNOWN	UNKNOWN	UNKNOWN	(e)	(e)	(e)	(e)	(e)	(e)	Crabs collected from oil areas were not found to have accumulated petroleum hydrocarbons.
Oyster	UNKNOWN	UNKNOWN	UNKNOWN	(e)	(e)	(e)	(e)	(e)	(e)	Although studies were initiated in 1989, they were not completed because they were determined to be of limited value.

a) There may have been an unequal distribution of injury within each region, see map for location of regions;
b) Adjusted for carcasses not found, not reported, scavenged, or otherwise lost;
c) Population may have been declining prior to the spill;
d) Based on recovery of dead animals from this region of the spill zone;
e) If no injury was detected or known, no assessment of recovery could be made;
f) Total body count, not adjusted for carcasses not found.

Resource	Description of Injury			Status of Recovery in December, 1992		Geographic Extent of Injury (a)				Comments/Discussion
	Oil Spill Mortality (total mortality estimate)(b)	Decline in Population after the spill	Evidence of Sublethal or Chronic Effects	Current Population Status	Evidence of Continuing Sublethal or Chronic Effects	PWS	Kenai	Kodiak	Alaska Penin.	
Sea Urchin	UNKNOWN	UNKNOWN	UNKNOWN	(e)	(e)	(e)	(e)	(e)	(e)	Studies limited to laboratory toxicity studies.
Shrimp	UNKNOWN	UNKNOWN	NO	(e)	(e)	(e)	(e)	(e)	(e)	No conclusive evidence presented for injury linked to oil spill.
INTERTIDAL/SUBTIDAL COMMUNITIES										
Intertidal Organisms/ Communities	YES	YES	YES	VARIABLE BY SPECIES, SEE COMMENTS	YES	YES	YES	YES	YES	Measurable impacts on populations of plants and animals were determined. The lower intertidal and, to some extent, the mid intertidal is recovering. Some species (Fucus) in the upper intertidal zone have not recovered, and oil may persist in and mussel beds.
Subtidal Communities	YES	YES	YES	VARIABLE BY SPECIES, SEE COMMENTS	YES	YES	UNKNOWN	UNKNOWN	UNKNOWN	Measurable impacts on population of plants and animals were determined in 1989. Eel grass and some species of algae appear to be recovering. Amphipods in eel grass beds recovered to pre-spill densities in 1991. Leather stars and helmet crabs show little sign of recovery through 1991.

a) There may have been an unequal distribution of injury within each region, see map for location of regions;
b) Adjusted for carcasses not found, not reported, scavenged, or otherwise lost;
c) Population may have been declining prior to the spill;
d) Based on recovery of dead animals from this region of the spill zone;
e) If no injury was detected or known, no assessment of recovery could be made;
f) Total body count, not adjusted for carcasses not found.

TABLE XX Services: Summary of Results of Injury Assessment Studies Done After the *Exxon Valdez* Oil Spill

RPWG draft 3/18/93

Service	Description of Injury	Status of Recovery in December, 1992	Geographic Extent of Injury (a)				Comments/Discussion
			PWS	Kenai	Kodiak	Alaska Penin.	
Passive Use	In 1991, over 90% of those surveyed (nation-wide) said they were aware of the *Exxon Valdez* oil spill. People report that values have been lost; their feelings about the spill area have changed. There is a wide-spread feeling that something has been lost.	Recovery status is unknown.	YES	YES	YES	YES	Over 50% of those surveyed believed that the spill was the largest environmental accident caused by humans anywhere in the world. The median household willingness to pay for future prevention was $31. Multiplying this by the number of U.S. household results in a damage estimate of $2.8 billion.
Recreation (e.g., hunting, fishing, camping, kayaking, sailboating, motorboating, environmental education)	The nature and extent of injury varied by user group and by area. About a quarter of key informants interviewed reported no change in their recreation experience, but others reported avoidance of the spill area, reduced wildlife sightings, residual oil, and more people. Overall, recreation use declined significantly in 1989. Between 1989 and 1990 a decline in sport fishing (number of anglers, fishing trips and fishing days) were recorded for PWS, Cook Inlet and the Kenai Peninsula. In 1992 an emergency order restricting cutthroat trout fishing was issued for western PWS due to low adult returns. Sport hunting of harlequin duck was affected by restrictions imposed in 1991 in response to damage assessment studies.	Declines in recreation activities reported in 1989 appear to be recovering for some user groups, but the degree of recovery is unknown. EVOS related sockeye over-escapement in the Kenai River and Red Lake system is anticipated to result in low adult returns in 1994 and 1995. These over-escapements may result in sport fishing closures or harvest restrictions during these and perhaps in subsequent years. The 1992 sport fishing closure for cutthroat trout is expected to continue at least through 1993. Harvest restrictions are expected to continue for harlequin duck through 1993.	YES	YES	YES	YES	Survey respondents also reported changes in their perception of recreation opportunity in terms of increased vulnerability to future oil spills, erosion of wilderness, a sense of permanent change, concern about long-term ecological effects, and, in some, a sense of optimism.

(a) There may have been an unequal distribution of injury within each region, see map for location of regions.

TABLE XX Services: Summary of Results of Injury Assessment Studies Done After the *Exxon Valdez* Oil Spill

Service	Description of Injury	Status of Recovery in December, 1992	Geographic Extent of Injury (a)				Comments/Discussion
			PWS	Kenai	Kodiak	Alaska Penin.	
Commercial Fishing	During 1989, emergency commercial fishery closures were ordered in PWS, Cook Inlet, Kodiak and the Alaska Peninsula. This affected salmon, herring, crab, shrimp, rockfish and sablefish. The 1989 closures resulted in sockeye over-escapement in the Kenai River and in the Red Lake system (Kodiak Island). In 1990 a portion of PWS was closed to shrimp fishing.	Currently there are no area-wide oil spill-related commercial closures in effect. Management actions to try to compensate for the spill are still in effect. EVOS related sockeye over-escapement in the Kenai River and Red Lake system is anticipated to result in low adult returns in 1994 and 1995. These over-escapements may result in closure or harvest restrictions during these and perhaps in subsequent years.	YES	YES	YES	YES	Injuries and recovery status of rockfish, pink salmon, shellfish and herring are uncertain. Therefore, future impacts on these fisheries is unknown.
Commercial Tourism	Approximately 43% of the tourism businesses surveyed felt their businesses had been significantly affected by the oil spill in summer 1989. The net loss in visitor spending in the oil spill area in 1989 was $19 million.	By 1990, 12% of the tourism businesses surveyed felt their businesses had been significantly affected by the oil spill.	YES	YES	YES	YES	

(a) There may have been an unequal distribution of injury within each region, see map for location of regions

TABLE XX Services: Summary of Results of Injury Assessment Studies Done After the *Exxon Valdez* Oil Spill

Service	Description of Injury	Status of Recovery in December, 1992	Geographic Extent of Injury (a)				Comments/Discussion
			PWS	Kenai	Kodiak	Alaska Penin.	
Subsistence	Subsistence harvests of fish and wildlife in 10 of 15 villages surveyed declined from 4 - 78% in 1989 when compared to pre-spill levels. At least 4 of the 10 villages showed continued lower than average levels of use in the period 1990-1991; this decline is particularly noticeable in the Prince William Sound villages of Chenega and Tatitlek. In 1989-1991, chemical analysis indicated that most resources tested, including fish, marine mammals, deer, and ducks, were safe to eat. In 1989-1991, health advisories were issued indicating that shellfish from oiled beaches should not be eaten.	Many subsistence users believe that continued contamination to subsistence food sources is dangerous to their health. In addition, village residents believe that subsistence species continue to decline or have not recovered from the oil spill.	YES	YES	YES	NO	For detailed information on village subsistence use see table _, page__.

a) There may have been an unequal distribution of injury within each region, see map for location of regions

TABLE XXX Other Natural Resources and Archaeology: Summary of Results of Injury Assessment Studies Done After the *Exxon Valdez* Oil Spill (b)

RPWG draft 3/18/93

Resource	Description of Injury	Status of Recovery in December, 1992	Geographic Extent of Injury (a)				Comments/Discussion
			PWS	Kenai	Kodiak	Alaska Penin.	
Air	Air quality standards for aromatic hydrocarbons were exceeded in portions of PWS. Health and safety standards for permissible exposure levels were exceeded up to 400 times.	Recovered	YES	NO	NO	NO	Impacts diminished rapidly as oil weathered and lighter factions evaporated.
Sediments	Oil coated beaches and became buried in beach sediments. Oil laden sediments were transported off beaches and deposited on subtidal marine sediments.	Patches of oil residue remain intertidally on rocks and beaches and buried beneath the surface at other beach locations. Oil remains in some subtidal marine sediments and has spread to depths greater than 20 meters.	YES	YES	YES	YES	Unweathered buried oil will persist for many years in protected low-energy sites.
Water	State of Alaska water quality standards may have been exceeded in portions of PWS. Federal and State oil discharge standards of no visible sheen were exceeded.	Recovered	YES	YES	YES	YES	Impacts diminished as oil weathered and lighter fractions evaporated.
Archaeological sites/artifacts	Currently, 24 sites are known to have been adversely affected by oiling, clean-up activities, or looting and vandalism linked to the oil spill. 113 sites are estimated to have been similarly affected. Injuries attributed to looting and vandalism (linked to the oil spill) are still occurring.	Archaeological sites and artifacts cannot recover; they are finite non-renewable resources.	YES	YES	YES	YES	
Designated Wilderness Areas	Many miles of Federal and State Wilderness and Wilderness Study Area coastlines were affected by oil. Some oil remains buried in the sediments of these areas.	Oil has degraded in many areas but remains in others. Until the remaining oil degrades, injury to Wilderness areas will continue.	YES	YES	YES	YES	

a) There may have been an unequal distribution of injury within each region, see map for location of regions.

b) This page has not yet been reviewed by the Chief Scientist.

NATURAL RESOURCE DAMAGE ASSESSMENT AND RESTORATION STUDIES

The most up to date list of interium and final damage assessment reports can be found at the Oil Spill Public Information Center (OSPIC). Some computerized information is available.

Oil Spill Public Information Center (OSPIC)
645 G Street, Anchorage, Alaska 99501
(907) 278-8008
Inside Alaska (800) 478-7795 * Outside Alaska (800)283-7745

MEMORANDUM

TO: RPWG

FROM: KAREN KHK

12 April '93

Here is a "first draft" of chapter 4. I have written this for a general audience and am expecting to include slightly more detailed information into an Appendices. As you read this, you will see references to a methodologies appendix. There are 3 things I expect to put into the appendix:

the full list of criteria used for evaluation (see Framework Document);

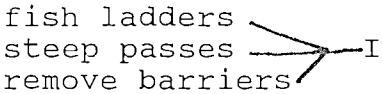
a more detailed explanation of the resource evaluation which will include graphs to explain using "confidence" and the differences between **some** and **substantial**; and,

a process for evaluating new resource options that parallel's the one we have already used.

One other thing that may be appropriate is a more detailed explanation of the key informant interview for services. I have included the process for evaluating new resource options in this package, but I have not yet completed other portions of the appendices.

CHAPTER IV. RESTORATION OPTIONS AND EVALUATION

Since 1989, the restoration planning process has identified the widest range of restoration ideas and projects based on suggestions from a public symposium (RPWG, 1990a), public "scoping" meetings (RPWG, 1990b), and a technical workshop (because of pending litigation, the workshop was closed to the public and a proceedings was not published). These ideas were combined into similar categories called restoration options. Figure xx. illustrates the genesis of one of the current restoration options.



An option may be applied for more than one resource or service. In the example above, improving access to spawning and rearing habitat could be applied for pink salmon as well as sockeye salmon. In most situations, implementing the option would be different for each different species because the specific project designs would have to be taylored for the targetted resource or service. Two options, monitoring and public information/education applied to so many of the injured resources and services, and were felt to be an integral part of any comprehensive program that they became "programmatic options". A total of thirty-five candidate restoration options were identified and presented in the Restoration Framework (Exxon Valdez Oil Spill Trustees, 1992a) for review and comment.

Throughout the life of this restoration plan the list of options will certainly change as new ideas are presented and as these options prove their effectiveness. The options discussed in this Draft Restoration Plan are presented in Table XX and are described in more detail in Appendix XX. They have undergone extensive evaluation and review as part of the planning process. Initially, options were evaluated to determine that they met the terms of the civil settlement, were technically feasible (or warranted research on the feasibility), and were not likely to cause substantial harm to injured resources. Restoration ideas which did not meet these criteria were rejected from further consideration. A list of these options appears at the end of Appendix XX.

The remaining restoration options were evaluated using criteria developed from the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (42 U.S.C. 9601). These criteria included:

> the effects of any other actual or planned response or restoration action;
>
> potential effects of the action on human health and safety;
>
> the relationship of expected costs to expected benefits; [note

to reviewers...did we ever actually use this criterion to reject or modify an option? If not, should we drop it or put it in the appendices?]

the potential for additional injury resulting from the option;

and, the degree to which the option benefits more than one resource or service.

Other criteria that were used in this stage of the evaluation are described in Appendix AX.

The above criteria were used to develop the list of appropriate options, but further evaluation was needed to determine which options could be the most effective in aiding the recovery of injured resources. (and services?). Determining the potential for an option to improve the rate or degree (relative to 100% recovery) is very difficult because of the great deal of uncertainty which surrounds the injuries and the possible unaided recovery times.

Further Evaluation of Resource Options

In order to estimate the effectiveness of different options on the recovery of injured resources, agency scientists and peer reviewers were interviewed. They were asked to predict what would happen to the species that they study if the Trustees were to conduct no restoration actions. This estimate of natural (or unaided) recovery provided the basis for determining the effects of the options. They were then asked to estimate what effect implementing a specific option would have on natural recovery, and asked to describe their level of uncertainty. At least two experts were interviewed for each of the injured resources and their responses were compared and combined to evaluate each option.

The interviews resulted in dividing the estimates of option effectiveness into three categories:

1) options that were not expected to provide more than a 10 percent improvement (these options were no longer considered viable for the specific resource in question);

2) options that provide at least **some** improvement over natural recovery; and,

3) options that could provide **substantial** improvement over natural recovery.

Because of the difficulties in predicting natural recovery as well as the outcome of implementing restoration options, the categories of "some" improvement and "substantial" improvement were based on changes in confidence as well as changes in the estimated time to

reach recovery. This process is described in more detail in the methodologies Appendix.

As new restoration ideas are developed to address injured resources, they will need to undergo a similar evaluation. A proposed process for developing and evaluating new restoration options is described in the methodologies Appendix.

Further Evaluation of Services Options

For services it became apparent (public and peer reviewer comments) that the restoration options described in the 1990 Restoration Framework document did not adequately address the scope of actions that could be taken to benefit services. Services are dependent upon the health of resources and are therefore benefited by options that are implemented to help the specific resource recover. However, other actions that are not necessarily focused on an injured resource can also be implemented to aid services. In order to identify and evaluate potential options a survey was conducted. This 'key informant' survey helped to develop options A-G.

Evaluating the "effectiveness" of restoration options for services can not be applied in the same context as for resources. Therefore, the options for services were divided into categories that described the level of opportunities for human uses. **(relative to use levels prior to 1989? - I need help here.)**

EVALUATION OF NEW OPTIONS

If the answer to the following questions is YES then proceed with the evaluation process outlined under the Implementation chapter for annual work plans.

Does the proposed project already fit into one of the existing restoration options?

Is the option identified appropriate for the restoration plan objectives?

If the proposed project does not belong with an existing restoration option then proceed with the following evaluation.

1) Should the proposed project be combined with similar project ideas to create a new restoration option, or is it an option in itself?

[This should be a quick "brain-storming" for other projects that achieve the same objective. A phone call to a resource or service expert that might help.]

2) Does the option meet the initial criteria of technical feasibility, suitability with the civil settlement guidence, and prevention of significant additional injury?
If no, reject the option. If yes, proceed with the following evaluation criteria.

[At least 2 people should decide if these criteria are met - legal advice may be necessary. If so, get a preliminary opinion and proceed if favorable while an 'official' decision is made.]

BACKGROUND INFORMATION NEEDED:

Which resources or services CAN this option be used for (it may only have been proposed for one, but may work for others as well).

What is/are the recovery status of the targeted resource.
This could either be the predicted natural recovery time or the predicted "aided" recovery time...which ever is available and appropriate.

Are there multiple species or ecosystem benefits expected from implementing this option?

Would implementing the option have a wide range effect, or always be site specific?

What are the potential negative effects from implementing the option and can they be mitigated?

How does this option relate to the injured resources' life history or to the injury?

WHAT EFFECT WOULD THE OPTION HAVE ON RECOVERY? **(note: this section would have to be completed separately for each targetted resource.)**

Relative to an expected recovery time (or range) does this option accelerate the recovery?
Please quantify the answer by showing a new expected recovery date, or range, and the uncertainty.

OR does this option provide greater confidence that the resource will be able to recover in the estimated

time...preferably towards the earlier years in the range?
Please express the change in confidence.

Does this option provide necessary protection for the resource?
"Necessary" needs to be defined... maybe: Without such protection it is less likely that the habitat could support the injured population at its 1988-89 (or maybe "at historic" is better) carrying capacity.

If the answers to any of the above questions produce a 25 percent or greater improvement (substantial improvement) then the Option would be considered in Alternatives 3-5.

If neither answer is greater than 25% but at least one is thought to produce a 10-24% improvement then the option is categorized as providing **some** improvement and would be considered only in Alternative 5.

Process for gathering the above information: The person/organization proposing the project AND two experts (peer reviewers, research scientists etc...) should be asked to estimate the effects of implementing the option.
If significant discrepancies occur try and reach concensus between the experts (preferably in person), or broaden the query to other experts.

DRAFT FOR RPWG REVIEW -
STILL SKETCHY

DRAFT 4/13/93

CHAPTER VI. Implementation Process for the Life of the Settlement

(INTRO PARAGRAPH HERE)

I. ANNUAL WORK PLANS

The annual work plan consists of a listing of restoration projects to be funded for that year. All projects must fit within an existing restoration option described in the Restoration Plan. Project proposals will be solicited from all qualified public and private organizations, including resource agencies. Final decisions will be guided by priorities and directions established in the Restoration Plan and will take into account the most current information from recovery and restoration monitoring programs.

A. Content

1. The Annual Work Plan Package will include: an introduction, a project budget summary, an affected area map, a list of agencies and organizations involved in implementation, timing and priorities for implemetation, and project summary descriptions.

2. Project Descriptions will: focus on the who, what, when, why, and how of implementation. These factors will be described for each project which is to be part of the Annual Work Plan Package. Within the package there will be a definitive statement on link to injury of a resource or service, a statement from the proposer that this project is within the scope of the Restoration Plan, and a description of what NEPA compliance is necessary for implementation and the status of the compliance process.

3. Relation of Projects to Restoration Plan: All proposed projects must fit within an existing option, as described in the Restoration Plan, in order to be considered for inclusion in an annual work plan.

B. **Schedule:** Proposed work plans will be issued annually (**bi-annually has also been suggested). They will be reviewed and approved prior to _____, in order to allow sufficient time for preparation for the upcoming field season.

C. **Environmental Compliance:** Individual projects funded under annual work plans must comply with NEPA requirements. However, the Trustee Council may approve projects prior to completing the NEPA process. However, funding will be withheld until the required documentation has been completed. Many projects will qualify for categorical exclusions, some may require EA's, and the largest and most extensive could require a project-level EIS.

D. **Public Review and Input:** Public review will be an integral part of the process. The public will have a chance to submit and comment on project ideas through forums such as the PAG, Trustee Council meetings and the annual call for project ideas.

E. **Competitive Bidding:** Projects will be subject to a competitive bidding process. Bids will be evaluated and scored by a non-partisan committee which will judge on factors such as proven ability to conduct similar projects in a timely and professional manner, logistical capabilities, technical expertise, and cost.

F. **Annual Work Plan Decision-Making Process:** The entity which compiles and reviews proposals NEEDS TO BE DESCRIBED HERE***. However, The Trustee Council makes the ultimate decision on approving the plan.

G. **Priorities and Timing of Activities within the Preferred Alternative:** (TO BE COMPLETED AFTER RPWG DISCUSSION)

II. AMENDMENTS TO THE FINAL RESTORATION PLAN

The Restoration Plan is intended to provide guidance for the life of the settlement, but must also be sufficiently flexible to accomodate new information and changing conditions. For example, it is anticipated that the monitoring program will continually provide new information on recovery rates and the effectiveness of restoration activities, which will influence how restoration options are applied. Minor changes can be incoporated without changing the plan. Major changes, however, may trigger more involved review and approval procedures.

A. MINOR AMENDMENTS

Minor amendments include all changes which fall within the parameters of whichever alternative is chosen for the final restoration plan. Minor amendments can be added without having to go through the entire public review process or redo the programmatic EIS. However, the public will be provided opportunity to comment on minor amendments. Also, the more technical amendments, such as adding new restoration options, must be approved by scientific peer reviewers.

For example, new restoration options can be added as minor amendments as long as they meet the criteria established in the plan for effectiveness, geographic location, resource or service addressed, etc. However, the process for adding options must be tightly controlled and only those options rated as acceptable by a panel of peer reviewers can be added to the plan. In the same way that the options in the final restoration plan were required to go through a rating process, based on input from recognized experts in relevant fields, any new option must likewise be demonstrated to be valid and applicable to the prescribed restoration program. Criteria to be considered when rating new options include:

(INSERT BRIEF DESCRIPTION OF CRITERIA FOR RATING NEW OPTIONS)

B. MAJOR REVISIONS

Major revisions are changes which fall outside the boundaries described in the final plan. For example, if the plan specified that options must only apply to species injured at a population level, a proposal to include an option treating sublethal injury would constitute a major revision. Likewise, decisions to greatly shorten or lengthen the proposed duration of the restoration program would count as a major change.

If the plan is changed significantly from that described in the alternative approach described in final Restoration Plan, then a full public review may be necessary, possibly including a new restoration plan and an additional programmatic EIS. Changes such as this would most likely be necessary only in the case of an unforseen significant event, such as another oil spill, an obvious lack of success with the restoration approach originally selected, or a radically different understanding of injury gained from the monitoring program.

III. PUBLIC INFORMATION PROGRAMS AND PUBLIC PARTICIPATION

Public participation in the restoration planning process is required and described by the Memorandum of Agreement and Consent Decree, the National Environmental Protection Act, and the Federal Advisory Committee Act. Public information programs have been set up to allow the public to participate in an informed manner and to provide general information on how settlement monies are being used. The Americans with Disabilities Act mandates equal access for the disabled to all public information and to all forums for public participation.

A. PUBLIC INFORMATION PROGRAMS

1. Oil Spill Public Information Center (OSPIC)

The Trustees set up the Oil Spill Public Information Center (OSPIC) to provide a repository for all materials related to the oil spill, facilitate patron use of those materials, and support the public information needs of public participation. These services include:

- Collection and maintenance of background legal and scientific scientific materials relating to the oil spill, such as natural resource damage assessment and restoration project reports, shoreline oiling reports, and newspaper and magazine clippings.

- Walk-in and telephone reference services on the Exxon spill and subsequent restoration activities.

- Creation and maintenance of a certifiable administrative

record of Trustee Council, Restoration Team, Public Advisory Group and other work group activities and published products.

The mailing address and contact numbers for OSPIC are:

The Oil Spill Public Information Center
645 G Street
Anchorage, Alaska 99501

(907) 278-8008 (PHONE)
(907) 276-7178 (FAX)

2. Other sources of information

Other sources of information available to the public include:

- Publicly available restoration documents, such as the Restoration Framework document and the brochure on Draft Restoration Plan Alternatives.

- Public symposia such as the EVOS Feb. '92 symposium which presented results of damage assessment studies.

- Educational efforts linked to particular restoration projects, such as public service announcements or instructional videos informing resource users how to reduce impact on a particular recovering resource.

- Agency publications, such as the recent issue of the Alaska Department of Fish and Game magazine devoted to restoration activities.

- Also, once the full-scale restoration monitoring program is underway, monitoring results will be reported regularly.

B. PUBLIC PARTICIPATION PROGRAMS

1. Formal Comment Periods on Restoration Planning Documents

The primary opportunity for the public to submit ideas for restoration and to review and comment on proposals made by others has been during public comment periods on the formal documents of the restoration planning process. Public comments will be solicited on the **Final Restoration Plan and** the accompanying **Final EIS** and subsequent **Annual Work Plans.**

2. Public Meetings in Communities

During 1992 and 1993, three rounds of public meetings have been held in oil spill-affected communities, plus Anchorage, Fairbanks, and Juneau. The latest round of meetings, in April 1993, presented and took comments on the brochure outlining the alternatives in the draft restoration plan.

3. Public Participation at Trustee Council Meetings

The Trustee Council meetings are advertised and open to the public. Any oil-spill affected community which requests to participate can be hooked in via teleconference.

4. Public Comments on the Environmental Impact Statement (EIS)

The public can comment on the development of the EIS which accompanies the Restoration Plan at three different times:

1) The initial scoping process, which allows the public to identify early in the process issues, concerns, and predictions of impacts. This has already occurred.

2) Public review and comments on a draft EIS.

3) Public review and comments on a final EIS, and on Supplemental EIS's, should they be necessary.

5. Public Advisory Group

The Trustee Council has established a Public Advisory Group (PAG). The PAG reviews all restoration activities and provides advice to the Trustee Council. The Trustee Council determined that the PAG should have 5 public-at-large seats and 12 "interest group" seats, representing aquaculture, commercial fishing, commercial tourism, conservation, environmental, forest products, local government, Native landowners, recreational users, science/ academic, sport hunting and fishing, and subsistence. There are also "ex-officio" seats for representatives chosen by the Alaska State House of Representatives and the Alaska State Senate. All meetings are open to the public and the public is specifically allowed time to speak or give written testimony to the group at each meeting.

C. AMERICANS WITH DISABILITIES ACT

The Americans with Disabilities Act of 1991 requires all government sponsored programs to provide equal for access for the disabled to telecommunications, and written and non-written materials, as well as opportunities for participation in public meetings and teleconferences. Requests for changes to accommodate any disabled members of the public, and complaints about non-compliance with the Act should be directed to:

Executive Director
Exxon Valdez Oil Spill Restoration Program
645 G St.
Anchorage, AK 99501
Phone: (907) 278-8012

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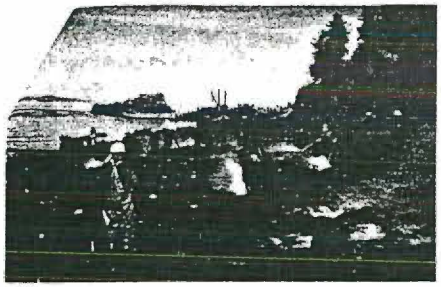

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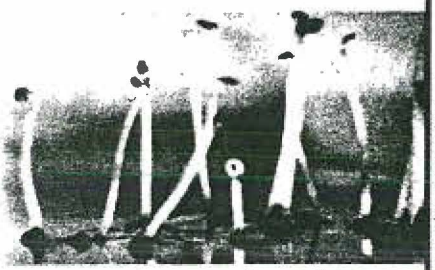

Kieber et al./Univ. Pennsylvania

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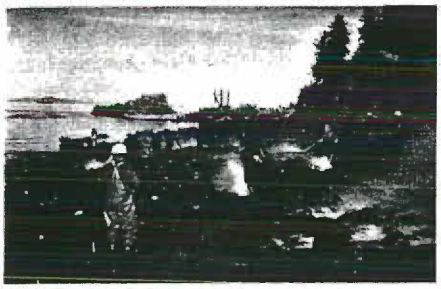

Courtesy of Exxon USA

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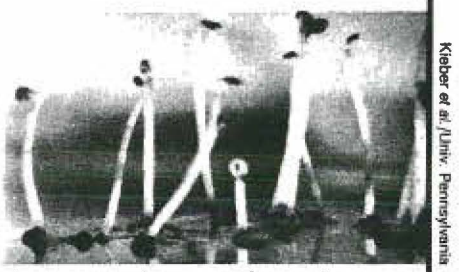

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MEMORANDUM State of Alaska

DEPARTMENT OF NATURAL RESOURCES Phone: 907/278-8012

OIL SPILL RESTORATION OFFICE FAX: 907/276-7178

TO: HPWG

DATE: April 21, 1993

FROM: Art Weiner [AHW]
Chuck Gilbert

SUBJECT: Draft Habitat Protection Appendix for the Restoration Plan

Attached, for your review, is the first draft of the Habitat Protection Appendix for the Restoration Plan. As you know, there is a one page summary of this option in the main text of the Draft Plan. The intent of the Appendix version is to provide a more comprehensive treatment of the option without burdening the public with a lot of unnecessary detail. We would like you to review the draft with this objective in mind.

We would also like for you to consider the following questions:

- Should the list of linked resources/services be presented as a separate table rather than embedded in the text?

- Do you feel that it is necessary/desirable to explain, in some detail, each of the evaluation/ranking criteria?

- Does the flow chart need to show more detail?

Please get your comments to us as soon as possible so that we can circulate the next draft. The final HPWG version must also be reviewed by the RT before we forward it on to RPWG.

Thank you!

HABITAT PROTECTION/ACQUISITION

Introduction

The objective of habitat protection/acquisition is to protect lands linked to resources and services that were injured by the Exxon Valdez oil spill. Protection of these lands prevents additional injury to living resources and habitats, services and natural support systems while recovery is taking place. The Trustee Council published this objective in the March 1, 1991 *Federal Register* notice that describes restoration planning and implementation activities under consideration. This notice stated that the objective of habitat protection is to *identify and protect strategic wildlife and fisheries habitats and recreation sites and to prevent further potential environmental damages to resources injured by the Exxon Valdez oil spill.*

In situations where natural recovery is slow to occur or where direct restoration is neither technically feasible or cost effective, other measures need to be considered to mitigate injury. These may include replacement of injured resources and services with those that are equivalent[1]. The *Memorandum of Agreement and Consent Decree* entered into by the State of Alaska and the United States states that: *Restoration includes all phases of injury assessment, restoration, replacement, and enhancement of natural resources, and acquisition of equivalent resources and services.* The *Agreement and Consent Decree* rendered as a Judgment by the Court specifies that funds received from EXXON and deposited in the Joint Account can be used for the acquisition of equivalent resources.

Habitat protection addresses cases where existing regulations affecting private land use are inadequate to protect essential habitats of recovering resources and services. It is also designed to provide additional protection to habitats of recovering species on public lands where agency management strategies are not currently directed toward facilitating recovery of these resources.

The *Habitat Protection and Acquisition Process* ~~has been~~ is adopted by the Trustee Council as the method for acquiring lands or partial interests in private lands that contain habitats linked to resources and/or services injured by the oil spill. The process is divided into evaluation, ranking, acquisition and post-acquisition management phases. This approach to land acquisition is a multi-step evaluation process that includes *threshold criteria* and *evaluation and ranking criteria.* The threshold criteria are designed to eliminate proposals that are inappropriate or unreasonable. The evaluation and ranking criteria are used to prioritize or rank those candidate lands that are in compliance with the threshold criteria.

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1 Replacement or acquisition of the equivalent means compensation for an injured, lost or destroyed resource by substituting another resource that provides the same or substantially similar services as the injured resource (56 Federal Register 8899 [March 1, 1991].

Protection tools that will be considered for use by the Trustee Council include: fee acquisition, conservation easements, acquisition of partial interests and others. Subsequent to purchase, acquired parcels will be managed by the appropriate resource agency in a manner that is consistent with the restoration of the affected resources and/or services. The Trustee Council will decide which agency will manage the land or may create a new management authority.

Linkage

Affected resources and services that were determined to be linked to the habitat protection strategy include:

Common murre, harlequin duck, marbled murrelet, river otter, pink salmon, sockeye salmon, cutthorat trout, dolly varden, Pacific herring, bald eagle, pigeon guillemot, sea otter, harbor seal, black oystercatcher, inter tidal and subtidal resources, consumptive and non-consumptive recreation[2], consumptive and non-consumptive commercial uses, subsistence, cultural resources and wilderness.

All of these species/services are dependent on

Linkage for the above-listed species means dependency upon essential upland and nearshore habitat(s) during critical life history stages, i.e., reproduction, feeding, molting. Habitat components linked to injured services include spawning fishing areas for anadromous fish, view sheds, freshwater streams and the inter tidal streams? zone. Anadromous streams and their adjacent riparian forests are considered to be both habitat and movement corridor. Streams, as habitat, support reproduction of anadromous fish and also act as movement corridors between the spawning and rearing habitat and the open sea. Harlequin ducks nest in trees in the riparian forest but use the open area under the canopy above the stream channel as a movement corridor to their inter tidal feeding habitat.

Threat

The Habitat Protection Process looks at the susceptibility of recovering resources and services to adverse impacts from human activity and the probability that these will occur. Potential threats to living resources and their habitats include both disturbance and habitat degradation or loss. Degradation or habitat loss can be caused by changes in land use such as development or resource extraction activities. An example of habitat degradation would be pollution of spawning or breeding habitat or fragmentation of nesting habitat. Man-induced disturbance can result in disruption of reproductive activity or displacement of animals from important feeding areas. Marine mammals, for example, when hauled out on to land, are sensitive to disturbance.

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[2] Non-consumptive uses refers to activities that generally have a low impact and do not include, as a primary objective, the harvest of fish and wildlife.

The most probable threat to recovering resources and services is intensive timber harvest. Although upland areas were not oiled, they often contain essential habitats of living resources that were directly affected by the spill and cleanup activities. Logging has the potential to jeopardize the nesting habitat of marbled murrelets, harlequin ducks and bald eagles. It can cause long term damage to forest systems through erosion, degradation of instream water quality, impairment of nutrient cycling, moisture uptake and retention. Practices associated with logging disturb animals that are dependent upon inter tidal and nearshore habitats. Wilderness values and tourism are adversely impacted by landscapes denuded by clearcutting. Habitat protection measures can eliminate these and other threats to affected resources and thereby facilitate recovery.

Habitat Protection/Acquisition Process

The process is built around a consecutive sequence of steps leading to the protection of those lands linked to the recovery or replacement of injured resources and services. Figure 1 is a summary chart of this process. These steps can be grouped into three phases: (1) Evaluation and Selection; (2) Acquisition; and (3) Management. This strategy evolved from discussions with local experts, literature reviews, reviews of damage assessment and restoration studies, and collaboration with biologists, ecologists, resource managers, archeologists, realty and services' specialists. Existing habitat protection systems, such as the Florida Conservation and Recreation Lands program were reviewed as models. To aid in the development of this process, The Nature Conservancy produced a handbook, for the Trustee Council[3]. The Handbook provides an overview of the identification and ranking processes and protection tools, techniques and strategies that are used by the Conservancy, federal and state resource agencies and by other land stewardship organizations.

Although the objective of this process is to protect and manage lands linked to spill-affected resources and services, other resources will also be affected, including water quality, wildlife, fisheries, tourism and outdoor recreation. There will also be economic and social impacts that result from the implementation of this process.

[3] *Options for Identifying and Protecting Strategic Fish and Wildlife Habitats and Recreation Sites* (The Nature Conservancy Handbook, 1991)

Key steps in the process are:

Evaluation and Selection

(1) Characterize essential habitat types for injured resources and services;

(2) Identify essential habitat types on specific parcels and determine the optimum boundary necessary for the most cost-effective protection;

(3) Evaluate and rank each candidate parcel;

Acquisition

(4) Acquire title to, or partial interests in, the highest ranked parcels, for the least cost, with the most appropriate protection tool (s); and

Management

(5) Implement a management plan for each acquired parcel that facilitates recovery of injured resources and services and provides for long term protection.

Nominations of private lands with willing sellers are first evaluated by biologists and resource managers against a set of *Threshold Criteria*. These criteria are designed to determine whether or not a nomination is acceptable for further consideration. A nomination will be rejected if it is not in compliance with **ALL** threshold criteria. Based on existing information, the threshold criteria will eliminate proposals that are inappropriate or unreasonable.

Threshold Criteria

1) There is a willing seller of the parcel or property right ;

2) The parcel contains key habitats that are linked to, replace, provide the equivalent of, or substitute for injured resources or services based on scientific data or other relevant information;

3) The seller acknowledges that the government can only purchase the parcel or property rights at fair market value;

4) Recovery of the injured resource or service would benefit from protection in addition to that provided by the owner and applicable laws and regulations; and

5) The acquired property rights can reasonably be incorporated into public land management systems.

Nominations that comply with all the threshold criteria will be listed as *Candidate Lands* and subjected to detailed evaluation against a set of *Evaluation/Ranking Criteria*. The first step in this assessment is the determination of a parcel boundary within which is contained the habitats and support systems that need to be protected. Once the optimum boundary is determined, the parcel is evaluated and ranked using the criteria. These evaluation criteria are designed to determine:

- The degree of linkage of injured resources and services to specific parcels; and

- The potential for benefit that implementation of habitat protection would have on each linked reource and service.

Evaluation/Ranking Criteria

1) The parcel contains essential habitat(s)/sites for injured species or services. Essential habitats include feeding, reproductive, molting, roosting, and migration concentrations; essential sites include known or presumed high public use areas. Key factors for determining essential habitat/sites are: (a) population or number of animals or number of public users, (b) number of essential habitats/sites on parcel, and (c) quality of essential habitats/sites.

2) The parcel can function as an intact ecological unit or essential habitats on the parcel are linked to other elements/habitats in the greater ecosystem.

3) Adjacent land uses will not significantly degrade the ecological function of the essential habitat(s) intended for protection.

4) Protection of the habitats on parcel would benefit more than one injured species/service (unless protection of a single species/service would provide a high recovery benefit).

5) The parcel contains critical habitat for a depleted, rare, threatened, or endangered species.

6) Essential habitats/sites on parcel are vulnerable or potentially threatened by human activity.

7) Management of adjacent lands is, or could easily be made compatible with protection of essential habitats on parcel.

8) The parcel is located within the oil spill affected area.

Highly ranked parcels that receive support from the Trustee Council are reviewed within the acquisition element of the process. Realty specialists, foresters, resource managers, attorneys, and land appraisers will review the anticipated cost of acquisition and recommend the most appropriate and cost-effective mix of protection tools.

4/20/93

DRAFT

ACQUISITION PROCESS

Acquisition of lands or interests in lands will be accomplished according to accepted realty principles and practices. Although there are minor differences in the ways the Federal government and the State of Alaska conduct acquisitions, the essential elements of real estate acquisitions are common to both processes. All acquisitions will require title evidence, appraisals of fair market value, hazardous substances surveys, legal review of title and negotiations. In addition, some acquisitions will require new land surveys.

Once a tract is identified for acquisition by the Trustee Council, it will be assigned as an acquisition case to an agency, multi-agency acquisition team, or other entity, at the discretion of the Trustee Council. Additionally, assistance in acquisitions may be obtained from other entities, such as non-profit land conservation groups. The party with responsibility for an acquisition will be required to coordinate and receive direction from the Trustee Council and Restoration Team to assure that acquisitions are conducted in accordance with Trustee Council directives and will fulfill restoration objectives. Once an acquisition has been fully negotiated, with agreement on a defined tract, all terms and conditions, and price, the Trustee Council will have final authority to approve or disapprove the acquisition and cause the disbursal of restoration funds. The agency or group that would receive title to the tract would also need to accept title.

From the time an acquisition case is assigned to its completion will typically take six months to two years, depending on the complexity of a variety of factors. Such factors include title conditions, potential contamination, need for land surveys, protracted negotiations and approvals by corporate boards and the Trustee Council.

Acquisitions may involve land exchanges. If suitable federal or state lands can be identified for exchange for lands that would be acquired for restoration purposes, land exchanges may be pursued. Because land exchanges involve both the acquisition and disposal of lands, they are more complex than purchases and typically take a minimum of two years.

As a general rule land acquisitions will occur on a willing seller basis. However, the federal and state governments have authority to acquire lands by eminent domain (condemnation). In extreme cases where acquisition may be vitally necessary for restoration purposes and an owner is unwilling to sell, condemnation may be employed.

HABITAT PROTECTION/ACQUISITION PROCESS

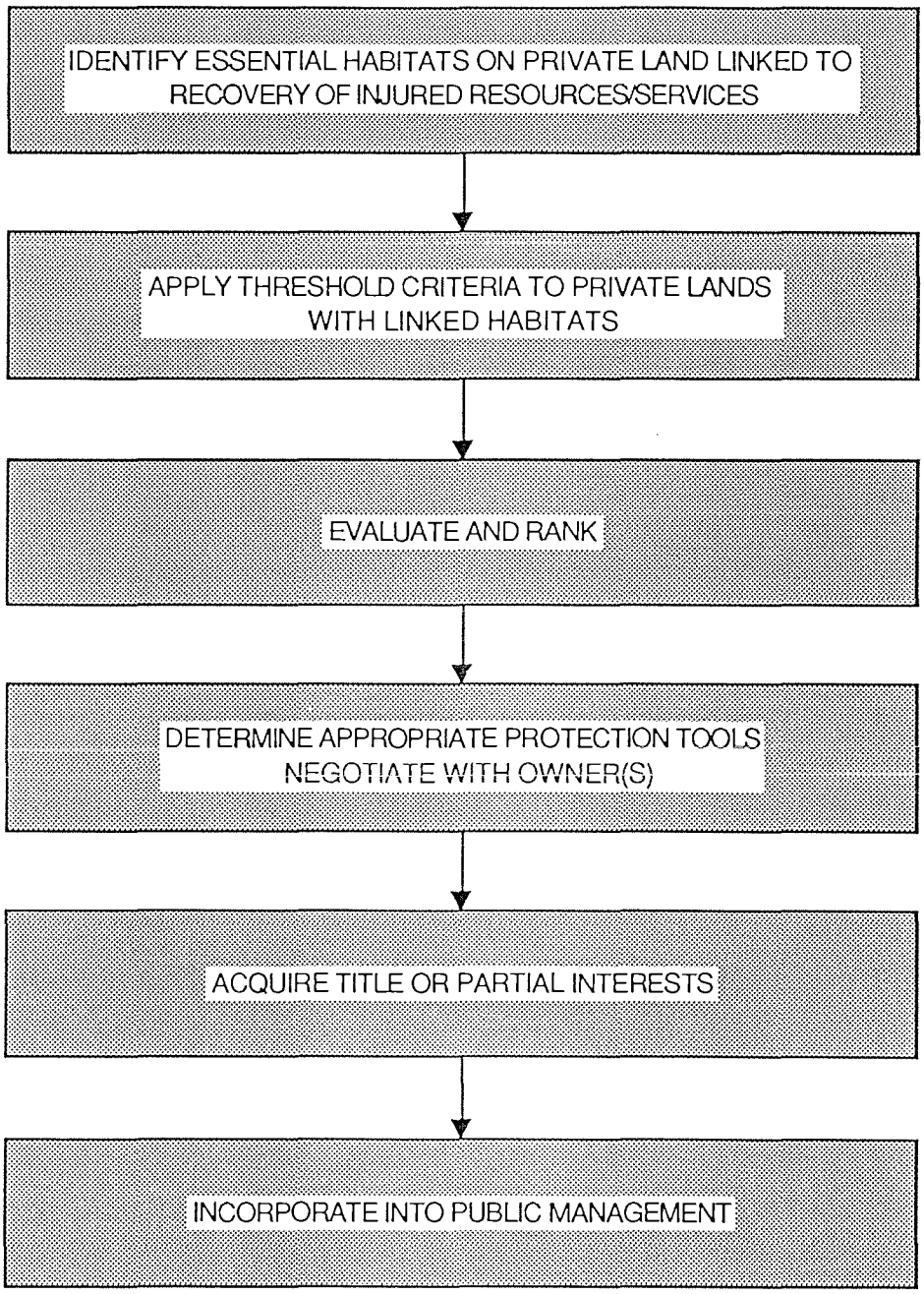


Figure 1 Summary of Habitat Protection/Acquisition Process

CHENEGA BAY MARINE SERVICE CENTER (CBMSC)
EXECUTIVE SUMMARY

Presented by Chenega Bay IRA Council

Introduction

Chenega Bay is located just north of Sawmill Bay on Evans Island in Prince William Sound (PWS), Alaska. The village of Chenega Bay, with a population of 96, was reestablished at this site in 1984 because the historic village site on Chenega Island, some 20 miles to the north, was destroyed by the 1964 earthquake and resulting tsunami.

The community of Chenega Bay has embarked upon a plan to seek significant funding for dock and port improvements with the goal of enhancing three natural advantages:

1) an excellent harbor, already recognized as a safe haven in bad weather;

2) a unique location, closer than any other settlement to the heart of the salmon-spawning habitat where the Prince William Sound fishing fleet harvests 48% of all salmon taken in Alaska;

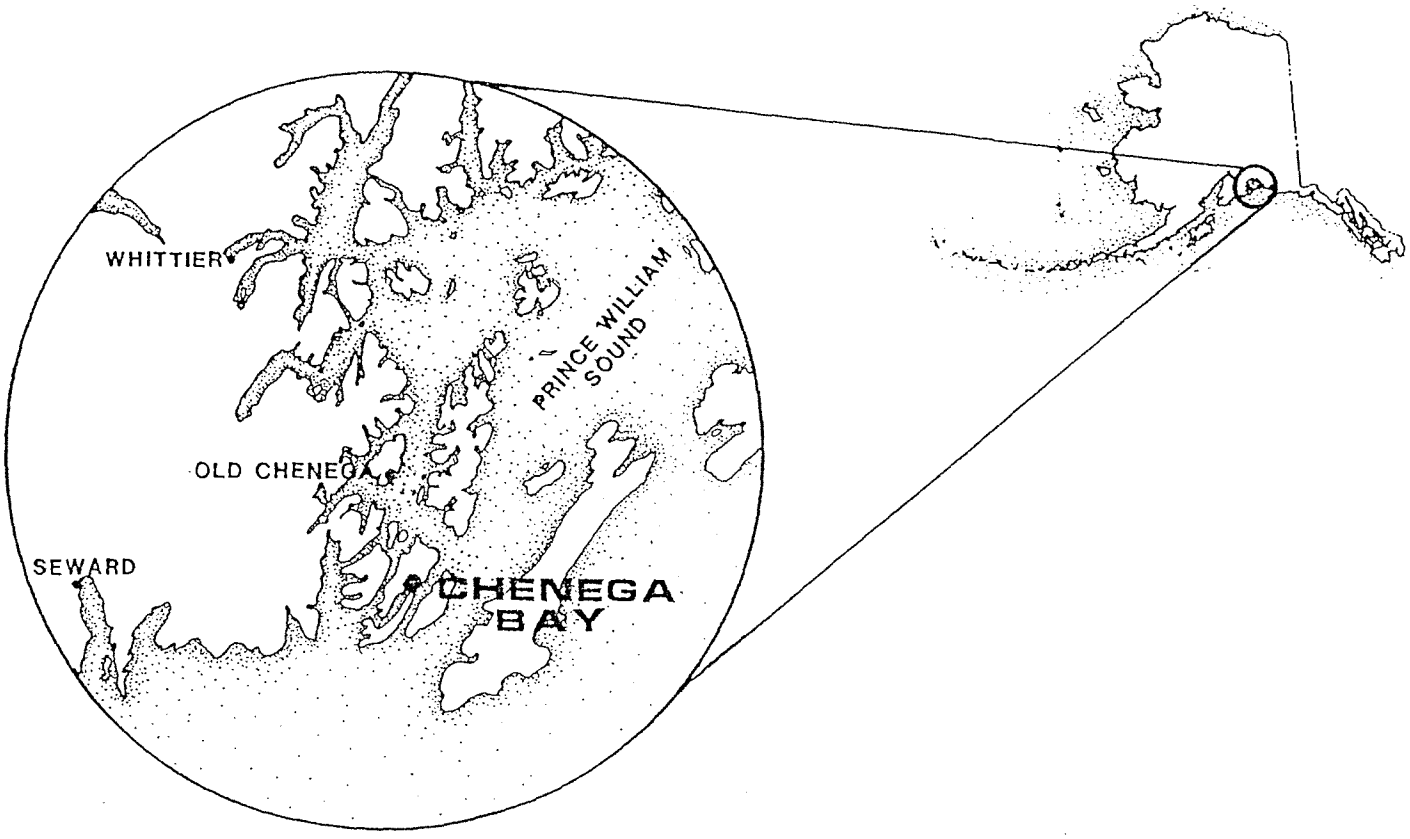
3) a gateway for tourists and recreational boaters to the western part of Prince William Sound. At present, the visitor market is shut out of this whole area due to lack of harbor, fuel, and supply services. Chenega Bay is approximately 75 statute miles from both Seward and Whittier, one day's voyage for most power boats.

Background

The Chenega Bay IRA Council has been planning for the development of the CBMSC since 1987. The Council initiated several planning studies beginning in 1990. The planning has been coordinated by the Council and consists of market study of PWS fishery (1991), a market demand study of fishery and recreation markets (1992), an economic forecasting and financial planning (1992), and marine facility planning and engineering (1993). The results of the planning and studies are briefly highlighted here.

The PWS and the adjacent waters of the Gulf of Alaska are important harvest areas for commercial fishermen. There are 243 salmon purse seine vessels, with crews of four to six people, operating in PWS, and hundreds of larger longline vessels operating in the northern Gulf of Alaska. Fishing begins in April-May, peaks in August, and ends in October-November. The above-referenced studies attest to a strong and growing demand for marine services at Chenega Bay during the May-October period.

Again, according to the marketing studies, more than 420 noncommercial boats now moored in Seward and Whittier are powerful enough to make a trip to Chenega Bay a pleasant outing. In addition, the marinas of both communities dispatch thousands of boaters annually aboard vessels as diverse as kayaks and 120-foot boats outfitted for week-long excursions. As an example of demand for services in Chenega Bay, tour operators and kayak rental businesses contacted in the demand study expressed an interest in 720 hotel rooms per 120-day season. Power and sail boat clientele demand exists for 1,012 nights of lodging per season. This equates to a total need of 15 rooms per night.

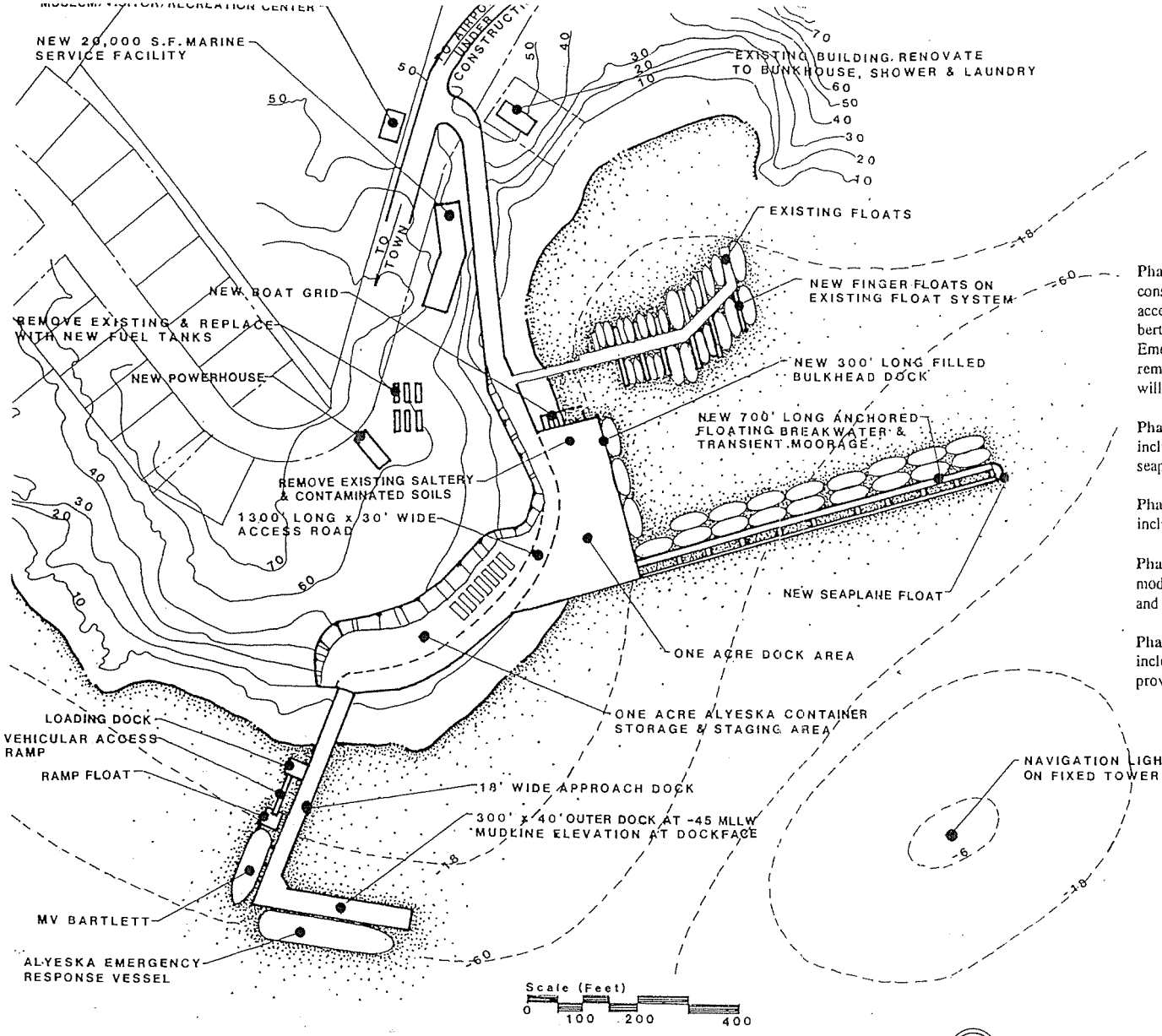


CHENEGA BAY MARINE SERVICE CENTER
PHASE FINANCING PLAN

Contained within the **Alyeska Pipeline Service Company Settlement** with the State of Alaska are $14.5 million to be used in Chenega Bay and Tatitlik for docks, suitable for oil spill response and the MV Bartlett, and oil spill response staging areas including oil spill response equipment and supplies. Also mentioned in the Settlement agreement is removal of the old Saltery, in order to make way for the dock and staging area. These funds will be used to fund **Phase I** of the construction project.

The Council is also looking to **Exxon/State of Alaska Criminal Penalties Fund** for construction of portions of the CBMSC. We are looking to that fund for local resource enhancement. We are requesting that $1.6 million be included in any appropriation from this fund to cover cost of construction of **Phases III and IV-A.**

Chenega Bay is presenting the **Exxon Valdez Trustees Council** with a proposal for construction funds as a match to the Alyeska Settlement. The request is based upon the restoration of recreation and tourism services lost on account of the Exxon Valdez oil spill (EVOS), to enhance and otherwise replace services damaged on account of the EVOS, and services to replace or substitute for injured, lost or destroyed resources and affected services. We will apply for funds from this source for construction of **Phase II and IV-B** of this project.



CHENEGA BAY MARINE SERVICE CENTER
PHASED CONSTRUCTION DEVELOPMENT PLAN

Phase I of the development plan focuses on removal of the abandoned saltery and construction of the outer main dock, bulkhead dock, adjacent uplands, breakwater, access road, area lighting and power, and water supply. The outer dock will allow berthing of the state ferries MV Bartlett and MV Tustemena and also Ayleska Emergency Response Vessels. The bulkhead dock will be constructed to contain fill removed to develop the one acre uplands needed for spill response supply storage and will serve as an important staging and work area for shoreside harbor activities.

Phase II of the development consists of improvements to the small boat harbor including a finger float addition to existing floats, boat grid, marine crane and a new seaplane float.

Phase III focuses on improvements to the village's supporting infrastructure and includes new fuel storage and distribution and improved power generation.

Phase IV-A creates upland amenities to service the needs of visitors and includes modification of an existing building into a bunkhouse with a shower/laundry facility, and also a museum/visitor/recreation center.

Phase IV-B completes the Chenega Bay Marine Service Center Development Plan and includes construction of the marine service facility a full service building which will provide supplies, food and lodging.

CHENEGA BAY MARINE CENTER DEVELOPMENT PLAN

Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

CHENEGA BAY MARINE SERVICE CENTER
DEVELOPMENT PLAN
ENGINEERS ESTIMATE (FEBRUARY 1993)

PHASE I - OUTER DOCK & UPLAND DEVELOPMENT

ITEM	UNIT	QUANTITY	PRICE	AMOUNT
SALTERY DEMOLITION	L.S.	ALL REQ'D	$600,000	$600,000
REMOVE CONTAMINATED SOILS	L.S.	ALL REQ'D	$400,000	$400,000
ACCESS ROAD	L.F.	1,300	$150	$195,000
ROCK EXCAVATION	C.Y.	25,000	$12	$300,000
BULKHEAD DOCK	L.F.	400	$3,000	$1,200,000
NAVIGATION MARKING	L.S.	ALL REQ'D	$30,000	$30,000
OUTER MAIN DOCK	S.F.	20,000	$120	$2,400,000
LOADING DOCK	S.F.	3,000	$150	$450,000
VEHICULAR RAMP	L.S.	ALL REQ'D	$600,000	$600,000
RAMP FLOAT	L.S.	ALL REQ'D	$500,000	$500,000
BARTLETT FENDERS	L.S.	ALL REQ'D	$400,000	$400,000
WATER TO DOCKS	L.S.	ALL REQ'D	$300,000	$300,000
AREA LIGHTING & POWER	L.S.	ALL REQ'D	$300,000	$300,000
TOTAL ESTIMATED CONSTRUCTION COST				$7,675,000
ENGINEERING, INSPECTION, & ADMINISTRATION				$1,151,250
TOTAL PHASE I COST				**$8,826,250**

PHASE II - SMALL BOAT HARBOR DEVELOPMENT

ITEM	UNIT	QUANTITY	PRICE	AMOUNT
FLOATING BREAKWATER	L.F.	700	$2,500	$1,750,000
SEAPLANE FLOAT	L.S.	ALL REQ'D	$50,000	$50,000
FINGER FLOATS	L.S.	ALL REQ'D	$150,000	$150,000
MARINE CRANE	L.S.	ALL REQ'D	$50,000	$50,000
BOATGRID	L.S.	ALL REQ'D	$200,000	$200,000
TOTAL ESTIMATED CONSTRUCTION COST				$2,200,000
ENGINEERING, INSPECTION, & ADMINISTRATION				$330,000
TOTAL PHASE II COST				**$2,530,000**

PHASE III - UPLAND INFRASTRUCTURE IMPROVEMENTS

ITEM	UNIT	QUANTITY	PRICE	AMOUNT
NEW FUEL STORAGE & LINES	L.S.	ALL REQ'D	$250,000	$250,000
FUEL DISTRIBUTION AT DOCK	L.S.	ALL REQ'D	$50,000	$50,000
NEW POWER HOUSE & GENERATORS	L.S.	ALL REQ'D	$250,000	$250,000
TOTAL ESTIMATED CONSTRUCTION COST				$550,000
ENGINEERING, INSPECTION, & ADMINISTRATION				$110,000
TOTAL PHASE III COST				**$660,000**

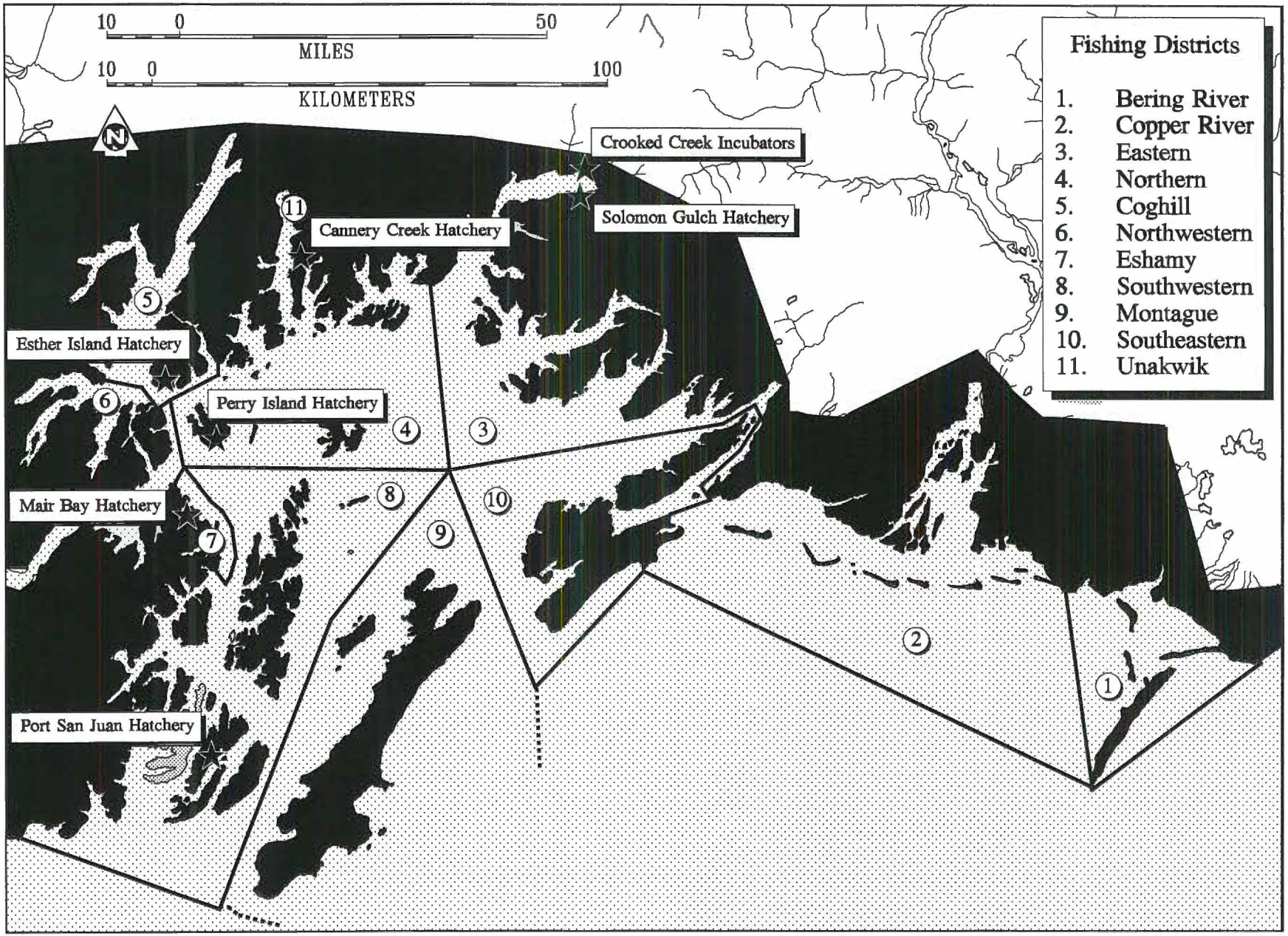
PHASE IV - MARINE SERVICE FACILITIES - PART A

ITEM	UNIT	QUANTITY	PRICE	AMOUNT
MUSEUM/VISITOR/REC. CENTER	S.F.	4,000	$120	$480,000
RENOVATE EXISTING BLDG.	L.S.	ALL REQ'D	$250,000	$250,000
WATER & SEWER TO STORE	L.S.	ALL REQ'D	$50,000	$50,000
TOTAL ESTIMATED CONSTRUCTION COST				$780,000
ENGINEERING, INSPECTION, & ADMINISTRATION				$156,000
TOTAL PHASE IV COST				**$936,000**

PHASE IV - MARINE SERVICE FACILITIES - PART B

ITEM	UNIT	QUANTITY	PRICE	AMOUNT
MARINE SERVICE FACILITY	S.F.	20,000	$120	$2,400,000
TOTAL ESTIMATED CONSTRUCTION COST				$2,400,000
ENGINEERING, INSPECTION, & ADMINISTRATION				$480,000
TOTAL PHASE IV COST				**$2,880,000**

OVERALL PROJECT COST **$15,832,250**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MILES
10 0 100
KILOMETERS
N
Crooked Creek Incubators
Solomon Gulch Hatchery
Cannery Creek Hatchery
Esther Island Hatchery
Perry Island Hatchery
Mair Bay Hatchery
Port San Juan Hatchery
Fishing Districts
1. Bering River
2. Copper River
3. Eastern
4. Northern
5. Coghill
6. Northwestern
7. Eshamy
8. Southwestern
9. Montague
10. Southeastern
11. Unakwik

WALCOFF & ASSOCIATES

M E M O R A N D U M

TO: EIS Team*

FROM: Jacquie Glover-Brown

DATE: April 22, 1993

SUBJECT: Project 4700-38 -- Ken Rice Visit, and Other Information/Matters

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After speaking with Ken yesterday afternoon, Carol has informed me of the following:

- Ken would like to begin EIS review/discussion at 1:00 p.m. on Tuesday, April 27

- He will be bringing the Restoration Plan Habitat Protection description. It is still being refined, but the core is available for perusal.

- The Options Package that was distributed to you on yesterday is the complete package. There are certain areas of descriptions missing, as noted in the package, but the list comprises all of the Options. (Ken is going to double check this, but he is certain that it is the complete listing.)

Please note that the attached comments from Pam Bergmann, as well as those from Chris Swenson to Ray Thompson, have not been reviewed by Ken, and therefore are not directive. They were sent by Ken as soon as possible to keep the writing-review-editing process ongoing. Any conflicts that appear in comments should be directed to Ken for resolution during his visit next week.

I have also attached a copy of the letter and a list of recipients that went to federal, state and local agencies, and Native corporations. Sixty-six letters were mailed, along with a Draft EVOS Restoration Plan brochure, as requested by Ken.

*Distribution
Carol Paquette
Matt McMillen
Kathleen Schildbach
Sue Brown

Attachments

G:\WP\PROJECT\JUSTICE\EIS\TEAMMEM3.JGB

Exxon Valdez Oil Spill Trustee Council

Restoration Office
645 "G" Street, Anchorage, AK 99501
Phone: (907) 278-8012 Fax: (907) 276-7178

April 21, 1993

MEMORANDUM

TO: Ken Rice, Chair, Environmental Compliance Work Group

FROM: PB Pamela Bergmann, Department of the Interior, Restoration Team Representative

SUBJECT: Comments on Draft Chapter 3 of the Draft Environmental Impact Statement

As requested at the April 15, 1993 Restoration Team meeting, the Department of the Interior has reviewed the draft Chapter 3 of the Draft Environmental Impact Statement (DEIS) in more detail. The following comments supplement those provided to you in a memorandum from me dated April 14, 1993. Our additional comments are as follows:

GENERAL COMMENTS:

This chapter needs to be rewritten to ensure that (1) baseline information that relates specifically to the information analyzed in the alternatives is included, and (2) the level of information presented is commensurate with the importance or significance of potential impacts. Currently, the chapter includes alot of information that is unnecessary to understand the impacts of the proposed alternatives (e.g., information on segments of the economy such as mining, agriculture, and communications and information on resources that were not injured by the Exxon Valdez Oil Spill [EVOS]).

The chapter needs to include a baseline discussion of the marine ecosystem (i.e., intertidal and subtidal areas, and open water).

SPECIFIC COMMENTS:

Section B. Biological Description. We believe the following key data should be provided for each biological species injured by EVOS or potentially impacted by the restoration alternatives:

* Legal status

* Pre-spill population and trend

* Pre-spill/post-spill management (i.e., identify management agency(ies) active or passive management actions)

* EVOS impact on population, critical life cycle stages, habitat areas

* Species relationships (e.g., killer whales and black cod fishery)

* Importance and/or ecosystem role (e.g., food chain, recreational, commercial, subsistence, and intrinsic)

Section C: Socioeconomic Description.

Information sources need to be expanded to ensure that the most current and relevant information is used. Several sections read like they were excerpted from promotional brochures.

This subsection should address the economic impacts, both positive and negative, associated with EVOS response-related actions.

This subsection needs to address non-EVOS-related factors that have influenced resources and services impacted by EVOS; e.g., increased Japanese demand for "fish-farmed" salmon; changes in state fisheries management; and the national recession. As written, this subsection seems to imply that negative effects were due solely to EVOS.

We recommend that Alaska Department of Fish and Game Subsistence Division personnel (i.e., Dr. Jim Fall) review the subsection on subsistence.

This subsection should focus on information related to commercial fish species that were injured by EVOS; e.g., pounds of catch, price, ship crew shares and value, operating costs, permit costs, numbers of boats, communities the boats came from, location of processing and other support facilities.

The subsection on sport fishing should include the following kinds of information: magnitude (number of days) and value of sport fishing by residents and nonresidents of the oil spill area, and the economic contribution of sport fishing to communities in the oil spill area.

Additional detailed comments are provided as Attachment A.

We believe the above comments should be taken into account as Chapter 3 is revised. Please call me at 271-5011, if you have any questions or require additional information.

Enc.: as noted

April 20, 1993

From: Chris Swenson CS
ADF&G

To: Ray Thompson
USFS

Subject: Comments on Ch. 3 of DEIS

General Comments

1. The document is too strongly focussed on PWS. Also, it should not always assume, as stated on page 1, that the most severe injury always occurred in PWS.

2. Species descriptions and descriptions of injury are not consistent in the level of detail. Also, injury is not described at all for some species.

3. In general, each section on a species should: a) provide enough life history information to understand the injury and the relevance of proposed restoration, and; b) describe the injury sufficiently to understand how restoration could help fix it.

4. The references should be listed at the end of the chapter.

Specific Comments

3A, page 1, last paragraph: State lands such as ADF&G special areas and state marine parks should be added to the list of public lands.

3A, page 3: There is some debate about whether water quality standards were exceeded.

3B, page 3, 2nd paragraph: Oiled sea lion were observed, but no injury was documented.

3B, page 4, 5th paragraph: The description of killer whales should specifically discuss the AB pod and any other pods suspected to have been injured.

3C, page 2, 5th paragraph: Specify location of brown bear harvest described (e.g., statewide statistic, southcentral AK, etc.)

3D, page 4, 4th paragraph: Sand lance is mis-spelled.

3D, page 9, 2nd paragraph: The statement that harlequin ducks have not been affected by habitat destruction seems highly speculative and should either be verified or deleted.

3E, page 1, 1st paragraph: Pink salmon are relatively scarce in Upper Cook Inlet, compared to sockeye. However, pinks are the most abundant species in the Lower Inlet.

3E, page 1, 4th paragraph: It is not true that red (sockeye) salmon are in low abundance in Cook Inlet.

3E, page 1, 5th paragraph: Delete the sentence that starts, "If the spill did not harm the pink salmon fry of 1989...."

3E, page 2, 2nd paragraph: The description needs to differentiate between odd and even year pink runs, in terms of abundance and preference for intertidal vs. stream spawning habitats.

3E, page 2: A description of the relative abundance and interactions of hatchery (vs. wild) fish should be added. This is key to understanding potential impacts of some of our fish options.

3E, page 3, 3rd paragraph: Kvichak River is mis-spelled.

3E, page 4, 5th paragraph: The herring section needs to describe the process and timeline for recruitment of juveniles into the spawning population.

3E, page 5: The rockfish section should mention that rockfish grow slowly, take a long time to reach reproductive maturity, and do not produce large numbers of young.

3E, pages 5, 6 and 7: Sections on both Dolly Varden and cutthroat trout need to mention that resident and anadromous populations of these species exist; that they both feed in nearshore areas and don't tend to migrate far; and that they are repeat spawners, i.e., they often survive to spawn multiple years, unlike salmon.

3E, page 6, 4th paragraph: Cutthroat trout in PWS are at the northern end of their range and, therefore, may be subject to additional environmental stresses.

3F, page 3, 5th paragraph: Littleneck clams in Alaska do not generally suffer from overfishing, poor water quality or habitat destruction.

3f, page 4: Razor clams are of limited economic importance in Alaska, although there is a sport fishery (and may still be some limited commercial harvest) in Cook Inlet. This section also contains irrelevant information on Washington State.

Appendix CC (glossary):

Need to define **population-level injury** and **enhancement.**

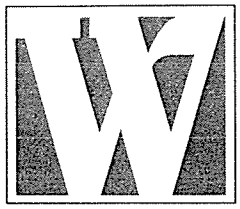
The definitions for restoration, acquisition of equivalents and replacement look OK, but should be checked again later to ensure that they are tracking the usage in the Restoration Plan.

Appendix DD (species names):

Listing of crab species is incomplete and needs to include Dungeness and Tanner crab.

Listing for chum salmon is inconsistent with other salmon listings. "Chum" should appear as the common name and "Dog salmon" could appear in parentheses. Also, the species name for chum is incorrect and should be Oncorhynchus keta.

cc: Mark Kuwada



WALCOFF

April 21, 1993

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2~:

Walcoff & Associates, Inc. has been contracted by the government to write an Environmental Impact Statement under the direction of the *Exxon Valdez* Oil Spill Trustee Council. The Environmental Impact Statement will analyze the impacts of the alternatives of the Restoration Plan on the physical, biological, social, cultural and economic resources of the affected areas of the oil spill, as identified by the map in the enclosed brochure.

It is required that we solicit and consider the proposed actions of federal, state and local agencies, and native entities to obtain a complete assessment of the short- and long-range implications of alternatives. Therefore, it is necessary to request from your organization a brief description of planned actions that are either currently underway, or that will be undertaken in the foreseeable future, that should be considered when evaluating the impact of the Restoration Plan's alternatives.

The scope of this request requires the following information:

- proposed or actual year of implementation of any plans of action,
- the specific area(s) involved, and
- a brief description of the project.

The requested information will be used in conjunction with information received from other public agencies to assess the cumulative impact of the Restoration Plan's proposed alternatives. Our requirement is for informational purposes to allow an analysis of the consequences of any given alternative on, for example, commercial and recreational fishing; the aggregate and specific effects on birds, fish, mammals, and other wildlife; effects on cultural and general recreational uses, transportation, etc.

Your prompt response would be greatly appreciated. In consideration of time limitations please respond to Jacquie Glover-Brown no later than Friday, May 7, 1993. (A fax response to her attention would be especially helpful.)

INFORMATION ◆ MANAGEMENT ◆ COMMUNICATIONS

635 Slaters Lane, Suite 400, Alexandria, Virginia 22314 Phone (703) 684-5588 / Fax (703) 548-0426 / TDD (703) 684-8226

If you have any questions regarding this request, please feel free to contact me. Thank you for your prompt and cooperative attention.

Sincerely,

Carol A. Paquette
Project Manager

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HOUSE BILL NO. 269

IN THE LEGISLATURE OF THE STATE OF ALASKA

EIGHTEENTH LEGISLATURE - FIRST SESSION

BY THE HOUSE RULES COMMITTEE BY REQUEST OF THE GOVERNOR

Introduced: 4/2/93
Referred: Finance

A BILL

FOR AN ACT ENTITLED

"An Act making special appropriations for restoration projects relating to the Exxon Valdez oil spill and for oil spill response projects; and providing for an effective date."

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

* Section 1. LEGISLATIVE FINDINGS AND PURPOSES. The legislature finds that

(1) As a result of the judgments entered by the United States District Court in the criminal cases United States of America v. Exxon Shipping Company and Exxon Corporation, No. A90-015 CR, the State of Alaska received $50,000,000 in restitution "to be used by the State of Alaska ... exclusively for restoration projects, within the State of Alaska, relating to the 'Exxon Valdez' oil spill." The judgments define restoration as including "restoration, replacement, and enhancement of affected resources; acquisition of equivalent resources and services; and long-term environmental monitoring and research programs directed to the prevention, containment, cleanup, and amelioration of oil spills." The money received by the state in restitution is held in the Exxon Valdez Oil Spill Restoration Fund,

established by the Department of Revenue, to implement the terms of those judgments.

(2) As a result of the Agreement and Consent Decree entered by the United States District Court in State of Alaska v. Exxon Corporation and Exxon Shipping Company, No. A91-083 CIV and the Memorandum of Agreement and Consent Decree entered by the United States District Court in United States of America v. State of Alaska, No. A91-081 CIV, the State of Alaska is entitled to receive reimbursements, paid into the state's general fund, for certain expenditures made by the state from the general fund in responding to the oil spill. It is the intent of the legislature that such money received during fiscal year 1994 be used for projects that enhance the ability of the state and the oil industry to respond to marine oil spills in the area affected by the Exxon Valdez oil spill.

(3) The appropriations in this Act are made in order to achieve the purposes described in the court's restitution order and to carry out the legislature's intent with regard to fiscal year 1994 reimbursements to the general fund under the Exxon settlement.

* Sec. 2. The sum of $12,500,000 is appropriated from the Exxon Valdez Oil Spill Restoration Fund, described in sec. 1(1) of this Act, to the Department of Administration for payment as a grant under AS 37.05.315 to the City of Seward for development of the Alaska Sea Life Center as a recreation and marine mammal rehabilitation center and as a center for education and research related to the natural resources injured by the Exxon Valdez oil spill and to the prevention and amelioration of marine oil spills. The appropriation made by this section may be used for design and engineering work and construction of the facility, on the condition that no money may be expended for design and engineering work or construction until the grantee has provided, and the Department of Administration has approved, a financial plan and a feasibility study demonstrating the financial viability of the center.

* Sec. 3. The sum of $7,000,000 is appropriated from the Exxon Valdez Oil Spill Restoration Fund, described in sec. 1(1) of this Act, to the Department of Natural Resources for the purchase, for $22,000,000, of the property rights of the Seldovia Native Association, Cook Inlet Region, Inc., and Timber Trading Company, Inc. within the Kachemak Bay State Park as identified in the Agreement For Sale and Purchase of Lands and Interests Within Kachemak Bay State Park entered into in March 1993 between the state, the Seldovia Native Association, Cook Inlet Region, Inc. and Timber Trading Company.

* Sec. 4. The sum of $500,000 is appropriated from the Exxon Valdez Oil Spill Restoration

Fund, described in sec. 1(1) of this Act, to the Department of Natural Resources for construction of a Kachemak Bay State Park visitors center.

* Sec. 5. The sum of $3,250,000 is appropriated from the Exxon Valdez Oil Spill Restoration Fund, described in sec. 1(1) of this Act, to the Department of Fish and Game to aid in the restoration of subsistence resources or services, lost or diminished as a result of the Exxon Valdez oil spill, through the development of a shellfish hatchery and technical center to be located at Kasistna Bay or lower Cook Inlet, whichever is considered by the Department of Fish and Game to be more appropriate. The appropriation made by this section may be used for feasibility studies, design and engineering work, and construction of the facility, on the condition that no money may be expended for design and engineering work or construction until the Department of Fish and Game has completed a feasibility study, including a financial and operating plan.

* Sec. 6. The sum of $4,000,000 is appropriated from the Exxon Valdez Oil Spill Restoration Fund, described in sec. 1(1) of this Act, to the Department of Fish and Game to enhance sport fishing services lost or diminished as a result of the Exxon Valdez oil spill, through the construction of a water delivery system connecting the Anchorage Municipal Water Utility with the Fort Richardson hatchery and the integration of that system with the hatchery.

* Sec. 7. The sum of $4,750,000 and the interest accrued before July 1, 1994 on the restitution payment described in sec. 1(1) of this Act, is appropriated from the Exxon Valdez Oil Spill Restoration Fund, described in sec. 1(1) of this Act, to the Department of Natural Resources for the construction or placement, within Prince William Sound, the southern Kenai Peninsula, and the coastal areas of the Kodiak Archipelago, of recreational amenities, including recreational cabins, trails, mooring buoys, floating docks and similar items, and the acquisition of sites and access rights for such amenities, that restore or enhance recreational services lost or diminished by the Exxon Valdez oil spill.

* Sec. 8. The sum of $3,000,000 is appropriated from the Exxon Valdez Oil Spill Restoration Fund, described in sec. 1(1) of this Act, to the Department of Fish and Game for restoration and enhancement projects, including the acquisition of development rights or conservation easements in aquatic, wetland, and riparian areas, within the Kenai River watershed related to the maintenance of commercial and sport fish species, and the services

they provide, that were injured or lost as a result of the Exxon Valdez oil spill.

* Sec. 9. The sum of $2,000,000 is appropriated from the Exxon Valdez Oil Spill Restoration Fund, described in sec. 1(1) of this Act, to the Department of Commerce and Economic Development for payment as a grant under AS 37.05.316 to the Prince William Sound Aquaculture Corporation for upgrade of the Main Bay Hatchery.

* Sec. 10. The sum of $3,000,000 is appropriated from the Exxon Valdez Oil Spill Restoration Fund, described in sec. 1(1) of this Act, to the University of Alaska, Fairbanks, Fishery Industrial Technology Center for design and engineering work and construction of an addition to the existing fishery technology and research facility, to enable that facility to engage in long-term environmental monitoring and restoration work in the area affected by the Exxon Valdez oil spill, on the condition that no money may be expended for design and engineering work or construction until the University has provided, and the governor has approved, a financial plan and feasibility study.

* Sec. 11. (a) The sum of $5,000,000 is appropriated from the Exxon Valdez Oil Spill Restoration Fund, described in sec. 1(1) of this Act, to the Department of Community and Regional Affairs for payment as grants under AS 44.47.050 to unincorporated rural communities for purposes of restoring, replacing, or enhancing subsistence resources or services damaged or lost as a result of the Exxon Valdez oil spill.

(b) It is the intent of the legislature that selection of the grant recipients shall be made after consultation with the state trustees, as defined in AS 37.14.450(2).

* Sec. 12. The sum of $5,000,000 is appropriated from the Exxon Valdez Oil Spill Restoration Fund, described in sec. 1(1) of this Act, to the Department of Environmental Conservation to enter into contracts with private entities under AS 46.03.020 for research programs directed to the prevention, containment, cleanup, and amelioration of oil spills within the state.

* Sec. 13. (a) Subject to the conditions set out in (c) of this section, the sum of $15,000,000 is appropriated from the fiscal year 1994 general fund Exxon Valdez reimbursement payments to the Department of Transportation and Public Facilities for the design and engineering work and construction of a road connecting the Seward Highway and the Port of Whittier.

(b) Subject to the conditions set out in (c) of this section, the sum of $5,000,000 is

appropriated from the fiscal year 1994 general fund Exxon Valdez reimbursement payments to the Department of Transportation and Public Facilities for the design, engineering, and construction of a state oil spill response assistance ferry vessel.

(c) The first $15,000,000 received by the state as fiscal year 1994 general fund Exxon Valdez reimbursement payments is allocated to the project described in (a) of this section; the next $5,000,000 received by the state is allocated to the project described in (b) of this section.

* Sec. 14. The appropriations made by secs. 3 - 8, 10, and 13 of this Act are for capital projects and are subject to AS 37.25.020.

* Sec. 15. (a) The unexpended and unobligated balance of a grant funded by an appropriation made by sec. 2, 9, or 11 of this Act lapses into the fund from which the appropriation was made if substantial, ongoing work on the grant project has not begun by December 1, 1994.

(b) The unexpended and unobligated balances of the appropriations made by secs. 2, 9, 11, and 12 of this Act lapse into the fund from which the appropriations were made December 1, 1994.

* Sec. 16. This Act takes effect immediately under AS 01.10.070(c).

Exxon Valdez Oil Spill Trustee Council
Restoration Office
645 "G" Street, Anchorage, AK 99501
Phone: (907) 278-8012 Fax: (907) 276-7178

MEMORANDUM March 19, 1993

TO: Carol Paquette, Walcoff and Associates

FROM: Ken Rice, Restoration Team Member

SUBJECT: Comments on Annotated Outline for DEIS

Below are the Restoration Team's comments on the annotated outline you presented to us last week. I don't think we identified any major omissions or changes so you should be on track. My notes say you will be sending us chapters 1, 2 and 3 by the end of March and I look forward to reviewing them.

- There should be a cover page with:
  title of project,
  State and local areas of activities (Prince William Sound, Kenai Peninsula Coast, Lower Cook Inlet, Kodiak Archipelago),
  list of responsible agencies,
  name and title of responsible official,
  name address phone number of person who can supply further information,
  type of document (DEIS),
  one paragraph abstract of document including alternatives considered and preferred alternative (if applicable),
  due date for comments.

- CH I Purpose and Need for Action chapter should address:
  What is the decision to be made,
  geographic scope of proposal,
  Date of Notice of Intent,
  Date of Notice of Availability (FEIS),
  Issues not within the scope of EIS and reasons why not,

- CH I A. On the Federal side the Trustees are different than the Trustee Council and therefore their role should also be discussed.

CH I D. This heading should be changed to Issues. The public raise issues. The agency (or in this case the Trustee Council) identifies the issues. Issues outside the scope of the EIS should also be identified. This may eliminate the need for [illegible] AA.

- CH II Alternatives Considered, 9th line: The effects of the short-term uses of the environment... This may better be discussed in chapter IV.

- CH II A. The Restoration Team had some discussion about the preferred action. The Trustee Council may or may not have one identified in the Draft EIS. If the Trustee Council makes a decision it will be displayed here, if not then a statement that there is no preferred alternative at this time will be included in the DEIS.

CH II B. We will go with the way you have it outlined, which included a no action alternative. We discussed deleting monitoring from the natural recovery monitoring alternative but decided at this time to leave it in. The no action alternative will only consist of normal agency management.

CH II I. There was some concerned expressed that this section should be in Ch IV but if it a comparison of alternatives that will be expanded on in Ch IV then it is appropriate. This section should be laid out to reflect a comparison of the alternatives as they relate to the issues identified in Ch I. Item 2 in this section may be providing more information than is appropriate for this section. A profile of the social systems may be better displayed in the Affected Environment chapter.

- CH II E,F,G. The percent of funds spent in each category are estimates only and should not be displayed as fixed or a commitment to actual expenditures. They are primarily needed for the economic analysis.

- CH III Affected Environment. This chapter should discuss what the environment is now, not just what it was pre-spill. Changes from implementing the alternatives will need to be discussed against what is out there now, not just the target (pre-spill) condition. Again, discussions of the existing environment should be in keeping with the issues identified. I would not spend a great deal of time discussion parts of the physical environment that do not lend themselves to understanding the alternatives and the effects of the alternatives.

- CH III B. We suggest putting the biological description before the socioeconomic description. The economic IMPLAN model may better be discussed in Ch II under a section called Analytic Tools Used.

- CH III C. The explanation of this section leads us to believe you are proposing to discuss the NRDA studies. Only the results of the studies as they relate to understanding the existing environment is needed. We suggest a brief discussion of the spruce bark beetle infestation on the Kenai Peninsula may be appropriate. It falls within the oil spill area map and it could have bearing on any habitat purchases or protection measures applied.

- CH IV. This chapter must address the issues and provide detailed information about the effects of each alternative on the issues identified in Chapter I.

- CH IV A.2. This heading should be Subsistence not Native Subsistence. The federal government does not draw a distinction between native and non-native for subsistence use. Several communities, such as Cordova, have a significant non-native population and are considered to be rural communities for subsistence use purposes.

- CH IV A.3. We do not think a separate section on transportation is appropriate. Any discussion on effects to transportation should be included in the services and facilities section.

- CH IV A.4. The Restoration Plan will be splitting out Recreation from Tourism and the discussions in the EIS should also split the two apart as much as possible.

- CH IV A.5. An emphasis on commercial fishing is appropriate. Aside from the oil terminal in Valdez, it is the most important economic factor in the spill area.

- CH IV A.7. A better title may simply be Cultural Resources.

- CH IV A.8. If this section discusses demographics it may be appropriate to separate it from land uses.

- CH IV A.9. Thirteen of the 21 communities in the spill area have well developed infrastructures.

- CH IV B. We have requested a reversal of the order in Ch III so that natural resources are discussed before socioeconomic and a similar ordering is appropriate in this chapter. It may be appropriate in this chapter to also discuss the spruce bark beetle infestation on the Kenai Peninsula. The various categories of resources discussed in this section may need to have their own subheading.

- CH IV F. This section is better discussed in Chapter I.

- CH X Appendices AA may not be necessary if sufficient discussion on issues is given in Chapter I. Appendix CC may better be placed in Ch VII in the FEIS.

- The EIS FRAMEWORK table (page 11 of the draft outline you gave us) should be consistent with the latest version of summary of injury table developed for the Restoration Plan. Subsistence should not be broken into two separate heading.

- I am sending you some better figures for the baseline socioeconomic description table and supporting documentation for the changes.

cc: Restoration Team
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Tom Sheehy

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FAX COVER SHEET

To: Carol Fagaerte Number: 705 684-6341

From: Ken Rice Date: 4/17/93

Comments: Total Pages: 3/

Here are our comments on the draft chapters and some additional information that should be useful.

Ken

COMMENTS ON CHAPTER I, PURPOSE AND NEED

Page 1.

3rd Paragraph. This paragraph is probably not needed.

4th Paragraph, EPA was never a trustee. They were advisors to the federal Trustees.

All pages: Remove reference to PWS as being the oil spill area. Either say spill affected area or identify specific regions as necessary.

Page 2.

2nd paragraph: Briefly discuss the criminal settlement. The figures given are not accurate. Fine was $125mm of which $100 was remitted. The unremitted $25 million is not managed by the Trustees.

2nd Paragraph: Criminal restitution funds are not part of TC managed funds. Exxon provided $50 million to State and Federal governments for restitution which is not part of the civil settlement funds. However, what actions are undertaken with the restitution funds need to be addressed in the cumulative effects section of the EIS.

3rd Paragraph: The Trustee Council receives advise from the public including a Public Advisory Group. The TC not the Trustees, appoint representatives to RT and work groups. Delete bureaus from discussion of DOI Trustee. See page 8 of the Restoration Framework Doc for the organization structure. Funds provided is $900 over 10 yr not $1.2 billion. The Restoration Team is a management group not study group. The Restoration Team receives input from the public as well as staff.

B. Clarify the role of the Restoration Plan and the role of the EIS.

Suggested wording for start of this section: "The restoration planning effort started in 1990 prior to any settlement of claims against the responsible parties. In February 1992 the Trustee Council determined the Restoration Plan being developed was a major federal action and an EIS would be developed to accompany the plan."

Page 3 first full sentence: The EIS is a evaluation tool (not decision-making tool)

1. Restoration plan: We think it would be better to use the 5 policy questions on page 3 of brochure. the plan will provide direction for remainder of 10 yr restoration process (not 10 years)

This section should describe the geographic scope of the proposed Restoration Plan both is size and management characteristics. The various land classifications and management responsibilities should be briefly discussed. This would be expanded in Chapter 3. DOI's letter suggests something a bit different than this direction. Go with this direction.

Don't reference NRDA regs as the definition of restoration. Quote from the settlement agreement, then provide bullets to describe injury assessment, restoration, replacement, enhancement, and acquisition of equivalent resources.

The Restoration Plan will provide information about the spill but not about cleanup response. Get rid of the footnote.

Insert Draft in front of Restoration Plan where appropriate.
Global replace NRDA and use damage assessment.
Insert services along with resources in bullet items.

Page 4.

Fst full sentence after the bullet items: insert "remainder of settlement" instead of life of the settlement.

2 EIS: Where does the quote about the U.S. District Court calling for a restoration plan come from? Is this in reference to the Settlement Agreement? The NRDA regulations call for a restoration plan. While the Trustees are not bound to these regulations they do use them as guidelines and have agreed to develop a Restoration Plan. We could not find any legal requirements for a restoration plan.

Intro paragraph, use wording from the CEQ regs instead of interpretation to define purpose of EIS.

2.a. Role of Trustee Agencies.

2nd sentence: the role of USDA Forest Service is to use their implementing regulations, policies and procedures for ensuring compliance with NEPA. All other Trustee Agencies are cooperating agencies for purposes of the EIS. Define role of cooperating agencies. (see wording changes to last sentence of fst paragraph).

Page 5.

1st full paragraph: Scoping commenced with release of the Volume I Restoration Framework in April 1992. (see DOI comments). Beef up this section

c. Role of the Public

Suggested change: The Settlement Agreement between the federal and state governments requires meaningful public involvement. Toward that end, all decisions by the Trustee Council have been made in an open public forum with opportunity for public comment. Comments on the Restoration Framework document were used to identify issues relating to implementing a restoration program. Comments on the Summary of Alternatives on the Restoration Plan released April 1993, and the Draft Restoration Plan and DEIS will be used to refine the final restoration plan.

A Public Advisory Group, formed in October 1992, was established to advise the Trustee Council on all matters relating to the planning, evaluation, and allocation of available funds and the planning, evaluation, and conduct of injury assessments and restoration activities. This group is made up of 17 individuals representing the cross section of interest groups and publics affected and concerned about the oil spill.

C. Restoration Definition. Page 3 covers this section so can delete.

D. Issues.

Suggested wording for first sentence: Issues raised by the public, agencies, community leaders and knowledgeable individuals and organizations were identified during the scoping process.

Page 6. 3rd line: Remove "by the Restoration Team". Do the same thing to the first line of the next paragraph. Sentence starting with "Many other..." Suggest that wording reflect that many issues raised were relevant to restoration planning while others were relevant to the effects of the restoration plan and implementation. Only those issues relevant to environmental effects of the restoration plan are discussed and analyzed in detail in the EIS.

First sentence under 1: Remove great from "great interest"

Paragraph under 2, last 2 lines: remove the first demographics and change the second demographics to population, then remove "numbers of harvestable surplus.

Page 7 #4. Add reference to services such as recreation use. Explain first sentence better (simplify)

Page 8.

6. Subsistence: Text needs to reflect that while some restoration actions may be directed at the availability or accessibility of subsistence resources, other restoration actions may have a positive or negative impact on their availability,

accessibility or use and they need to be evaluated to determine that impact. For example creating or expanding human use could negatively impact subsistence use of that area. Need to define subsistence somewhere in document for those not in Alaska and not familiar with it. (You may have done that in CH III).

7. Last sentence is confusing.

Page 9-13.

Suggest both lists be combined. Issues 2 and 5 are outside the scope of the decision to be made. The Restoration Plan will not be able to resolve genetic diversity questions. Agency policies and procedures determine the management of genetic diversity and management of land. Genetic diversity issues are resolved on a project by project basis and agency procedures make decisions on genetic diversity impacts. Likewise the plan will not resolve any tideland management disputes. All the other issues are related to development of a Restoration Plan and allocation of resources directed at restoration. They are not issues relevant to environmental impacts.

Page 10 #3. Delete examples.

Page 13.

Somewhere in Ch 1 there should be a brief discussion of Third-party contract EIS and lead agency responsibilities. There should also be a discussion of the availability of planning records.

COMMENTS ON CHAPTER II

We have removed alternative 1 from the Restoration Plan. Therefore alternative 0 becomes alternative 1. Second sentence than should say that these alternatives include the no action alternative.

The description of the Implan model analysis tool should describe parameters it does and does not take into account as well as sources of data used.

COMMENTS ON CHAPTER III

We were not able to complete our review of Chapter III prior to our meeting this week. More detailed comments will be sent by late next week. We do have a few general impression comments. A lot of the life history information on injured resources is probably not necessary. The EIS needs to only focus on those elements of life history that are relevant to restoration actions. Need discussion of population levels status (T&E, commercially valuable etc.) Karen Klinge with the

RPWG has done a lot of work with life history work and perhaps that information is relevant if used as an appendix to the EIS/RP. Need to discuss fed and state laws that apply to these species such as Bald Eagle Protection Act.

This chapter needs a brief discussion of vegetation within the spill area.

Presentation of economic information was not perceived to be that useful. The tables are not well presented. Suggested changes will be forthcoming.

Exxon Valdez Oil Spill Trustee Council
Restoration Office
645 "G" Street, Anchorage, AK 99501
Phone: (907) 278-8012 Fax: (907) 276-7178

April 14, 1993

MEMORANDUM

TO: Ken Rice, Chair, EVOS Environmental Compliance Work Group

FROM: PB Pamela Bergmann, Department of the Interior, EVOS Restoration Team Member

SUBJECT: Comments on Draft Chapters 1 and 3 of the Draft Environmental Impact Statement

As requested at the April 9, 1993 Restoration Team meeting, the Department of the Interior (DOI) has completed a quick review of the subject documents. We will provide comments on Chapter 2 once it has not been provided to us in draft form. Our comments on Chapters 1 and 3 are as follows:

GENERAL COMMENTS

DOI continues to believe that this document should display an intial proposed action agreed upon by the Trustee Council and detailed alternatives to the initial proposed action. (Please note that we did not identify specific wording changes in Chapter 1 that are necessary to implement this recommendation.)

SPECIFIC COMMENTS

CHAPTER 1: PURPOSE AND NEED FOR ACTION

Page 1, Paragraph 2. The information regarding when oil was at specific locations needs to correspond to the information documented in "Movement of Oil Spilled from the T/V Exxon Valdez" by J.A. Galt and D.L. Payton (Attachment 1).

Page 1, Paragraph 2. The last sentence in this paragraph needs to be rewritten to clarify what "massive cleanup efforts" were mobilized by the State of Alaska and private citizens.

Page 1, Paragraph 4. The documents referred to in the last sentence in this paragraph need clarification. In addition, preparation and distribution of these documents should be attributed to the Trustee Council, rather than the Restoration Planning Work Group.

State of Alaska: Departments of Fish & Game, Law/Natural Resources, and Environmental Conservation
United States: National Oceanic & Atmospheric Administration, Departments of Agriculture and Interior

Page 2, Third Full Paragraph. References to the National Park Service and U.S. Fish and Wildlife Service should be deleted from the first sentence. The Department of the Interior (DOI) is the member of the Trustee Council.

The last two sentences in this paragraph should be re-written to more accurately reflect the Trustee Council organization, as shown in Attachment 2 from the Restoration Framework.

Page 2, Part B. The heading for this section should be changed to read "B. Purpose of the Restoration Plan" and the first paragraph should be deleted. We believe it is unnecessary to explain an Environmental Impact Statement (EIS).

Page 3, Section 1. The information under the third bullet should be rewritten to read: "What are the methods proposed for restoring those injured resources and services to acceptable condition?" and that this information should be placed first in the list of bullets.

Page 4, First Full Paragraph. This sentence needs to be rewritten to specify what is meant by "the life of the settlement".

Page 4, Section 2. The first sentence of this section is unnecessary and should be deleted.

Page 4, Section 2. This section needs a subsection that describes the roles of the cooperating agencies.

Page 4, Section 2a. The last sentence in this paragraph should be rewritten as follows: "Following development of the Final EIS (FEIS), each Federal agency will be responsible for publishing a Record of Decision in the Federal Register."

Page 5, First Full Paragraph. The information contained in this paragraph needs to be placed in a separate section addressing public scoping for this EIS. The discussion should be expanded to describe the process followed, the details of public involvement, the identification of the issues and alternatives raised during scoping, and the identification of any issues and alternatives set aside, including reasons.

Page 5, Section D. This heading be changed to read: "D. Planning Issues".

Page 13, Section E. This paragraph should be modified to reflect that a programatic EIS still requires quantification of the overall actions intended, their general lcoations, their level of activity, and the identity of classes of activities; e.g., acres of land acquired.

The following phrase should be deleted from the last sentence ". . .if the hatchery is considered a major Federal action significantly affecting the quality of the numan environments (40 CFR 1508.18 and 4500.11)".

CHAPTER 3: AFFECTED ENVIRONMENT

Section B. The species description in this section should identify Federal and state regulations and laws that apply to each species; e.g., the Marine Mammal Protection Act or the Bald Eagle Protection Act. In addition, the species discussion should indicate if any species have been classified as "threatened" or "endangered" under the Endangered Species Act.

This section also needs to be expanded to include the following: (1) description of the terrestrial environment of the spill area since habitat protection is part of four alternatives, (2) identification of any plants that have special protection under Federal or State laws or regulations, and (3) identification and description of existing Federal and state agency land use and resource management plans and programs for each biological resource discussed.

Due to the short timeframe allowed for the review of Chapter 3, we are unable to provide more detailed comments on this document.

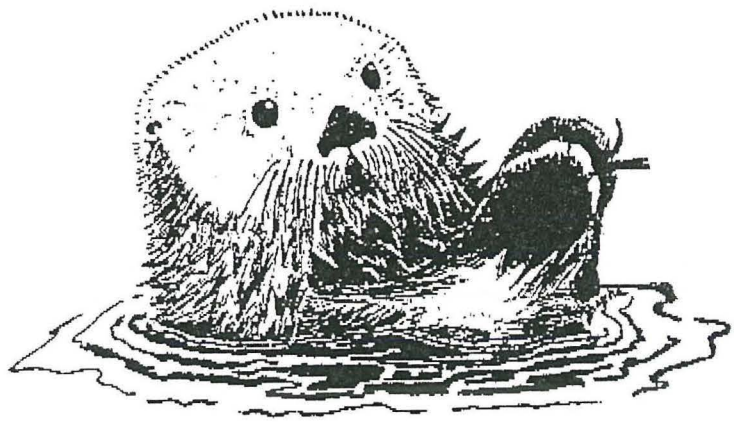
Enc.: as noted

Attachment 1

Biological Report 90(12)
December 1990

Sea Otter Symposium

Sea Otter Symposium: Proceedings of a Symposium to Evaluate the Response Effort on Behalf of Sea Otters After the T/V *Exxon Valdez* Oil Spill Into Prince William Sound, Anchorage, Alaska, 17–19 April 1990



U.S. Department of the Interior
Fish and Wildlife Service
Washington, D.C. 20240

National Fish and Wildlife Foundation
18th and C Streets, N.W.
Washington, D.C. 20240

Introductory Session

Editor and Chair: Pamela A. Bergmann, U.S. Department of the Interior, Office of Environmental Affairs, Anchorage, Alaska.

Movement of Oil Spilled From the T/V *Exxon Valdez*

by

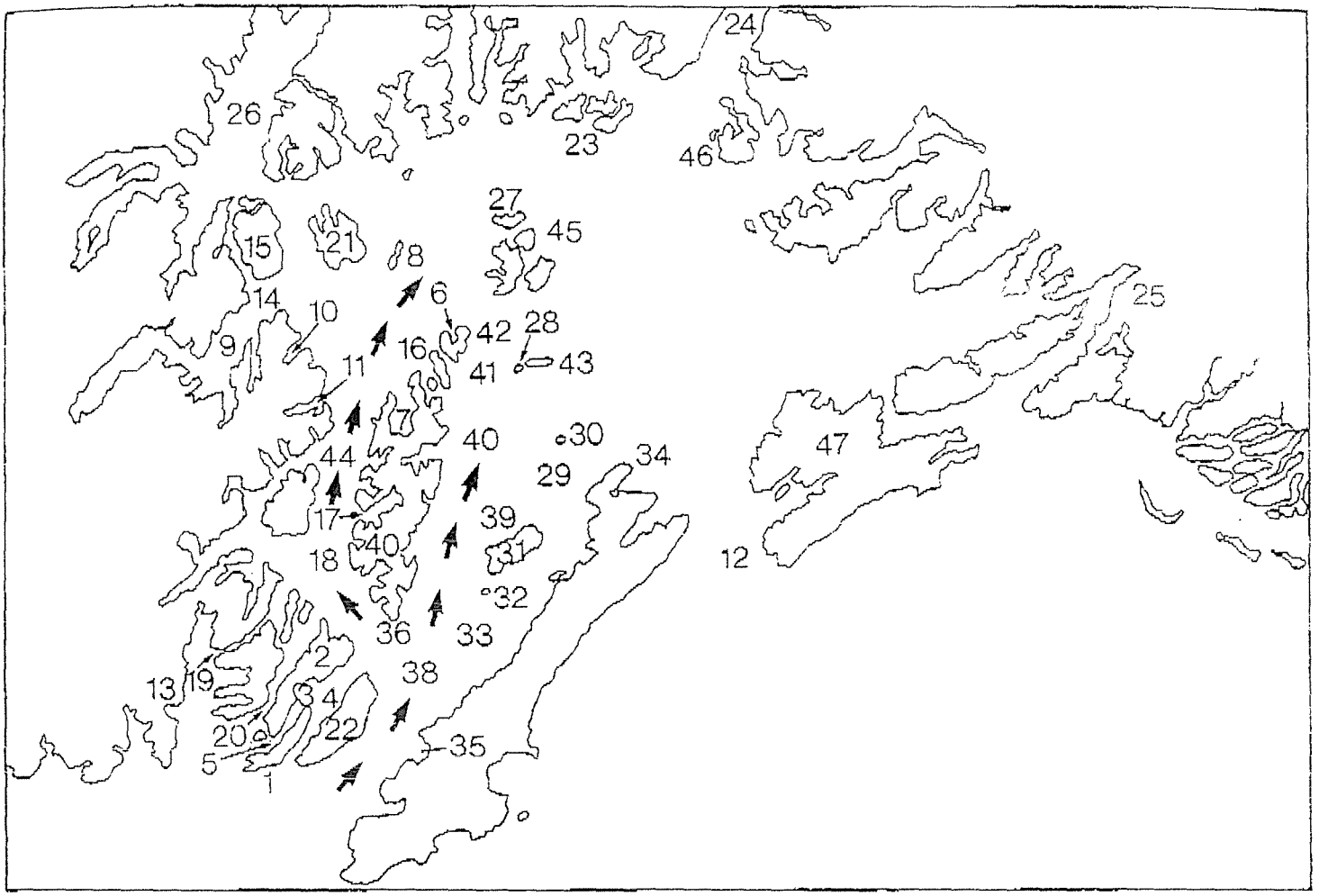
J. A. Galt and D. L. Payton

National Oceanic and Atmospheric Administration
Hazardous Materials Response Branch
7600 Sand Point Way, N.E.
Seattle, Washington 98115

ABSTRACT.—The task of tracking and estimating the movement of oil spilled from the T/V *Exxon Valdez* resulted in a considerable expenditure of effort by industry as well as Federal and State agencies. These efforts resulted in hundreds of overflight reports, hours of remote-sensing data, a greatly expanded weather observation network, satellite-tracked current drifters, and significant computer analysis or modeling techniques—all providing fragments of information.

Modeling techniques, combined with observational data, have been used to hindcast the surface movement of the spilled oil. Preliminary results indicate that, by the end of the second week of the spill, about 30% of the spilled oil may have been lost to weathering processes, 40% beached within Prince William Sound, 25% exited Prince William Sound, and about 5% remained floating within Prince William Sound. Of the oil leaving the Prince William Sound system, it is estimated that about 10% traveled beyond Gore Point, and only about 2% reached as far as Shelikof Strait.

When the T/V *Exxon Valdez* grounded early in the morning of 24 March 1989, a large amount of crude oil was released almost instantaneously. From that moment on, the task of estimating how the spilled oil would move and spread through the Prince William Sound (Fig. 1) and the Gulf of Alaska coastal areas (Fig. 2) became a major concern. During the next few months considerable resources were directed at this problem by industry and private, Federal, and State agencies. This resulted in hundreds of overflight reports, hours of remote-sensing data, a greatly expanded weather observation network, satellite-tracked current drifters, and significant computer analysis or modeling techniques—all providing fragments of information. These data were analyzed as they were generated and have been the subject of continual reexamination. We discuss our present estimate of where the oil went and the processes that were responsible for its movement.

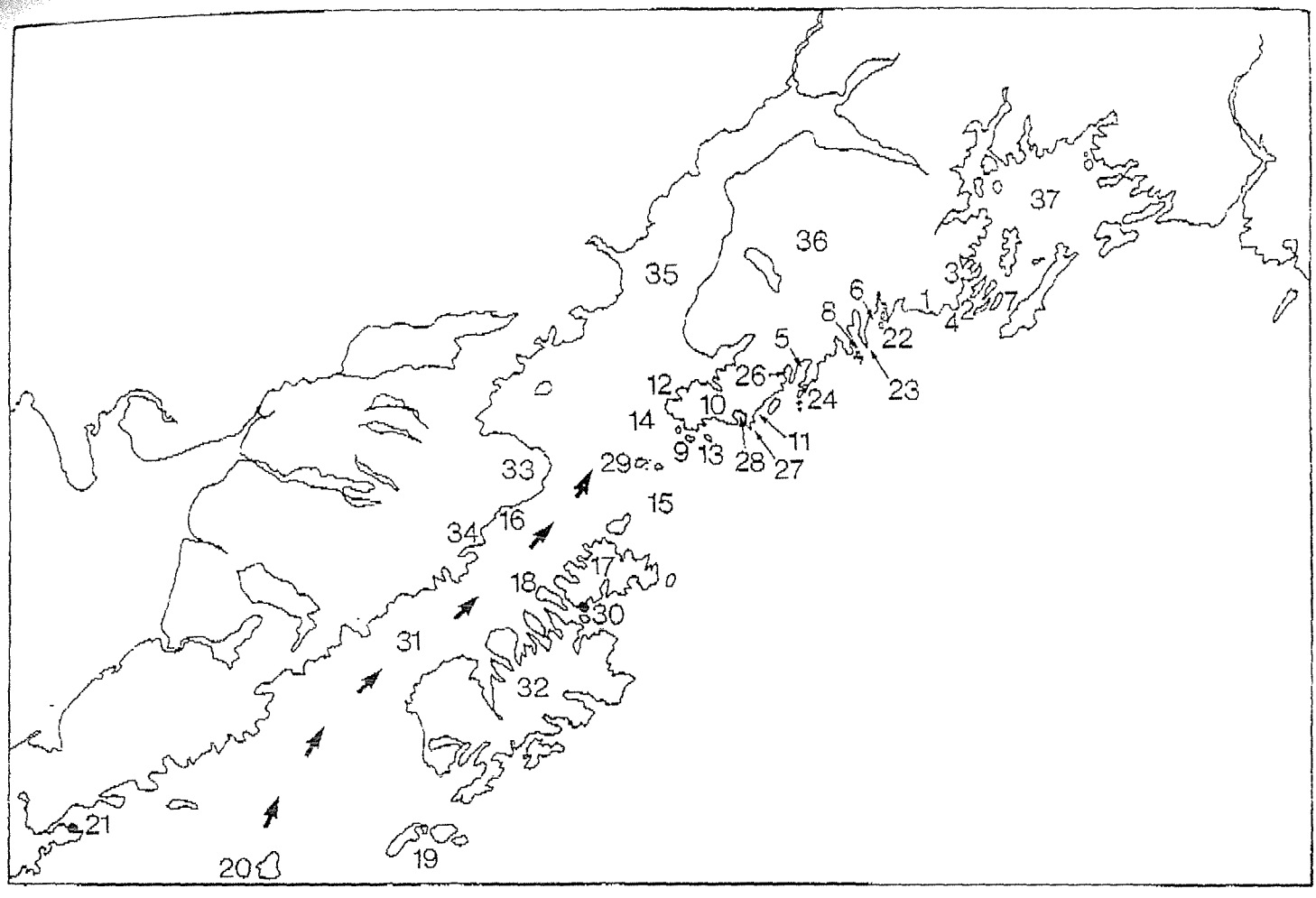


1	Erlington Is.	17	Lower Herring Bay	33	The Needle
2	Evans Is.	18	Pleiades Is.	34	Montague Pt.
3	Sawmill Bay	19	Bainbridge Passage	35	Hanning Bay
4	Latouche Passage	20	Prince of Wales Passage	36	Pt. Hellen
5	Elrington Passage	21	Perry Is.	37	Montague Is.
6	N.W. Bay	22	Latouche Is.	38	Montague Strait
7	Herring Bay	23	Glacier Is.	39	Green Is.
8	Lone Island	24	Valdez Arm	40	Knight Is.
9	Port Nellie Juan	25	Orca	41	Ingot Is.
10	Main Bay	26	Port Wells	42	Eleanor Is.
11	Eshamy Bay	27	Story Is.	43	Smith Is.
12	Hinchinbrook Entrance	28	Little Smith Is.	44	Knight Is. Passage
13	Port Bainbridge	29	Applegate Rock	45	Naked Is. Group
14	Applegate Is.	30	Seal Is.	46	Bligh Reef
15	Culross Is.	31	Gibbon Anchorage	47	Hinchinbrook Is.
16	Ingot Is.	32	Little Green Is.		

Fig. 1. Map of Prince William Sound with major place names.

Initial Phase of the Spill

When the T/V *Exxon Valdez* grounded, the weather in Prince William Sound was calm and relatively clear. Under these conditions, there was very little wind or wave activity to affect the movement of the spilled oil. These conditions persisted throughout Friday, 24 March, and Satur-



1	Cape Fairfield	13	East Chugack Is.	26	Tonsina Bay
2	Pt. Erlington	14	Kennedy Entrance	27	Gore Pt.
3	Cape Puget	15	Stevenson Entrance	28	Windy Bay
4	Cape Junken	16	Hallo Bay	29	Barren Is.
5	Nuka Sound	17	Afognak Is.	30	Afognak
6	Resurrection Bay	18	Raspberry Is.	31	Shelikof Strait
7	Montague Strait	19	Trinity Is	32	Kodiak
8	Rabbit Is.	20	Chirokof Is.	33	Cape Douglas
9	Chugach Is.	21	Chignik	34	Katmai Coast
10	Dicks Bay	22	Chiswell Is. Group	35	Cook Inlet
11	Port Dick	23	Granite Cape	36	Kenai Pennisula
12	Rocky Bay	24	Outer Is.	37	Prince William Sound

Fig. 2. Map of the south-central Gulf of Alaska coast.

day, 25 March. During this time, the oil spread into a large, more or less contiguous pool that moved slowly to the west and southwest. As can be seen from Fig. 3, the center of the oil pool was generally south of Glacier Island, between Bligh Reef and Naked Island. During this quiescent period, the oil showed no tendency to form a mousse (water-in-oil emulsion) and, although evaporation of the lighter weight hydrocarbon components took place rapidly, the evaporation process was most likely limited by the surface transfer processes because there was virtually no stirring or rupturing of the oil surface by wave action.

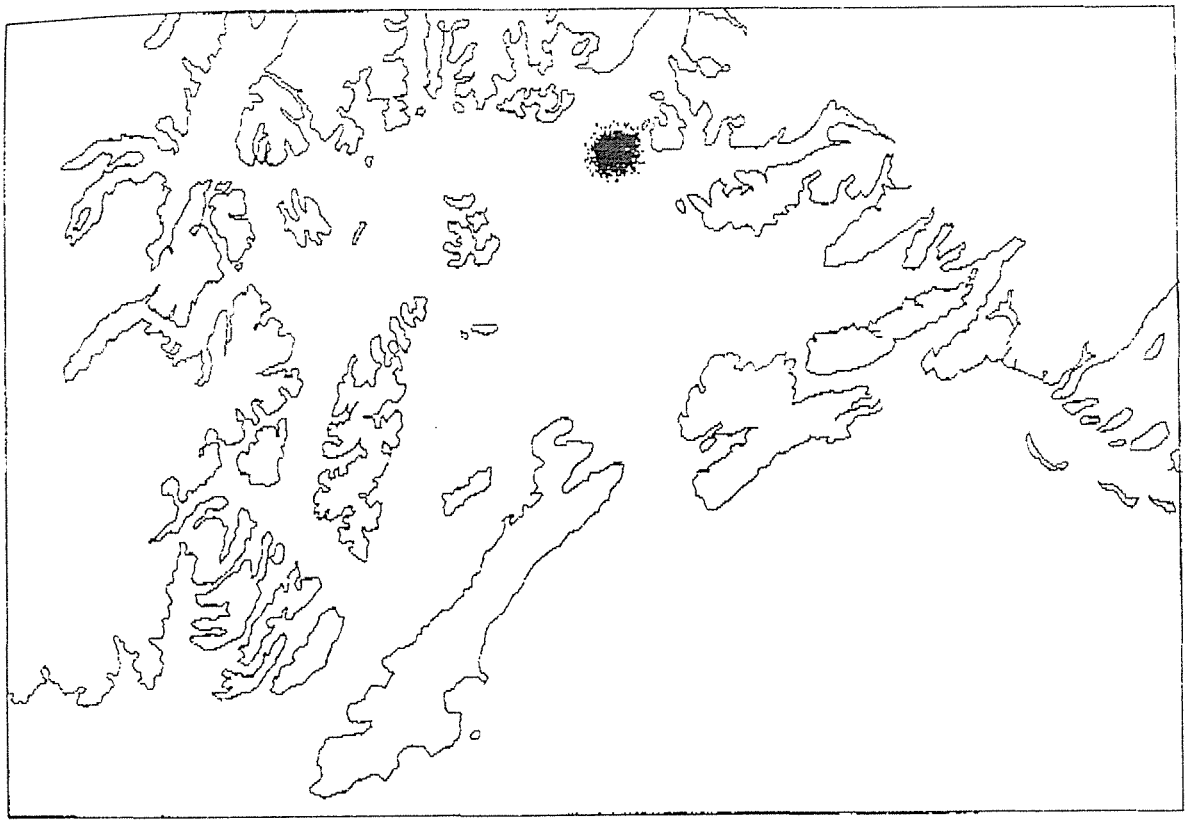


Fig. 3. Approximate distribution of the floating oil on 24 March 1989.

The major movement of the oil during this period was controlled by currents and was consistent with the simple circulation pattern shown in Fig. 4. This pattern is a reasonable representation of the mean surface flow in Prince William Sound and indicated that the future movement of the oil would be west and south through Montague Strait. In addition, the predominant tendency for drainage winds to flow out of major bays or fjord arms (e.g., Valdez, Orca, and Port Wells) seemed to indicate that, even at this stage in the spill, the possibility of oil traveling into the eastern or southeastern segments of Prince William Sound was minimal.

During this early phase of the spill an additional process, which was related to the freshwater runoff from major glaciers and streams, was first noticed and appeared in many places throughout Prince William Sound and along the Kenai Peninsula. In this process, relatively fresh water spread as a lens, pushing out from boundary fjords. As the lens spread, it formed a convergence line along its leading edge that tended to trap flotsam (or oil) and inhibit its movement into the fjord or nearshore region. This process was clearly effective around and south of Glacier Island on 25 March. The freshwater interface controlled the northern edge of the oil from Glacier Island along a line extending to the northern edge of Storey Island.

Major Storm

During the third day of the spill, Sunday, 26 March, the Prince William Sound area experienced a major windstorm. This had a profound effect on the spilled oil, dramatically changing its appearance, character, and distribution. The dominant wind direction during the storm was east to northeast; however, drainage winds from the northern fjord arms and Port Wells translated into a northeast to north–northeast wind over the central area of the spill. As a result, oil moved rapidly between Naked Island and Smith Island toward Montague Strait.

In addition to simply moving the oil, the storm supplied a tremendous amount of mixing energy that affected the spilled oil in three important ways. The first effect was that the more or less contiguous slick was ruptured into bands and streaks and spread over a significantly larger area. This meant that the oil was no longer of uniform thickness. Typically under such conditions, slicks will cover

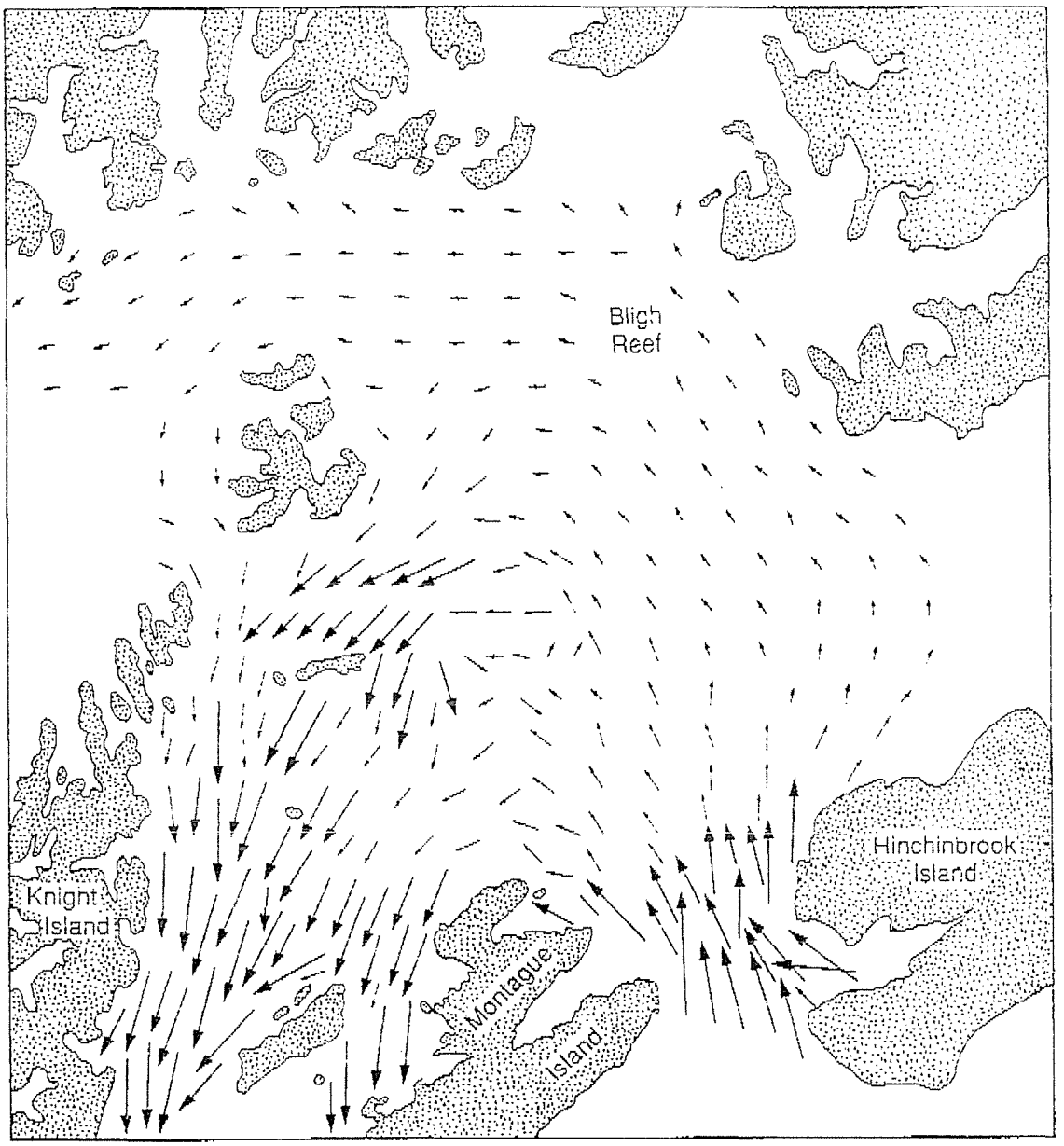


Fig. 4. Approximate mean current pattern used for trajectory analysis in central Prince William Sound during the initial period of the spill.

large areas, with 90% or more being on the order of microns thick and leaving most of the product in relatively small, narrow bands that are associated with vertical movement in the water column (convergence zones). Under heavy wind conditions, these convergence zones are typically associated with Langmuir cells, which are depicted in Fig. 5. This explains the banded or streaked appearance that shows up in most overflight pictures taken during this period of the spill.

The second effect of the storm was that mixing processes were dramatically increased. Evaporation of the lighter (and more toxic) fractions of the oil was enhanced, with estimates of about 15–20% of the total being lost by the end of the storm. In addition, breaking waves caused by the wind led to the dissolution of oil into the water column. Natural surfactants enhance this process, acting somewhat like a dispersant, so that small droplets appear to be in solution and rapidly mix to extremely low concentrations. This may have accounted for another 15–20% loss of total oil by the end of the storm.

The third effect of the storm was that a significant fraction of the remaining oil formed a water-in-oil emulsion (mousse). The water content of the

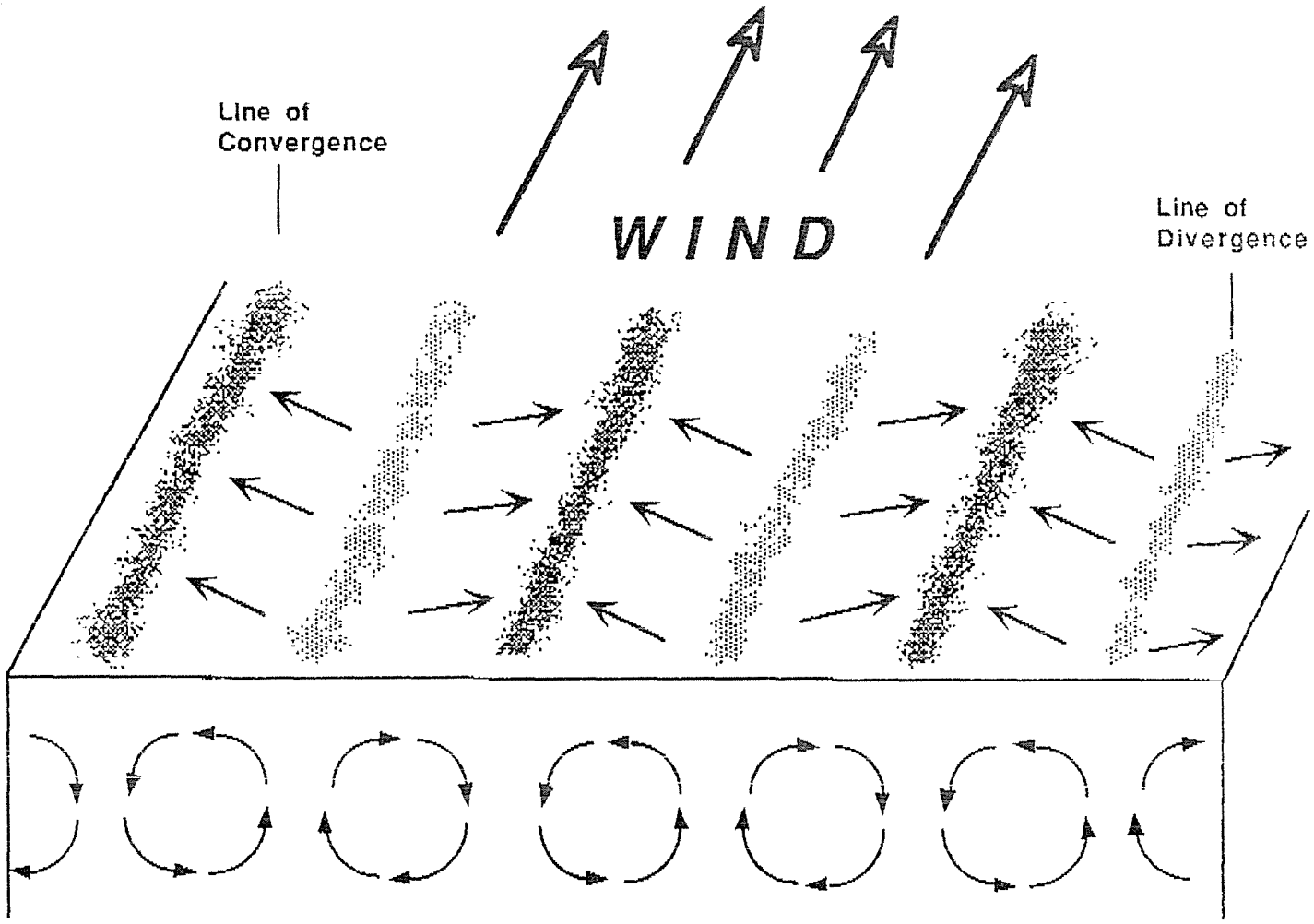


Fig. 5. Schematic representation of wind-induced Langmuir cell development. Convergence lines act as collection zones for floating materials such as popweed (*Utricularia vulgaris*), oil, or pollen.

mousse was tested and found to be about 70%. This more than tripled the volume of the slick for that fraction of the oil spilled and remaining that formed a mousse. The mousse also had different physical properties than the original oil, most notably, a higher viscosity, which made it "sticky" and slower to weather or degrade.

As the storm progressed, the oil slick arched southwest and then south-southwest, first affecting beaches along the southwest coast of Naked Island and then grounding large quantities of oil on Smith Island, Little Smith Island, and Eleanor Island. Figure 6 illustrates the location of the oil near the end of the storm. By the end of the storm, the oil had weathered, mixed, emulsified, and moved so that a distinct new phase of the spill was at hand. Scattered, but heavy, concentrations of floating oil were centered in the area between Naked Island, Smith Island, and Eleanor Island. From this junction, channels lead in all directions but, because of persistent current and wind patterns, the oil was expected to move south or west. The areas of special interest then became Montague Strait and Knight Island Passage. Oil quickly moved though both of these passages. This major bifurcation continued throughout the spill, giving two branches to the trajectory problem, each of which acted somewhat differently.

At this time, the spill had become significantly more difficult to deal with and, somewhat ironically, it became easier to understand and predict future movement. With the slick's center of mass near the northern end of Montague Strait, it had moved close to the influence of the most dominant and persistent current in Prince William Sound.

Fig. 6. Approximate distribution of the floating oil on the afternoon of 26 March 1989.

Montague Strait

The major current in Prince William Sound is the flow that enters it through Hinchinbrook Entrance and exits through Montague Strait. This current is concentrated along the eastern shore of Knight Island, with most of the flow traveling between Knight and Seal islands. Observations of the oil movement revealed that the maximum speed along the axis of this current has a net displacement of 16 to 24 km per day. A rough computer simulation of this current is shown in Fig. 7. In addition to this net current, there are tidal currents; however, throughout Montague Strait the tidal currents are usually not strong enough to reverse the flow. During the first few weeks of the spill, when floating oil concentrations were high, no up-strait flows were evident. As oil entered the northern end of Montague Strait between Smith and Eleanor islands during the fourth and fifth days of the spill (27 and 28 March), the oil quickly spread out, thereby affecting the coast of Eleanor, Ingot, and Knight islands, with lesser concentrations beaching on Seal Island and Applegate Rock. By the end of 28 March, the leading edge of the oil was between Latouche Island and the southern end of Montague Island; by 29 March (day 6 of the spill), it had moved beyond Montague Strait into the Gulf of Alaska. This relatively fast movement through Montague Strait, with shoreline oiling primarily along the eastern shore of the Knight Island group, is typical of the movement of most of the oil that entered the northern end of Montague Strait. During the first few weeks of the spill there were several exceptions to this typical flow. Two of those exceptions were of particular significance.

The first exception occurred on 29 March, when there were northwest winds in the triangle formed by Smith, Naked, and Knight islands and through-

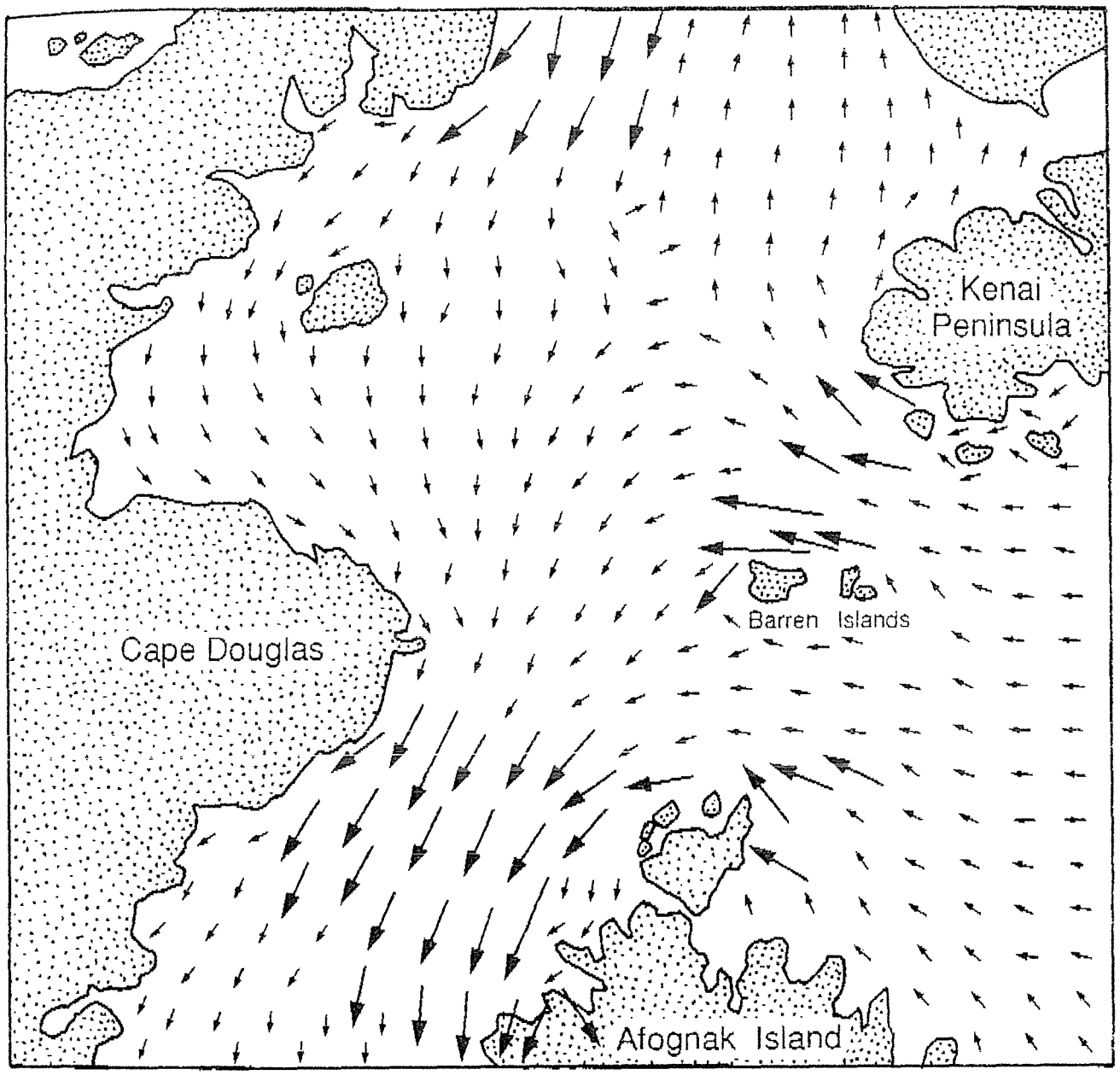


Fig. 7. Approximate mean current pattern used for trajectory analysis in southwest Prince William Sound during the initial period of the spill.

out the northern end of Montague Strait. As a result, some of the oil moving between Smith and Eleanor islands moved away from the strong current region along the western side of Montague Strait. This oil, which moved south around Applegate Rock, resulted in relatively heavy concentrations of oil on beaches along the northern coast of Green Island, with initial effects concentrating along the northeast coves of the island around Gibbon Anchorage. As shown in Fig. 7, the currents east and south of Green Island are much weaker than those on the western side of Montague Strait. As a result, this oil remained in the area for some days, recoiling Applegate Rock, the northern shore of Green Island, and eventually spreading lighter concentrations on to Little Green Island and The Needles. This eastward extension of the oil was responsible for the initial and major oiling of Green Island and generally represented the eastern limit of significant oiling in Montague Strait. Later in the spill, however, minor amounts of oiling occurred at a few places along the west coast of Montague Island, in particular, along the northern shore centered around Montague Point,

and later far to the south around Hanning Bay. Both of these events were associated with northwest wind episodes.

The second exception to the typical current occurred at the southern end of Knight Island, where Knight Island Passage meets Montague Strait. The flow along the western side of Knight Island is predominantly south, but is much weaker than the flow along the eastern side of Knight Island. In Knight Island Passage this flow is sufficiently weak that, during some phases of the spring-neap tidal cycle, the currents during the flood tide are strong enough to reverse the direction of the flow in the southern part of Knight Island Passage, which means that as oil drifted south past Point Helen, it entered an area where the current flooded west into Knight Island Passage. Thus the oil was deflected, so that when the tides ebbed, the trajectory led along the western side of Latouche Island, threatening Elrington Island, Latouche Passage, Evans Island, and the Sawmill Bay hatchery. This phenomenon was first noticed on 30 March, which was about halfway between neap tides (weakest period) and spring tides (strongest period). Over the next week, these tides increased each day and subsequently sent larger and larger pulses of oil into the passage between Latouche and Evans islands. During the first week of April major oil concentrations threatened Latouche and Elrington passages. Lesser amounts of oil continued to threaten this area, but never to the extent as was seen during this period. Figure 8 shows the general distribution of the oil by 30 March.

Knight Island Passage

As oil moved west between Naked Island and Eleanor Island it entered an area that has virtually no steady current patterns, and winds dominate the trajectories. By the end of the first major storm, oil had entered this area in relatively high concentrations. During the next two days (days 4 and 5 of the spill), the oil moved south under the influence of northerly winds, and heavy concentrations went ashore on Eleanor Island, particularly in Northwest Bay. Heavy oil also moved past Ingot Island and onto the northwest parts of Knight Island, with large concentrations entering Herring Bay.

For the next few days widely scattered bands of heavy oil seemed to mill around in the area between Lone Island, southwest Naked Island, and the northern end of Knight Island. Some patches moved west nearly to Port Nellie Juan, and light

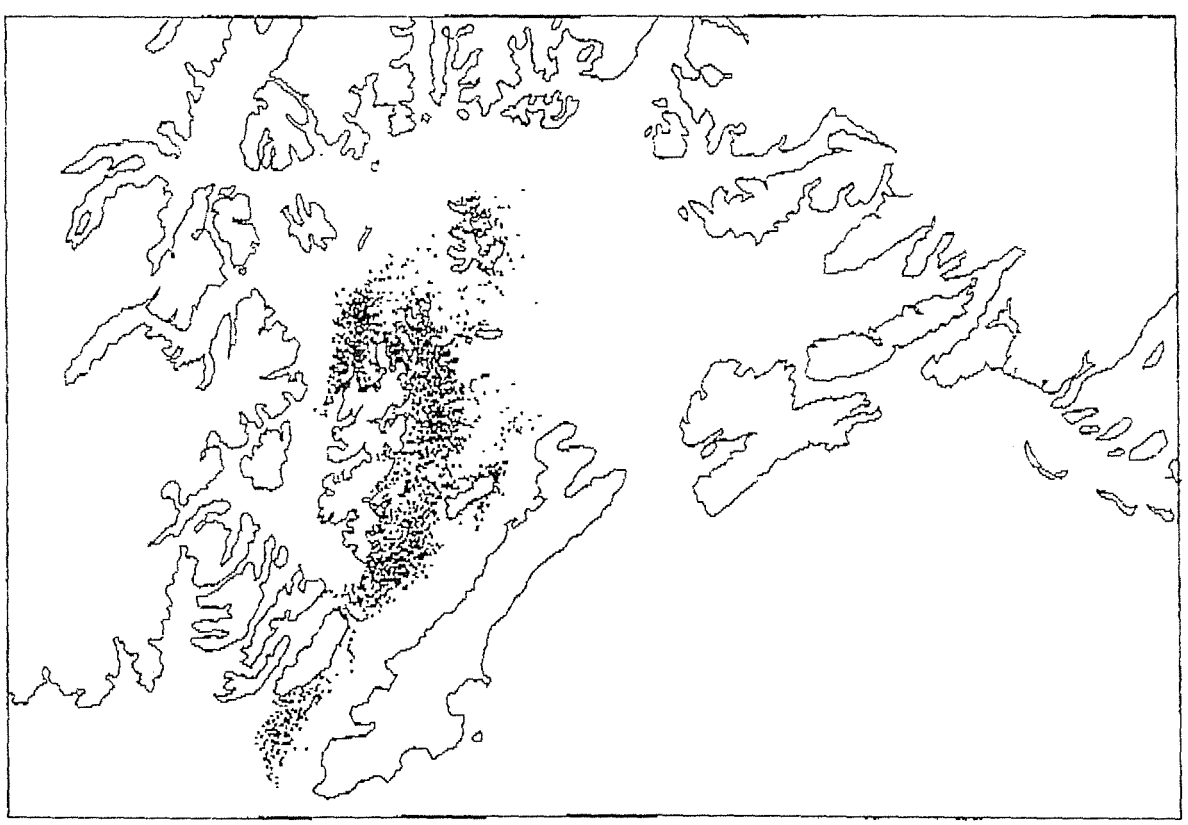


Fig. 8. Approximate distribution of the floating oil, midday 30 March 1989, 6.5 days into the spill.

shoreline effects were observed between Main Bay and Eshamy Bay. As patches and bands of oil reached the southern part of this area, they entered Knight Island Passage and came under the influence of a weak current system that carried them south at a speed of 5 to 8 km per day. As this slow drift continued, day-to-day variations in the wind pushed the oil back and forth, but the dominant direction was such that most shoreline effects were from Northwest Bay to Herring Bay, with some oil actually passing through the channels north and south of Ingot Island and back into the current system of Montague Strait.

Over the next 2 weeks, most of the oil that moved west between Naked Island and Eleanor Island followed this general pattern; however, relatively small amounts of oil moved down Knight Island Passage, with moderate shoreline effects in Little Herring Bay; and past the Pleiades Island group, with scattered shoreline effects. Eventually, some of the oil following this path was seen to pass through Bainbridge Passage and Prince of Wales Passage into Port Bainbridge and then into the Gulf of Alaska.

The steep shorelines along much of the coasts of Smith, Eleanor, Ingot, and Naked islands provided a special physical process caused by reflected or standing wave patterns. These wave patterns have a convergence node just offshore that trapped oil close to shore, without having the oil actually beach. Then, after a sudden change in the wind (and wave patterns), this oil floated away from shore and appeared as a secondary source or new patch of oil. This phenomenon occurred on 10–11 April, when a large (compared with what was left floating in the area) patch of oil moved away from Smith Island and, under the influence of a strong easterly wind, moved between Naked and Eleanor islands to form a large patch between Northwest Bay and Lone Island. In the next week, this patch moved back and forth. When more-easterly winds developed, moderate amounts of the oil went ashore on Lone Island, southwestern Perry Island, Culross Island, and Applegate Island.

Lighter concentrations of oil also moved up Perry Channel and down into Port Nellie Juan. As the winds returned to a northerly and northwesterly direction, the movement of the remnants of this oil was more typical of movements seen in the early part of the spill and led to additional shoreline oiling between Main and Eshamy bays to the west and Herring Bay to the east.

Gulf of Alaska

Floating oil first exited Prince William Sound through Montague Strait about 30 March (day 7 of the spill) after which a more or less continuous passage of oil flowed into the Gulf of Alaska. This passage of oil probably reached its maximum sometime within the next week. By the second week of April (more than 2 weeks into the spill), between 20 and 25% of the oil had moved into the Gulf of Alaska, primarily through Montague and Latouche straits, with lesser amounts passing through Port Bainbridge. In the second week of April, although the Prince William Sound system continued to act as a source of oil for the Gulf of Alaska, the amount of oil coming from Prince William Sound was greatly reduced. By mid- to late April, this source, which consisted of small, isolated patches of light-to-moderate oil, diminished further.

The major current systems that affect the flow over the Alaska Continental Shelf are the result of two components. The first component is the large-scale Gulf of Alaska Gyre, which leads to a westerly flow over the shelf. This current generally flows at less than a knot, but reaches a maximum (typically about a knot) near the shelf break region. The second component is a relatively strong nearshore current (the Alaska Coastal Current) that has been studied in detail by Johnson et al. (1988). This current is caused by a pressure gradient set up by freshwater runoff from the coast, and is typically 10 to 24 km wide in the region between Montague Island and the western end of the Kenai Peninsula. Although this current varies in speed, depending on the amount of fresh water that enters the system, speeds as high as 3.4 knots have been observed (Johnson and Royer 1986). In the first week of April, the Alaska Coastal Current was considerably below its maximum; typical speeds were between one-quarter and one-third knots. Even at this reduced level, the Alaska Coastal Current was the dominant transport process affecting oil leaving Prince William Sound. Virtually all of that oil moved west and then southwest along the coast, with the highest concentrations generally within 24 km of the various headlands.

As mentioned previously, oil first entered the Alaska Coastal Current about 30 March. By 2 April, the leading edge of the oil was west of Cape Fairfield, centered about 16 km offshore. Although most of the oil did not reach the coast, light oiling was reported on Point Elrington, Cape Puget, and Cape Junken. By 4 April, the leading edge of the oil was south of the Chiswell Island group, from

just off the headlands and extending a little more than 18 km across the width of the coastal current. This movement in the coastal current progressed at a rate of about 10 to 13 km per day. Just west of the Chiswell Island group, the bathymetric contours become more complex, with a fairly large bank extending south of the islands. In this area, the coastal current is deflected offshore, and large eddies tend to spin off between the current axis and the shore (typically somewhere south of Granite Cape). Floating oil followed these patterns, with the majority deflected south and away from shore, while a smaller portion tended to get caught up in the eddies and mill around west of the Chiswell Islands. By 7 April (day 15 of the spill), the leading edge was about 32 km offshore, between Outer Island and the Chiswell Islands, with widely scattered oil patches and streamers occurring nearer to the shore, west of the Chiswell Islands and south of Granite Cape.

By 9 April, the oil's leading edge, which had continued to move southwest, was about 56 km south of Nuka Sound. From here, the oil could be traced in a more or less continuous series of streaks, streamers, and patches to Montague Strait, a distance of about 161 km. Beyond that point, the leading edge feathered out into broken patches of scattered sheen. On windy days, this process was exaggerated and the slick would actually appear to shrink; on calm days it would extend, but never beyond Montague Strait as a single, connected series of oil patches. Despite the more or less continuous appearance of the oil up to this time, over the segment of the Alaska Coastal Current that contained floating oil, the actual fraction of the surface covered was very small (a few percent). Thus, there were many thin lines of floating oil separated by large areas of clear water.

Beyond Nuka Sound, the oil was in individual patches or streaks. A simple line could no longer be followed out from Prince William Sound, and reconnaissance became more difficult. Nonetheless, the amount of oil remaining in these scattered patches, although often difficult to see from the air, still represented significant hazards to offshore birds, floating sea otters, and shorelines in the event that it was blown ashore. The resulting bits of oil were patchy and generally widely scattered, with many relatively clear areas in between.

The coast between Prince William Sound and the Barren Islands is composed of rugged headlands separated by large fjords. The coastal mountains are sufficiently high to interact with large-scale weather patterns, causing local variations in the wind fields, which strongly affected the movement and beaching of the oil. The most pronounced of these small-scale weather patterns was the down-fjord winds that developed routinely as winds off the coast came from the south or southeast. Under these conditions, the south or southeast winds moved oil closer to shore and threatened beaches. At the same time, winds blowing down the larger bays (such as Resurrection Bay) tended to keep oil out. In addition to wind effects, fresh water that entered most fjords near their heads set up a two-layer circulation system, where surface waters moved seaward and deeper waters exhibited return flows into fjords. This reinforced the tendency for oil to remain offshore and not penetrate deeply into fjords.

Considering the nature of the Alaska Coastal Current and the drainage, or offshore, winds and currents within fjords, it was likely that oil beaching would be concentrated along offshore islands, coastal headlands, and eastward-facing spits or promontories. Relatively few coastal effects would be expected within fjords. This was generally what occurred—all of the major fjords showed little or no oil moving into them, and offshore islands were moderately to heavily oiled at some time (including the Chiswell Island group south of Resurrection Bay in the first week of April; then Hagget Island, Rabbit Island, and Outer Island, south of Nuka Bay; and the Chugach Islands near the western end of the Kenai Peninsula in the second week in April). Although most of the headlands were oiled to some extent, many rewashed relatively quickly because they were often subject to high-energy wave action. A major patch or concentration of oil was blown toward shore slightly west of Nuka Sound around 11 April. The eastward-facing spits and promontories showed heavy oiling in several instances; Gore Point was one that acted like a scoop in the westward drift and was heavily oiled. Under the influence of southeast winds, oil was also driven into Tonsina Bay. In addition, Dicks Bay and Port Dick, which are just west of Gore Point, received light-to-moderate oiling during this period. These fjords are not large enough to develop much protective drainage winds and circulation. During the next few days, oil patches continued to move west and come ashore. By 13 April, some of the western bays, such as Rocky Bay and Windy Bay (north of East Chugach Island), also received light-to-moderate amounts of oiling.

Barren Islands and Beyond

By the time oil from the T/V *Exxon Valdez* reached the Chugach Islands, it was in the form of widely scattered patches and lines of sheen. Typically these patches were composed of tarballs, which are small pieces of mousse that vary in size from less than 2.5 cm to nearly 1 m in diameter. In some instances, strong surface convergence patterns in the currents (caused by

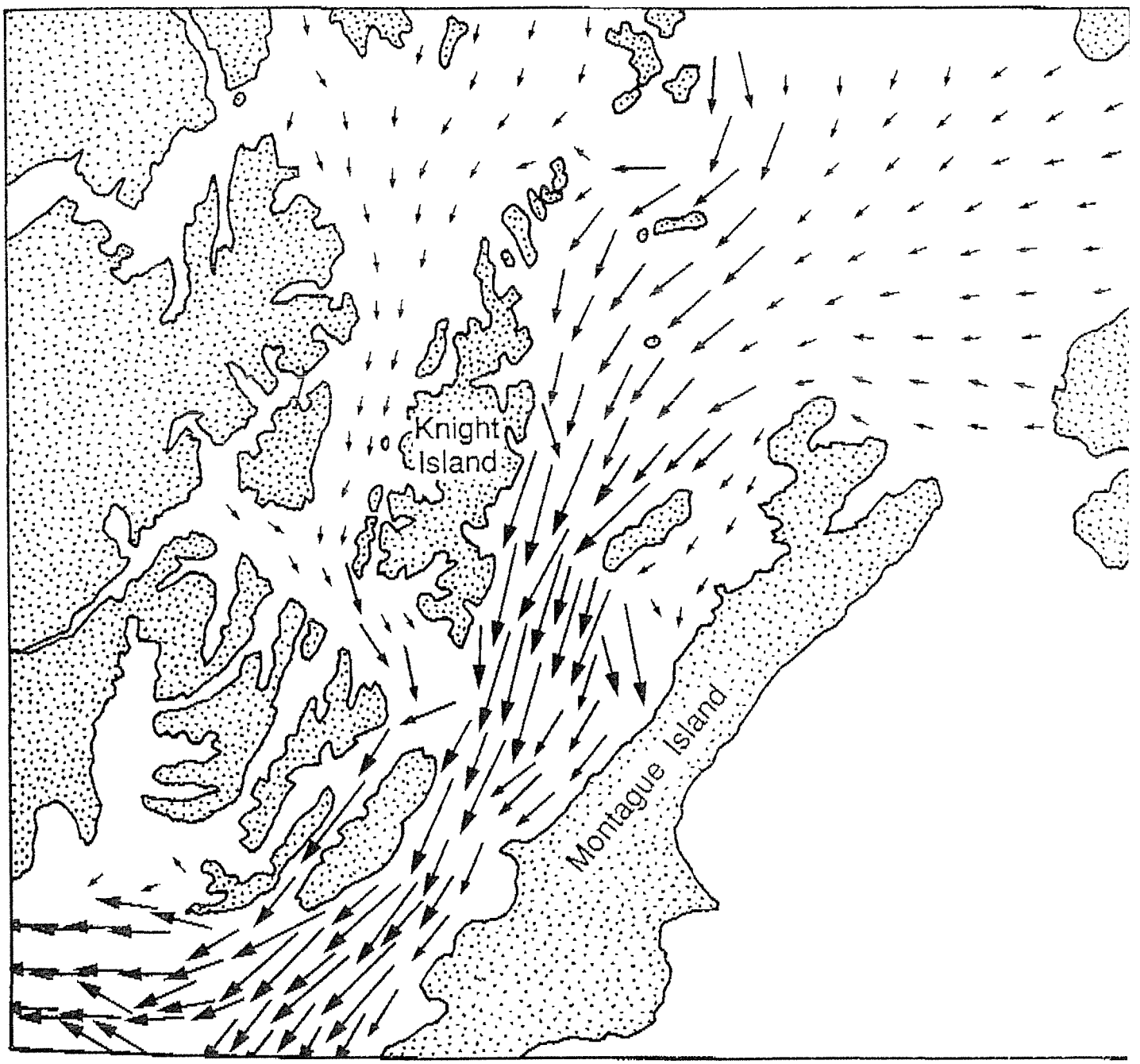


Fig. 9. Approximate mean current pattern used for trajectory analysis in Lower Cook Inlet and Upper Shelikof Strait.

freshwater mixing or wind shear) collected tarballs into streaks, where they coalesced and mixed with other debris and flotsam to form a continuous line of mousse. Widely scattered tarballs can also coalesce along a beach and yield a continuous band of mousse in the intertidal zone. By the third week in April, scattered patches of oil were moving between Afognak Island and the western end of the Kenai Peninsula. This path includes the Barren Islands, with the Kennedy Entrance to the north and the Stevenson Entrance to the south.

As the Alaska Coastal Current moves beyond the Barren Islands, it is deflected north, around the end of the Kenai Peninsula, where it then flows west, turns south of Cape Douglas, and then enters Shelikof Strait (Fig. 9). A small part of the current closest to the Kenai Peninsula shoreline actually moves north along the coast and enters lower Cook Inlet. In addition to this current structure, the wind patterns in lower Cook Inlet tend to show fjord-like behavior, and strong northerly winds are common. Therefore, most of the oil passing the Barren Islands moved along the Alaska Coastal Current across the mouth of lower Cook Inlet and into Shelikof Strait. Only a small fraction of the oil could move north along the eastern side of lower Cook Inlet.

As scattered oil patches moved across lower Cook Inlet and into Shelikof Strait, another physical process affected the oil and caused behavior that is of interest. This process was due to the relatively large amounts of fresh water flowing out of Cook Inlet which, in turn, cause a strong convergence band that wraps around Cape Douglas and extends down the northern side of Shelikof Strait. This convergence zone was able to coalesce a good deal of scattered oil, thereby appearing to reconstitute the spill. More serious than the visual appearance of a large band of oil was the fact that many birds that raft up and sleep on the water during the night were also drawn into convergence lines and mixed with the oil. This explains the sudden appearance of large numbers of oiled birds along the Katmai coast, particularly around Hallo Bay.

During the oil movement across lower Cook Inlet and down Shelikof Strait, individual wind patterns grounded a number of patches, resulting in widely scattered light-to-moderate coastal effects. Once again, the heaviest shoreline effects were seen on beach segments that faced the predominant currents and winds. This led to scattered oil along the Katmai coast and a moderate concentration at Cape Douglas. In April, however, spotty shoreline oiling also took place on Afognak, Raspberry, and Kodiak islands because of northerly winds.

By the time the remnants of the oil reached the end of Shelikof Strait, they were so widely scattered that only isolated tarballs could be found. Currents generally turn south around the western end of Kodiak Island, and some tarball spatter was seen on the Trinity Islands and eventually on Chirikof Island. Along the coast of the Alaskan Peninsula a small number of tarballs (about six) were discovered in the Chignik area.

All of the oil that came to Kodiak Island did not necessarily come in the Alaska Coastal Current and pass by lower Cook Inlet and Shelikof Strait. Oil that moved offshore south of Nuka Sound was seen to scatter and spread out in a number of offshore eddies. These eddies generally mill around over Portlock Bank; however, some mixing takes place with water of the Alaska Stream that runs offshore along the shelf break south of Kodiak. It is estimated that a small fraction of the oil followed this route and may have been responsible for the widely scattered tarball spatter that was reported along the southern coast of Kodiak Island.

Summary and Conclusions

No oil spill in recent U.S. history has been studied as much as that of the T/V *Exxon Valdez*. Moreover, these investigations and studies will undoubtedly continue, and response personnel and environmental scientists will be able to broaden their knowledge about oil spills from these efforts. It is also true that no oil spill in recent history captured the attention of the press and public as much as that of the T/V *Exxon Valdez*. As a result, hundreds of reporters looking for stories and many naive observers were seeing a major oil spill for the first time. Unfortunately, information management during the height of a spill response has little quality control. Thus, many misconceptions were passed on, which left millions of readers and viewers overwhelmed with information that tended to be more sensational than true. Although this happened in all areas of spill response, the greatest problem for trajectory analysis and understanding of the movement and spreading of the oil was the false-positive sightings. On a daily basis, reports of floating oil came in from dozens of sources. Hundreds of overflight maps were prepared. During the course of the spill, ice, internal waves, kelp beds, natural organics coming from kelp beds, pollen, plankton blooms, cloud shadows, and guano washing off rocks were all reported at one time or

another as oil. These, of course, were in addition to the hundreds of reports of actual oil sightings, of which there were a great deal. Press, television, and news magazine accounts typically treated all reports the same; the most common representation of the spill that was presented to the public was a continuous black blob extending from Prince William Sound to somewhere in the Aleutian Islands. It is easy to understand why the several hundred million people who were interested in the spill and had no other sources of information thought that the spill looked like a 600-mile-long parking lot.

Faced with this kind of confusion, it is difficult to get an accurate picture of where the oil spill moved and what it was like. There are several techniques, however, that help. The first technique is to concentrate on trained observers (as the spill went on their numbers increased). The second technique is to use computers and trajectory analysis routines that account for the oil movement due to winds and currents. During a spill, such models are used for actual forecasts, but after the fact, they become very useful in a hindcast mode. This technique uses both the observations and the computer, neither of which is totally reliable. The model is run forward from the initial spill. Once or several times each day it is checked against observations. If sighted oil patches are required to swim upstream (or move against strong winds), then they are treated as false positives. If, on the other hand, the leading edge of the slick or individual patches of oil are seen to outrun or lag behind the computer projections, then the hydrodynamic current estimates are suspect and the model is adjusted accordingly and rerun. The chronology and coverage of the spill can be reconstructed in a fairly reliable way with these methods.

A second advantage of using hindcast techniques is that the computer models are quantitative and will provide estimates of the actual amounts of oil that moved to various locations throughout the spill history, which allow something like an oil budget to be approximated. Preliminary results of such a process indicated that, by 7 April or the end of the second week of the spill, about 30% of the spill had evaporated within Prince William Sound. An additional 40% was on the beaches or in the intertidal zone, mostly on Smith, Eleanor, Ingot, and Knight islands, with secondary amounts on Green and Latouche islands. About 25% of the oil had passed through Prince William Sound and extended in the Alaska Coastal Current to south of the Chiswell Islands. This left about 5% of the oil floating in Prince William Sound. Beyond this time decreasing amounts of floating oil were seen, primarily due to the rewashing of the oiled shorelines.

Initial hindcasting studies have also been carried out for the Gulf of Alaska portion of the spill and indicate that only about 10% of the oil traveled beyond the area around Gore Point; about 2% actually reached Shelikof Strait. These hindcast studies are continuing, and more detailed results will eventually be available for the entire spill area.

To summarize the floating oil distribution: heavy concentrations of floating oil were present in southwest Prince William Sound for about 2 weeks; reduced amounts (less by a factor of 10) were present for about 2 more weeks. After that time, many light sheens were reported, but the actual amounts of floating heavy oil were small. In the Gulf of Alaska during the first 2 weeks of April, scattered patches of heavy oil were present slightly offshore between Montague Island and the Chiswell Island group. Between the Chiswell and Barren islands, even more widely scattered patches and heavy shoreline effects were seen in the area on both sides of Gore Point. Beyond the Barren Islands, only widely scattered patches of mousse were observed around mid-April. An exception was the strong convergence zone south of Cape Douglas and in the eastern end of Shelikof Strait, where bands of mousse coalesced. In these areas, shoreline effects were widely scattered and generally light.

References

Johnson, W. R., and T. C. Royer. 1986. A comparison of two current meters on a surface mooring. Deep Sea Res. 33:1127–1138.

Johnson, W. R., T. C. Royer, and J. L. Luick. 1988. On the seasonal variability of the Alaska coastal current. J. Geophys. Res. 93 (C10):12423–12437.

Attachment 2

- all natural resource damage recoveries will be expended on restoration of natural resources in Alaska unless the Trustees unanimously agree that spending funds outside of the state is necessary for effective restoration.

Organization

The post-settlement organization is largely guided by the Memorandum of Agreement. Under this agreement, the natural resource Trustees are responsible for making all decisions regarding funding, injury assessment and restoration.

The State of Alaska Trustees are:

- Commissioner of the Department of Environmental Conservation;
- Commissioner of the Department of Fish and Game; and
- Alaska Attorney General, Department of Law.

The Federal Trustees are:

- Secretary of the U.S Department of the Interior;
- Secretary of the U.S. Department of Agriculture; and
- Administrator of the National Oceanic and Atmospheric Administration, U.S. Department of Commerce.

The Federal Trustees have appointed representatives to the Alaska-based Trustee Council. These representatives are the Alaska Regional Forester for the Department of Agriculture, the Special Assistant to the Secretary of the Interior, and the Regional Director for the National Marine Fisheries Service, National Oceanic Atmospheric Administration. The State Trustees, unlike their Federal counterparts, serve on the Trustee Council.

The Trustee Council appointed an interim Administrative Director and a Restoration Team to take on the day-to-day management and administrative functions for implementation of the restoration program. Each Trustee has appointed one representative to the Restoration Team. The Attorney General of Alaska appointed a representative from the Department of Natural Resources. The Trustee Council will approve the hiring of a permanent full-time Administrative Director to chair and support the Restoration Team. The Trustee Council has formed various subgroups from agency staff to work on components of the restoration program, such as finance, public participation, and habitat evaluation and protection. The organization chart approved by the Trustee Council on February 5, 1992 is shown below (Figure 2).

EIS D 0137 (7)

Matt's markup

Exxon Valdez ~~Prince William Sound~~ Restoration Plan Draft Environmental Impact Statement

Annotated Outline

I. Executive Summary

The Executive Summary will provide the "highlights" of the full document, giving summary-level data for the projected impacts for each alternative. This section will contain many tables, graphs, and charts to facilitate comparison of the alternatives. The definition/purpose of a programmatic Environmental Impact Statement (EIS) will be given.

II. Table of Contents

The ToC will list the major and minor sections of the document. A list of exhibits (figures and tables) will also be included.

I. Purpose and Need for Action

A. Introduction

?? Trustees,

The spill, applicable laws, the case and its settlement, roles of Trustee Council, Restoration Team, and Restoration Planning Work Group, NRDA process, and the NEPA process and its requirements will be described. (NOI, NOA)

B. Purpose of Restoration Plan and EIS

Geographic Scope - Decision to be made

The purpose of and legal requirements for both documents will be described. A brief description of the Restoration Plan will be included.

C. Restoration Definition and Need

The court orders and settlement agreements will provide the definition of and need for restoration. Definitions of resources and services will be presented.

D. ~~Major Issues Identified by the Public~~

Issues ~~identified~~ raised during the scoping process and covered in the DEIS will be listed.

Issues not within the scope of the EIS and reasons why

II. Alternatives Considered

Each alternative and its associated option categories, as presented in the Restoration Plan, will be described. Tables, charts, and graphs will be used to show the elements of each alternative and to highlight the differences among the alternatives. The projected indirect impacts of each of the alternatives will be addressed. Issues such as economic and development opportunity costs, possible employment benefits associated with biological research and monitoring, and infrastructure impacts will be addressed where possible. Option categories likely to require site-specific environmental analyses will be identified. The effects of the short-term uses of the environment related to the 10-year spending program on the maintenance and/or enhancement of the long-term productivity of the region will be discussed. Ecosystem productivity, employment levels, and economic impacts will be covered.

A. Preferred Action

No preferred alternative has yet been identified. It is assumed that the Trustee Council will identify the preferred alternative(s) before public release of the Draft EIS.

* if not then include the statement

B. Alternative 0: No Action

The NEPA requirement for the null alternative will be explained. The "do-nothing" alternative will be described.

C. Alternative 1: Natural Recovery/No Change

Normal agency management, monitoring, and administration will be discussed as parts of this alternative. The alternative will be described per the Restoration Plan's definition.

D. Alternative 2: Habitat Protection/Acquisition

This alternative will purchase or otherwise protect land and marine habitats. The description will come from the Restoration Plan.

E. Alternative 3: Limited Restoration

The percentage of funds to be spent on each option category will be presented. General option categories included in the Restoration Plan's definition of the alternative will be discussed.

explain that funding amounts are estimates and that no commitment has been made

F. Alternative 4: Moderate Restoration

see E. The percentage of funds to be spent on each option category will be presented. General option categories included in the Restoration Plan's definition of the alternative will be discussed.

G. Alternative 5: Comprehensive Restoration

see E. The percentage of funds to be spent on each option category will be presented. General option categories included in the Restoration Plan's definition of the alternative will be discussed.

H. Other Alternatives Considered but Rejected

Alternatives considered and rejected will be briefly described and the reasons for their rejection given.

I. General Analysis of the Alternatives

Short summary/overview of differences among the alternatives.
should be laid out as a comparison of alternatives on the issues identified in chapter I

1. Injured resources
A table organized by injured resources and services will be used to show how each alternative is anticipated to affect each resource. Another table will list the possible methods of natural resource management and compare them with the five alternatives.

2. Sociocultural

3. Economic
The comparison of the economic ramifications associated with implementing the options included in the proposed alternatives will be presented in tables similar to those presented for biological resources. The various sectors of the economy likely to be affected can be identified for each alternative.

J. Analytical tools used (reference methodology section, then describ IN PLAN.

III. Affected Environment

immediate impact of spill
status today
(projected recovery periods)

This chapter presents baseline information ~~(from before the spill, up through the treatment period)~~ against which impacts will be measured.

A. Physical Description

Baseline description of the physical environment within the study area, including geological features and activity, water quality, mineral and energy potential, climate, and habitat types will be presented.

only important one

I Do not spend time discussing parts of the physical environment that do not lend themselves to understanding the alternatives or effects of alternatives

B. Socioeconomic Description

Baseline description of the social, cultural, and economic conditions of the study area will be included. A brief historical background will be presented, as will descriptions of affected communities, subsistence, and injured cultural and anthropological resources. Topics to be included in the socioeconomic section include demographic data from 1990 Census data; local land use; and access to the communities. Economic resources/services that could be affected by implementation of the proposed alternatives will be represented by economic sectors or industries. These sectors will be described in the context of factors such as income and employment that could be affected by implementation of the options proposed as part of the alternatives. A brief description of the economic model, IMPLAN, will also be presented.

C. Biological Description

An overview of the common and injured biota in the study area will be presented. A summary of the Natural Resources Damage Assessment (NRDA) studies from 1989 to 1992 will also be presented.

Also included will be a brief discussion of the Spruce bark beetle infestation on the Kenai Peninsula (may affect habitat purchases)

results of

as appropriate for the resources and services included in the Restoration Plan.

IV. Environmental Consequences of the Restoration Plan

Must address the issues and provide detailed information about the effects of each alternative on the issues identified in chapter I

We need to add issues to methodology

This chapter will set forth and will compare the projected effects of each of the proposed alternatives on the existing environment. Impacts will be quantified where possible; where quantification is not possible, qualitative data will be presented. Mitigation and offset measures will also be described.

A. Socioeconomic

The impacts of the alternatives on the social, cultural, and economic systems of affected communities will be identified and discussed.

1. Local economy and jobs

An assessment of the effect restoration plan options and alternatives have on the regional economy will include the effect on public and private sector employment and income. Where possible, option-related income generated within Alaska Native

Corporations and other regional entities (i.e., boroughs) will be presented. Modeling to quantify the effects of various options will be used wherever possible and as appropriate. Economic modeling will be performed using the IMPLAN model. IMPLAN considers, where data permit, the effect that the purchase of goods/resources and services have on the sector (e.g., public, private, private-nonprofit) where this spending enters the local economy. The results of IMPLAN estimate the direct, indirect, and induced changes in regional income and employment likely to accompany these changes.

2. ~~Native~~ subsistence (Section 810 ANILCA)

Potential effects of alternatives on subsistence harvest patterns of the Prince William Sound area with regard to habitat alteration will be addressed. Issues will include—

a. Subsistence hunting and fishing

b. Use of subsistence resources

c. Access to subsistence resources

d. Changes in subsistence resources

e. Changes in subsistence resources distribution patterns

3. Transportation

Transportation impacts for all restoration plan alternatives will be measured in terms of the options being proposed for those alternatives. The demand for access to areas that could be affected will be of greatest concern. Specific options, if any, that are intended to facilitate transportation (e.g., refueling stations) will be addressed for the effect the option might have on the volume and methods of transportation involved. Future accessibility afforded by the option, and the transportation needs required to implement the option, will also be considered.

combine with community facilities (#9)

4. Recreation/tourism

Recreation and tourism is an important economic and social concern in the areas that may be affected by proposed restoration options. Real and perceived increases or decreases in recreational opportunities associated with the proposed alternatives will be measured in qualitative terms. A comparison will be made, where possible and appropriate, between what currently exists and the short- and long-term potential associated with option implementation. Tourism may require some shared impact assessment (i.e., common impacts) between the economic aspects of tourism and the physical increase or decrease in recreation opportunities.

Separate Recreation and Tourism (i.e, what we figured out anyway)

5. Commercial fishing

Commercial fishing, like recreation and tourism, is a major part of the Alaskan economy and may be affected by various options under the proposed alternatives. The socioeconomic aspects of the commercial fishing industry can be measured in increases or decreases in employment and income in harvesting and seafood processing industries. Changes in the commercial fishing industry related to improvement or harm caused by the various relevant options (i.e., those affecting numbers of fish available for harvest, modification of regulations and fishing opportunities, etc.) will be evaluated for their impact on the commercial fishing industry and the individuals participating in the industry.

"Aside from the oil terminal in Valdez, it is the most important economic factor in the oil spill area" K.R.

6. Commercial timber

The commercial timber industry will be affected by various restoration plan options such as the acquisition of habitat and timber rights, and natural/wilderness set-asides. These and other options have the potential to affect employment and income of the companies and individuals participating in the industry. The effect that a restoration plan alternative may have will depend on a variety of factors including the location, size, value, and quality of the forest resources involved. From a qualitative perspective, the impact assessment will identify the potential impacts alternatives could have on the number of jobs available and the income realized from the gain or loss of commercial timbering

opportunities. Where possible and appropriate, quantitative impacts identified by the IMPLAN economic model will be presented.

7. Cultural ~~and anthropological~~ resources
The alternatives will be reviewed with regard to their impact on cultural and archaeological resources over the long and short term.

8. Local land use and growth
Most of the area affected by the alternatives is rural and remote. Information will be collected and evaluated regarding the potential short- and long-term impacts on local land use and growth relative to the alternatives.

Demographics

9. Community facilities
The majority of the affected communities exhibit little in the way of community facilities or infrastructure. The alternatives may require communities to invest in development of facilities and infrastructure. This potential and its impact on the communities will be discussed.

13 of 21 have "well developed infrastructure" K.R. * what does "well developed mean?

Add Transportation here

10. Consumers, civil rights, minorities, and women
The general impacts of the alternatives in specific segments of the study area will be addressed.

B. Natural Resources (~~terrestrial and fishery biologists~~)

The environmental consequences associated with the implementation of the Restoration Plan will be assessed for several natural resource categories affected by the options contained in the Restoration Plan alternatives. The categories of natural resources include marine mammals, terrestrial mammals, birds (including waterfowl), fish (including shellfish), and coastal habitats. An alternatives's impacts will be evaluated for impacts (positive and adverse) on each of the resource categories. As appropriate, the effects of options on specific species or habitats within the resource category will be identified. The assessment of impacts will consider the effectiveness of the option (as identified by

Move up in front of Socio.

Discuss Spruce bark beetle infestation break out the various resources into their own sub headings

the Restoration Team alternatives development information) for benefiting or harming each resource or species within the resource category. A qualitative assessment methodology will be employed, consistent with the programmatic nature of the document. Tiering to available detailed resource evaluations and studies will be used as appropriate, to supplement the analysis performed for this section of the EIS.

C. Summary of Probable Unavoidable Adverse Impacts

A summary of the probable unavoidable negative impacts associated with each alternative will be presented.

D. Irreversible and Irretrievable Commitment of Resources

This section will describe the resources that will be permanently committed under each alternative. Actions such as increased mining or timber harvesting would fall into this category, as would threatened or endangered species whose populations are declining in PWS.

E. Cumulative Impacts

"Additive effects" will be addressed in this section. These are environmental, economic, socioeconomic, and physical effects from past, present and future changes in regional land/resource use. Changes related to implementation of the Restoration Plan and other reasonably forseeable (i.e., planned) actions will be considered.

F. Unresolved Issues

This section will list all issues identified by the public but not addressed in the EIS.

V. List of Preparers

VI. Distribution and Review (NEPA process) of DEIS

A. Scoping Process

combine this discussion into chapter I

discuss in chapter I

The scoping process (meetings, mailings, hearings, and open houses) will be described.

B. Trustee Council Role

VII. Public Comments and Coordination

VI

This section will present a brief summary of how NEPA requirements for public involvement were satisfied—Notice of Intent, scoping, the appointment of the Public Advisory Group (PAG), and review of the Draft EIS and public comments. Copies of relevant advertisements and public announcements will be included, as well as the Notice of Intent.

VIII. References

VII

IX. Index

VIII

X. Appendices

IX

can eliminate if Chap I D. is expanded

AA. Issues Identified by the Public

AA BB. List of Agencies and Persons to Whom DEIS Was Sent, and Letters Received from Agencies

CC. Comments and Public Responses to DEIS

move this into into Chap VII

Before establishing the format for this section, the team plans to wait and see how many responses are received and to solicit input from the PAG. The FEIS will include public comments on the DEIS and the options. The EIS will answer only technical questions; political questions will be handled by the Trustee Council or the Restoration Team.

BB DD. Lists of Trustee Council, Restoration Team, and Public Advisory Group members

CC EE. Section 810 Evaluation on Subsistence

DD FF. Glossary of terms and acronyms

EE GG. Species List will include the common name, the Latin genus and species, and habitat for each species.

HH. Maps (any oversized maps will be folded into a pocket)

W137
(9)

Environmental Impact Statement Checklist

Name of National Forest: **DATE:**
Name of Project/Activity:

DOCUMENTATION REQUIRMENTS	Covered	Not Covered	N/A	Comments
COVER SHEET (not to exceed 1 page) Title of project. State(s) and County(ies) where project/ activity is located. Lists responsible agencies, including lead and cooperating agencies. Name and title of responsible official. Name, address, and phone number of person who can supply further information. Type of document - DEIS, FEIS, etc. One paragraph abstract of document including alternatives considered and the preferred alternative. Due date for comments (DEIS only).				
SUMMARY (does not exceed 15 pages) Adequately and accurately summarizes the EIS. Stresses: Areas of controversy. issues raised by agencies & public. issues to be resolved. Choice among alternatives. Major conclusions. If distributed as separate document: States how complete EIS can be obtained or reviewed. Has a cover sheet attached.				
TABLE OF CONTENTS				

DOCUMENTATION REQUIRMENTS	Covered	Not Covered	N/A	Comments
PURPOSE AND NEED **What is proposed? Who made the proposal?** **Describe the project or activity.** What is the nature of the proposal.				
Where is the proposed action located?				
How much area will be affected?				
What are the characteristics of the area which would be affected?				
What kinds of environmental effects are likely to result from this project?				
Will any of these effects be likely to be considered "significant"?				
Would someone outside the Forest Service consider them "significant"?				
Will any of these effects be likely to compound environmental effects of earlier developments in the area or developments anticipated in the foreseeable future?				
Has anyone on the Forest written a thorough Environmental Assessment or Environmental Impact Statement for the same kind of project in the same kind of environment?				
Did this earlier document (or the underlying analysis) reveal any significant effects for projects of this kind or any significant effects we've failed to anticipate here?				
Of the environmental effects we can anticipate, which must have more information about in order to accurately describe in a NEPA document?				
Why is it proposed. What is the decision to be made. What is the underlying purpose and need to which the Forest Service is responding?				
Why are we doing this?				
What has happened in the geographic area in recent years to create this purpose and need?				
What is Forest Service authority/responsibility to deal with proposal. Is it our problem?				

DOCUMENTATION REQUIRMENTS	Covered	Not Covered	N/A	Comments
How does the situation relate to the Forest Service's statutory duties and authorities?				
Identify cooperating agencies. **Authorities.** **Decisions to make.** **Permits.** **Other agency actions required.**				
Any state or Federal regulatory agencies involved?				
What information will we need to present to these groups or agencies in order to deal effectively with their concerns?				
Location of project/activity. What is the geographic scope of the proposal? How much area will be affected?				
What are the characteristics of the area which would be affected?				
What is the Forest Plan Direction for the Management Area(s) in which the proposal is located.				
Background of project/activity.				
Discussion and date of any previous Decision Notice and FONSI on this project/activity. Has the Chief or the Secretary issued appeal any decisions on this project, or on the Forest Plan, or otherwise that we need to consider?				
Has someone else (Forest Service, other federal agencies, state or local agencies) already studied all or part of this situation? (Earlier work can exist in a variety of forms including monitoring reports, a Grazing Allotment Management Plan, Timber Sale or Treatment Plan, Roadless Study Area Analyses, Wilderness Study Areas Reports, Management Area Direction, water quality monitoring plans, maps, diversity studies, or suitability analyses, etc.)				
Have we considered the hierarchy of existing planning and decision documents: RPA, Regional Guide, Forest Plan and all amendments and the Forest Plan EIS?				
Date of Notice of Intent.				
Date of Notice of Availability (FEIS).				

DOCUMENTATION REQUIRMENTS	Covered	Not Covered	N/A	Comments
Scoping: **Issues identified.** Does this project involve any issues described in the Forest Plan?				
Are there new issues?				
Have we defined the issues and legal requirements?				
Have we tracked the issues and any information relevant to the issue by citations to specific pages in the Forest Plan, the Plan EIS, third party contract (if any), project DEIS, comments and responses, and project EIS?				
Source of issues. Have we identified who cares about the situation or who should care?				
Who will have vested interests in the successful out come of the proposal? Why? Who will have vested interests in keeping things the way they are now? Why?				
Will the change be disruptive to the people who have vested interests in current conditions?				
Who would be the most likely appellant or appellants on this project?				
Is this project likely to become involved in any on-going controversy about management of NFS lands or the effects of management?				
Is it likely to attract the attention of organized special interest groups in the Region?				
Have we told the public, adjoining land owners, permittees, contractors and other governmental agencies that we may take action and would appreciate their views?				
Have we aggressively sought their input and documented this effort?				
Have we responded fully to comments and carefully considered them?				
Issues in scope of EIS.				
Issues not in scope of EIS. **Reasons why not.**				
Third-party EIS and Forest Service responsibility.				
Availability of project/planning records.				

DOCUMENTATION REQUIRMENTS	Covered	Not Covered	N/A	Comments
Other information: **Adoption.** **Tiering.** **Incorporation by reference.** **Glossary.** **Bibliography.**				
ALTERNATIVES INCLUDING PROPOSED ACTION **Process used to formulate alternatives.** Is there only one way of doing this/				
Is the preferred alternative consistent with the Forest Plan as amended and/or revised?				
How does the preferred alternative operate to achieve the goals, objectives, standards, and guidelines of the Forest Plan? How does it bring the characteristics of the resource or area closer to the desired condition described in the Forest Plan?				
Does the Forest Plan need to be amended to permit the project to proceed?				
If so, what specific portions of the Forest Plan must be amended?				
If the Forest Plan is to be amended, will the changes bring about a detectable change in the resource conditions or "outputs" expected as a result of implementing the original Plan?				
Have we considered alternatives which are not consistent with the Forest Plan? Is the lack of consistency included in the alternative description?				
Are there reasonable alternatives which are not consistent with Forest Service policy, regulation or current law?				
Have alternatives been considered even though these may be outside the jurisdiction of the Forest Service?				
Does the Forest Plan comply with NFMA and 36 CFR 219?				
Has it been five years since the last review of conditions described in the Forest Plan?				
Have conditions or demands in the area changed significantly since the Forest Plan was written or last revised?				
Is a Forest Plan revision needed?				
Is supplementation of an EIS or EA needed?				

DOCUMENTATION REQUIRMENTS	Covered	Not Covered	N/A	Comments
Is the preferred alternative consistent with the Regional Guide?				
Is it consistent with State and local environmental protection laws, regulations, and ordinances?				
It it consistent with Manual direction?				
Analytical tools used.				
Role of analytical tools used.				
Response to issues.				
Alternatives eliminated from detailed study: **Balanced description.** **Why eliminated.**				
Alternatives considered in detail: **Broad range.** **Equal detail.** **Respond to issues.** **No action.** **Proposed action identified?** **Preferred alternative identified?**				
Comparison of alternatives. **Relates to issues.** **Significant differences identified.** **Social and economic factors identified.** **Resources.** **Outputs.** **Effects.** **Cost.** **Financial efficiency.**				
Trade-offs. **Social and Economic.** **Resource.** **Issues.**				
Environmental effects (from Ch. 4) summarized by issue and significant effects.				

DOCUMENTATION REQUIRMENTS	Covered	Not Covered	N/A	Comments
AFFECTED ENVIRONMENT **Succinctly describes the environment which will be affected or created by the alternatives under consideration. (FSH 1909.15, Ch. 61)**				
Physical Factors **Biological factors.** **Economic Factors.** **Social Factors.**				
What elements of the environment were studied for possible impact?				
Were all the most important elements studies?				
What other developments are taking place in the "affected environment" which might compound the effects of this project?				
Will projects be developed in this area in the immediate future which will add to the effects of this project? Are the projects identified and/or described?				
Have the past, current, and reasonably foreseeable projects in the area been mapped so their physical relationship and the possible cumulative effects can be considered?				
What actual analyses were performed and what kinds of information gathered? Include citations to reports and data.				
ENVIRONMENTAL CONSEQUENCES				
Identifies issues/effects which have no significant effects and will not be discussed.				
States role of mitigation in analysis.				
Describes mitigation included in Forest Plan prescriptions and additional measures needed. What Federal, State or local agencies have permitting and/or mitigation authority or duty?				
What alternative mitigation approaches were considered?				
What are their relative advantages and disadvantages?				
How likely is it that the effects will be reduced or eliminated?				
What effects will remain after the required mitigation?				

DOCUMENTATION REQUIRMENTS	Covered	Not Covered	N/A	Comments
Do those remaining effects prevent compliance with any statutes or regulations?				
Discusses direct, indirect, and cumulative effects and their significance for the following:				
Physical Factors. **Biological factors.** **Economic Factors.** **Social Factors.**				
Is only the area immediately adjacent to the project likely to be affected, or will there be off-site and downstream effects?				
Will there be indirect or cumulative effects off-site and downstream?				
Is there a discussion of the land and environmental factors which would be affected under each of the alternatives?				
How would the land and environment be affected? (This discussion of effects should include proximity [direct or indirect effects], beneficial or detrimental, cumulative, short-term and long-term, static or changing effects, and the rate of change.)				
Which elements of the environment will be "significantly" affected by the project before mitigation?				
How significant are these effects? (Discuss context and intensity.)				
How can these effects be reduced?				
Does the discussion of environmental effects in the EIS include information from cited pages in the Forest Plan, Plan FEIS, and applicable laws, regulations, executive orders, etc. on the issues? (Have we tracked the issues?)				
Are the differing viewpoints on the issues measired against applicable legal requirements?				
Do the alternatives make economic sense? Are they economically efficient ways of complying with the Forest Plan? Are they financially efficient?				
Does the analysis cover the economic life of the project. Are all current and future costs and benefits or revenues resulting from the project accounted for?				
Are the economic and financial measures (present net value, benefit cost ratio, revenue cost ratio) incremental? That is, do they measure the difference in benefits, revenues and costs resulting from implementing the alternatives, as opposed to the no-action alternative?				

DOCUMENTATION REQUIRMENTS	Covered	Not Covered	N/A	Comments
Are there other significant economic factors, such as employment and income effects, that should be considered?				
If the alternatives are not economically or financially efficient, are there still good reasons (in terms of economic intangibles and the public interest) to proceed?				
What are these reasons?				
Do you have information adequate to make a reasoned choice among the alternatives?				
Have the requirements of NEPA Regulations (40 CFR 1502.22) regarding in adequate or unavailable information been complied with?				
Do discussions cover the information on which to base the findings required by laws and regulations? For example, NFMA, ESA, Clean Air Act, Clean Water Act, etc.				
Provides citations to support conclusions.				
Provides comparative analysis.				
Discusses monitoring and enforcement. What will be done to enforce compliance with statutes, regulations, permit clauses and stipulations, contract clauses, etc., when monitoring or other information shows that there is a problem?				
What will be done to monitor the action?				
Adverse environmental effects which cannot be avoided should the proposal be implemented.				
Relationship between short term uses of the environment and maintenance and enhancement of long term productivity.				
Irreversible and irretrievable commitment of resources which would be involved if proposal should be implemented.				
Possible conflicts between proposed action and the objectives of				
Federal regional, State and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned.				
Energy requirements and conservation potential of various alternatives and mitigation measures.				

DOCUMENTATION REQUIRMENTS	Covered	Not Covered	N/A	Comments
Urban quality, historic and cultural resources, and the design of the built environment, including the reuse and conservation potential of various alternatives and mitigation measures.				
LIST OF PREPARERS Names, qualifications, expertise, experience, and professional disciplines of persons who were primarily responsible for preparing the EIS or background papers.				
CONSULTATION WITH OTHERS AND LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THE STATEMENT ARE SENT Dates of Federal Register Notices. Notice(s) of Intent. Notice(s) of Availability. Other.				
Brief background of public participation				
Other agencies/ Tribes involved.				
Meetings and nature of contacts.				
Purpose of asking for comments on DEIS.				
Purpose of responses.				
Demographics of respondents.				
Summary of responses on major issues.				
New issues identified.				
Changes in issues between DEIS & FEIS.				
List of respondents.				
Able to tract or tie comments to respondents.				
If each response is printed: Comments numbered/identified. Responses numbered/identified.				
List of persons, agencies and groups to whom EIS is sent.				

DOCUMENTATION REQUIRMENTS	Covered	Not Covered	N/A	Comments
APPENDIX Consists of material prepared in connection with the EIS.				
Consists of material which substantiates any analysis fundamental to the document.				
Analytic and relevant to decision.				
Circulated with EIS or readily available on request.				

WALCOFF & ASSOCIATES

M E M O R A N D U M

TO: EIS Team*

FROM: Jacquie Glover-Brown

DATE: April 12, 1993

SUBJECT: Project 4700-38 -- Ken Rice Visit, Draft Chapter 3 (Last Section) and Options

---

Carol has asked me to inform you that Ken Rice will be visiting Walcoff on April 27, 28, and, if necessary, April 29. She is unsure whether or not this will effect the planned visit to Anchorage on May 17.

Enclosed is a current listing of the Options that we did not have, and a short description of each. This was received late Friday afternoon from Ray Thompson.

Also, I have enclosed the latest Chapter 3 for your review, etc.

*Distribution
Carol Paquette
Matt McMillen
Kathleen Schildbach
Sue Brown

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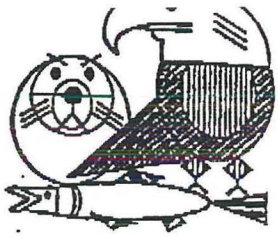
Exxon Valdez Oil Spill Trustee Council
Restoration Office
645 "G" Street, Anchorage, AK 99501
Phone: (907) 278-8012 Fax: (907) 276-7178



copy for Team

FAX COVER SHEET

To: Carol Paquette
Walker & Assoc.

Number: 703-548-0426

From: RAY THOMPSON
USFS - RPWG

Date: April 9, 1993

Comments:

Total Pages: 12

Options either written or rewritten are enclosed. Let me know if you are still missing any. If you have questions on these I will gladly answer or find an answer for you. OPTIONS 18, 45, 46, 47, 48 49, 50.1, 50.2 and 51 are enclosed.

RPWG is commenting on draft EIS chapters I & II this afternoon. Results will be sent when I collate them - probably late today. I will also have information on chapter III of the Plan (Injury).

Later,

Ray

State of Alaska: Departments of Fish & Game, Law, Natural Resources, and Environmental Conservation
United States: National Oceanic and Atmospheric Administration, Departments of Agriculture, and Interior

4/9/93

Option 51.0 Relocate or Change Timing of Existing Hatchery Salmon Runs

This option entails shifting the location and, possibly, the timing of salmon runs released from hatcheries. For instance, hatchery-produced sockeye runs in Prince William Sound might be changed to result in adults returning to hatcheries earlier in the season. This strategy could decrease fishing pressure on wild-stock pink salmon which use similar migration corridors but return later in the season. Alternatively, hatchery fish could be released and harvested at remote sites not heavily utilized by wild-stocks. In either case, the objective is to decrease interception of injured, wild-stock pink salmon returning to spawning streams. If fishing effort is directed away from migration corridors used by wild-stocks, interceptions will decrease and the injured populations will recover more rapidly.

Implementing this option requires considerable planning and coordination between agency biologists, aquaculture associations and Regional Planning Teams. Factors to be considered include the impacts of shifting run timing or location on existing runs of hatchery and wild fish. Obviously, it would not be desirable to decrease interception of one run at the expense of greatly increasing interceptions of another. The types of information required to implement these changes include surveying locations of wild-stocks, evaluating existing and potential degrees of wild-stock interception, and possible genetic impacts on wild-stocks caused by straying of hatchery fish.

How will this help recovery?

This option is designed to reduce interception of injured, wild-stock pink salmon by commercial fishermen who are targeting runs of hatchery-reared salmon. By shifting the location and, possibly, the timing of returning hatchery runs, fishing could, in some cases, be directed away from injured stocks. Recovery of wild-stock pink salmon would be aided by reducing fishing mortalities. This option would effectively promote recovery of wild-stocks suffering population-level injuries, but would not be particularly effective for restoring sublethal injuries.

Additional information:

This option is found in Alternatives 4 and 5 for pink salmon.

The injury description for pink salmon is found on page ____.

Analysis of similar projects in other areas will be conducted. The information will be incorporated into the project design.

Evaluation and feasibility determinations of potential projects for restoration, replacement or enhancement of bivalve shellfish in more remote areas, but of import to marine mammals, birds and fish will also be accomplished.

B. Coordination with other efforts

During the process of needs assessment and feasibility analysis, necessary coordination of efforts needs will also be determined and analyzed. At this time ADF&G is aware of efforts by Alaska native groups to establish a shellfish hatchery and an aquatic farm industry in the oil-affected area. This project is supportive of and will be coordinated with those efforts to insure maximum efficiency and utility.

ENVIRONMENTAL COMPLIANCE

Project compliance with the National Environmental Policy Act (NEPA) will be assessed during the feasibility phase. Until project design and specifications are finalized, specific NEPA requirements cannot be determined. Aquatic farms are addressed under a Corps of Engineers' general permit (GP 91-7). If facilities are constructed, a determination of compliance with the Alaska Coastal Management Plan (ACMP) will be required. The required State and Federal permits will be identified and incorporated into the project planning process.

WHEN

The feasibility study will occur this budget year (1/1/93 - 9/30/93). The clam restoration/enhancement demonstration project will occur next budget year.

If the project is determined to be feasible and appropriate budgets realized, construction of the facilities will begin in 1993 (Oil Year 6). The facilities will be operational in 1994.

BUDGET ($K)

	ADF&G
Personnel	37.6
Travel	8.0
Contractual	2.0
Commodities	2.4
Equipment	0.0
Capital Outlay	0.0
Sub-total	50.0
General Administration	5.7

negative affects of the Exxon Valdez oil spill on native communities.

B. Objectives

The initial objectives of the project are to assess the feasibility of a shellfish production hatchery and a mariculture technical center to be used to restore, replace and/or enhance bivalve shellfish populations in oil-impacted areas. A report on the feasibility of the proposed facilities relative to potential uses will be generated from data collected during the year. Alternative configurations will be considered and analyzed. This initial study will also attempt to identify potential species and establish production goals for those species.

Native communities and organizations in the affected area would be involved from the outset in development of this project. Pending the results of the feasibility analysis, they would be the logical entity to operate the production shellfish hatchery.

If full funding for construction of the facilities is not realized from oil spill funds, additional funding sources will be required before they can be built. Though this would not affect the stated objectives, it would alter the project time frames and facility priorities

WHY

A. Benefit to Injured Resources/Services

Bivalve shellfish populations were severely impacted by the oil spill and by the cleanup efforts following. All of the affected populations were used to some degree by marine mammals, birds, fishes and in many cases for human subsistence. This project would provide the facilities and infrastructure to research techniques to restore, replace and/or enhance affected populations using shellfish hatchery and aquatic farm-based technology.

HOW

A. Methodology

Utilizing concepts already developed for the Seward shellfish hatchery and the ADF&G Mariculture Technical Center, a feasibility analysis of the project will be conducted. Engineering and biological expertise will be retained to conduct the analysis. If construction funds are later approved, direct restoration, replacement and/or enhancement of bivalve shellfish will be accomplished via an onshore production hatchery operated by the private sector using technology developed at a State-operated research center. The combination of the two facilities is necessary to accomplish the overall production objectives of this project because of the lack of technology for indigenous species.

12/10/92

OPTION 50.2

[redacted] Bivalve Shellfish Hatchery and Research Center

APPROACH CATEGORY: Restoration manipulation and/or enhancement

INJURED RESOURCES AND SERVICES: Subsistence, shellfish

INTRODUCTION

A. Background on the Resource/Service

Shellfish resources in the Exxon Valdez oil spill (EVOS) affected area were impacted in several ways. Most obviously, shellfish populations were damaged, destroyed and/or contaminated by the spill and/or subsequent cleaning activities.

B. Summary of Injury

Some bivalve shellfish populations were affected directly by the toxic effects of the spilled oil and subsequent cleaning. Still other populations were contaminated or were suspected to be contaminated to the degree that they were unfit for human consumption and/or were negatively affecting birds, mammals and other animals that fed upon those shellfish. Evidence indicates that natural cleansing is not proceeding well in some areas. The sheltered habitats most hospitable to shellfish were also those most protected from natural cleansing action. Oil spill residues continue to persist in these areas.

Native communities in the oil-impacted area were altered by the EVOS. Prior to the EVOS at least one mariculture feasibility study was under way (near Chenega Bay Village). This was terminated because of the spill. Replacement shellfish opportunities are reasonable expectations for impacted villages.

C. Location

The project involves two physical facilities. The proposed location for these facilities is in Seward, Alaska. A component of this study is to determine if that is the best location. Target locations for projects resulting from the operation of these facilities include Tatitlek, Chenega Bay, Eyak, Port Graham and Nanwalek.

WHAT

A. Goal

The goal of this project is to assess the feasibility of using aquatic farming technology to restore, replace or enhance bivalve shellfish populations in oil-affected areas and to mitigate the

DRAFT

30B - Provide Access to Alternative Subsistence Foods

The goal of this option is to minimize interruption of subsistence activities at those native communities most affected by the oil spill. As a result of the oil spill, some resource populations have declined, while others (especially shellfish) continue to be chronically contaminated by persistent pockets of buried oil. This project will provide funds for subsistence hunters from Chenega to travel to eastern Prince William Sound to harvest traditional subsistence resources not injured or contaminated by the oil spill. Funding also would be provided to facilitate subsistence hunters in other native communities ~~(Tatitlek)~~ to assist the Chenegans by gathering, preserving and forwarding subsistence foods to Chenega. This support will continue until the resources in the subsistence area traditionally used by the Chenagans are no longer contaminated by oil, the resource populations have recovered to pre-spill levels, or the native community is no longer concerned that their traditional foods are contaminated. Cost to implement this option is [redacted] over a 10-year duration.

~~**30C - Develop Shellfish Mariculture in Impacted Subsistence Areas**~~

OPTION 50.1 DEVELOP SUBSISTENCE MARICULTURE SITES

This program will provide the villages of Chenega, Tatitlek, Port Graham, English Bay, Ouzinkie, and Ahkiok with a means to develop an alternative bivalve resource for both subsistence and commercial harvest. The basic strategy for the village mariculture program is to initially concentrate on oyster culture, and subsequently test the feasibility of establishing clam and scallop mariculture.

Tititlek, Eyak and Chenega Bay already have begun to develop oyster culture. Seed of Pacific oyster has been obtained from Washington and Oregon, and excellent growth rates have been achieved with bag and net culture techniques in eastern Prince William Sound. A good market exists for oysters grown in Alaska, and oysters have proven to be an acceptable substitute for local subsistence shellfish species (oysters are not native to Alaska).

For those villages already permitted (Eyak, Tatitlek, Chenega), settlement funds will be used to establish new oyster culture operations or increase existing operations to commercial production levels. A mariculture specialist will be hired to organize village operations, help initiate and sustain a training program, and prepare and implement mariculture development plans. For those villages without permits (Port Graham, English Bay, Ouzinkie, Ahkiok), initial efforts will focus on identification of potential culture sites and the development of permit applications. Activities in ensuing years will include preparation of mariculture development plans, training, establishing production, and development of markets.

The bulk of costs for this program is associated with developing a mariculture management structure in each village and training

* NOTE! THIS OPTION WILL UNDERGO LEGAL REVIEW.

4/8/93

Option 49.0 Provide Subsistence Users Access to Traditional Foods

As a result of the oil spill, some species traditionally harvested by subsistence communities have declined or are suspected by many subsistence users to be contaminated (e.g., harbor seals, shellfish and waterfowl). This option would provide funds for subsistence users from impacted areas to travel to unimpacted areas to harvest traditional subsistence resources. Funding may also be provided to allow people in other subsistence communities to assist impacted communities by gathering, preserving and sending subsistence foods.

Continuation of harvest activities would also help ensure that traditional hunting skills will continue to be passed down and that the cultural importance of harvesting and sharing foods is not diminished. The option would continue until subsistence resources are no longer contaminated, populations have recovered injuries, and foods are no longer perceived to be contaminated. This option will undergo legal review.

How will this help recovery?

The option will improve subsistence recovery by providing traditional subsistence foods to villages for which they are not readily available. It would also minimize the damage to culture and community cohesiveness that could result from continued interruption of subsistence harvests.

Additional information:

This option is found under Alternatives 3, 4 and 5.

The injury description for subsistence is found on page ____.

April 1, 1993

48.0 Improve Survival of Salmon Eggs and Fry

This option could be used to restore injured salmon runs to pre-spill levels or to enhance either injured or equivalent runs above pre-spill levels. Two techniques could be applied under this option as described below. As part of a project-level monitoring program, a representative group of fry may be coded-wire tagged to evaluate the success of the program and reduce exploitation of damaged stocks in the fishery. Recoveries of coded-wire tagged fish when they return as adults will provide additional information fishery managers need to direct exploitation away from damaged stocks.

48.1 Improve survival with remote egg takes and rearing in egg boxes or hatcheries.

Artificial spawning techniques could be used to fertilize eggs taken from wild salmon. Fertilized eggs could then be placed in egg boxes adjacent to streams utilized by damaged wild stocks or nearby areas. Fry will outmigrate from the boxes on their own in the spring. Alternatively, wild stock eggs could be incubated in existing hatcheries and released into their native spawning areas when conditions were favorable for survival. The fry would then imprint on their home streams and return there as adults to spawn. Either of these techniques would increase the egg to fry survival rates and, given favorable marine conditions, would increase adult returns.

48.2 Improve survival with remote fry rearing in net pens.

Fry to smolt survival could be increased by rearing and feeding ~~the~~ hatchery fish in net pens until environmental conditions and food availability were optimal for survival. At this time, the fish would be released into their native spawning areas and would, as mentioned above, return to these areas to spawn. It ~~would probably not be cost effective to use~~ net pens, ~~for fry not reared in hatcheries since~~ but capturing and transporting large numbers of ~~outmigrant~~ fry would be problematic. It should also be noted that net pen rearing should be done very carefully to mitigate increased risks of disease transmission caused by confining large numbers of fry in a relatively small space.

MEANS TO IMPROVE RECOVERY

The fry-to-adult survival of pink and sockeye fry reared under controlled conditions is double the natural survival rate. Marine survival is also much higher than under uncontrolled conditions. Increased stock productivity and adult returns will result from this restoration technique.

Additional information:

This option may be found under alternative 3, 4, and 5 for sockeye salmon and under alterative 5 for pink salmon.

The injury descriptions are found on page ____ for pink salmon and on page ___ for sockeye salmon.

Chris

March 24, 1993

47.0 Cooperative Program With Subsistence Users to Assess Marine Mammal Harvest Levels

Harbor seals and sea otters are legally harvested by subsistence users in the spill area. This option provides a means for agency wildlife biologists and subsistence users to cooperatively assess the need for voluntary harvest reductions. If it was mutually agreed that an injured species was being overharvested, ~~biologists and~~ subsistence users and biologists could ~~mutually~~ determine voluntary reductions in subsistence harvest levels which would remain in place until populations had recovered from oil spill injuries. Harvest reductions would enhance the rate of natural recovery of injured species by reducing harvest pressures. ~~If harvest levels are reduced, plans should be made to provide alternative sources of traditional foods~~. Subsistence harvest and other services dependent on these species would also benefit in the long-run from population recovery.

Funding would be used to pay for biologists to travel to subsistence areas and meet with subsistence hunters and, possibly, to reimburse subsistence hunters for assistance provided in gathering relevant biological information or samples. This would facilitate regular, face-to face discussion of the latest information on the injury status of subsistence species and would supplement ongoing public information efforts, such as newsletters and videos put out by the Subsistence Division of the Alaska Department of Fish and Game. This option would be closely coordinated with all such ongoing agency programs.

How will this help recovery?

If current subsistence harvest levels are slowing species recovery and voluntary harvest reduction can be mutually agreed upon, reduced harvest pressures could enhance the rate of recovery. Increased communication between agency biologists and subsistence users could help the users decide if their traditional harvest activities might be slowing the recovery of the injured populations. Face-to-face contact between agency researchers and subsistence users increases community trust in scientific data and facilitates discussion of the politically and culturally sensitive topic of subsistence harvest levels. In addition, biological and harvest information provided to agency biologists by subsistence hunters could provide useful supplements to existing data.

Additional information:

This option is found in alternatives 3, 4, and 5.

The injury description for sea otters is found on page ____.
The injury description for harbor seals is found on page ____.

Option 46 Develop a cooperative program with commercial fishermen for harbor seal management.

This option could combine an education program along with an observer program between researchers, managers and commercial fishermen. The potential for fishermen to be impacted by regulations designed to protect harbor seals is very great. Developing a cooperative program that is willingly supported by commercial fishermen may help lessen the impact of any such legislation. It would also help the researchers and managers develop a better understanding of commercial fishing interactions and the long-term harbor seal decline.

Note - this is simply a description for Wolcoff. The actual wording will be changed for the summary that appears in the draft plan. Have them talk with me if they need more information at this time. Thanks, karen KLINGE (907)278-8012

FOUND IN ALTERNATIVES 3, 4 & 5

April 8, 1993

45.0 Facilitate Changes in Black Cod Fishery Gear

This option would examine the feasibility of subsidizing a voluntary change of gear types in the Prince William Sound black cod (sablefish) fishery. The existing fishery uses longlines and has historically attracted killer whales. The whales learned to strip the cod off the lines. In the past, this has resulted in harassment and shooting of killer whales. While this has not been a major problem recently, upcoming changes in the way the fishery will be conducted may increase interactions. However, in areas such as British Columbia where black cod are caught in pots, whales are unable to take the fish and are not generally attracted to the boats.

Several factors must be considered to determine the feasibility of subsidizing a gear change, one of which is the willingness of fishermen to make the switch. Also, boats must be above a certain size in order to safely handle pots and, if large numbers of small boats currently participate in the fishery, the gear change would not be feasible. Other factors to study would be the history and location of problem areas, and the impact of the upcoming changes in the way the fishery is regulated, which will result in fewer boats fishing for longer periods. This may provide more sustained opportunities for whales to steal fish from boats they have learned to associate with longline fishing.

How will this help recovery?

If changing gear types is feasible and fishermen are willing to make the change, the switch will reduce interactions between fishermen and killer whales. Since killer whales are not able to take black cod from pots, they will not be as attracted to the boats attracted to pot fisheries and won't be as subject to harassment by fishermen. This reduction in disturbance and should facilitate recovery of killer whales in the Prince William Sound area.

Additional information:

This option is found in Alternatives 4 and 5.

The description of injury for killer whales is found on page ___.

NEW VERSION

April 8, 1993

18.0 Replace Fisheries Opportunities by Creating New Salmon Runs

This option entails starting new salmon runs to replace fishing opportunities lost due to closures resulting from the oil spill. For example, if Kenai River sockeye fishing is closed or restricted for multiple years, alternative runs could partially compensate the loss. The option restores services by providing replacement harvests, but does not restore injuries suffered by impacted species of fish. Commercial, sport and subsistence fishermen could all potentially benefit.

The option would be implemented by starting terminal runs, originating from and returning to hatcheries or remote release sites. Returning fish would be harvested and brood stock would be used to artificially propagate the next generation. Since the runs would be dependent on artificial fertilization, the new runs could be terminated once recovery of target fisheries occurs.

ADF&G standards and requirements for genetic and disease screening and brood stock selection would have to be met. Also, Regional Planning Teams must approve any proposed actions. Planning concerns include avoiding harmful interactions with wild stocks and interceptions of existing stocks. There may be some areas for which this option is not appropriate.

How will this help recovery?

The aim of this option is to minimize additional injuries to user groups by providing alternative fishing opportunities when historical fishing areas are restricted. As an alternative to completely closing fisheries or reducing bag limits, fishing pressures could be redirected to target these new runs until injured stocks recover. This option could also be used to enhance fishing opportunities above pre-spill levels if new runs were continued after target species recover.

Additional Information:

This option may be found under Alternatives 3, 4, and 5 for Commercial Fishing and Recreation and Alternative 5 for Subsistence.

Injury descriptions for Commercial Fishing, Recreation and Subsistence are found on pages _____.

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EIS
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W137
(11)

March 26, 1993

MEMORANDUM

TO: Carol Pacquette
TEL: 684-5588
FAX: 548-0426

FROM: Kathy Schildbach
TEL: 354-9461 (home)
354-9338 (office)
FAX: 354-9334

RE: EIS

1. Sorry I missed yesterday's meeting. Are there notes on what was discussed? Where materials distributed? What were the meeting outcomes? Can the the information be faxed, sent or prepared for pick-up?

2. Has a new annotated outline been prepared which incorporates the comments of Ken Rice? If so, please fax it.

3. Today please send the most current issues of revised Chapters 1, 2 & 3 of the EIS.

4. The end of the month is Wednesday. I am concerned about the deliverables. Have you insight to offer?

Ken - what is principal objective:

→ brochure statement

spending the $
restoring PWS ecosystem

what happens if all $ not expended to restore
i.e., some $ left over

Note: This is an unedited rough draft of the Recreation and Tourism Section of the EIS. Also references would be provided at a later date.

6. Recreation and Commercial Tourism

a. Overview

Alaska has the largest assemblage of park, refuge and forest lands in the United States, and much of this land is still natural. The nation's two largest national forests are located in Alaska: Tongass in Southeast (16 million acres) and Chugach in Southcentral (4.8 million acres) (Ref....). The Alaska State Park System, with more than 3.2 million acres of land and water, and 100 park units, is the largest state park system in the United States. This vast expanse of undeveloped land together with freshwater and marine systems has created a wide range of outdoor recreational opportunities in Alaska including hunting, fishing, hiking, camping, skiing, sightseeing, backpacking, climbing, dogsledding, snowmobiling, snowshoeing, kayaking, canoeing, power boating, flightseeing, photographing, and filming. In recent years, mountain biking, wind-surfing, river rafting, paragliding, paraskiing, winter camping, ice fishing, and scuba diving have also increased in popularity (Ref.....). These limitless recreational opportunities has helped create a growing tourism industry which offers a variety of professional services enabling visitors to use and enjoy the wilderness.

Hiking and camping, being relatively inexpensive and easily available, are by far the most preferred outdoor recreation for the majority of Alaska's residents and visitors. Although, there are very few trails in Alaska, the vast taiga and tundra terrain along with the perpetual daylight during hiking season allow freedom to deviate from normal hiking/camping cycles (Ref....). In addition, while hiking there is a possibility of encountering the abundant wildlife. Photography of the scenery and the fauna and flora go hand in hand with hiking and camping.

The Exxon Valdez oil spill has impacted some of the recreational activities in Southcentral and Southwest Alaska. More than ----% (this figure would be provided later on) of the land in the oil spill area is designated as national and state parks, forests, and wildlife refuges and is managed by various Federal and State government agencies. The national parks and forests include the Chugach National Forest, Kenai Fjords National Park, Katmai National Park and Preserve, Lake Clark National Park and Preserve, and Aniakchak National Monument and Preserve; the national wildlife refuges include Alaska Maritime National Wildlife Refuge, Kenai National Wildlife Refuge, Kodiak National Wildlife Refuge, Alaska Peninsula National Wildlife Refuge, and Becharof National Wildlife Refuge; and the state parks include the Chugach State Park and Kachemak Bay State Wilderness Park (Ref.....). Large portions of land within Katmai National Park and the Becharof National Wildlife Refuge have been designated wilderness areas by the Congress. Both of these areas and the Kachemak Bay State Wilderness Park were oiled by the Exxon Valdez spill. The following sections describe the recreation and tourism in the spill-affected area.

b. Recreation

For the purposes of this section, the oil spill area is divided into two regions: Southcentral region which includes Anchorage, Kenai Peninsula, and Prince William Sound; and Southwest region which includes Kodiak Island, Katmai, and other southwest locations. A brief description of recreational opportunities provided by each region follows.

Southcentral Alaska

Southcentral Alaska is a land of short rivers, long mountain ranges, and wide valleys, which extends north from the Gulf of Alaska to the crest of the Alaska range. Southcentral is the rich heartland of Alaska, with one big metropolis, many small towns, some of the State's finest scenery, and best hiking/camping opportunities (Ref.....). Chugach National Forest, the second largest national forest, encompasses much of this region. The Chugach National Forest provides a highly visible and popular recreation program in the Kenai mountain range. Alaska's second-largest state facility, Chugach State Park, located within this region, encompasses nearly half a million acres. Hiking is the main recreational activity in this park with about a dozen well-maintained, well-used, moderate-to-difficult trails. Along with hiking, photography and wildlife-

watching are popular recreational activities.

The Kenai Peninsula is like a mini-Alaska, compressing all of the country's features. The Kenai is the most popular all around destination for all Alaskans and visitors (Ref.....). Captain Cook State Recreation Area, Kenai National Wildlife Refuge, Kenai Fjords National Park, Alaska Maritime National Wildlife Refuge, Kachemak Bay State Park, and Chugach National Forest are some of the areas affording a wide variety of recreational opportunities in the Kenai Peninsula and making it best in the state for wildlife viewing. The Kenai Fjords National Park, under the management of National Park Service, is an area with ice fields and a deep-water fjord coastline providing opportunities to see whales, tortoise, sea otters, and birds of all kinds. At locations in the western and southern parts of the peninsula, the Alaska Department of Natural Resources maintains public access and recreation sites (including the Kachemak Bay State Park) totaling several thousand acres (Ref....).

Few refuges contain as diverse landscape, abundant fish and wildlife populations, and varied recreational opportunities as the Kenai Refuge (Ref.....). Although not large compared to refuges in Alaska, the Kenai Refuge supports more recreational use than any other refuge in the world. The Kenai refuge has natural and man-made features necessary to support a wide variety of outdoor activities. The wide array of facilities that support and encourage public use and protect refuge resources include a headquarter, visitor centers, and 47 recreational sites including campgrounds, access areas, wayside, and trailheads. These facilities vary from small undeveloped sites to large campgrounds with tables, fire grates, parking-spurs, boat ramps, water wells, and sanitary facilities. Recreational opportunities in the Kenai Refuge include salmon fishing, camping in developed campgrounds along roads and trails to isolated and primitive areas, hunting, wildlife observation, sightseeing, canoeing, boating, horseback riding, crosscountry skiing, snowmobiling, and berry picking. Most visitors participate in several activities while on the refuge (Ref....).

Besides the public lands, various small communities offer recreational opportunities on the Kenai Peninsula and their economy, to some extent, is based on recreation and tourism. The city of Seward, located at the head of deep-water inlet known as Resurrection Bay, is popular for fishing and sightseeing. The city of Soldotna, located in the Central Peninsula region, is famous for salmon fishing in Kenai River along with scenic views across Cook Inlet. The city of Kenai sits on a bluff where the Kenai River meets Cook Inlet and where some of the greatest tidal ranges occur, is famous for whale watching. Incoming tides actually reverse the flow of the river, influencing the movement of fish and the white beluga whales that follow them. Homer, located on the southern tip of the Kenai Peninsula provides charter boat tours to Gull Island for viewing thousands of birds. Homer is also visited for salmon fishing (Ref....).

Prince William Sound, located within the Southcentral region at the northern-most point of the Gulf of Alaska, is considered by many to be a unique, pristine, wilderness abundant with land and marine wildlife. The Sound is filled with deep fjords, tidewater glaciers, and hundreds of islands with innumerous sea birds. Murre colonies on Chiswell Islands, located in this region, are colonies most visited by tourists in Alaska. Prince William Sound covers over 2,700 miles of coastline, 4.4 million acres of National Forest and three of North America's major icefields. Prince William Sound offers tremendous opportunities for hiking, sightseeing, wildlife viewing, glaciers viewing, and fishing (Ref.....).

Several communities located within the Prince William Sound area offer recreational opportunities and services expected from large cities. The city of Cardova, a modern thriving community, offers a wide variety of lodging options and recreational services including flightseeing, several boat charter services, and recreation centers. The city of Valdez, surrounded by towering mountains, provides a wide variety of local tours and sightseeing opportunities. Numerous scheduled cruises to Columbia and Shoup Galciers start here. In addition, several guided walking and bus tours showing historic Valdez and the Alyeska Pipeline Terminal are also available (Ref...).

Outdoor recreation plays an important role in the lifestyles of many Alaskan residents. A public survey conducted on the lifestyles of Southcentral Alaskans yielded information on the recreational activities that these residents engage in (Table I) (Ref....). The results of the survey indicated that driving, walking, and

fishing were the most popular activities among the Southcentral Alaskans. Respondents also indicated that the important attributes of their favorite activities include getting away from usual demands, being close to nature, doing something exciting, experiencing new and different things, and being with family and friends. Attributes of favorite recreational places considered important by the respondents included fishing opportunities, scenery, and remoteness.

Table I

Participation of Southcentral Residents in Various Activities

Activity	% of Respondents Who Engaged in Activity
Driving for pleasure	59
Walking or running for pleasure	53
Freshwater fishing	42
Attending outdoor sport	37
Tent camping	31
Motor boating	30
Bicycling	29
Cross Country skiing	26
Target shooting	25
RV camping	24
Hiking with pack	22
Baseball, softball	19
Flying for pleasure	19
Sledding, toboggan	17
Kayaking, canoeing	17
ORV winter	17
ORV summer	14
Outdoor tennis	17
Swimming, scuba diving	16
Alpine skiing	14

Source: USDA 1981. Clark, Roger, Johnson, Parryll. Alaska Public Survey.

Southwest Alaska

Southwest region includes the Kodiak Island group, the Alaska Peninsula, the Aleutian Islands, and Katmai. In this region Katmai National Park and Preserve, Alaska Peninsula National Wildlife Refuge, Becharof National Wildlife Refuge, Kodiak National Wildlife Refuge, and Aniakchak National Monument and Preserve are located.

Kodiak Island is the largest island in Alaska and the second largest in the U.S. Kodiak has Alaska's longest history, largest fishing fleet, and biggest brown bear population. Kodiak Refuge, established in 1941 to protect the habitat of brown bear and other wildlife, occupies about two-thirds of the island. Five species of Pacific salmon rearing and spawning habitat is provided within the refuge. Over 200 species of birds, large brown bear and bald eagle populations make the refuge an exciting place for wildlife viewing. Other recreational activities include photography, rafting, canoeing, camping, backpacking, hiking, hunting, and fishing. A visitors center and a limited number of recreational cabins are also located within the refuge (REF....). The town of Kodiak, where the majority of the Kodiak Island population live, is accessible by air and is a tourist attraction for viewing commercial fishing operations. The communities of Larsen Bay and Ports Lion on the Kodiak Island are visited for hiking, fishing, and hunting opportunities and their economy to a large extent is dependent on tourism.

c. Sport Fishing

Sport fishing is one of the most popular recreational activity for both residents and visitors of Alaska. A wide variety of sport fishing opportunities exist in the oil-affected region. Several species of Pacific salmon, rockfish and halibut are available in both fresh and salt water and Dolly Varden, rainbow and cutthroat trout are found in several freshwater streams and lakes (Ref....). Although sport fishing is popular throughout the state, seventy percent of Alaska's sport fishing occur in the Southcentral region and majority of which occur in the Kenai Peninsula. The Kenai River is well known for king salmon fishing. Sport fishing throughout the state is conducted according to the Alaska Sport Fishing Regulations, formulated by the Alaska Department of Fish and Game. The fishing regulations specify bag, possession, and size limits for the fishes to be taken from different streams/rivers/lakes etc (Ref...). In addition, there are management plans for king salmon in Kenai River.

Historically (between 1984 and 1988), the number of anglers, fishing days, and fish harvest in the oil-affected area had been increasing at a rate of 10 - 16% per year. However, following the oil spill, there have been decline in the number of anglers, fishing days, and fish harvest, whereas, the area outside the oil spill continued to experience increase. The estimated number of anglers in the oil-affected region decreased 13% from 120,160 in 1988 to 104,739 in 1989, the number of days fished decreased 6% from 312,521 to 294,598, and the number of fish harvested decreased 10% from 352,630 to 318,981 (Mills, 1992). Since 1977, there has been a 4.5% average annual increase in the number of residents who sport fish, while the number of non-residents sport fishing has increased 16% annually.

d. Hunting

Alaska has 12 species of big game, including several not found (muskox, Dall sheep), or very rare (wolf, wolverine, brown bear, caribou), in the other 49 states. Approximately 144,000 - 166,000 moose; 835,000 caribou; 60,000 - 80,000 Dall sheep; 32,000 - 43,000 brown bears; over 100,000 black bears; 5,900-7,900 wolves; 2,100 muskoxen; 13,000 - 15,000 mountain goats; 350,000 - 400,000 black-tailed deer; 1,400 - 1,600 elk and 850 bison inhabit the state. Also abundant are 19 species of furbeareres, three species of ptarmigan, four species of grouse, two species of hares and many species of waterfowl, migratory birds, raptors and marine mammals (Ref....). Hunting is conducted according to the Alaska State Hunting and Trapping Regulations formulated by Alaska Department of Fish and Game (Ref...). These regulations specify bag limits and season area-wise for hunting. The many wildlife refuges, parks, and national forests located within the oil-affected region provide tremendous opportunities for hunting.

e. Tourism

Tourism is Alaska's third-largest industry behind petroleum production and commercial fishing. Tourism was, and is, an industry of growing economic importance to the state. Once regarded as a stepchild of the major traditional resource industries, tourism's obvious growth in the 1980s gave it legitimacy as a major industry. A visitor survey conducted by the Alaska Division of Tourism under the Alaska Visitors Statistics Program II (AVSP) revealed important statistics on the tourism industry (Ref.....). The survey results indicated that more than 750,000 people visited Alaska in 1989 from all around the world and of this 521,000 visited in summer generating $304 million in revenue in summer alone. The Southcentral region was the major beneficiary of visitor spending, capturing 44% of the $304 million. Sixty-nine percent of the total summer visitors were vacation/pleasure (VP) visitors. Southcentral Alaska accommodated more visitors per year than any other region but among VP visitors, Southeast was the most visited region, with nearly three out of every four VPs visiting the region. Southcentral was second with two-thirds of the visiting market (Ref...).

Information on vacation planning for tourists is available through various sources such as, Alaska Division of Tourism, travel agents, and newspaper travel sections. The State Vacation Planner is widely used by the visitors in planning their Alaska trip. Once in Alaska, the majority of the visitors used visitor information centers (VICs), and reported that the VICs were doing a good job. Past studies have shown that the use

of VICs enhanced visitor satisfaction and the likelihood of returning to Alaska in the future. A visitor using a VIC is more likely to see the best attractions in the local area, have contact with friendly locals, and be more active as a result. However, with the exception of one visitor information center at Tok, the state of Alaska relies on local communities and government agencies (usually Federal) to provide information to visitors. While many communities and agencies do a good job, brochure distribution practices are inconsistent, as are training, hours and seasons of operations, signage, and facility size and quality. Additionally, most agency information centers are oriented towards single attractions and some communities limit the types of information and brochures which they offer (Ref...).

Survey results also revealed that Anchorage, Seward, Kenai/Soldotna, Homer, Valdez/PWS, and Whittier were among the most visited communities in the Southcentral region and King Salmon, Kodiak, Bethel were among the most visited communities in the Southwest region. The most visited attractions on the Kenai Peninsula were Kenai River, Kenai National Wildlife Refuge, Resurrection Bay, Kachemak Bay, and Kenai Fjords National monument. In the Prince William Sound area the most visited attractions were Columbia Glacier, Prince William Sound, Valdez Pipeline Terminal, and College Fjord. In the Southwest region the most visited attractions were Kodiak Russian Orthodox Church, Katmai National Park, and Kodiak National Wildlife Refuge. In addition, cultural attractions and museums were popular among Southcentral visitors (Ref....).

Among the wide variety of recreational opportunities offered in Alaska, wildlife viewing was the most common activity in every region among the VP visitors and was the main activity in the Denali region. Bird watching was also common in all regions. Rafting was most popular in Southeast and Denali. Hiking was universal but Southwest and Denali visitors did it most. Southwest was fishing country, with twice the participation of the next leading fishing region, Southcentral (Ref...).

The visitors of Southcentral rated flightseeing and day cruises highly in the tour list while rafting, hiking, and canoeing/kayaking lead the activities list in satisfaction. Southwest VP visitors give that region's activities the highest marks in the state. Fishing (fresh water more than salt water), hunting, rafting, and canoeing/kayaking all score very well, and the state's highest flightseeing score was in Southwest (Ref...).

DYNAMAC
CORPORATION
Environmental Services

(13)

March 26, 1993

Ms. Carol Paquette
Walcoff & Associates
635 Slaters Lane, Suite 102
Alexandria, VA 22314

Dear Carol:

Enclosed is the revised write-up of the EIS methodology that we discussed at the meeting at Walcoff on March 25. Also enclosed is the draft of the Recreation and Tourism sections for the Affected Environment chapter (Chapter III) of the EIS.

After considering the scheduled delivery date to RPWG for the drafts of Chapters I, II, and III, it appears that a great deal of work is left to do in a very short period of time. I have not seen how previous submittals of information (e.g., the commercial fishing section) have been incorporated into those chapters, and I would like to make some revisions to that information. Also, it appears that there is a deficit of information necessary to complete Chapter III of the EIS outline (annotated outline) recently revised by the Restoration Team (per comments received from Ken Rice March 24). Because of the recent Restoration Team revisions to the outline, I think it would be a legitimate request to ask Ken Rice for additional time to complete Chapter III, and make Chapters I and II consistent with what was recommended by the Restoration Team.

As you stated in our meeting at Walcoff on March 18, you are taking responsibility for completing Chapters I, II, and III. I believe this is a major effort and would like to provide assistance wherever possible. I have several Dynamac staff available to provide the manpower should you require such help with the completion of the sections of Chapter III that remain unfinished.

Please do not hesitate to call me concerning the above-mentioned work effort, and advise of how Dynamac should proceed.

Sincerely,

Matthew C. McMillen

Matthew C. McMillen
Senior Environmental Scientist

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