

15.2.1

3 of 5

**ADDITIONAL PUBLIC COMMENT ON 1989 (15.2.1)
NATURAL RESOURCE DAMAGE ASSESSMENT PLAN
IS LOCATED IN BLACK BINDERS ON TOP OF FILING CABINET**

PROPOSAL FOR
SELECTING DATA TO DESCRIBE OILING AT NRDA STUDY SITES

**DRAFT
RECEIVED**
NOV 02 1992

Selection of the most relevant and consistent data to describe oiling at NRDA study sites could proceed stepwise as follows:

EXHIBIT 1
SPILL
INVESTIGATOR
COUNCIL
ADMINISTRATIVE RECORD

1. Inventory and describe each of the oiling data sets gathered by response projects.

-NRDA needs to know which data sets are available and have a description of each to use in step 2.

-Descriptions should include:

- a. Objectives
- b. Methods
- c. Results
- d. Assessment of reliability

-Personnel required to accomplish this step include one state and one federal litigation support person assigned full-time to locate and describe data sets for each government (some of this work has already been accomplished by the Data Exchange Technical Committee).

2. Selection of the most applicable data set(s) for each NRDA study.

-Using the descriptions developed in step one, a selection of the most applicable data set or sets to describe oiling will be made for each NRDA study. If oiling was described by the NRDA investigator, its applicability will also be evaluated.

-The primary concern is selecting an oiling data set that best describes the pathway of oil contamination. For example, oiling of salmon eggs and fry in an anadromous stream is more appropriately described by field sketches or photos of oil present in that specific stream than by more general aerial observations of shorelines.

-Selections will be made by a group consisting of:

- a. NRDA investigator
- b. State and federal litigation support personnel
- c. Oiling peer reviewer or agency oiling expert
- d. State and federal legal team representatives.

-Rational for selections will be documented.

3. Identification of inconsistencies between oiling data sets

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when more than one set is considered appropriate.

-If more than one data set is selected to describe oiling for an NRDA study, then descriptions for each study site will be compared and inconsistencies will be identified and documented.

-This work will be completed by the state and federal litigation support personnel with the cooperation of NRDA investigators.

4. Resolution of inconsistencies between oiling data sets when more than one set is considered appropriate.

-After inconsistencies have been identified in step 3, each one will be examined in detail and an attempt made to explain why differences exist. It is likely that detailed field notes, photos, etc. will be required.

-Resolutions will be made by a group including:

- a. NRDA investigator
- b. State and federal litigation support personnel
- *c. Oiling peer reviewer or agency oiling expert
- *d. State and federal legal team representatives.
(*may not be needed)

-Resolutions will be documented.

**STATE OF ALASKA
OIL MOVEMENT ON WATER**

(DEPARTMENT OF ENVIRONMENTAL CONSERVATION)

Objectives: These studies were intended to:

1. provide information on oil movement on water for use in making decisions regarding the allocation of cleanup equipment and personnel within Prince William Sound and the Gulf of Alaska, and
2. locate and estimate the number and magnitude of sheens emanating from shorelines previously oiled by Exxon or other potential sources (e.g. Exxon cleanup equipment).

Alaska Department of Environmental Conservation (ADEC) initiated this work to track the actual and likely trajectory of oil spilled by the Exxon Valdez.

Status: This effort was begun on the first day of the spill in 1989 and continued in 1990.

Scope: Data were collected throughout the spill area.

Supporting Data: Components of this study include:

1. aerial surveillance to track the movement of oil on water,
2. analysis of existing satellite imagery, and
3. sheen surveillance to locate and estimate the number and size of sheens and to pinpoint their source as possible.

Raw data consists of hand annotated maps showing the flight path of surveillance aircraft and location of oil. Field notes were also taken to document size and color of oiling, date, time, observers, and closest shoreline segments. Additional documentation is provided by photos and videos

Database Size, Format, and Storage: Mapping data is stored on hard disks, requiring approximately 200 megabytes. Tabular data is also stored on hard disk, requiring approximately 30 megabytes.

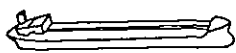
**Database
Management
System:**

Mapping Data is in ADEC Geographic Information System for queries, printing, and analysis. It is also available in standard AutoCad formats. In addition, tabular data on location, size, color, observers, date, time and closest shoreline segment are in R-base.

Reports:

ADEC maps of the extent of oiling at various time intervals after the spill have been produced using aerial surveillance data (Figure 1). Satellite imagery data is in the form of a report from University of Alaska, Fairbanks to the Trustees.

Extent of oil as
observed by ADEC
on March 29, 1989


"Exxon Valdez"
grounding site

Valdez

Bligh Island

Prince William
Sound

Knight I.

Sawmill Bay

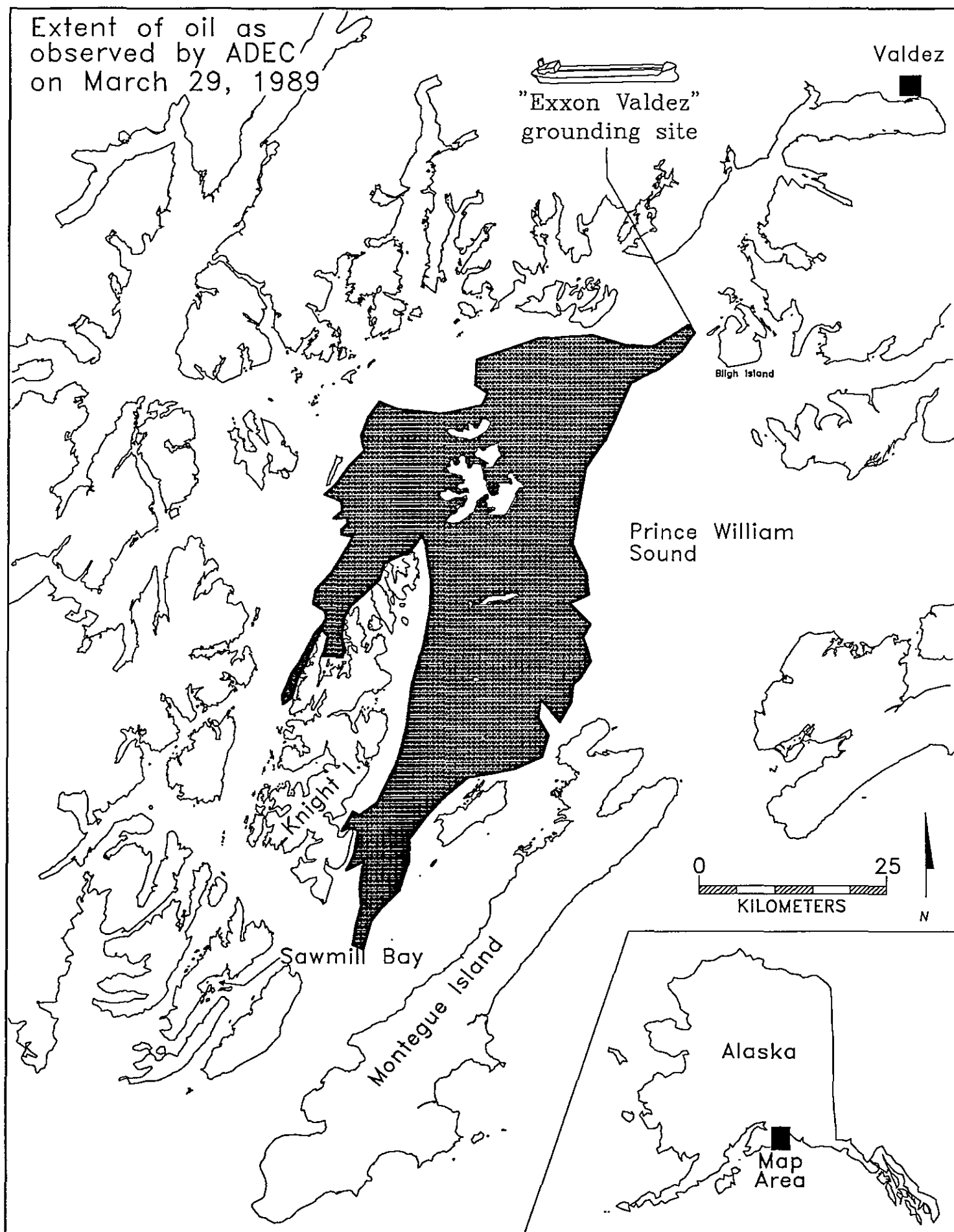
Montegue Island

0 25
KILOMETERS

N

Alaska

Map
Area



**STATE OF ALASKA
SHORELINE ASSESSMENT**

**AERIAL SURVEYS
(DEPARTMENT OF ENVIRONMENTAL CONSERVATION)**

Objective: Shorelines were surveyed by trained observers from low flying helicopters to determine the amount and extent of oiling.

Status: Observations began on March 26, 1989 and continued until August 1989. Most were completed during early and mid summer. A time series is available for this period.

By the end of summer 1989 aerial observations were no longer conducted and the emphasis was switched to shoreline survey stations.

Scope: Work was conducted over the entire spill area.

Supporting Data: This data is available in the form of maps for each individual survey or as maximum impacts for any time period. There are four categories of oiling: heavy, moderate, light and very light. These have been described in the "Shoreline Cleanup Manual".

Records of survey dates, principle observers, and survey methods are also available.

Database Size, Format and Storage: The database is stored on hard disk, requiring approximately three megabytes.

Database Management System: Data is in Alaska Department of Environmental Conservation (ADEC) Geographic Information System (GIS). It is available in standard Autocad form, and as a map. Data detailing survey date, observers and survey methods is also stored in R-base. This tabular data is linked to the GIS.

Reports: Maps of maximum cumulative shoreline oiling have been produced.

**STATE OF ALASKA
SHORELINE ASSESSMENT**

**SURVEY STATIONS
(DEPARTMENT OF ENVIRONMENTAL CONSERVATION)**

Objectives: Shoreline survey stations were established to:

1. provide a detailed time series of beach status for planning of response activities,
2. show the change over time of the status of oiling,
3. provide comparisons between various types and amounts of treatment, and
4. determine the composition of oil in the sediments and on the surface through chemical analysis of samples collected over time.

Status: Data collection was done on an as needed basis. It began in March 1989 and will continue at least into spring/summer of 1991. Measurements were taken along an established transect at each station during each visit.

Scope: Survey stations were located from Prince William Sound to the Alaska Peninsula.

Supporting Data: Data were collected at 134 stations and included:

1. a profile of the beach,
2. measures of percent cover of oil on the surface,
3. measures of the thickness of surface oil,
4. measures of the type and thickness of subsurface oil taken from pits dug along the transect,
5. a base map of the site, and
6. Total petroleum hydrocarbons (TPH) and detailed chemical analyses from sediment samples (not all detailed chemical analyses have been completed but most TPH analyses are available).

Photographs of each station are also available.

Database Size, Format and Storage: The database is stored on hard disk, requiring approximately 30 megabytes. It can be unloaded into an ASCII file if needed and is easily adapted to produce a variety of products and receive additional inputs. The associated graphs are also stored in computer form. A database of photos also exists and can be searched by station and date. Station photographs are available for printing.

Database Management System: The data is in R-base files. The graphs are in sigma plot and HPGL form.

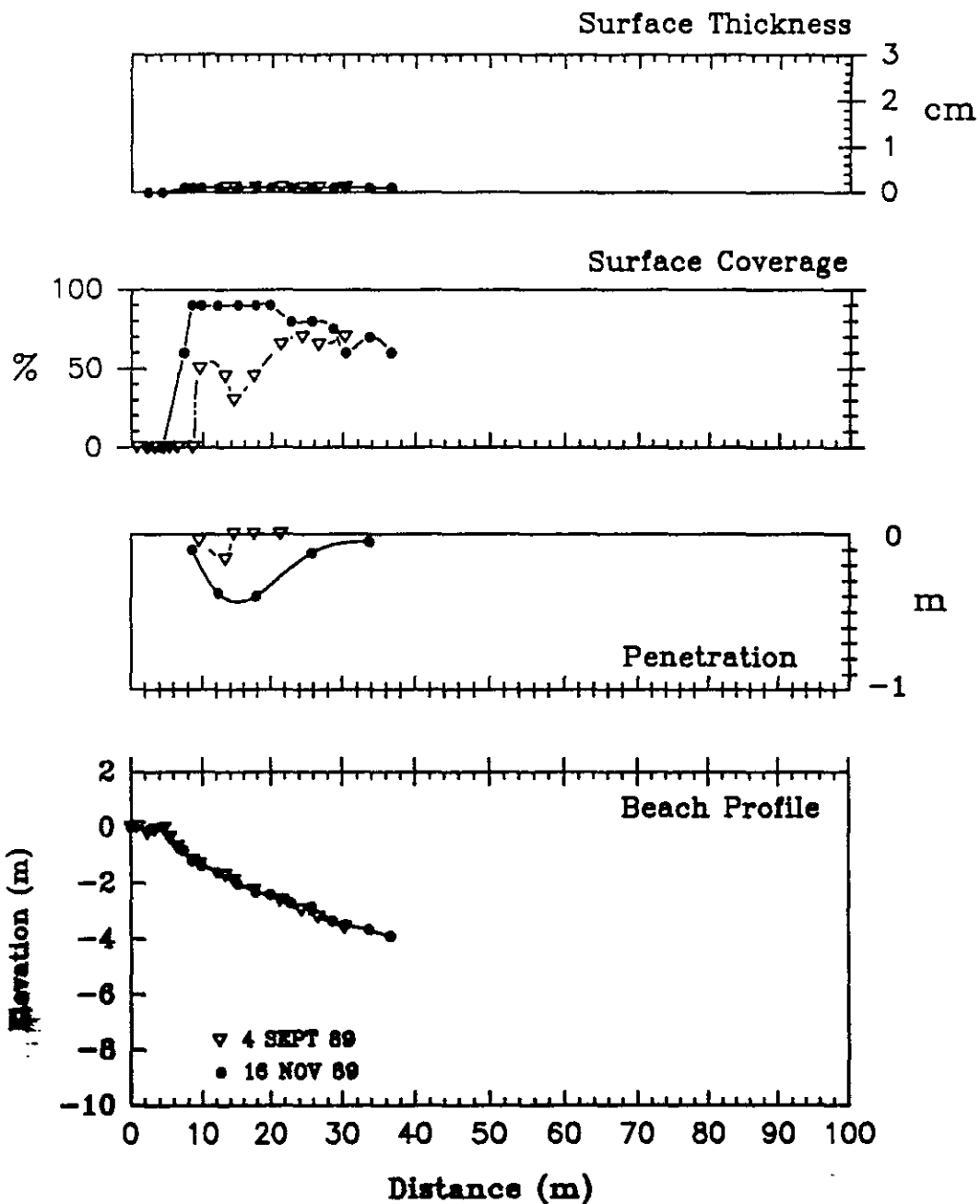
Reports: Reports are in the form of station survey books.

Alaska Department of Environmental Conservation
BEACH TRANSECT DATA

GREEN ISLAND

Segment GR101

Station 022



STATE OF ALASKA
OIL MOVEMENT ON WATER AND SHORELINE ASSESSMENT

COMMERCIAL FISHERIES
(DEPARTMENT OF FISH AND GAME)

Objective: This effort was conducted to:

1. ascertain if oil pollution was present in fishing districts, sections, areas and subareas before fishery openings by conducting aerial, marine and beach surveys, and
2. To document the character and general location of oil found during surveys.

Alaska Department of Fish and Game (ADF&G) also conducted test fisheries before initial fishery openings to determine whether there was a potential for gear contamination or adulteration of product. All information was then used to decide whether areas should be closed to fishing as a result of oil pollution.

Status: Data collection began in April 1989 and continued in 1990.

Scope: The scope of this effort included all fishing districts, sections, areas and subareas in northern and western Prince William Sound; Resurrection Bay and the outer Kenai Peninsula; Cook Inlet; Kodiak, and the Alaska Peninsula.

Supporting Data: Test fisheries were conducted and beaches and near shore areas were surveyed. Samples were collected for hydrocarbon analysis from: floating and beached oil, sheens, and contaminated fishing gear, and contaminated fish. Variables recorded during beach surveys included location; date; time; survey distance, conditions, and method; and oil impact and type. Near shore areas were inspected during beach surveys for the presence of oil. Photographs and videos were taken to supplement field logs.

Total number of surveys conducted in 1989 and 1990 were approximately 8,616 and 738, respectively. Total samples collected for hydrocarbon analysis in 1989 and 1990 were approximately 1752 and 43, respectively.

Database Size, Format and Storage: Data from Kodiak and the Alaska Peninsula are stored on hard disk, requiring approximately 3 megabytes. All other data is in the form of field logs. Summary tables of data from Prince William Sound are available in Lotus 123 files.

Database Management System: Electronic data are in R-base files.

Reports: Much of the 1989 and 1990 data collected in the Kodiak and Chignik management areas was reported in State of Alaska Regional Information Reports 4K89-28, 4K89-24 and 4K90-26. Additional information on Prince William Sound studies conducted during 1989 will be detailed in the ADF&G annual finfish management report for 1989 that is expected to be available in January 1991.

Results of two studies conducted cooperatively with Exxon in Prince William Sound during 1990 were reported in Shrimp Pot Fishery/Herring Net Tow Study, Exxon Study No 47 and in Salmon test Fishery, Exxon Study No. 75.

**STATE OF ALASKA
SHORELINE ASSESSMENT**

**WALKING SURVEY
(DEPARTMENT OF ENVIRONMENTAL CONSERVATION)**

Objectives: This survey was conducted to determine how much oil was remaining on the shoreline after the 1989 treatments.

Status: The survey was done from September 11 to October 19, 1989. This effort has been commonly described as the "Fall Walk-a-thon". The data was provided to Exxon, the U.S. Coast Guard and other state and federal agencies. It formed the basis for the spring 1990 walking surveys of shoreline.

Scope: The survey was conducted over the entire spill area.

Supporting Data: The data is in the form of hand annotated maps that were digitized. Also, there is extensive tabular data detailing principle surveyors, survey date, samples taken, and subsurface oiling thickness and characteristics.

Database Size, Format and Storage: The tabular data and maps are stored on hard disk and require approximately 4.5 and 8 megabytes, respectively.

Database Management System: Digitized map data is in Alaska Department of Environmental Conservation and Department of Natural Resources Geographic Information Systems. It is also available as AutoCad drawing files. Tabular data is in R-base files that can be easily converted into ASCII format for inclusion in other databases. These files are in a user friendly application that can readily integrate other data.

Reports: Data has been published in a series of books that have been distributed to all interested parties.

**STATE OF ALASKA
SHORELINE ASSESSMENT**

**OILING SURVEYS
(DEPARTMENT OF FISH AND GAME)**

Objective: This effort was designed to conduct systematic and opportunistic surveys of shoreline oiling conditions.

Shoreline oiling information was collected to supplement Alaska Department of Environmental Conservation data. Focus was on shorelines near commercial fishing areas; refuges, critical habitats and game sanctuaries; and other areas of key ecological importance (for example, pinniped haulouts).

Status: This effort has been underway since the spill occurred in 1989. Some sediment sampling has been conducted, but the majority of data have been obtained through site observations. Most data is in the form of written or photographic documentation.

Scope: Data were collected throughout the spill zone in Prince William Sound, Seward, Homer and Kodiak.

Supporting Data: In order to assist other divisions within Alaska Department of Fish and Game (ADF&G), and other agencies involved in the Exxon Valdez oil spill cleanup effort, ADF&G spill response staff continually monitored oiling conditions in key fish and wildlife habitats and harvest areas. This information was used to schedule work, define appropriate treatments, develop work plans, and provide additional information for management decisions.

Data products include field and office logs, trip reports, oil and sediment samples, intertidal transect observations, daily and weekly reports, and photographs and videos.

Database Size, Format and Storage: Most of the information obtained during 1989 has been cataloged. The 1990 information is in the process of being cataloged. The data resides primarily as hard copy in file cabinets in

Anchorage, Homer and Kodiak. There are approximately 10 file cabinets of documents, photographs and videos. Narrative information has not been entered in an automated retrieval system at this time.

**Database
Management
System:**

Data are in R-base and Wordperfect 5.1 files.

Reports:

A preliminary report on intertidal transects in the Homer zone should be completed in December. The transects were designed to evaluate the effects of oil and various treatment methodologies on intertidal organisms.

**STATE OF ALASKA
SHORELINE ASSESSMENT**

**ANADROMOUS FISH STREAMS
(DEPARTMENT OF FISH AND GAME)**

Objective: This effort was designed to document oiling conditions in anadromous fish streams in order to facilitate cleanup operations.

Information on stream oiling conditions was used to develop cleanup work plans, schedule treatments, define locations and extent of contamination, estimate oil volumes, and assess oil related impacts.

Documentation was gathered during field monitoring activities and in systematic surveys.

Status: Anadromous fish stream assessments began immediately following the oil spill in April 1989 and continued through the summer of 1990. All available stream information is being compiled in individual stream files. Additional surveys are planned during spring 1991 to assess levels of oiling and develop work plans if necessary.

Scope: Data were collected from streams in Prince William Sound, Seward, Homer and Kodiak zones.

Supporting Data: Surveys of oiling in anadromous fish streams were both systematic and opportunistic. Systematic surveys began immediately following the spill in April of 1989 when approximately 50 streams in the Prince William Sound oil impact zone were evaluated for degrees of oiling. This effort was followed by a comprehensive survey of all streams that were located in oiled areas throughout the impact zones (PWS, Seward, Homer and Kodiak) during late summer 1989. Representative streams continued to be assessed over winter 1989-90, and a pre-assessment survey was conducted in early April 1990 to define candidate streams for a joint ADF&G/Exxon Anadromous Stream Cleanup Assessment Team (AnadScat) survey later that month. The AnadScat formed the basis for specific work plans to address cleanup of anadromous fish streams. Streams were once again assessed during the August Shoreline Assessment Program (ASAP).

Opportunistic reports of stream oiling conditions were made during routine field inspections, during Resource Advisory Team (RAT) operations, and during the course of stream cleanup monitoring.

Data products include field log notebooks, stream survey data sheets, oiling diagrams, pre-assessment survey data forms, AnadScat data forms, AnadScat work orders, daily reports, RAT reports, RLS forms, work order addendums, laboratory analyses, ASAP survey reports, staff summary reports, oil and sediment samples, videos, and photographs.

Database size, Format and storage: Approximately 20 megabytes were required to catalog oil and sediment samples, video and photographic documentation. Data stored on hard and floppy disks, and in hard copy. Most site-specific information is hard copy stored in individual stream files.

Database Management System: Data are in R-base files.

Reports: Draft reports on ADF&G 1989 stream survey program have been prepared and should be finalized by December. Reports on 1990 stream survey program should be prepared by February.

SHORELINE SURVEILLANCE FOR CLEANUP

August Shoreline Assessment Program (ASAP)

- **Objective**

In July and August, 1990, five teams composed of a geomorphologist, ADEC, USCG/NOAA, the land manager, and Exxon conducted a survey of shorelines having cleanup operations in 1990. These segments were mutually selected by all parties from 1990 worksites to identify areas needing additional work in 1990 or reassessment in 1991.

- **Scope of Program**

The teams surveyed 522 shoreline subdivisions covering about 160 miles.

- **Types of Analyses**

Documents for segments with follow-up recommendations were prepared by the team and the Cultural Technical Advisory Group and were submitted to the TAG for review and to Exxon and the FOSC for approval of cleanup plans or assignment of priority for inspection in 1991.

- **Protocols**

Standardized forms were used by the teams to collect comparable data among surveys and document observations in a uniform manner.

- **Materials That Potentially May be Used in Exxon/Trustee Discussions**

Information from the SCAT, SSAT, and ASAP programs will be consolidated to show the evolution of shoreline oiling from May 1989 through August 1990. Exhibits will include maps showing extent and degree of oiling and statistics on oil coverage.

- **Potential Material for Data Exchange**

Each shoreline segment file contains the following information; in cases where shoreline segments covered in the original SCAT survey were subdivided, the file contains information on each subdivision.

- Field Shoreline Comment Sheet
- ASAP Shoreline Oiling Summary
- Shoreline sketch
- Shoreline map showing sites and oiling bandwidth

- ASAP Follow-Up Recommendations Form

In addition to summary and interpretive reports, the material submitted will be approximately 5000 pages in over 500 files.

SHORELINE SURVEILLANCE FOR CLEANUP

Set Aside Site Monitoring Program (SAS)

- **Objective**

In 1989 state and federal agencies and Exxon agreed to set aside nine shoreline segments from the cleanup program to allow monitoring of recovery of untreated areas. The survey program for these sites included Type A assessment at up to six locations, SSAT inspection in the spring of 1990, and a joint set aside survey (SAS) conducted in June 1990. Sites were chosen to represent a variety of beach morphology types, exposure to waves, and degrees of oiling.

- **Scope of the Program**

Data available include information similar to that generated by the SSAT program and the Type A survey program.

- **Types of Analyses**

Same as SSAT and Type A programs.

- **Protocols**

Same as SSAT and Type A programs.

- **Materials That Potentially May be Used in Exxon/Trustee Discussions**

SAS report will consolidate information from applicable programs for each site.

- **Potential Material for Data Exchange**

SAS report and supporting data.

SHORELINE SURVEILLANCE FOR CLEANUP

Spring Shoreline Assessment Team (SSAT) Survey

- **Objective**

In April and May 1990, 20 teams composed of a geomorphologist, a biologist, ADEC, USCG or NOAA, an appropriate land manager, and Exxon conducted a survey of shorelines in PWS and GOA. Segments were selected to plan and approve 1990 cleanup activities. These teams documented oil coverage and nature, subsurface oil occurrence, beach morphology and geometry, and suggested cleanup techniques. The program included information on subsurface oil from 5000 pits.

A separate, parallel survey of 106 anadromous streams in PWS and GOA was conducted by teams composed of a geomorphologist, a biologist, ADF&G, NOAA/USCG, a land manager, and Exxon. These surveys collected information similar to the general SSAT program, but focussed on protecting streams during cleanup operations.

- **Scope of Program**

The various teams completed assessments of over 1000 shoreline subdivisions covering 1220 miles.

- **Types of Analyses**

Documents prepared by the survey teams and the Cultural Technical Advisory Group (CTAG) were submitted to the Technical Advisory Group (TAG) composed of ADEC, NOAA, USCG, and Exxon for review and to Exxon and the FOSC for approval of cleanup plans.

- **Protocols**

Standardized forms were used by the teams to collect comparable data among surveys and document observations in a uniform manner.

- **Materials That Potentially May be Used in Exxon/Trustee Discussions**

Information from the SCAT, SSAT, and ASAP programs will be consolidated to show the evolution of shoreline oiling from May 1989 through August 1990. Exhibits will include maps showing extent and degree of oiling and statistics on oil coverage.

- **Potential Material for Data Exchange**

Each shoreline segment file contains the following information; in cases where shoreline segments covered in the original SCAT survey were subdivided, the file contains information on each subdivision.

- Shoreline Evaluation Form - Signed Version
- Field Shoreline Comment Sheet
- Shoreline Oil Summary
- Shoreline Ecological Summary
- Shoreline sketch of geography, pit locations, and other features.
- Shoreline map showing subdivisions and oil band width.
- Addendum: Subdivision constraints

In addition to summary and interpretive reports, the material submitted will involve about 28,000 pages in over 1000 files.

- **Information to be excluded from data exchange**

- 1990 FASST survey. (Results are duplicated by more detailed SSAT survey described above.)

Fish and Wildlife Service and National Park Service Shoreline Assessment

Objective: To inspect National Wildlife Refuge (NWR) and National Park (NP) shorelines within the Exxon Valdez oil spill impact zone that were not adequately examined by EXXON or the Alaska Department of Environmental Conservation; to assess the extent of oiling and to look for recoverable oil while cleanup was ongoing.

Status: During 1990, the Fish and Wildlife Service (FWS) surveyed 950 miles of the

1575 miles of NWR shoreline not surveyed by EXXON. The National Park Service (NPS) surveyed 569 miles of the 682 miles of NP shoreline not surveyed by EXXON. No additional work on remaining unsurveyed shoreline is anticipated for 1991.

Scope: The following table outlines the total miles of shoreline within the oil impact zone and the miles of shoreline assessment (SAT) done by EXXON and by the land managers.

	Total miles w/in impact zone	EXXON SAT	FWS/NPS SAT
Kodiak NWR	600	20	200
Alaska Peninsula/Becharof NWR	550	30	520
Alaska Maritime NWR	650	100	230
Kenai Fjords NP	395	68	270
Katmai NP	382	95	281
Aniakchak National Monument	68	0	45
Total	2645	313	1546

Supporting data: Biologists walking the shorelines collected oiling data in conformance with procedures established by EXXON: shorelines were given predesignated EXXON segment labels, and an EXXON shoreline oiling summary (OG sheet) and a map were filled out for each segment. Shoreline ecological summaries were filled out for many NWR beaches. All NPS shorelines received ecological and geomorphological evaluations.

Type of analyses:

- Not analyzed in any formal sense
- Data to be summarized in a report to be completed by March 1991
- Shoreline oil to be mapped by March 1991

Data base size, format and storage:

- Currently on data sheets only (3000 sheets)
- Data base size is anticipated to be less than one megabyte
- Data reported in tab-limited ASCII format, integrated into ARC/INFO on UNIX or MS-DOS systems.
- Storage on floppy disk

Data base software: ARC/INFO

Shoreline Monitoring and Assessment

1. Objective: The primary objective of this program is to evaluate the recovery of intertidal areas impacted by the Exxon Valdez spill. Analysis of data collected by the National Oceanic and Atmospheric Administration (NOAA) and others will support decisions on shoreline treatment in future spills. Comparisons will be made among shorelines treated in 1989 and 1990, untreated oiled shorelines, and unoiled control sites.

The primary measures of recovery will be the quantity, composition and distribution of residual oil; the availability of oil to biological communities; and the effects of oil and shoreline treatment on biological recovery. The rates at which intertidal and selected subtidal habitats recover from oil impacts will be monitored. These data will enable comparison of oil fate and shoreline recovery, both physical and biological, on treated and untreated shorelines.

The duration of monitoring will depend on the rates of recovery measured during the first season. While the program is expected to extend over a number of years, program planning for the second year and beyond must await analysis of the first season's data.

2. Status: Winter 1989 physical and chemical sampling and Summer 1990 physical, chemical and biological sampling have been completed. All chemical analyses of Winter 1989 samples and about 50% of the Summer 1990 chemical analyses have been completed. Additional physical surveys will be conducted in January 1991.

3. Supporting Data: At each study site, the physical setting was mapped using the zonal method. The biological and chemical data are tied to this physical framework.

Basic data measurements included:

1. A base map of the study site.
2. Beach profiles.
3. A sediment distribution map .
4. A distribution map of oil types.
5. Sediment samples for analysis of total petroleum hydrocarbons, with selected samples for detailed chemical characterization.
6. Detailed photographs.

The 1990 biological sampling effort focused on three intertidal habitat types of particular importance in Prince William Sound: protected rock, protected sand/gravel/cobble (mixed soft), and exposed cobble. The protected sites were included because of their high biological productivity and because the low energy regime reduces the rate of natural weathering of oil. Exposed cobble beaches include some of the most heavily oiled beaches in the Sound and are

areas where oil often penetrated particularly deeply into the open spaces between the coarse bed materials.

A stratified-random sampling design was used to assess important assemblage and population (individual taxa) parameters. Sampling was structured to obtain statistically reliable estimates of density or cover of macrobiota inhabiting the surface (epibiota) and, where possible, the subsurface (infauna) within important life zones. Typically, three elevations were sampled on rocky habitats and two elevations were sampled on cobble and mixed soft habitats. Because the preponderance of oil that grounded in Prince William Sound initially came to rest in the mid- to upper intertidal, population dynamics and reproductive success of a range of important intertidal organisms were examined to determine whether hydrocarbons have interfered with the intertidal communities.

Samples will be collected at each site to determine levels of hydrocarbon contamination in sediments and tissues. Samples will be labeled appropriately, recorded on field logs, frozen, and shipped to the specified analytical chemistry laboratory through appropriate channels.

Intertidal sediments were collected at each site at which mixed-soft sediments are sampled and as possible at each rocky site. At sites sampled commonly by the geological and biological program, the geological team will collect the sediments.

Subtidal sediments were collected at each site at which mixed-soft sediments are sampled and, as possible, at each rocky site. At sites sampled commonly by the geological and biological program, the geological team will collect the sediments.

Tissue samples were collected at each site using representative species. Target species for collections include the bivalves *Mytilus edulis* and *Protothaca staminea*; the snails *Littorina sitkana*, *Nucella lamellosa* and *N. lima*, and the starfish *Pycnopodia helianthoides*.

4. Data Base Size, Format, and Storage: Data base size is anticipated to be less than one megabyte. Data will be reported in a tab-delimited ASCII format compatible with programs on both Macintosh and MS-DOS systems. Storage will be on floppy disk.

5. Data Base Management System(s) and Software: There is not specific software to manage the data base.

6. Data Documentation and Supportive Information: There is not specific data documentation. Site names and data fields will be documented in the interpretive products.

7. Interpretive Products: Preliminary results of the Winter 1989 sampling program are available. A report documenting physical, chemical, and

biological survey results is expected by December 30, 1990. The report will include documentation the methods used for sampling and analysis of data, documentation of the location of sample stations and sample locations within stations, and findings for each of the specific study topics.

8. Future Plans: Additional physical surveys will be conducted in January 1991.

	Segment Number	Site Name	1989 Only	Set Aside
1	KN-405	Point Helen	X	
2	GR-103	Green Island	X	
3	SM-06	Smith Island	X	
4	SM-05	Smith Island	X	
5	KN-401	Snug Harbor	X	X
6	KN-201	Bay of Isles	X	X
7	KN-211	N.E. Knight Island	X	
8	Station	Abandoned	X	
9	EL-11	Block Island Sand Flat	X	
10	KN-112	Herring Bay	X	
11	CR-5	Crafton Island	X	
12	CR-5	Crafton Island	X	
13	KN-5000	Herring Bay	X	X
14	EL-52	Northwest Bay	X	
15	LA-15	N.E. Latouche	X	X
16	AE-4	Applegate	X	
17	PR-16	Perry Island	X	
18	LA-18	Sleepy Bay	X	
19	Not Assigned	Hogg Bay Islet		
20	Not Assigned	Sheep Bay Islet		
21	EV-500	Crab Bay Hard		
22	EV-500	Crab Bay Soft		
23	EV-21	Shelter Bay		
24	KN-401	Snug Harbor Soft		
25	EL-13	Mussel Beach		
26	EL-55	Northwest Bay Islet		
27	NA-26	Outside Bay Soft-1		
28	NA-26	Outside Bay Soft-2		
29	NA-26	Outside Bay Rocky		
30	EB-7	Eshamy Bay		
31	NA-27	Bass Harbor		
32	IN-24	Ingot Island Rocky		
33	IN-24	Ingot Island Soft		

Public Response Coding Orientation

15.2.1

Roy

The Purpose of Coding

To be able to sort information in the public responses and be able to send appropriate comments to the responsible management team members.

The Process

1. Read the response to get an idea of the general content and the feel of it.
2. Re-read the response and identify the substantive comments.
3. Mark the comment, stamp, and code.

Substantive Comment

1. A comment that suggests a change to the document
2. A comment that points out a shortcoming or flaw
3. A comment that supports the document or a portion thereof
4. A comment that does not suggest a specific change but offers the respondent's view of a topic in the document

Nonsubstantive Comments

1. Comments which do not address the document
2. Opinions not addressing the document
3. Statements of fact not directly relating to the document
4. Matters of record
5. Paraphrases of the document
6. Resumes, family histories, and folklore

Guide for Using the Coded Comments

In order to work with the coded comments you will need:

1. A set of the coded comments
2. The code sheets
3. The printouts listing the comments for your parts of the document.

Explanations

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EXXON VALDEZ OIL SPILL

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- 1230 No 3 Geographic and Temporal Distribution of Dissolved and Particulate Petroleum Hydrocarbons in the Water Column. ADEC, NOAA
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1430	No 13 Injury to Prince William Sound Clams.	ADF&G
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1450	No 15 Injury to Prince William Sound Spot Shrimp.	ADF&G
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1570	Need New Studies	

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1820 No 2 Surveys to Determine Distribution and Abundance of Migratory Birds in PWS and Northern Gulf of Alaska. USFWS

1830 No 3 Population Surveys of Seabird Nesting Colonies in PWS, the Outside Coast of the Kenai Peninsula, the Barren Islands and Other Nearby Colonies Likely to be Impacted. USFWS

1840 No 4 Assessing the Injury to Bald Eagles. USFWS

1850 No 5 Impact Assessment on Peale's Peregrine Falcons. USFWS

1860 No 6 Assessment of the Abundance of Marbled Murrelets at Sites Along the Kenai Peninsula and PWS. USFWS

1870 No 7 Assessment of the Effects on Reproductive Success of the Fork-Tailed Storm Petrel. USFWS

1880 No 8 Assessment of Effects on the Reproductive Success of Black-legged Kittiwakes in PWS. USFWS

1890 No 9 Assessment of Injury to Waterbirds Based on the Population and Breeding Success of Pigeon Guillemots in PWS. USFWS

1900 No 10 Assessment on Injury to Glaucous-Winged Gulls using PWS. USFWS

1910 No 11 Injury Assessment of Hydrocarbon Uptake by Sea Ducks in PWS and the Kodiak Archipelago. USFWS

1920 No 12 Assessment of Injury to Shorebirds Staging and Nesting in Rocky Intertidal Habitats of PWS and the Kenai Peninsula. USFWS

1930 No 13 Impact Assessment on Passerines and Other Nongame Birds in PWS. USFWS

1940 No 14 Effects on Migratory Birds on Exposure to North slope Crude Oil. USFWS

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2000 Technical Services

2010 No 1 Hydrocarbon Analytical Support Services and Analysis of Distribution and Weathering of Spilled Oil. NOAA, USFWS

2020 No 2 Histopathology: Examination of Abnormalities in Tissues from Birds, Mammals, Finfish, and Shellfish Exposed to Spilled Oil. USFWS, ADF&G

2030 No 3 Mapping of Damage Assessment Data and Information. ADNR, USFWS

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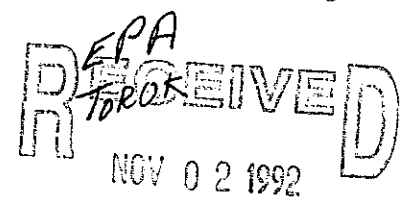
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Guide for Using the Coded Comments



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3. Mark the comment, stamp, and code.

Substantive Comments - A substantive comment is:

1. A comment that suggests a change to the document
2. A comment that points out a shortcoming or flaw
3. A comment that supports the document or a portion thereof
4. A comment that does not suggest a specific change but offers the respondent's view of a topic in the document

Only substantive comments will be coded.

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2. Opinions not addressing the document
3. Statements of fact not directly relating to the document
4. Matters of record
5. Paraphrases of the document
6. Resumes, family histories, and folklore

Nonsubstantive comments will not be coded.

CODE SHEET FOR CODES FOR PUBLIC COMMENTS ON THE DRAFT DAMAGE ASSESSMENT

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ISSUE 0100 TO 1000 SORTED BY ISSUE, ID NUMBER, and COMMENT

Page 1

Issue	ID Number	Comment	Last Name	Comp Agency Org
0100	4	1	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		2	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		25	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		34	SMITH	ALYESKA PIPELINE SERVICE COMPANY
				Number of Comments for ID Number 4 - 04
	5	1	HOLLIDAY	HOLLIDAY ENVIRONMENTAL SERVICES INC
		Number of Comments for ID Number 5 - 01		
6		3	BULLINGTON	KENAI PENINSULA BOROUGH
		4	BULLINGTON	KENAI PENINSULA BOROUGH
		5	BULLINGTON	KENAI PENINSULA BOROUGH
		6	BULLINGTON	KENAI PENINSULA BOROUGH
		7	BULLINGTON	KENAI PENINSULA BOROUGH
		8	BULLINGTON	KENAI PENINSULA BOROUGH
		18	BULLINGTON	KENAI PENINSULA BOROUGH
		19	BULLINGTON	KENAI PENINSULA BOROUGH
				Number of Comments for ID Number 6 - 08
7		8	MCMULLEN	PWS AQUACULTURE CORPORATION
		9	MCMULLEN	PWS AQUACULTURE CORPORATION
				Number of Comments for ID Number 7 - 02
8		8		NATURAL RESOURCES DEFENSE COUNCIL
		14		NATURAL RESOURCES DEFENSE COUNCIL
		21		NATURAL RESOURCES DEFENSE COUNCIL
		22		NATURAL RESOURCES DEFENSE COUNCIL
		68		NATURAL RESOURCES DEFENSE COUNCIL
		72		NATURAL RESOURCES DEFENSE COUNCIL
		114		NATURAL RESOURCES DEFENSE COUNCIL
		115		NATURAL RESOURCES DEFENSE COUNCIL
		128		NATURAL RESOURCES DEFENSE COUNCIL
		142		NATURAL RESOURCES DEFENSE COUNCIL
				Number of Comments for ID Number 8 - 10
10		7	PETUNENOS	BIRCH HORTON BITTNER AND CHEROT
		8	PETUNENOS	BIRCH HORTON BITTNER AND CHEROT
		10	PETUNENOS	BIRCH HORTON BITTNER AND CHEROT
		12	PETUNENOS	BIRCH HORTON BITTNER AND CHEROT
				Number of Comments for ID Number 10 - 04
12		6	PAYNE	MANOMET BIRD OBSERVATORY
		7	PAYNE	MANOMET BIRD OBSERVATORY
				Number of Comments for ID Number 12 - 02
13		3	SHANE	FRIENDS OF THE SEA OTTER
		4	SHANE	FRIENDS OF THE SEA OTTER
		17	SHANE	FRIENDS OF THE SEA OTTER
		21	SHANE	FRIENDS OF THE SEA OTTER
				Number of Comments for ID Number 13 - 04
16		2	ROYER	UNIV OF ALASKA FAIRBANKS
		3	ROYER	UNIV OF ALASKA FAIRBANKS

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Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0100	16	4	ROYER	UNIV OF ALASKA FAIRBANKS
		5	ROYER	UNIV OF ALASKA FAIRBANKS
		7	ROYER	UNIV OF ALASKA FAIRBANKS
		8	ROYER	UNIV OF ALASKA FAIRBANKS
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	15		ROYER	UNIV OF ALASKA FAIRBANKS
			Number of Comments for ID Number 16 - 08	
	23	3	HELMINSKI	
			Number of Comments for ID Number 23 - 01	
	27	1	HILLSTRAND	
			Number of Comments for ID Number 27 - 01	
	35	3	MITCHELL	NORTH PACIFIC FISHERY MGT COUNCIL
			Number of Comments for ID Number 35 - 01	
	45	1	REED	
			Number of Comments for ID Number 45 - 01	
	50	1	SANDERS	CALIFORNIA STATE LANDS COMMISSION
			Number of Comments for ID Number 50 - 01	
	52	1	SCHEER	
			Number of Comments for ID Number 52 - 01	
	54	2	LISKAMMM	
		9	LISKAMMM	
		10	LISKAMM	
		11	LISKAMM	
		12	LISKAMM	
		15	LISKAMM	
		16	LISKAMM	
			Number of Comments for ID Number 54 - 07	
	59	4	HARVILLE	PWS SCIENCE AND TECH INSTITUTE
			Number of Comments for ID Number 59 - 01	
	60	3	INOUYE	
			Number of Comments for ID Number 60 - 01	
	63	5	WALTER	NAT TRUST FOR HISTORIC PRESERVATION
			Number of Comments for ID Number 63 - 01	
	64	3	MCCALLION	HILL BETTS & NASH
		4	MCCALLION	HILL BETTS & NASH
			Number of Comments for ID Number 64 - 02	
	65	3	MYERS	NATIONAL AUDUBON SOCIETY
		4	MYERS	NATIONAL AUDUBON SOCIETY
		7	MYERS	NATIONAL AUDUBON SOCIETY
		8	MYERS	NATIONAL AUDUBON SOCIETY
		9	MYERS	NATIONAL AUDUBON SOCIETY

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0100	65	18	MYERS	NATIONAL AUDUBON SOCIETY
			Number of Comments for ID Number 65 - 06	
	66	7	IAROSSI	EXXON SHIPPING COMPANY
		13	IAROSSI	EXXON SHIPPING COMPANY
		14	IAROSSI	EXXON SHIPPING COMPANY
		17	IAROSSI	EXXON SHIPPING COMPANY
		35	IAROSSI	EXXON SHIPPING COMPANY
		37	IAROSSI	EXXON SHIPPING COMPANY
		39	IAROSSI	EXXON SHIPPING COMPANY
		42	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 08	
	67	1	FRINK	TRISTATE BIRD RESCUE & RESEARCH INC
		6	FRINK	TRISTATE BIRD RESCUE & RESEARCH INC
		7	FRINK	TRISTATE BIRD RESCUE & RESEARCH INC
		8	FRINK	TRISTATE BIRD RESCUE & RESEARCH INC
			Number of Comments for ID Number 67 - 04	
	68	7	HAIR	NATIONAL WILDLIFE FEDERATION
		85	HAIR	NATIONAL WILDLIFE FEDERATION
		93	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 03	
	71	2	WILLIAMSON	UNIV OF ALASKA FAIRBANKS ARCTIC BIO
		3	WILLIAMSON	UNIV OF ALASKA FAIRBANKS ARCTIC BIO
			Number of Comments for ID Number 71 - 02	
	72	10	TABIOS	THE NORTH PACIFIC RIM
		13	TABIOS	THE NORTH PACIFIC RIM
			Number of Comments for ID Number 72 - 02	
	74	8	FRICK	AMERICAN PETROLEUM INSTITUTE
			Number of Comments for ID Number 74 - 01	
	75	1	GERLACH	UNIV OF ALASKA MUSEUM FAIRBANKS
			Number of Comments for ID Number 75 - 01	
	76	5	GOULD	KODIAK CITY OF
			Number of Comments for ID Number 76 - 01	

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0102	4	5	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		8	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		11	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		30	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		31	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		89	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		90	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		Number of Comments for ID Number 4 - 07		
	7	4	MCMULLEN	PWS AQUACULTURE CORPORATION
		Number of Comments for ID Number 7 - 01		
	8	2		NATURAL RESOURCES DEFENSE COUNCIL
		3		NATURAL RESOURCES DEFENSE COUNCIL
		129		NATURAL RESOURCES DEFENSE COUNCIL
		140		NATURAL RESOURCES DEFENSE COUNCIL
		Number of Comments for ID Number 8 - 04		
	10	2	PETUNENOS	BIRCH HORTON BITTNER AND CHEROT
		Number of Comments for ID Number 10 - 01		
	12	1	PAYNE	MANOMET BIRD OBSERVATORY
		Number of Comments for ID Number 12 - 01		
	16	9	ROYER	UNIV OF ALASKA FAIRBANKS
		10	ROYER	UNIV OF ALASKA FAIRBANKS
		12	ROYER	UNIV OF ALASKA FAIRBANKS
		26	ROYER	UNIV OF ALASKA FAIRBANKS
		Number of Comments for ID Number 16 - 04		
	27	3	HILLSTRAND	
		Number of Comments for ID Number 27 - 01		
	28	1	HOFMAN	MARINE MAMMAL COMMISSION
		2	HOFMAN	MARINE MAMMAL COMMISSION
		5	HOFMAN	MARINE MAMMAL COMMISSION
		Number of Comments for ID Number 28 - 03		
	35	1	MITCHELL	NORTH PACIFIC FISHERY MGT COUNCIL
		Number of Comments for ID Number 35 - 01		
	50	4	SANDERS	CALIFORNIA STATE LANDS COMMISSION
		Number of Comments for ID Number 50 - 01		
	54	4	LISKAMMM	
		Number of Comments for ID Number 54 - 01		
	56	4	TORRICELLI	US CONGRESS
		Number of Comments for ID Number 56 - 01		
	65	1	MYERS	NATIONAL AUDUBON SOCIETY
		Number of Comments for ID Number 65 - 01		

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0102	66	9	IAROSS	EXXON SHIPPING COMPANY
		48	IAROSS	EXXON SHIPPING COMPANY
		49	IAROSS	EXXON SHIPPING COMPANY
		51	IAROSS	EXXON SHIPPING COMPANY
		52	IAROSS	EXXON SHIPPING COMPANY
		54	IAROSS	EXXON SHIPPING COMPANY
		55	IAROSS	EXXON SHIPPING COMPANY
		56	IAROSS	EXXON SHIPPING COMPANY
		57	IAROSS	EXXON SHIPPING COMPANY
		Number of Comments for ID Number 66 - 09		
	68	4	HAIR	NATIONAL WILDLIFE FEDERATION
		86	HAIR	NATIONAL WILDLIFE FEDERATION
		Number of Comments for ID Number 68 - 02		
	69	3	PARKER	ADLER JAMESON & CLARAVAL
		Number of Comments for ID Number 69 - 01		
	72	2	TABIOS	THE NORTH PACIFIC RIM
		Number of Comments for ID Number 72 - 01		
	73	2	FARRINGTON	UNIV OF MASSACHUSETTS
		Number of Comments for ID Number 73 - 01		
	74	1	FRICK	AMERICAN PETROLEUM INSTITUTE
		13	FRICK	AMERICAN PETROLEUM INSTITUTE
		17	FRICK	AMERICAN PETROLEUM INSTITUTE
		Number of Comments for ID Number 74 - 03		

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0103	4	21	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		91	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		93	SMITH	ALYESKA PIPELINE SERVICE COMPANY
			Number of Comments for ID Number	4 - 03
	7	5	MCMULLEN	PWS AQUACULTURE CORPORATION
			Number of Comments for ID Number	7 - 01
	12	2	PAYNE	MANOMET BIRD OBSERVATORY
			Number of Comments for ID Number	12 - 01
	66	8	IAROSSI	EXXON SHIPPING COMPANY
		38	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number	66 - 02

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0104	4	22	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		94	SMITH	ALYESKA PIPELINE SERVICE COMPANY
			Number of Comments for ID Number	4 = 02
	10	4	PETUNENOS	BIRCH HORTON BITTNER AND CHEROT
			Number of Comments for ID Number	10 = 01

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_	
0105	4	47	SMITH	ALYESKA PIPELINE SERVICE COMPANY	
		48	SMITH	ALYESKA PIPELINE SERVICE COMPANY	
		49	SMITH	ALYESKA PIPELINE SERVICE COMPANY	
		50	SMITH	ALYESKA PIPELINE SERVICE COMPANY	
		51	SMITH	ALYESKA PIPELINE SERVICE COMPANY	
		Number of Comments for ID Number			4 - 05
66	6		IAROSSI	EXXON SHIPPING COMPANY	
		Number of Comments for ID Number			66 - 01
74	10		FRICK	AMERICAN PETROLEUM INSTITUTE	
	26		FRICK	AMERICAN PETROLEUM INSTITUTE	
		Number of Comments for ID Number			74 - 02

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0106	4	39	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		53	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		Number of Comments for ID Number		
				4 - 02
	64	7	MCCALLION	HILL BETTS & NASH
		8	MCCALLION	HILL BETTS & NASH
		Number of Comments for ID Number		
				64 - 02

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0107	4	8	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		31	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		60	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		61	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		76	SMITH	ALYESKA PIPELINE SERVICE COMPANY
			Number of Comments for ID Number	4 - 05
45	2		REED	
			Number of Comments for ID Number	45 - 01
66	28		IAROSSI	EXXON SHIPPING COMPANY
	45		IAROSSI	EXXON SHIPPING COMPANY
	50		IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number	66 - 03

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0108	4	9	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		35	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		50	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		52	SMITH	ALYESKA PIPELINE SERVICE COMPANY
			Number of Comments for ID Number 4 = 04	
	8	20		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 = 01	
74		6	FRICK	AMERICAN PETROLEUM INSTITUTE
		7	FRICK	AMERICAN PETROLEUM INSTITUTE
		9	FRICK	AMERICAN PETROLEUM INSTITUTE
		11	FRICK	AMERICAN PETROLEUM INSTITUTE
			Number of Comments for ID Number 74 = 04	

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0109	4	9	SMITH	ALYESKA PIPELINE SERVICE COMPANY
			Number of Comments for ID Number	4 - 01
	5	3	HOLLIDAY	HOLLIDAY ENVIRONMENTAL SERVICES INC
			Number of Comments for ID Number	5 - 01
	16	6	ROYER	UNIV OF ALASKA FAIRBANKS
			Number of Comments for ID Number	16 - 01
	66	36	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number	66 - 01
	78	3	HALGREN	
			Number of Comments for ID Number	78 - 01

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0110	66	58	IAROSSI	EXXON SHIPPING COMPANY
Number of Comments for ID Number				66 = 01

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0111	3	1	SCHACTLER	
			Number of Comments for ID Number	3 = 01
	8	7		NATURAL RESOURCES DEFENSE COUNCIL
		74		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number	8 = 02
	16	11	ROYER	UNIV OF ALASKA FAIRBANKS
		13	ROYER	UNIV OF ALASKA FAIRBANKS
			Number of Comments for ID Number	16 = 02
	28	3	HOFMAN	MARINE MAMMAL COMMISSION
		4	HOFMAN	MARINE MAMMAL COMMISSION
			Number of Comments for ID Number	28 = 02
	65	5	MYERS	NATIONAL AUDUBON SOCIETY
		6	MYERS	NATIONAL AUDUBON SOCIETY
			Number of Comments for ID Number	65 = 02
	68	5	HAIR	NATIONAL WILDLIFE FEDERATION
		9	HAIR	NATIONAL WILDLIFE FEDERATION
		96	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number	68 = 03
	69	7	PARKER	ADLER JAMESON & CLARAVAL
		9	PARKER	ADLER JAMESON & CLARAVAL
			Number of Comments for ID Number	69 = 02

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0112	66	41	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 = 01	
	68	6	HAIR	NATIONAL WILDLIFE FEDERATION
		15	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 = 02	

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0113	10	9	PETUNENOS	BIRCH HORTON BITTNER AND CHEROT
			Number of Comments for ID Number	10 - 01
	43	1	FREUDENBURG	
		2	FREUDENBURG	
			Number of Comments for ID Number	43 - 02
	54	13	LISKAMM	
			Number of Comments for ID Number	54 - 01
	68	18	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number	68 - 01
	78	1	HALGREN	
			Number of Comments for ID Number	78 - 01

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0130	4	4	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		7	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		17	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		24	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		26	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		27	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		28	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		29	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		30	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		40	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		44	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		57	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		58	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		60	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		62	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		Number of Comments for ID Number 4 - 15		
66	2	2	IAROSSE	EXXON SHIPPING COMPANY
	11	11	IAROSSE	EXXON SHIPPING COMPANY
	24	24	IAROSSE	EXXON SHIPPING COMPANY
	27	27	IAROSSE	EXXON SHIPPING COMPANY
	33	33	IAROSSE	EXXON SHIPPING COMPANY
	46	46	IAROSSE	EXXON SHIPPING COMPANY
	47	47	IAROSSE	EXXON SHIPPING COMPANY
		Number of Comments for ID Number 66 - 07		
68	10	10	HAIR	NATIONAL WILDLIFE FEDERATION
	87	87	HAIR	NATIONAL WILDLIFE FEDERATION
		Number of Comments for ID Number 68 - 02		
74	2	2	FRICK	AMERICAN PETROLEUM INSTITUTE
	14	14	FRICK	AMERICAN PETROLEUM INSTITUTE
	19	19	FRICK	AMERICAN PETROLEUM INSTITUTE
		Number of Comments for ID Number 74 - 03		

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_	
0131	4	63	SMITH	ALYESKA PIPELINE SERVICE COMPANY	
		64	SMITH	ALYESKA PIPELINE SERVICE COMPANY	
		65	SMITH	ALYESKA PIPELINE SERVICE COMPANY	
		66	SMITH	ALYESKA PIPELINE SERVICE COMPANY	
		Number of Comments for ID Number			4 - 04
	74	23	FRICK	AMERICAN PETROLEUM INSTITUTE	
		Number of Comments for ID Number			74 - 01

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0132	4	19	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		67	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		68	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		70	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		87	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		Number of Comments for ID Number		
			4	- 05
	66	18	IAROSSI	EXXON SHIPPING COMPANY
		19	IAROSSI	EXXON SHIPPING COMPANY
		Number of Comments for ID Number		
			66	- 02
	74	4	FRICK	AMERICAN PETROLEUM INSTITUTE
		20	FRICK	AMERICAN PETROLEUM INSTITUTE
		Number of Comments for ID Number		
			74	- 02

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_	
0133	4	20	SMITH	ALYESKA PIPELINE SERVICE COMPANY	
		69	SMITH	ALYESKA PIPELINE SERVICE COMPANY	
		81	SMITH	ALYESKA PIPELINE SERVICE COMPANY	
		83	SMITH	ALYESKA PIPELINE SERVICE COMPANY	
		85	SMITH	ALYESKA PIPELINE SERVICE COMPANY	
		86	SMITH	ALYESKA PIPELINE SERVICE COMPANY	
		88	SMITH	ALYESKA PIPELINE SERVICE COMPANY	
		90	SMITH	ALYESKA PIPELINE SERVICE COMPANY	
		Number of Comments for ID Number			4 - 08
	66	23	IAROSSI	EXXON SHIPPING COMPANY	
		31	IAROSSI	EXXON SHIPPING COMPANY	
		44	IAROSSI	EXXON SHIPPING COMPANY	
		Number of Comments for ID Number			66 - 03

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0140	8	131		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number	8 - 01
	13	16	SHANE	FRIENDS OF THE SEA OTTER
			Number of Comments for ID Number	13 - 01
	50	3	SANDERS	CALIFORNIA STATE LANDS COMMISSION
			Number of Comments for ID Number	50 - 01
	54	1	LISKAMMM	
			Number of Comments for ID Number	54 - 01
	74	5	FRICK	AMERICAN PETROLEUM INSTITUTE.
		18	FRICK	AMERICAN PETROLEUM INSTITUTE
		21	FRICK	AMERICAN PETROLEUM INSTITUTE
			Number of Comments for ID Number	74 - 03

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0141	4	41	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		43	SMITH	ALYESKA PIPELINE SERVICE COMPANY
			Number of Comments for ID Number	4 = 02
	10	5	PETUNENOS	BIRCH HORTON BITTNER AND CHEROT
			Number of Comments for ID Number	10 = 01

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0142	4	23	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		95	SMITH	ALYESKA PIPELINE SERVICE COMPANY
			Number of Comments for ID Number 4 - 02	
	66	32	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01	
	68	14	HAIR	NATIONAL WILDLIFE FEDERATION
		90	HAIR	NATIONAL WILDLIFE FEDERATION
		91	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 03	
	69	5	PARKER	ADLER JAMESON & CLARAVAL
			Number of Comments for ID Number 69 - 01	

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0150	4	4	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		39	SMITH	ALYESKA PIPELINE SERVICE COMPANY
			Number of Comments for ID Number 4 - 02	
	8	132		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 01	
	13	20	SHANE	FRIENDS OF THE SEA OTTER
			Number of Comments for ID Number 13 - 01	
	54	14	LISKAMM	
		17	LISKAMM	
			Number of Comments for ID Number 54 - 02	
	55	3	DUFFY	INTECOL
			Number of Comments for ID Number 55 - 01	
	56	3	TORRICELLI	US CONGRESS
			Number of Comments for ID Number 56 - 01	
	59	1	HARVILLE	PWS SCIENCE AND TECH INSTITUTE
			Number of Comments for ID Number 59 - 01	
	66	16	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01	
	68	11	HAIR	NATIONAL WILDLIFE FEDERATION
		88	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 02	
	76	2	GOULD	KODIAK CITY OF
			Number of Comments for ID Number 76 - 01	

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0151	4	18	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		46	SMITH	ALYESKA PIPELINE SERVICE COMPANY
			Number of Comments for ID Number 4 - 02	
	8	117		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 01	
65	10		MYERS	NATIONAL AUDUBON SOCIETY
			Number of Comments for ID Number 65 - 01	
66	5		IAROSS	EXXON SHIPPING COMPANY
	10		IAROSS	EXXON SHIPPING COMPANY
	15		IAROSS	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 03	
68	2		HAIR	NATIONAL WILDLIFE FEDERATION
	95		HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 02	
69	2		PARKER	ADLER JAMESON & CLARAV
			Number of Comments for ID Number 69 - 01	
74	12		FRICK	AMERICAN PETROLEUM INSTITUTE
			Number of Comments for ID Number 74 - 01	

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0152	4	13	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		33	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		42	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		44	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		45	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		51	SMITH	ALYESKA PIPELINE SERVICE COMPANY

Number of Comments for ID Number 4 - 06

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0153	4	14	SMITH	ALYESKA PIPELINE SERVICE COMPANY
			Number of Comments for ID Number	4 - 01
	68	8	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number	68 - 01

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0200	4	3	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		10	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		37	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		97	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		98	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		101	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		Number of Comments for ID Number 4 - 06		
	8	5		NATURAL RESOURCES DEFENSE COUNCIL
		6		NATURAL RESOURCES DEFENSE COUNCIL
		18		NATURAL RESOURCES DEFENSE COUNCIL
		19		NATURAL RESOURCES DEFENSE COUNCIL
		Number of Comments for ID Number 8 - 04		
55	2		DUFFY	INTECOL
		Number of Comments for ID Number 55 - 01		
66	12		IAROSSE	EXXON SHIPPING COMPANY
	34		IAROSSE	EXXON SHIPPING COMPANY
		Number of Comments for ID Number 66 - 02		
68	84		HAIR	NATIONAL WILDLIFE FEDERATION
	97		HAIR	NATIONAL WILDLIFE FEDERATION
		Number of Comments for ID Number 68 - 02		
70	1		LANMAN	CHICKALOON TRADITIONAL COUNCIL
		Number of Comments for ID Number 70 - 01		
74	15		FRICK	AMERICAN PETROLEUM INSTITUTE
		Number of Comments for ID Number 74 - 01		
77	5		GRISCO	NATIONAL PARKS & REC ASSOC ALASKA
		Number of Comments for ID Number 77 - 01		

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0201	1	1	WURTZ	
			Number of Comments for ID Number	1 - 01
	6	1	BULLINGTON	KENAI PENINSULA BOROUGH
			Number of Comments for ID Number	6 - 01
	8	1		NATURAL RESOURCES DEFENSE COUNCIL
		4		NATURAL RESOURCES DEFENSE COUNCIL
		73		NATURAL RESOURCES DEFENSE COUNCIL
		81		NATURAL RESOURCES DEFENSE COUNCIL
		116		NATURAL RESOURCES DEFENSE COUNCIL
		120		NATURAL RESOURCES DEFENSE COUNCIL
		130		NATURAL RESOURCES DEFENSE COUNCIL
		141		NATURAL RESOURCES DEFENSE COUNCIL
		143		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number	8 - 09
	10	1	PETUNENOS	BIRCH HORTON BITTNER AND CHEROT
		3	PETUNENOS	BIRCH HORTON BITTNER AND CHEROT
			Number of Comments for ID Number	10 - 02
	11	1	ROBY	SO ILLINOIS UNIV CARBONDALE
			Number of Comments for ID Number	11 - 01
	12	3	PAYNE	MANOMET BIRD OBSERVATORY
			Number of Comments for ID Number	12 - 01
	13	1	SHANE	FRIENDS OF THE SEA OTTER
			Number of Comments for ID Number	13 - 01
	16	1	ROYER	UNIV OF ALASKA FAIRBANKS
			Number of Comments for ID Number	16 - 01
	28	20	HOFMAN	MARINE MAMMAL COMMISSION
			Number of Comments for ID Number	28 - 01
	29	1	FRY	PACIFIC SEABIRD GROUP
		3	FRY	PACIFIC SEABIRD GROUP
			Number of Comments for ID Number	29 - 02
	36	2	ARUNDALE	UNIV OF ALASKA FAIRBANKS
			Number of Comments for ID Number	36 - 01
	42	4	BALCOMB	CENTER FOR WHALE RESEARCH INC
			Number of Comments for ID Number	42 - 01
	50	2	SANDERS	CALIFORNIA STATE LANDS COMMISSION
			Number of Comments for ID Number	50 - 01
	54	5	LISKAMMM	
			Number of Comments for ID Number	54 - 01
	55	1	DUFFY	INTECOL

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
				Number of Comments for ID Number 55 - 01
0201	56	1	TORRICELLI	US CONGRESS
				Number of Comments for ID Number 56 - 01
	58	1	MATKIN	NORTH GULF OCEANIC SOCIETY
				Number of Comments for ID Number 58 - 01
	59	2	HARVILLE	PWS SCIENCE AND TECH INSTITUTE
				Number of Comments for ID Number 59 - 01
	64	1	MCCALLION	HILL BETTS & NASH
				Number of Comments for ID Number 64 - 01
	65	2	MYERS	NATIONAL AUDUBON SOCIETY
		17	MYERS	NATIONAL AUDUBON SOCIETY
				Number of Comments for ID Number 65 - 02
	67	3	FRINK	TRISTATE BIRD RESCUE & RESEARCH INC
				Number of Comments for ID Number 67 - 01
	68	1	HAIR	NATIONAL WILDLIFE FEDERATION
		12	HAIR	NATIONAL WILDLIFE FEDERATION
		92	HAIR	NATIONAL WILDLIFE FEDERATION
				Number of Comments for ID Number 68 - 03
	69	1	PARKER	ADLER JAMESON & CLARAVAL
				Number of Comments for ID Number 69 - 01
	71	1	WILLIAMSON	UNIV OF ALASKA FAIRBANKS ARCTIC BIO
				Number of Comments for ID Number 71 - 01
	72	9	TABIOS	THE NORTH PACIFIC RIM
		12	TABIOS	THE NORTH PACIFIC RIM
				Number of Comments for ID Number 72 - 02
	73	5	FARRINGTON	UNIV OF MASSACHUSETTS
				Number of Comments for ID Number 73 - 01
	78	2	HALGREN	
				Number of Comments for ID Number 78 - 01

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0202	4	6	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		46	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		54	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		56	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		Number of Comments for ID Number		
			4	- 04

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0203	4	15	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		57	SMITH	ALYESKA PIPELINE SERVICE COMPANY
			Number of Comments for ID Number	4 - 02
	74	22	FRICK	AMERICAN PETROLEUM INSTITUTE
			Number of Comments for ID Number	74 - 01

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_	
0204	4	16	SMITH	ALYESKA PIPELINE SERVICE COMPANY	
		58	SMITH	ALYESKA PIPELINE SERVICE COMPANY	
		59	SMITH	ALYESKA PIPELINE SERVICE COMPANY	
		Number of Comments for ID Number			4 = 03
	66	29	IAROSSI	EXXON SHIPPING COMPANY	
		Number of Comments for ID Number			66 - 01

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0205	4	62	SMITH	ALYESKA PIPELINE SERVICE COMPANY
			Number of Comments for ID Number	4 = 01
	66	26	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number	66 = 01

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_	
0206	4	12	SMITH	ALYESKA PIPELINE SERVICE COMPANY	
		38	SMITH	ALYESKA PIPELINE SERVICE COMPANY	
		61	SMITH	ALYESKA PIPELINE SERVICE COMPANY	
		99	SMITH	ALYESKA PIPELINE SERVICE COMPANY	
		100	SMITH	ALYESKA PIPELINE SERVICE COMPANY	
		Number of Comments for ID Number			4 - 05
	66	1	IAROSSI	EXXON SHIPPING COMPANY	
		3	IAROSSI	EXXON SHIPPING COMPANY	
		4	IAROSSI	EXXON SHIPPING COMPANY	
		25	IAROSSI	EXXON SHIPPING COMPANY	
		Number of Comments for ID Number			66 - 04
	74	3	FRICK	AMERICAN PETROLEUM INSTITUTE	
		16	FRICK	AMERICAN PETROLEUM INSTITUTE	
		Number of Comments for ID Number			74 - 02

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0207	6	2	BULLINGTON	KENAI PENINSULA BOROUGH
			Number of Comments for ID Number 6 - 01	
	8	10		NATURAL RESOURCES DEFENSE COUNCIL
		11		NATURAL RESOURCES DEFENSE COUNCIL
		12		NATURAL RESOURCES DEFENSE COUNCIL
		13		NATURAL RESOURCES DEFENSE COUNCIL
		15		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 05	
	13	5	SHANE	FRIENDS OF THE SEA OTTER
			Number of Comments for ID Number 13 - 01	
	56	2	TORRICELLI	US CONGRESS
			Number of Comments for ID Number 56 - 01	
	68	3	HAIR	NATIONAL WILDLIFE FEDERATION
		89	HAIR	NATIONAL WILDLIFE FEDERATION
		94	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 03	
	69	4	PARKER	ADLER JAMESON & CLARAVAL
			Number of Comments for ID Number 69 - 01	

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0208	29	5	FRY	PACIFIC SEABIRD GROUP
			Number of Comments for ID Number	29 - 01
	42	5	BALCOMB	CENTER FOR WHALE RESEARCH INC
			Number of Comments for ID Number	42 - 01
	65	11	MYERS	NATIONAL AUDUBON SOCIETY
			Number of Comments for ID Number	65 - 01
	68	13	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number	68 - 01

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0209	64	2	MCCALLION	HILL BETTS & NASH
		5	MCCALLION	HILL BETTS & NASH
		6	MCCALLION	HILL BETTS & NASH
			Number of Comments for ID Number 64 - 03	
	70	2	LANMAN	CHICKALOON TRADITIONAL COUNCIL
		3	LANMAN	CHICKALOON TRADITIONAL COUNCIL
		4	LANMAN	CHICKALOON TRADITIONAL COUNCIL
		5	LANMAN	CHICKALOON TRADITIONAL COUNCIL
			Number of Comments for ID Number 70 - 04	
	72	1	TABIOS	THE NORTH PACIFIC RIM
			Number of Comments for ID Number 72 - 01	

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
0240	5	2	HOLLIDAY	HOLLIDAY ENVIRONMENTAL SERVICES INC
			Number of Comments for ID Number 5 - 01	
	13	15	SHANE	FRIENDS OF THE SEA OTTER
			Number of Comments for ID Number 13 - 01	
	28	21	HOFMAN	MARINE MAMMAL COMMISSION
			Number of Comments for ID Number 28 - 01	
	29	2	FRY	PACIFIC SEABIRD GROUP
			Number of Comments for ID Number 29 - 01	
	65	12	MYERS	NATIONAL AUDUBON SOCIETY
		13	MYERS	NATIONAL AUDUBON SOCIETY
			Number of Comments for ID Number 65 - 02	
	69	19	PARKER	ADLER JAMESON & CLARAVAL
			Number of Comments for ID Number 69 - 01	
	73	1	FARRINGTON	UNIV OF MASSACHUSETTS
		3	FARRINGTON	UNIV OF MASSACHUSETTS
		4	FARRINGTON	UNIV OF MASSACHUSETTS
		6	FARRINGTON	UNIV OF MASSACHUSETTS
			Number of Comments for ID Number 73 - 04	

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
1000	59	3	HARVILLE	PWS SCIENCE AND TECH INSTITUTE
			Number of Comments for ID Number	59 - 01
	66	40	IAROSSE	EXXON SHIPPING COMPANY
		43	IAROSSE	EXXON SHIPPING COMPANY
		53	IAROSSE	EXXON SHIPPING COMPANY
			Number of Comments for ID Number	66 - 03
	74	24	FRICK	AMERICAN PETROLEUM INSTITUTE
			Number of Comments for ID Number	74 - 01
	76	1	GOULD	KODIAK CITY OF
			Number of Comments for ID Number	76 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
8	34		NATURAL RESOURCES DEFENSE COUNCIL
	75		NATURAL RESOURCES DEFENSE COUNCIL
	133		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 03
65	69	MYERS	NATIONAL AUDUBON SOCIETY
			Number of Comments for ID Number 65 - 01
68	16	HAIR	NATIONAL WILDLIFE FEDERATION
	19	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 02
69	10	PARKER	ADLER JAMESON & CLARAVAL
	12	PARKER	ADLER JAMESON & CLARAVAL
			Number of Comments for ID Number 69 - 02

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
6	9	BULLINGTON	KENAI PENINSULA BOROUGH
		Number of Comments for ID Number 6 - 01	
7	1	MCMULLEN	PWS AQUACULTURE CORPORATION
		Number of Comments for ID Number 7 - 01	
8	24		NATURAL RESOURCES DEFENSE COUNCIL
	25		NATURAL RESOURCES DEFENSE COUNCIL
	135		NATURAL RESOURCES DEFENSE COUNCIL
	137		NATURAL RESOURCES DEFENSE COUNCIL
		Number of Comments for ID Number 8 - 04	
16	16	ROYER	UNIV OF ALASKA FAIRBANKS
	17	ROYER	UNIV OF ALASKA FAIRBANKS
		Number of Comments for ID Number 16 - 02	
28	6	HOFMAN	MARINE MAMMAL COMMISSION
		Number of Comments for ID Number 28 - 01	
66	59	IAROSSI	EXXON SHIPPING COMPANY
		Number of Comments for ID Number 66 - 01	

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
8	114		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 01
16	18	ROYER	UNIV OF ALASKA FAIRBANKS
	19	ROYER	UNIV OF ALASKA FAIRBANKS
	20	ROYER	UNIV OF ALASKA FAIRBANKS
			Number of Comments for ID Number 16 - 03
65	70	MYERS	NATIONAL AUDUBON SOCIETY
	71	MYERS	NATIONAL AUDUBON SOCIETY
	72	MYERS	NATIONAL AUDUBON SOCIETY
			Number of Comments for ID Number 65 - 03
66	60	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	17	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01
69	6	PARKER	ADLER JAMESON & CLARAVAL
			Number of Comments for ID Number 69 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
8	28		NATURAL RESOURCES DEFENSE COUNCIL
	76		NATURAL RESOURCES DEFENSE COUNCIL
	136		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 03
16	21	ROYER	UNIV OF ALASKA FAIRBANKS
			Number of Comments for ID Number 16 - 01
28	7	HOFMAN	MARINE MAMMAL COMMISSION
			Number of Comments for ID Number 28 - 01
66	61	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
6	10	BULLINGTON	KENAI PENINSULA BOROUGH
			Number of Comments for ID Number 6 - 01
8	29		NATURAL RESOURCES DEFENSE COUNCIL
	77		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 02
28	8	HOFMAN	MARINE MAMMAL COMMISSION
			Number of Comments for ID Number 28 - 01
66	62	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
8	30		NATURAL RESOURCES DEFENSE COUNCIL
	78		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 02
16	22	ROYER	UNIV OF ALASKA FAIRBANKS
			Number of Comments for ID Number 16 - 01
28	9	HOFMAN	MARINE MAMMAL COMMISSION
			Number of Comments for ID Number 28 - 01
66	63	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
8	31		NATURAL RESOURCES DEFENSE COUNCIL
	79		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 02
16	23	ROYER	UNIV OF ALASKA FAIRBANKS
			Number of Comments for ID Number 16 - 01
66	64	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
8	32		NATURAL RESOURCES DEFENSE COUNCIL
	80		NATURAL RESOURCES DEFENSE COUNCIL
	127		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 03
66	65	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
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8	139		NATURAL RESOURCES DEFENSE COUNCIL
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Number of Comments for ID Number 8 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
4	80	SMITH	ALYESKA PIPELINE SERVICE COMPANY
			Number of Comments for ID Number 4 - 01
8	42		NATURAL RESOURCES DEFENSE COUNCIL
	43		NATURAL RESOURCES DEFENSE COUNCIL
	82		NATURAL RESOURCES DEFENSE COUNCIL
	83		NATURAL RESOURCES DEFENSE COUNCIL
	84		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 05
16	24	ROYER	UNIV OF ALASKA FAIRBANKS
			Number of Comments for ID Number 16 - 01
54	7	LISKAMMM	
			Number of Comments for ID Number 54 - 01
65	73	MYERS	NATIONAL AUDUBON SOCIETY
	74	MYERS	NATIONAL AUDUBON SOCIETY
			Number of Comments for ID Number 65 - 02
66	66	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	20	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01
69	13	PARKER	ADLER JAMESON & CLARAVAL
			Number of Comments for ID Number 69 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
7	6	MCMULLEN	PWS AQUACULTURE CORPORATION
			Number of Comments for ID Number 7 - 01
8	85		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 01
66	67	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	22	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
8	86		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 01
66	68	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	23	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
7	2	MCMULLEN	PWS AQUACULTURE CORPORATION
			Number of Comments for ID Number 7 - 01
8	87		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 01
16	25	ROYER	UNIV OF ALASKA FAIRBANKS
			Number of Comments for ID Number 16 - 01
66	69	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	24	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
7	3	MCMULLEN	PWS AQUACULTURE CORPORATION
			Number of Comments for ID Number 7 - 01
8	88		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 01
66	70	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	25	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
8	89		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 01
66	71	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	26	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
6	11	BULLINGTON	KENAI PENINSULA BOROUGH
			Number of Comments for ID Number 6 - 01
8	46		NATURAL RESOURCES DEFENSE COUNCIL
	90		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 02
66	72	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	27	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
6	12	BULLINGTON	KENAI PENINSULA BOROUGH
			Number of Comments for ID Number 6 - 01
8	91		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 01
30	1	MOSS	COOK INLET SEINERS ASSOCIATION
			Number of Comments for ID Number 30 - 01
66	73	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	28	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
6	13	BULLINGTON	KENAI PENINSULA BOROUGH
			Number of Comments for ID Number 6 - 01
8	92		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 01
30	2	MOSS	COOK INLET SEINERS ASSOCIATION
			Number of Comments for ID Number 30 - 01
66	74	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	29	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
6	14	BULLINGTON	KENAI PENINSULA BOROUGH
			Number of Comments for ID Number 6 - 01
8	93		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 01
30	3	MOSS	COOK INLET SEINERS ASSOCIATION
			Number of Comments for ID Number 30 - 01
66	75	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	30	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
8	45		NATURAL RESOURCES DEFENSE COUNCIL
	94		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 02
30	4	MOSS	COOK INLET SEINERS ASSOCIATION
			Number of Comments for ID Number 30 - 01
66	76	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	31	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01
72	15	TABIOS	THE NORTH PACIFIC RIM
			Number of Comments for ID Number 72 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
8	48		NATURAL RESOURCES DEFENSE COUNCIL
	95		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 02
28	10	HOFMAN	MARINE MAMMAL COMMISSION
			Number of Comments for ID Number 28 - 01
66	77	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	32	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
6	15	BULLINGTON	KENAI PENINSULA BOROUGH
			Number of Comments for ID Number 6 - 01
8	49		NATURAL RESOURCES DEFENSE COUNCIL
	96		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 02
28	10	HOFMAN	MARINE MAMMAL COMMISSION
			Number of Comments for ID Number 28 - 01
66	78	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	33	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
8	52		NATURAL RESOURCES DEFENSE COUNCIL
	97		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 02
28	11	HOFMAN	MARINE MAMMAL COMMISSION
			Number of Comments for ID Number 28 - 01
66	79	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	34	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
8	56		NATURAL RESOURCES DEFENSE COUNCIL
	98		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 02
66	80	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	35	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
8	58		NATURAL RESOURCES DEFENSE COUNCIL
	99		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 02
66	81	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	36	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
4	78	SMITH	ALYESKA PIPELINE SERVICE COMPANY
			Number of Comments for ID Number 4 - 01
8	54 100		NATURAL RESOURCES DEFENSE COUNCIL NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 02
9	2	HETRICK	ALASKA AQUAFARMS INC
			Number of Comments for ID Number 9 - 01
66	82	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	37	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
8	50		NATURAL RESOURCES DEFENSE COUNCIL
	101		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 02
66	83	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	38	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
8	51		NATURAL RESOURCES DEFENSE COUNCIL
	59		NATURAL RESOURCES DEFENSE COUNCIL
	102		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 03
66	84	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	39	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
8	61		NATURAL RESOURCES DEFENSE COUNCIL
	103		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 02
35	2	MITCHELL	NORTH PACIFIC FISHERY MGT COUNCIL
			Number of Comments for ID Number 35 - 01
54	6	LISKAMMM	
			Number of Comments for ID Number 54 - 01
66	85	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	40	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
8	62		NATURAL RESOURCES DEFENSE COUNCIL
	104		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 02
28	12	HOFMAN	MARINE MAMMAL COMMISSION
			Number of Comments for ID Number 28 - 01
66	86	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
6	16	BULLINGTON	KENAI PENINSULA BOROUGH
			Number of Comments for ID Number 6 - 01
8	53		NATURAL RESOURCES DEFENSE COUNCIL
	105		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 02
66	87	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	41	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
8	57		NATURAL RESOURCES DEFENSE COUNCIL
	106		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 02
66	88	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	42	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
6	17	BULLINGTON	KENAI PENINSULA BOROUGH
			Number of Comments for ID Number 6 - 01
8	107		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 01
66	89	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	43	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
8	60		NATURAL RESOURCES DEFENSE COUNCIL
	108		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 02
66	90	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	44	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
4	79	SMITH	ALYESKA PIPELINE SERVICE COMPANY
			Number of Comments for ID Number 4 - 01
8	55 109		NATURAL RESOURCES DEFENSE COUNCIL
			NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 02
66	91	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	45	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
8	63		NATURAL RESOURCES DEFENSE COUNCIL
	110		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 02
65	75	MYERS	NATIONAL AUDUBON SOCIETY
			Number of Comments for ID Number 65 - 01
66	92	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	46	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
9	1	HETRICK	ALASKA AQUAFARMS INC
			Number of Comments for ID Number 9 - 01
68	21	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
18	1	ROTT	
			Number of Comments for ID Number 18 - 01
23	1	HELMINSKI	
			Number of Comments for ID Number 23 - 01
58	7	MATKIN	NORTH GULF OCEANIC SOCIETY
			Number of Comments for ID Number 58 - 01
65	76	MYERS	NATIONAL AUDUBON SOCIETY
	78	MYERS	NATIONAL AUDUBON SOCIETY
	83	MYERS	NATIONAL AUDUBON SOCIETY
	84	MYERS	NATIONAL AUDUBON SOCIETY
			Number of Comments for ID Number 65 - 04
66	93	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	47	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01
69	14	PARKER	ADLER JAMESON & CLARAVAL
			Number of Comments for ID Number 69 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
12	4	PAYNE	MANOMET BIRD OBSERVATORY
			Number of Comments for ID Number 12 - 01
28	14	HOFMAN	MARINE MAMMAL COMMISSION
			Number of Comments for ID Number 28 - 01
42	1	BALCOMB	CENTER FOR WHALE RESEARCH INC
			Number of Comments for ID Number 42 - 01
58	2	MATKIN	NORTH GULF OCEANIC SOCIETY
			Number of Comments for ID Number 58 - 01
66	94	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	49	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
12	5	PAYNE	MANOMET BIRD OBSERVATORY
			Number of Comments for ID Number 12 - 01
28	15	HOFMAN	MARINE MAMMAL COMMISSION
			Number of Comments for ID Number 28 - 01
42	2	BALCOMB	CENTER FOR WHALE RESEARCH INC
			Number of Comments for ID Number 42 - 01
58	3	MATKIN	NORTH GULF OCEANIC SOCIETY
			Number of Comments for ID Number 58 - 01
66	140	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	50	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
28	16	HOFMAN	MARINE MAMMAL COMMISSION
			Number of Comments for ID Number 28 - 01
42	3	BALCOMB	CENTER FOR WHALE RESEARCH INC
			Number of Comments for ID Number 42 - 01
65	79	MYERS	NATIONAL AUDUBON SOCIETY
			Number of Comments for ID Number 65 - 01
66	95	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	51	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
28	17	HOFMAN	MARINE MAMMAL COMMISSION
			Number of Comments for ID Number 28 - 01
58	4	MATKIN	NORTH GULF OCEANIC SOCIETY
			Number of Comments for ID Number 58 - 01
66	96	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	52	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
28	18	HOFMAN	MARINE MAMMAL COMMISSION
			Number of Comments for ID Number 28 - 01
58	5	MATKIN	NORTH GULF OCEANIC SOCIETY
			Number of Comments for ID Number 58 - 01
65	80	MYERS	NATIONAL AUDUBON SOCIETY
			Number of Comments for ID Number 65 - 01
66	97	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	53	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_			
13	6	SHANE	FRIENDS OF THE SEA OTTER			
	7	SHANE	FRIENDS OF THE SEA OTTER			
	8	SHANE	FRIENDS OF THE SEA OTTER			
	9	SHANE	FRIENDS OF THE SEA OTTER			
	10	SHANE	FRIENDS OF THE SEA OTTER			
	11	SHANE	FRIENDS OF THE SEA OTTER			
	13	SHANE	FRIENDS OF THE SEA OTTER			
			Number of Comments for ID Number	13	-	07
14	1	MANVILLE	DEFENDERS OF WILDLIFE			
	2	MANVILLE	DEFENDERS OF WILDLIFE			
	3	MANVILLE	DEFENDERS OF WILDLIFE			
			Number of Comments for ID Number	14	-	03
19	1	DEDERICK				
			Number of Comments for ID Number	19	-	01
21	1	BROWN				
			Number of Comments for ID Number	21	-	01
22	1	JENKINS				
			Number of Comments for ID Number	22	-	01
23	2	HELMINSKI				
			Number of Comments for ID Number	23	-	01
24	1	ROOTH				
			Number of Comments for ID Number	24	-	01
25	1	ROTT				
			Number of Comments for ID Number	25	-	01
26	1	THOMAS				
			Number of Comments for ID Number	26	-	01
27	2	HILLSTRAND				
	4	HILLSTRAND				
	5	HILLSTRAND				
	6	HILLSTRAND				
			Number of Comments for ID Number	27	-	04
28	19	HOFMAN	MARINE MAMMAL COMMISSION			
			Number of Comments for ID Number	28	-	01
31	1	FAUST	KACHEMAK BAY CONSERVATION SOCIETY			
			Number of Comments for ID Number	31	-	01
32	1	HILLSTRAND				
			Number of Comments for ID Number	32	-	01
34	1	WUNNICKE				
			Number of Comments for ID Number	34	-	01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
37	1	KUCHNICKI	
		Number of Comments for ID Number	37 - 01
38	1	PARK	
		Number of Comments for ID Number	38 - 01
39	1	GRAY	
		Number of Comments for ID Number	39 - 01
40	1	ELVSAAS	SELDOVIA NATIVE ASSOCIATION
	2	ELVSAAS	SELDOVIA NATIVE ASSOCIATION
		Number of Comments for ID Number	40 - 02
41	1	HILL	
		Number of Comments for ID Number	41 - 01
46	1	PETITION	
		Number of Comments for ID Number	46 - 01
58	6	MATKIN	NORTH GULF OCEANIC SOCIETY
		Number of Comments for ID Number	58 - 01
65	81	MYERS	NATIONAL AUDUBON SOCIETY
		Number of Comments for ID Number	65 - 01
66	98	IAROSSI	EXXON SHIPPING COMPANY
		Number of Comments for ID Number	66 - 01
68	54	HAIR	NATIONAL WILDLIFE FEDERATION
		Number of Comments for ID Number	68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
13	12	SHANE	FRIENDS OF THE SEA OTTER
			Number of Comments for ID Number 13 - 01
28	19	HOFMAN	MARINE MAMMAL COMMISSION
			Number of Comments for ID Number 28 - 01
65	82	MYERS	NATIONAL AUDUBON SOCIETY
			Number of Comments for ID Number 65 - 01
66	99	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	55	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
28	13	HOFMAN	MARINE MAMMAL COMMISSION
			Number of Comments for ID Number 28 - 01
68	48	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01
71	4	WILLIAMSON	UNIV OF ALASKA FAIRBANKS ARCTIC BIO
			Number of Comments for ID Number 71 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
65	85	MYERS	NATIONAL AUDUBON SOCIETY
			Number of Comments for ID Number 65 - 01
66	100	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	56	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01
69	15	PARKER	ADLER JAMESON & CLARAVAL
			Number of Comments for ID Number 69 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
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66	101	IAROSSI	EXXON SHIPPING COMPANY
Number of Comments for ID Number			66 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
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66	102	IAROSSI	EXXON SHIPPING COMPANY
Number of Comments for ID Number			66 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
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66	103	IAROSSI	EXXON SHIPPING COMPANY
Number of Comments for ID Number			66 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
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66	104	IAROSSI	EXXON SHIPPING COMPANY
Number of Comments for ID Number			66 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
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3	2	SCHACTLER	
		Number of Comments for ID Number	3 - 01

66	105	IAROSSI	EXXON SHIPPING COMPANY
		Number of Comments for ID Number	66 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
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66	106	IAROSSI	EXXON SHIPPING COMPANY
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Number of Comments for ID Number 66 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
65	14	MYERS	NATIONAL AUDUBON SOCIETY
	15	MYERS	NATIONAL AUDUBON SOCIETY
	16	MYERS	NATIONAL AUDUBON SOCIETY
	19	MYERS	NATIONAL AUDUBON SOCIETY
	20	MYERS	NATIONAL AUDUBON SOCIETY
	21	MYERS	NATIONAL AUDUBON SOCIETY
	22	MYERS	NATIONAL AUDUBON SOCIETY
	23	MYERS	NATIONAL AUDUBON SOCIETY
	24	MYERS	NATIONAL AUDUBON SOCIETY
	25	MYERS	NATIONAL AUDUBON SOCIETY
	26	MYERS	NATIONAL AUDUBON SOCIETY
	68	MYERS	NATIONAL AUDUBON SOCIETY
			Number of Comments for ID Number 65 - 12
66	107	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
67	2	FRINK	TRISTATE BIRD RESCUE & RESEARCH INC
			Number of Comments for ID Number 67 - 01
68	57	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01
69	16	PARKER	ADLER JAMESON & CLARAVAL
			Number of Comments for ID Number 69 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_			
29	7	FRY	PACIFIC SEABIRD GROUP			
			Number of Comments for ID Number	29	-	01
65	27	MYERS	NATIONAL AUDUBON SOCIETY			
	28	MYERS	NATIONAL AUDUBON SOCIETY			
			Number of Comments for ID Number	65	-	02
66	108	IAROSSI	EXXON SHIPPING COMPANY			
			Number of Comments for ID Number	66	-	01
68	59	HAIR	NATIONAL WILDLIFE FEDERATION			
			Number of Comments for ID Number	68	-	01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_			
29	8	FRY	PACIFIC SEABIRD GROUP			
			Number of Comments for ID Number	29	-	01
65	29	MYERS	NATIONAL AUDUBON SOCIETY			
			Number of Comments for ID Number	65	-	01
66	109	IAROSSI	EXXON SHIPPING COMPANY			
			Number of Comments for ID Number	66	-	01
68	60	HAIR	NATIONAL WILDLIFE FEDERATION			
			Number of Comments for ID Number	68	-	01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
29	9	FRY	PACIFIC SEABIRD GROUP
			Number of Comments for ID Number 29 - 01
65	30	MYERS	NATIONAL AUDUBON SOCIETY
	31	MYERS	NATIONAL AUDUBON SOCIETY
	32	MYERS	NATIONAL AUDUBON SOCIETY
	33	MYERS	NATIONAL AUDUBON SOCIETY
			Number of Comments for ID Number 65 - 04
66	110	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	61	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_			
29	10	FRY	PACIFIC SEABIRD GROUP			
			Number of Comments for ID Number	29	-	01
65	34	MYERS	NATIONAL AUDUBON SOCIETY			
	35	MYERS	NATIONAL AUDUBON SOCIETY			
	36	MYERS	NATIONAL AUDUBON SOCIETY			
	37	MYERS	NATIONAL AUDUBON SOCIETY			
			Number of Comments for ID Number	65	-	04
66	111	IAROSSI	EXXON SHIPPING COMPANY			
			Number of Comments for ID Number	66	-	01
68	62	HAIR	NATIONAL WILDLIFE FEDERATION			
			Number of Comments for ID Number	68	-	01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_			
29	11	FRY	PACIFIC SEABIRD GROUP			
			Number of Comments for ID Number	29	-	01
65	38	MYERS	NATIONAL AUDUBON SOCIETY			
	39	MYERS	NATIONAL AUDUBON SOCIETY			
			Number of Comments for ID Number	65	-	02
66	112	IAROSSI	EXXON SHIPPING COMPANY			
			Number of Comments for ID Number	66	-	01
67	4	FRINK	TRISTATE BIRD RESCUE & RESEARCH INC			
			Number of Comments for ID Number	67	-	01
68	63	HAIR	NATIONAL WILDLIFE FEDERATION			
			Number of Comments for ID Number	68	-	01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_			
29	12	FRY	PACIFIC SEABIRD GROUP			
			Number of Comments for ID Number	29	-	01
65	40	MYERS	NATIONAL AUDUBON SOCIETY			
	41	MYERS	NATIONAL AUDUBON SOCIETY			
			Number of Comments for ID Number	65	-	02
66	113	IAROSSI	EXXON SHIPPING COMPANY			
			Number of Comments for ID Number	66	-	01
68	64	HAIR	NATIONAL WILDLIFE FEDERATION			
			Number of Comments for ID Number	68	-	01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
11	2	ROBY	SO ILLINOIS UNIV CARBONDALE
	3	ROBY	SO ILLINOIS UNIV CARBONDALE
			Number of Comments for ID Number 11 - 02
29	13	FRY	PACIFIC SEABIRD GROUP
			Number of Comments for ID Number 29 - 01
65	43	MYERS	NATIONAL AUDUBON SOCIETY
	44	MYERS	NATIONAL AUDUBON SOCIETY
	45	MYERS	NATIONAL AUDUBON SOCIETY
	46	MYERS	NATIONAL AUDUBON SOCIETY
	47	MYERS	NATIONAL AUDUBON SOCIETY
	48	MYERS	NATIONAL AUDUBON SOCIETY
			Number of Comments for ID Number 65 - 06
66	114	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	65	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_			
29	14	FRY	PACIFIC SEABIRD GROUP			
			Number of Comments for ID Number	29	-	01
65	49	MYERS	NATIONAL AUDUBON SOCIETY			
	50	MYERS	NATIONAL AUDUBON SOCIETY			
	51	MYERS	NATIONAL AUDUBON SOCIETY			
			Number of Comments for ID Number	65	-	03
66	115	IAROSSI	EXXON SHIPPING COMPANY			
			Number of Comments for ID Number	66	-	01
68	66	HAIR	NATIONAL WILDLIFE FEDERATION			
			Number of Comments for ID Number	68	-	01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
29	15	FRY	PACIFIC SEABIRD GROUP
			Number of Comments for ID Number 29 - 01
65	52	MYERS	NATIONAL AUDUBON SOCIETY
	53	MYERS	NATIONAL AUDUBON SOCIETY
	54	MYERS	NATIONAL AUDUBON SOCIETY
	55	MYERS	NATIONAL AUDUBON SOCIETY
			Number of Comments for ID Number 65 - 04
66	116	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	67	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
29	16	FRY	PACIFIC SEABIRD GROUP
			Number of Comments for ID Number 29 - 01
65	56	MYERS	NATIONAL AUDUBON SOCIETY
	57	MYERS	NATIONAL AUDUBON SOCIETY
	58	MYERS	NATIONAL AUDUBON SOCIETY
			Number of Comments for ID Number 65 - 03
66	117	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	68	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
29	17	FRY	PACIFIC SEABIRD GROUP
			Number of Comments for ID Number 29 = 01
65	59	MYERS	NATIONAL AUDUBON SOCIETY
			Number of Comments for ID Number 65 = 01
66	118	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 = 01
68	69	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 = 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
29	18	FRY	PACIFIC SEABIRD GROUP
			Number of Comments for ID Number 29 = 01
65	60	MYERS	NATIONAL AUDUBON SOCIETY
	61	MYERS	NATIONAL AUDUBON SOCIETY
	62	MYERS	NATIONAL AUDUBON SOCIETY
	63	MYERS	NATIONAL AUDUBON SOCIETY
			Number of Comments for ID Number 65 = 04
66	119	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 = 01
68	70	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 = 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
29	19	FRY	PACIFIC SEABIRD GROUP
			Number of Comments for ID Number 29 = 01
65	65	MYERS	NATIONAL AUDUBON SOCIETY
			Number of Comments for ID Number 65 = 01
66	120	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 = 01
68	71	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 = 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
29	20	FRY	PACIFIC SEABIRD GROUP
			Number of Comments for ID Number 29 = 01
65	66	MYERS	NATIONAL AUDUBON SOCIETY
			Number of Comments for ID Number 65 = 01
66	121	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 = 01
68	72	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 = 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
29	4	FRY	PACIFIC SEABIRD GROUP
			Number of Comments for ID Number 29 - 01
65	42	MYERS	NATIONAL AUDUBON SOCIETY
	64	MYERS	NATIONAL AUDUBON SOCIETY
	67	MYERS	NATIONAL AUDUBON SOCIETY
			Number of Comments for ID Number 65 - 03
68	58	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
8	71		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 = 01
64	11	MCCALLION	HILL BETTS & NASH
			Number of Comments for ID Number 64 = 01
66	122	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 = 01
68	73	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 = 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
8	23		NATURAL RESOURCES DEFENSE COUNCIL
	64		NATURAL RESOURCES DEFENSE COUNCIL
	111		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 = 03
29	21	FRY	PACIFIC SEABIRD GROUP
			Number of Comments for ID Number 29 = 01
66	123	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 = 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
8	65		NATURAL RESOURCES DEFENSE COUNCIL
	112		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 02
29	22	FRY	PACIFIC SEABIRD GROUP
			Number of Comments for ID Number 29 - 01
66	124	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
8	66		NATURAL RESOURCES DEFENSE COUNCIL
	69		NATURAL RESOURCES DEFENSE COUNCIL
	113		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 = 03
58	8	MATKIN	NORTH GULF OCEANIC SOCIETY
			Number of Comments for ID Number 58 = 01
66	125	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 = 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
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8	9	NATURAL RESOURCES DEFENSE COUNCIL	
Number of Comments for ID Number		8	- 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
8	70		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 01
54	3	LISKAMMM	
	8	LISKAMMM	
			Number of Comments for ID Number 54 - 02
66	136	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
69	11	PARKER	ADLER JAMESON & CLARAVAL
			Number of Comments for ID Number 69 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
8	16		NATURAL RESOURCES DEFENSE COUNCIL
	67		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 02
13	14	SHANE	FRIENDS OF THE SEA OTTER
			Number of Comments for ID Number 13 - 01
65	86	MYERS	NATIONAL AUDUBON SOCIETY
			Number of Comments for ID Number 65 - 01
66	137	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01
68	83	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
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8	26		NATURAL RESOURCES DEFENSE COUNCIL
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	27		NATURAL RESOURCES DEFENSE COUNCIL
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		Number of Comments for ID Number	8 - 02
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64	9	MCCALLION	HILL BETTS & NASH
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		Number of Comments for ID Number	64 - 01
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ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
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66	138	IAROSSI	EXXON SHIPPING COMPANY
Number of Comments for ID Number			66 - 01

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
4	92	SMITH	ALYESKA PIPELINE SERVICE COMPANY
	96	SMITH	ALYESKA PIPELINE SERVICE COMPANY
Number of Comments for ID Number			4 - 02

ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_			
65	88	MYERS	NATIONAL AUDUBON SOCIETY			
			Number of Comments for ID Number	65	-	01
66	139	IAROSSI	EXXON SHIPPING COMPANY			
			Number of Comments for ID Number	66	-	01

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
2200	4	36	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		55	SMITH	ALYESKA PIPELINE SERVICE COMPANY
			Number of Comments for ID Number 4 - 02	
	7	7	MCMULLEN	PWS AQUACULTURE CORPORATION
			Number of Comments for ID Number 7 - 01	
	8	17		NATURAL RESOURCES DEFENSE COUNCIL
		118		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 02	
10	6		PETUNENOS	BIRCH HORTON BITTNER AND CHEROT
			Number of Comments for ID Number 10 - 01	
66	30		IAROSSO	EXXON SHIPPING COMPANY
	126		IAROSSO	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 02	
68	74		HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01	
69	8		PARKER	ADLER JAMESON & CLARAVAL
	17		PARKER	ADLER JAMESON & CLARAVAL
			Number of Comments for ID Number 69 - 02	
72	14		TABIOS	THE NORTH PACIFIC RIM
			Number of Comments for ID Number 72 - 01	
74	25		FRICK	AMERICAN PETROLEUM INSTITUTE
			Number of Comments for ID Number 74 - 01	
76	3		GOULD	KODIAK CITY OF
			Number of Comments for ID Number 76 - 01	
77	3		GRISCO	NATIONAL PARKS & REC ASSOC ALASKA
			Number of Comments for ID Number 77 - 01	

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
2210	66	20	IAROSSI	EXXON SHIPPING COMPANY
		127	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number	66 = 02
	68	76	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number	68 = 01
	76	4	GOULD	KODIAK CITY OF
			Number of Comments for ID Number	76 = 01

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
2220	4	71	SMITH	ALYESKA PIPELINE SERVICE COMPANY
			Number of Comments for ID Number	4 = 01
	66	21	IAROSST	EXXON SHIPPING COMPANY
		128	IAROSST	EXXON SHIPPING COMPANY
			Number of Comments for ID Number	66 = 02
	68	77	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number	68 = 01

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
2230	4	71	SMITH	ALYESKA PIPELINE SERVICE COMPANY
			Number of Comments for ID Number	4 = 01
	66	129	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number	66 = 01
	68	78	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number	68 = 01

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
2240	4	71	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		72	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		84	SMITH	ALYESKA PIPELINE SERVICE COMPANY
			Number of Comments for ID Number	4 - 03
	8	123		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number	8 - 01
66		22	IAROSSI	EXXON SHIPPING COMPANY
		130	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number	66 - 02
68		79	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number	68 - 01

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
2250	4	82	SMITH	ALYESKA PIPELINE SERVICE COMPANY
			Number of Comments for ID Number	4 = 01
	8	121		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number	8 = 01
	65	87	MYERS	NATIONAL AUDUBON SOCIETY
			Number of Comments for ID Number	65 = 01
	66	131	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number	66 = 01
	68	80	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number	68 = 01
	69	20	PARKER	ADLER JAMESON & CLARAVAL
			Number of Comments for ID Number	69 = 01

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
2260	4	73	SMITH	ALYESKA PIPELINE SERVICE COMPANY
			Number of Comments for ID Number 4 - 01	
	8	126		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 01	
	17	1	ARNDT	
		2	ARNDT	
			Number of Comments for ID Number 17 - 02	
	20	1	WORKMWN	UNIV OF ALASKA ANCHORAGE
		2	WORKMWN	UNIV OF ALASKA ANCHORAGE
		3	WORKMWN	UNIV OF ALASKA ANCHORAGE
		4	WORKMWN	UNIV OF ALASKA ANCHORAGE
		5	WORKMWN	UNIV OF ALASKA ANCHORAGE
			Number of Comments for ID Number 20 - 05	
	36	3	ARUNDALE	UNIV OF ALASKA FAIRBANKS
			Number of Comments for ID Number 36 - 01	
	57	1	HARVILLE	WASHINGTON STATE UNIVERSITY
			Number of Comments for ID Number 57 - 01	
	66	132	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01	
	72	3	TABIOS	THE NORTH PACIFIC RIM
		4	TABIOS	THE NORTH PACIFIC RIM
		5	TABIOS	THE NORTH PACIFIC RIM
		6	TABIOS	THE NORTH PACIFIC RIM
			Number of Comments for ID Number 72 - 04	
	75	4	GERLACH	UNIV OF ALASKA MUSEUM FAIRBANKS
			Number of Comments for ID Number 75 - 01	
	77	2	GRISCO	NATIONAL PARKS & REC ASSOC ALASKA
			Number of Comments for ID Number 77 - 01	
	79	1	ARENSON	KODIAK AREA NATIVE ASSOCIATION
			Number of Comments for ID Number 79 - 01	

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
2270	4	74	SMITH	ALYESKA PIPELINE SERVICE COMPANY
			Number of Comments for ID Number 4 - 01	
	8	122		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number 8 - 01	
	13	18	SHANE	FRIENDS OF THE SEA OTTER
		19	SHANE	FRIENDS OF THE SEA OTTER
			Number of Comments for ID Number 13 - 02	
	29	6	FRY	PACIFIC SEABIRD GROUP
			Number of Comments for ID Number 29 - 01	
	63	4	WALTER	NAT TRUST FOR HISTORIC PRESERVATION
			Number of Comments for ID Number 63 - 01	
	64	12	MCCALLION	HILL BETTS & NASH
			Number of Comments for ID Number 64 - 01	
	66	133	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01	
	68	81	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01	
	69	21	PARKER	ADLER JAMESON & CLARAVAL
			Number of Comments for ID Number 69 - 01	

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
2280	4	75	SMITH	ALYESKA PIPELINE SERVICE COMPANY
			Number of Comments for ID Number	4 - 01
	8	124		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number	8 - 01
63		3	WALTER	NAT TRUST FOR HISTORIC PRESERVATION
			Number of Comments for ID Number	63 - 01
66		134	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number	66 - 01

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
2290	4	32	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		77	SMITH	ALYESKA PIPELINE SERVICE COMPANY
		Number of Comments for ID Number 4 - 02		
	8	125		NATURAL RESOURCES DEFENSE COUNCIL
		Number of Comments for ID Number 8 - 01		
	10	11	PETUMENOS	BIRCH HORTON BITTNER AND CHEROT
		Number of Comments for ID Number 10 - 01		
	15	1	BETTS	VANGUARD RESEARCH
		2	BETTS	VANGUARD RESEARCH
		3	BETTS	VANGUARD RESEARCH
		4	BETTS	VANGUARD RESEARCH
		5	BETTS	VANGUARD RESEARCH
		6	BETTS	VANGUARD RESEARCH
		7	BETTS	VANGUARD RESEARCH
		8	BETTS	VANGUARD RESEARCH
		Number of Comments for ID Number 15 - 08		
	17	3	ARNDT	
		4	ARNDT	
		Number of Comments for ID Number 17 - 02		
	20	6	WORKMWN	UNIV OF ALASKA ANCHORAGE
		7	WORKMWN	UNIV OF ALASKA ANCHORAGE
		8	WORKMWN	UNIV OF ALASKA ANCHORAGE
		9	WORKMWN	UNIV OF ALASKA ANCHORAGE
		10	WORKMAN	UNIV OF ALASKA ANCHORAGE
		Number of Comments for ID Number 20 - 05		
	36	1	ARUNDALE	UNIV OF ALASKA FAIRBANKS
		Number of Comments for ID Number 36 - 01		
	44	1	DUMOND	UNIVERSITY OF OREGON
		Number of Comments for ID Number 44 - 01		
	48	1	JORDAN	UNIV OF ALASKA FAIRBANKS
		Number of Comments for ID Number 48 - 01		
	49	1	MOSS	UNIV OF ALASKA FAIRBANKS
		Number of Comments for ID Number 49 - 01		
	53	1	LOVIS	MICHIGAN STATE UNIV MUSEUM
		2	LOVIS	MICHIGAN STATE UNIV MUSEUM
		Number of Comments for ID Number 53 - 02		
	57	2	HARVILLE	WASHINGTON STATE UNIVERSITY
		Number of Comments for ID Number 57 - 01		
	60	1	INOUE	
		Number of Comments for ID Number 60 - 01		

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
2290	62	1	YESNER	
			Number of Comments for ID Number 62 - 01	
	63	1	WALTER	NAT TRUST FOR HISTORIC PRESERVATION
		2	WALTER	NAT TRUST FOR HISTORIC PRESERVATION
			Number of Comments for ID Number 63 - 02	
	64	10	MCCALLION	HILL BETTS & NASH
		13	MCCALLION	HILL BETTS & NASH
			Number of Comments for ID Number 64 - 02	
	66	135	IAROSSI	EXXON SHIPPING COMPANY
			Number of Comments for ID Number 66 - 01	
	68	82	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number 68 - 01	
	72	7	TABIOS	THE NORTH PACIFIC RIM
		8	TABIOS	THE NORTH PACIFIC RIM
		11	TABIOS	THE NORTH PACIFIC RIM
			Number of Comments for ID Number 72 - 03	
	75	2	GERLACH	UNIV OF ALASKA MUSEUM FAIRBANKS
		2	GERLACH	UNIV OF ALASKA MUSEUM FAIRBANKS
			Number of Comments for ID Number 75 - 02	
	77	1	GRISCO	NATIONAL PARKS & REC ASSOC ALASKA
		4	GRISCO	NATIONAL PARKS & REC ASSOC ALASKA
			Number of Comments for ID Number 77 - 02	

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
2295	8	119		NATURAL RESOURCES DEFENSE COUNCIL
			Number of Comments for ID Number	8 - 01
	68	75	HAIR	NATIONAL WILDLIFE FEDERATION
			Number of Comments for ID Number	68 - 01
	69	18	PARKER	ADLER JAMESON & CLARAVAL
			Number of Comments for ID Number	69 - 01

Issue_	ID_Number_	Comment_	Last_Name_	Comp_Agency_Org_
2300	4	36	SMITH	ALYESKA PIPELINE SERVICE COMPANY
			Number of Comments for ID Number	4 = 01
	13	2	SHANE	FRIENDS OF THE SEA OTTER
			Number of Comments for ID Number	13 = 01
	67	5	FRINK	TRISTATE BIRD RESCUE & RESEARCH INC
			Number of Comments for ID Number	67 = 01

15.02.01

1989 NRDA

15.2.1

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EXHIBIT VALUED \$1,000.00
TRUSTEE COUNCIL
ADMINISTRATIVE RECORD



UNIVERSITY OF ALASKA MUSEUM

October 31, 1989

Cercla Trustee Council
P.O. Box 20792
Juneau, AK 99802

Dear Trustees:

After reviewing the Public Review Draft of the Assessment Plan issued by the Council, I am compelled to express my dissatisfaction with it. The entire plan is in need of reconsideration, but I will restrict my comments to sections related to anthropology and archaeology since these are the areas in which I am qualified to comment.

Com.	Topic	Issue	Sug.	Sort
1	2	0100		2

The section treating the problem of archaeological sites is contained within Economic Uses Study Number 9. Unfortunately, this section is incomplete, inadequate, ambiguous, and too vague to evaluate. The contractual relationship between contractor and contractee must be explicit, although it clearly is not at the present time, as it would be impossible to perform professionally responsible and ethical research on the basis of the document as it now stands. The project statement, moreover, contains no language pertaining to compliance, quality control, or evaluation, and thus there is no insurance of accountability. In addition, and unlike other studies in the plan, the lack of specific proposals related directly to specific costs renders this section useless for anything other than the purposes of political rhetoric. Obviously, protection of the cultural resources of the region is not a high priority item for the trustees.

Com.	Topic	Issue	Sug.	Sort
2	3	2290		2

The region affected by the oil spill contains archaeological sites and cultural resources that are of local, state, national, and international significance. At the very least one would think that the trustees would consider our own cultural heritage to be as important as the Soviets do, a proposition that is not, however, borne out by Economic Uses Study Number 9. Part of my criticism here rests with the fact that no where in this document is the problem of archaeological looting and vandalism addressed. There must be an explicit acknowledgement of the problem and there must be specific proposals for increasing public awareness of the issue, for protecting significant sites through surveillance and monitoring, and for archaeological research and compliance under the Archaeological Resources Protection Act. Vandalism of archaeological properties and other illegal activities associated with the artifact trade clearly resulted from the oil spill. Since the state and federal

Com.	Topic	Issue	Sug.	Sort
3	4	2290		2

UNIVERSITY OF ALASKA - FAIRBANKS
PO BOX 100000 Fairbanks Alaska 99715-0000 (907) 471-7800

UNIVERSITY OF ALASKA

Cercia Trustee Council
October 31, 1989
Page 2

agencies both have a legal mandate to protect cultural resources, the need to provide funding sufficient to implement this mandate must be considered in more detail.

Finally, I find the content of Economic Uses Study Number 6 to be technically inadequate and conceptually barren as well. This is, for better or worst, probably more serious since we are dealing here with assessment of the impact of the oil spill on subsistence activities, subsistence values, economic opportunities and constraints, changing wage and labor patterns, impacts of industry on small rural communities, and the social and psychological consequence of this terrible tragedy on human lives. The proposal contained within Economic Uses Number 6 are vague, impossible to apply in their present form, and neither necessary nor sufficient to insure that concrete ethnographic research on these problems will be the result. Not only are quantitative socioeconomic impact studies needed, but clearly the more qualitative types of ethnographic studies handled by anthropologists working on cultural values, perception of the land, and environment, and relationships between work, community, and quality of life must be acknowledged and funded. These studies must be undertaken with as much local involvement as possible.

Com.	Topic	Issue	Sug.	Sort
4	2	22/00		2

The Review Draft is inadequate as presented and I urge you to reconsider proposals contained within Economic Uses Study Number 6 and 9. If you have any questions or comments, please do not hesitate to contact me.

Sincerely,

S. Craig Gerlach

S. Craig Gerlach
Assistant Professor
University of Alaska Museum
University of Alaska Fairbanks
907 Yukon Drive
Fairbanks, AK 99775-1200
(907) 474-7817

sao

c: Representative Mike Davis
Senator Ted Stevens
Senator Fran Murkowski
Wallace Steffan, Museum Director
E. James Dixon, Curator of Archaeology

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EXXON VALDEZ OIL SPILL
TRUSTEE COUNCIL
ADMINISTRATIVE RECORD

ADMINISTRATIVE OFFICES
POST OFFICE BOX 1397, KODIAK, ALASKA 99615
TELEPHONE (907) 486-3224
FAX (907) 486-4009

October 30, 1989

Trustee Council
Box 20792
Juneau, AK 99802

Dear Trustees:

We have reviewed the State/Federal Natural Resource Damage Assessment and Restoration Strategy for the Exxon Valdez Oil Spill document.

Part I Studies: Injury Determination/Quantification appears to be quite comprehensive, however, we have no way of knowing if it is all inclusive or if it encompasses all affected environmental components.

We emphasize the need to structure the Development of the Restoration Plans in a very careful manner to assure that all areas of concern are included. We will welcome the opportunity for additional review and comments as mentioned in the "Methods and Analysis" section on page 186.

The studies cited in Part III Damage Determination: Economic Value of Resource Use are of paramount concern for the City of Kodiak, the Kodiak Island Borough, and probably for all other geographically impacted areas. The Methods and Analysis section of Economic Uses Study Number 1 mentions utilization of comparative price studies using 1989 prices from affected and unaffected areas regarding commercial fisheries (page 190). We feel this study should examine other aspects of the 1989 commercial fishery. It is our belief that the Exxon Valdez Oil Spill depressed seafood prices worldwide. Previous surveys have indicated significant planned reductions of household seafood consumption in several countries. These reductions were predicated upon the oil spill in Alaska.

The Summary of Fiscal Needs in Part IV includes the summary of the financial requirements estimated for accomplishment of the studies noted therein. These seem to result from a studied approach which required reasonable thought and effort. We are not, however, in a position to evaluate such for adequacy.

1 3 000 X

2 3 0150 Y 2

3 1 2200 Y 1

4 3 2210 X 2

Trustee Council
October 30, 1989
Page 2

Overall the Public Review Draft appeared to be an excellent compilation of needed studies. We appreciate this opportunity to review and comment on this document. We would welcome additional participation when the studies are implemented. If you need further information or clarification of review, please contact Wayne Coleman at 486-6700.

Com.	Topic	Issue	Sug.	Comm
5	1	0100	X	0

Sincerely,

CITY OF KODIAK



Gordon J. Gould
City Manager

GJG:WC/keh

cc: Robert Brodie, City Mayor
Jerome Selby, Borough Mayor

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EXXON VALDEZ OIL SPILL
TRUSTEE COUNCIL
ADMINISTRATIVE RECORD



The Commonwealth of Massachusetts
University of Massachusetts-Boston
Harbor Campus
Boston, Massachusetts 02125-3393

(617) 929-8255

ENVIRONMENTAL SCIENCES PROGRAM

October 31, 1989

Trustee Council
State/Federal Natural Resource Damage Assessment
for Exxon Valdez Oil Spill
P.O. Box 20792
Juneau, Alaska 99802

Dear Trustee Council and Staff,

I offer the following comments on the Draft State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill, dated August, 1989.

1) The "research issue". I recognize that the intent of the draft plan and studies outline is not to describe research needs for understanding the immediate and long term fate and effects of the spilled oil and cleanup efforts as stated clearly in the "Dear Reviewer" preface letter. I further recognize the enormity and complex nature of the task confronting the Trustee Council and staff. In my opinion, it is very difficult to separate research on the immediate and long term fate and effects of the spilled oil from the research needs perceived by the Trustees Council, staff and advisors to document the damage and to support restoration efforts.

The draft plan does not contain more than indirect mention of any mechanism by which the Trustees Council will make such a determination of separation of research for research sake and research for damage assessment restoration issues. The indirect mention is in the schematic of figure 6 and figure 7 and the fact that the Trustee Council is legally in charge of the study.

2) Lack of Adequate Information for Reviewing the Study Plan.

I submit that there is a major flaw in the draft plan document that prevents me, or any other scientist-reviewer not already engaged in the study and "cleared" for access to the data already in hand, from providing the type of valid review based in fact that the citizens of the United States and especially of Alaska deserve. This flaw is the lack of inclusion of more than vague, generally descriptive phrases of a terse news media type about is known to date about the spill. In point of fact there is nothing in the draft plan that tells me more about what is known about the spill than I have read in the popular press and not as much as I have learned in person from two visits to Prince William Sound

Com.	Topic	Issue	Sug.	Sort
1	3	0240	X	2

Com.	Topic	Issue	Sug.	Sort
2	3	0102	X	2

(April and June, 1989). This reduces the review of the draft plan to the level of whether or not the topics of the studies "seem" appropriate. Thus, as an independent reviewer I am asked to take on faith that the preliminary data in hand support the general descriptive statements of study and that the best qualified people will carry out the studies. In regard to the latter statement, I recognize several names of very well qualified people from NMFS laboratories in Alaska and Seattle, Washington and from the University of Alaska in Appendix D who are acknowledged as contributors to the draft plan development. There is no statement that these people will actually be involved in the study and to what extent; how, when, where, and for which tasks. Generic statements about agencies responsible for a given study provide me with very little information as to the extent that competent scientists in those agencies will be involved.

I have been told in an open public meeting in June with the Trustee Council members in conjunction with the MMS Science Committee meeting in Juneau, Alaska (in paraphrase as I do not have a transcript of the meeting available to me) that - the best interests of the people of the United States as determined by the U.S. Department of Justice interpretations of the NRDA provision of CERCLA are served by not releasing data on the fate and effects of the spilled oil i.e. data obtained by government scientists and contractors.--- end of paraphrase ---. This interpretation and its apparent extension to the draft plan prevents me from providing an adequate review of the draft plan.

Com.	Topic	Issue	Sug.	Sort
3	3	0240	X	2

3) What will the review accomplish, considering that several studies of the draft plan have already been initiated and indeed have to be completed by 2/28/90 for an estimated expenditure of \$35,420,900? Thus, the reviewers are being asked to comment on a "fait accompli" at this time. Is this review process an after the fact exercise designed to satisfy the law?

Com.	Topic	Issue	Sug.	Sort
4	3	0240	X	2

4) One year's worth of data will be insufficient to satisfy many of the study plan objectives.

Com.	Topic	Issue	Sug.	Sort
5	3	0201		2

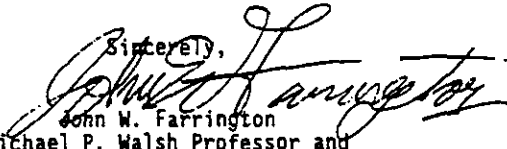
5) Independent Scientific Review Council. The Trustee Council would be well advised to set up an autonomous scientific review council that would derive no actual benefit from the damage assessment and restoration study other than compensation for their time and expenses in connection with reviewing the quality and appropriateness of the scientific efforts including plans, progress reports, data interpretations and recommendations vis a vis damage assessment and restoration. This scientific review council would be composed of experts in disciplines appropriate to the damage assessment and restoration activities with experience, where possible, with oil pollution or environmental pollution in general. State of Alaska and Federal Agency scientists could not be members of the council because of inherent conflicts of interest with respect to the legal actions. The same would be true for scientists from members of the partnership in Alyeska or from Exxon.

Com.	Topic	Issue	Sug.	Sort
6	4	0240		2

I submit that it is only in this manner that the Trustee Council can ensure for itself and to the world outside of the people under "gag" orders not to discuss data and interpretations that the very best study has been accomplished.

Given the over arching nature of my concerns mentioned above, it seemed non productive to delve into great detail on the same theme in each and every project.

You have a formidable task, as I stated above, and I wish you the very best success in this endeavor.

Sincerely,

John W. Farrington
Michael P. Walsh Professor and
Director
(Adjunct Scientist, Chemistry Dept
Woods Hole Oceanographic Institution)

CC. Senator Edward Kennedy
Senator John Kerry
Congressman Gerry Studds
Congressman John Joseph Moakley
Dr. Sherry Penney, Chancellor University of Massachusetts-Boston
Dr. Lev Zompa, Provost, University of Massachusetts-Boston
Dr. Fuad Safwat, Dean Graduate Studies and Research, University of
Massachusetts-Boston
Dr. Richard Freeland, Dean College of Arts and Sciences, University of
Massachusetts-Boston
Dr. John H. Steele, FRS, President
Woods Hole Oceanographic Institution
Dr. Craig Dorman, Director, Woods Hole Oceanographic Institution

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TRUSTEE COUNCIL
ADMINISTRATIVE RECORD

Valdez
Tatitlek
Eyak

Chenega
Seward

English Bay
Port Graham

the north pacific rim

October 30, 1989

Trustee Council
P.O. Box 20792
Juneau, AK 99802

**Subject: Comments on Draft State/Federal Natural Resource
Damage Assessment Plan and Restoration Strategy for the Exxon
Valdez Oil Spill**

Dear Sirs:

Chugach Natives, whom The North Pacific Rim serves, are the primary economic users of the subsistence resources of Prince William Sound/Lower Cook Inlet. We are the source and spiritual heir of the region's archaeological heritage. And we rely on the subsistence and commercial use of the region's diverse natural resources for our livelihood, as do most of the region's residents.

In sum, the economic and social well-being of Chugach Natives rests on continued use of publicly owned and managed resources imperiled by the Exxon Valdez oil spill. This fact was explicitly cited by Secretary Manuel Lujan as the basis for his directive of May 15, 1989 to the Interior Representative on the Trustee Council acknowledging the Department of Interior's responsibilities toward Alaska Natives adversely impacted by the Exxon Valdez oil spill.

Thus, The North Pacific Rim has a vital stake in seeing that Exxon Valdez oil spill's injuries to publicly owned natural resources are fully identified and damages fairly assessed, pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). Only in that way will federal and state agencies and tribes obtain the means to restore the natural resource values that flourished before the Exxon Valdez oil spill.

3300 "C" Street / Anchorage, Alaska 99503 / Ph. (907) 562-4155 / Fax (907) 563-2891

The Non-Profit Corporation Serving The People Of The Chugach Native Region



Further, we believe that Section 208 of CERCLA, as amended, envisioned that Alaska Native villages and their governing bodies would be formally involved during the CERCLA process. Unfortunately, this involvement did not occur in the present context.

Com.	Topic	Issue	Sug.	Sort
1	5	0209		2

With this overriding concern in mind, I want to address personally the Draft State/Federal Natural Resource Damage Assessment Plan and Restoration Strategy for the Exxon Valdez Oil Spill's treatment of two topics--subsistence and cultural resources--that are of foremost concern to the Alaskan Native people of the Chugach region.

Subsistence

There are three serious deficiencies in the Draft Assessment Plan's treatment of oil spill impacts on subsistence habitats and resources.

First, the scope and methods of the Part I resource studies are so briefly outlined in the Draft Assessment Plan that evaluation of their technical adequacy, either in general or with specific regard to subsistence, is precluded. The sketchy study descriptions give no assurance that field studies of injuries to natural resources will include a representative sample of the diverse coastal and marine resources and habitats harvested for subsistence by village residents near spill-affected areas. (To remedy this shortcoming, we urge that the final Assessment Plan studies program endorse the principle that studies to identify and assess resource damages must take full account of subsistence habitats and resources relied upon by Alaska Natives.

Com.	Topic	Issue	Sug.	Sort
2	5	0102		2

Com.	Topic	Issue	Sug.	Sort
3	3	2260		2

Second, the assessment of oil spill impacts on subsistence is diffused among a long list of resource studies primarily oriented to other resource issues. This piecemeal approach fails to address overall spill impacts upon subsistence in any focused or systematic manner. To remedy this defect, we urge that the Part I studies program be revised to explain, in advance, how the cumulative findings of the individual Part I assessment studies will be fused into a comprehensive account of subsistence impacts.

Com.	Topic	Issue	Sug.	Sort
4	3	2260		2

Third, the most alarming single feature of the Draft Assessment Plan is the brief description of the study approach planned for valuation of economic damages attributable to subsistence resources. The proposed methodology assumes that the economic value of subsistence damages can be reduced to market-basket substitutes. This one-dimensional approach totally ignores that subsistence is an integral element of the social well-being of Alaska Natives.

Com.	Topic	Issue	Sug.	Sort
5	5	2260		2

To Chugach Natives, subsistence is more than food, more than wealth--subsistence is the cornerstone of our society and culture. Subsistence is the unique basis for irreplaceable

Com.	Topic	Issue	Sug.	Sort
6	3	2260		2

non-material benefits for which an economic valuation must nevertheless be imputed under CERCLA. We are concerned that slighting these associated non-monetary economic values will diminish the damage assessment and, in turn, the funds obtained for restoration of publicly managed subsistence resources upon which our traditional subsistence lifestyle has long relied. Therefore, we recommend that the valuation of "losses to subsistence households" take specific account of the loss of these non-monetary benefits.

Cultural Resources

The Draft Assessment Plan properly acknowledges that archeological resources situated on lands over which government has assumed proprietorship are an economic asset to society. Nonetheless, we are extremely concerned that the scope, techniques, and funds for the single archeological study proposed in the Draft Assessment Plan are inadequate to secure a comprehensive assessment of spill damages to cultural resources.

Com.	Topic	Issue	Sug.	Sort
7	5	2290		2

The funds for the archeological study are not specified, but they are surely inadequate for the formidable task of surveying the entire spill-damaged coastline. Additionally, it will be impossible to survey the entire spill-affected coastline to identify, assess, and report on all damaged archeological sites by February 28, 1990. Nor does the proposed study clearly acknowledge that clean-up activities have, at some sites, compounded the original oil spill damages.

Com.	Topic	Issue	Sug.	Sort
8	5	2290		2

Com.	Topic	Issue	Sug.	Sort
9	3	0201		0

We recommend that the Draft Assessment Plan be revised to provide for technical studies under Part I to determine and quantify injury to archeological resources. The results of these technical studies should serve as the basis for restoration plans and for the determination of economic values. This is the scheme uniformly followed for all other resources addressed in the Draft Assessment Plan. It should be followed for archeological resources as well.

Com.	Topic	Issue	Sug.	Sort
10	3	0100		2

We are concerned, too, that the economic evaluation of archeological resources may consider only known sites at which physical injury has been positively determined. Such an approach would be deficient, as present knowledge of the archeological assets of the spill-affected area is patchy. The field survey should, of course, be as complete as feasible. But there is no need to confine the calculation of economic damages to specific archeological sites for which there is material evidence of damage, no more than it is necessary to count every single tainted fish or organism to assess biological injuries. A well designed study employing rigorous sampling methods can produce an assessment of overall archeological damages, in advance of identification and evaluation of every damaged site.

Com.	Topic	Issue	Sug.	Sort
11	3	2290		2

The above noted inadequacies in the subsistence and cultural resources study proposals lead us to some final points about the

proposed schedules and funding levels for the Part I resource studies and the Part III economic studies.

Schedule

While we are pleased that the Draft Assessment Plan envisions speedy completion--by February 28, 1990--of the initial studies proposed in Part I to determine and quantify damages to natural resources, we are alarmed that the EXECUTIVE SUMMARY states that "the damage assessment document is essentially a one-year plan" and implies that support for further studies will be the exception.

Contrariwise, the Draft Assessment Plan elsewhere repeatedly and explicitly observes that significant new environmental damages from residual oil contamination or from delayed impacts are expected to arise for years to come. Thus, a comprehensive field studies program to assess spill damages calls for patience as well as speed. It is prudent that some field studies be undertaken quickly to capture immediate or transitory spill effects, but rash to terminate all field studies before long-term spill effects become apparent. Therefore, we urge that the final Assessment Plan state an explicit, positive commitment to commission whatever follow-up studies are indicated by Part I research as well as studies to assess long-term impacts not yet manifest.

Additionally, we note that the economic use studies must await availability of the database to be compiled in the Part I resource studies. Timeliness may be critical to certain field data collection studies, but there is much more scheduling leeway for the conduct of economic studies. For this reason, we believe that it is advisable and prudent to extend the schedule for completion of the economic use studies.

Funding Levels

The Draft Assessment Plan offers no rationale or justification for the funding level proposed for the studies program. We recommend that the final Assessment Plan present an analysis of the optimal level of effort needed overall and for individual studies to accomplish the objectives of CERCLA.

Finally, the climax of this damage assessment process is the determination of economic damages. This determination will set the compensatory damages or restorative efforts sought for public resources. This part (Part III--Economic Use Studies) of the Draft Assessment Plan is seriously deficient in several respects. The Draft Assessment Plan does not list specific budgets or lead agencies for any of the proposed nine individual economic uses studies. The overall level of funding for economic studies seems scant in light of the pivotal importance of the damages assessment and the technical difficulties that these economic studies confront.

We cannot support an Assessment Plan that does not provide any information on the sponsorship or level of effort committed to

Com.	Topic	Issue	Sug.	Sort
12	3	0201		2

Com.	Topic	Issue	Sug.	Sort
13	3	0100		2

Com.	Topic	Issue	Sug.	Sort
14	2	2200		2

studies that are critical to restoration of our region's natural resource base. We think there is both substantial need and ample opportunity to improve the proposed program of economic uses studies. Therefore, we recommend that Part III of the Draft Assessment Plan be revised accordingly and re-circulated for public comment before it is finalized.

Lastly, we wish to endorse proposed Study Number 10, "Injury to Dolly Varden Char and Sockeye Salmon in the Lower Kenai Peninsula." This study may provide information helpful to other efforts already underway by The North Pacific Rim and the State of Alaska Department of Fish and Game to restore the productivity of habitats in the English Bay/Port Graham vicinity.

Thank you for this opportunity to comment upon the Draft Assessment Plan.

Very truly yours,

THE NORTH PACIFIC RIM


Derenty Tabios
Executive Director

Com.	Topic	Issue	Sug.	Sort
15	1	1400		2



77

PO Box 202045
Anchorage, AK 99520
October 30, 1989

Trustee Council
PO Box 20792
Juneau, AK 99802

Dear Council Members,

Thank you for providing this opportunity to comment on the draft Natural Resource Damage Assessment Plan and Restoration Strategy.

National Parks & Conservation Association has submitted extensive comments regarding the natural resources studies in cooperation with other conservation organizations.

The focus of these comments is cultural resources as outlined in Economic Uses Study Number 9 and related to Economic Uses Study Number 6.

It appears that cultural resources responsibilities have been given cursory consideration in this draft plan. With approximately 1,920 miles of oil pathway impacting an area with the highest Eskimo coastal habitation in the world, cultural resources damage assessment and restoration needs clear delineation. Nowhere has NPCA been able to find that this planning process is exempt from the responsibilities of Section 106 of the National Historic Preservation Act.

Economic Uses Study Number 9 is rather general and somewhat vague. Under "Methods and Analyses", the various agencies with professional knowledge and expertise are not listed. No agency has been given the go-ahead to begin any assessment. The various agencies, such as the National Park Service, US Forest Service, State of Alaska Office of History & Archeology, and the Bureau of Indian Affairs, have no flexibility within their current operating budgets to perform needed assessments. All need additional staff and support services. This Study also has no timeline nor budget.

The same kinds of points can be made for Economic Uses Study Number 6. Losses to subsistence households fits into the cultural resources arena as historic and traditional uses, the importance of ethnography and other cultural issues need addressing.

Add the above concerns to the fact that fall/winter weather has begun to set into the oiled areas and frankly, we do not know how the February, 1990 deadline for these assessment studies can realistically be met.

Doc.	Topic	Index	Page	File
1	3	2200	X	2

Doc.	Topic	Index	Page	File
2	3	2260	X	2

Doc.	Topic	Index	Page	File
3	4	2200	X	2

National Parks and Conservation Association
1015 Thirty-First Street, N.W., Washington, D.C. 20007
Telephone (202) 944-8530

Trustee Council
page 2

The US Coast Guard and the Exxon Corporation did recognize Section 106 responsibilities. It is our understanding that a team of recognized professional archeologists and historians did present the Trustee Council with a draft to be included in this Plan. It is difficult to believe that these professionals would submit such a simplified, distilled version of a draft.

In closing, I will summarize our basic concerns. The cultural resources assessment is inadequate and not acceptable. The lack of budget and timelines, the lack of clarity for methods and analyses, the missing listing of agencies involved and the lack of connection to Section 106 need addressing. It is not possible for this draft plan to provide the necessary studies to determine the injury to natural resources and to determine the damages resulting from the loss of public use of those resources and provide the strategy for restoration.

Com.	Topic	Event	Imp.	Form
4	2	2290	X	2

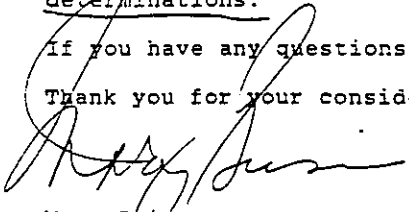
NPCA urges that the Trustee Council reconsider its responsibilities under Section 106.

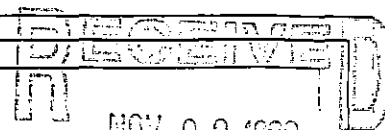
NPCA also has serious concerns about the Trustee Council's method of operating with regards to deciding about using Natural Resources Damage Assessment regulations and about whether and to what extent potentially responsible parties should participate in the damage assessment. We would urge the inclusion of a meaningful public process to make these determinations.

Com.	Topic	Event	Imp.	Form
5	3	0200	X	2

If you have any questions, please contact me at 907-258-4576.

Thank you for your consideration,


Mary Grisco
Alaska Regional Representative



EXXON SHIPPING COMPANY

EXXON VALDEZ OIL SPILL
TRUSTEE COUNCIL
ADMINISTRATIVE RECORD

**STATE/FEDERAL
NATURAL RESOURCE DAMAGE
ASSESSMENT PLAN
FOR THE EXXON VALDEZ OIL SPILL
AUGUST 1989
PUBLIC REVIEW DRAFT**

**REVIEW COMMENTS
OCTOBER 30, 1989**

EXXON SHIPPING COMPANY

POST OFFICE BOX 1512 • HOUSTON, TEXAS 77251-1512 "EXXSHIP HOUSTON"

FRANK J. IAROSCI
PRESIDENT

October 27, 1989

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Gentlemen:

Exxon Shipping Company (ESC) has received the Draft of the Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill, dated August 1989. The attached document provides the ESC response and comments on that Draft.

From the outset, ESC has attempted to deal fairly with both the private and public aspects of the spill. A comprehensive claims handling process was established to deal with claims from private individuals, communities, and government agencies. With respect to public interests, ESC has repeatedly offered to participate and cooperate with the Trustees in order to identify environmental impacts and consider restoration activities.

Moreover, the April 13 agreement between the Trustees and ESC provided for ESC's participation in development of the Assessment Plan as specified in the Department of Interior's NRDA regulations. Now, however, since much of the work described in the Draft has been completed and study plans for remaining work appear irreversible, the opportunity for ESC to cooperate or provide substantive input to the assessment has been significantly circumscribed, if not foreclosed. This adversarial posture does not serve the public interest; its continuation will seriously impede definition and timely completion of an optimum restoration plan.

The principal issue in the Draft Assessment Plan appears to be injury identification, with scant attention to restoration of the impacted resources. In contrast, an appropriate plan will undertake to identify impacted services and what, if any, restoration steps beyond natural recovery are warranted.

October 27, 1989

Finally, the principles and procedures contained in the DOI NRDA regulations have not been incorporated in the Trustees' process. Whether or not the Trustees are required to follow the regulations, it would be prudent to utilize them as a model of procedures and methodologies to assess damages. Had these regulations been followed, the Trustees' program would have been significantly different than described in the Draft.

ESC remains willing to participate in an assessment process, consistent with the DOI regulations, to conduct valid studies to determine environmental impacts and to design a restoration plan.

Sincerely,

Frank Javosi
fjm

FJI:mw

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PART 1
EXECUTIVE SUMMARY

Introduction

Exxon Shipping Company (ESC) has received the Draft of the Natural Resource Damage Assessment Plan ("Draft") for the Exxon Valdez Oil Spill, dated August 1989. This document was issued by the U.S. Departments of Interior, Commerce, and Agriculture and the state of Alaska as Trustees for natural resources affected by the spill. The Draft will elicit comments from both the public and potentially responsible parties ("PRP") regarding the process and program to determine impact on resources.

After the spill on March 24, 1989, ESC offered to participate and cooperate with the Trustees to identify environmental impacts and engage in restoration activities. However, a similar spirit of cooperation is notably absent from the assessment process outlined in the Draft. The Draft and the work it describes are biased and adversarial in tone. One trustee has already filed a lawsuit against ESC, an action which was launched before collaboration was attempted or the Draft was issued.

ESC's attempts to cooperate on the assessment and restoration issues have been repeatedly rebuffed. In May, ESC met with Trustees' counsel in Washington to discuss joint action in conducting studies or selecting scientific protocols. At Trustee counsel's suggestion, by a letter dated May 26, 1989, ESC formally requested meetings with Trustee Council representatives to explore these issues further. There has been no response to that proposal. As a consequence, no collaboration was possible on the development of an objective program. All attempts by ESC to jointly plan this effort and avoid duplication of technical studies have been rejected by the Trustees.

ESC has maintained a consistent willingness to cooperate and expeditiously settle reasonable claims. Shortly after the spill, ESC established a comprehensive claims-handling process to deal with private individuals, communities, and governmental agencies. Through September 1989, ESC dealt with more than 13,000 claims and paid more than \$100 million to mitigate the effects of the spill on claimants. ESC's spirit of cooperation with the relevant government authorities to seek a timely and effective restoration of the environment and economies affected by the spill is further evidenced by ESC mounting the largest spill cleanup in history in a remote and, sometimes, physically hostile environment. This cleanup activity involved more than 11,000 people and 1400 boats. This effort provided the best opportunity for the natural restoration process to begin even before the winter of 1989. ESC also established and funded numerous animal, bird, and eagle rescue operations and rehabilitation centers. In light of these cooperative steps, there is no apparent basis for the adversarial positions being taken.

Because of the adversarial postures of the Trustees reflected in the Draft, expressed by Department of Justice correspondence to ESC on September 29, and indicated by the state's lawsuit, ESC now finds it difficult to provide a constructive reply to the Draft. The public interest would be best served by a set of technical studies that will accurately evaluate natural resource injury and the best means of restoring environmental services. Clearly, all parties should have as their objective the execution of such studies to serve as the basis for future decision-making.

ESC's comments are summarized as follows:

Cooperative Process

The Trustees should conduct the assessment as part of a cooperative effort with the PRPs. Cooperation between the Trustees and the PRPs on damage assessments is recognized as an important element in reaching settlement for resource damages by both the Department of Interior's Natural Resource Damage Assessment (NRDA) regulations and the court, Ohio v. Department of Interior.¹ On April 13, ESC signed an agreement with the Trustees providing a voluntary advance payment of \$15 million to fund natural resource damage assessment studies. That agreement provided for ESC's participation in development of the Assessment Plan as specified in the Department of Interior's NRDA regulations.

Similar requests for participation in the NRDA process were expressed to Trustees in subsequent meetings and letters. Despite these repeated attempts to cooperate with the Trustees on the assessment, ESC has been repeatedly denied any role by the Trustees in the assessment process. Moreover, since much of the work described in the Draft has already been completed or study plans for remaining work have become irreversible, the opportunity for PRPs to cooperate or provide substantive input to the assessment has been circumscribed, if not foreclosed.

Draft Lacks Restoration Emphasis

The issue of highest concern is the Draft's focus on injury identification studies rather than restoration. This focus on injury to individual species or habitats obscures the importance of comprehensive planning to restore services provided by natural resources. Oil spilled from the Exxon Valdez affected very small portions of the vast ecosystems present in Prince William Sound, the Gulf of Alaska, and Lower Cook Inlet. Had restoration been the objective, the Draft would have differed significantly from the adversarial approach presented.

¹ 880F.2d 432 (D. B. Cir. 1989), rehearing denied, September 11, 1989.

Natural Recovery

The Draft ignores the natural recovery processes which rapidly dissipate the effects of oil spills. For an oil spill, a key element in achieving restoration is the ability of ecosystems to recover naturally in a timely manner. Over the last 25 years, oil spills have been extensively studied by both government and academia in environments ranging from tropical and temperate climates to colder waters similar to those in Alaska. These studies--covering large spills at Santa Barbara and from the Amoco Cadiz and the Argo Merchant--show that adverse environmental consequences associated with oil spills persist only a few years. The initial adverse impacts on fish, animals and birds are quickly rectified through natural recovery.

Cleanup Effects

The Draft also ignores the effects of the extensive cleanup activities undertaken by ESC. In the case of the Valdez spill, the natural recovery processes have been accelerated by a massive effort to remove oil undertaken by ESC over the spring and summer of 1989 and conducted at the direction of the Federal On-Scene Coordinator. Instead of recognizing that natural recovery, enhanced by the cleanup process, will occur, the Draft program consists of detailed studies of the initial impacts of the spill to be conducted in a single year.

Deficient Technical Studies

Irrespective of the relevance of the individual studies to the overall restoration objective, the methodologies selected by the Trustees for their studies are deficient in many cases and will not provide valid data for an assessment. For example, the use of a submersible vehicle for underwater observations is not an accepted method for sediment sampling on a broad scale. Likewise, in a large number of studies the Trustees propose to measure injury to species or habitats using techniques which will not provide statistically significant results. There are a large number of different factors which can affect the abundance and vitality of the various species to be investigated in the Trustees' programs. In order to detect and document injury, it is imperative that the studies be designed to statistically determine the impact of all factors, including the oil spill. From the information provided in the Draft, there is no indication that such designs have been adopted. Final conclusions drawn from such defective studies will not be valid. Compounding these problems, in numerous instances the studies are not described in sufficient detail to assess their utility or adequacy for the assessment process, nor is the necessary information otherwise available to the public or scientific community.

Relationship between Measurements and Restoration

In a broader sense, many of the methodological problems result from a failure to identify clear hypotheses which relate scientific studies explicitly to a damage assessment and restoration strategy. The Draft offers no information concerning the methods which will be used to translate small-scale, localized injuries identified in the studies to conclusions concerning the impacts on the ecosystem as a whole. Moreover, there is no description in the Draft regarding how localized injury studies will be utilized in designing restoration steps which might be undertaken.

NRDA Regulations

The Trustees continue to disregard both the spirit and the requirements of the NRDA regulations. Whether or not the Trustees are required to follow the regulations, they are a model of both procedures and methodologies that can be employed to assess damages. The NRDA regulations were designed by the Department of Interior to provide standardized and cost-effective procedures for assessing natural resource damages. These regulations were developed through a lengthy rulemaking review process involving government agencies, technical and environmental experts, and other interested parties. They incorporate and fully describe the technical, economic, and legal elements needed to conduct an assessment. Moreover, both the structure and general content of those regulations were examined and upheld in a recent Circuit Court decision.

Management Process

Because of the procedural and technical inadequacies contained in the Draft, the Trustees should become directly involved in the management of the assessment process. The uncooperative and adversarial positions assumed by the U.S. Department of Justice and the state of Alaska are in no party's best interest. More importantly, these positions may ultimately impede the restoration of areas impacted by the spill. Focusing on restoration would be best achieved by designation of a lead agency to conduct technically sound projects with the involvement of the PRPs.

ESC remains willing to participate in such a process, consistent with the DOI regulations, to design and conduct valid studies to determine environmental impacts and to design a restoration plan.

PART 2
COMMENTS ON THE INTRODUCTION IN THE DRAFT

The Draft contains an Introduction (pp. 1-28) which discusses a broad variety of issues and topics, both related and unrelated to the resource damage assessment process. This part of the response addresses deficiencies and errors in that section of the Draft with respect to both the relevant statutes and the Department of Interior (DOI) regulations for Natural Resource Damage Assessments (43 C.F.R. 11).¹

I. LEGAL AND REGULATORY ISSUES

It is apparent that the NRDA process depends on information and data developed from sound technical and economic studies of the affected resources. A balanced and coordinated program, which blends these studies with restoration objectives in the context of the statutes and DOI regulations, will lead to a timely, cost-effective, and reasonable recovery of natural resources affected by a spill.

A. The design of the Draft assessment studies are inconsistent with the stated goal of restoration.

The first paragraph of the Executive Summary states that "restoration is the primary objective of the state and federal Trustees and EPA and will be undertaken expeditiously" (Draft, Ex. Sum. i). Elsewhere, consistent with this goal, the Draft reports that "restoration techniques and strategies will be evaluated and an assessment of the feasibility and costs of each will be made" (Draft, p. 27). However, after identifying restoration as the "primary objective" of the Trustees' efforts, the Draft's apparent approach is to assess the amount of injury to resources caused by the spill, on the basis of essentially first-year data without any consideration of natural restoration, extrapolate from these data to determine the longer-term losses caused by the spill, derive a dollar damage figure to be assessed against the responsible parties, and then proceed with restoration financed by these damages.

The errors of the Draft's approach toward determining damages are reflected in a number of instances. Figure 7 (Draft, p. 21), which is stated to be the basis for determining damages (Draft, p. 20) ignores restoration costs and instead focuses exclusively on the value of resources damaged by the spill as measured by effects on human uses, services, market factors, and other values, such as "intrinsic, tourism, and recreation." Likewise, the Draft states (p. 17), that "quantification of the injury is then used by the trustees to estimate the amount of money to be sought as compensation" and (p. 20) that "determination of damages involves the assessment of economic

¹ Because the Trustees purport to have retained the option of following the DOI regulations it is appropriate to point out the discrepancies between those regulations and the Trustees' approach. In any event, even if the Trustees should in the future disavow compliance with DOI regulations, those regulations will still serve as a basis for judging the reasonableness of the Trustees' approach.

values, or damages, that may be claimed for the cumulative injury sustained by all resources." Thus, while restoration is the stated goal, the Draft appears to be overly focused on determination of the dollar damage of injury rather than the cost of reasonable restoration.

Such an approach to the calculation of damages and the funding of restoration ignores both the terms of § 311(f)(4) of the Clean Water Act (CWA), 33 U.S.C. § 1321(f)(4) and the regulations that have been published by the Department of the Interior to calculate damages for purposes of § 311(f)(4). That section of the CWA provides that:

The costs of removal of oil . . . for which the owner or operator of a vessel . . . is liable under subsection (f) of this section shall include any costs or expenses incurred by the Federal Government or any State government in the restoration or replacement of natural resources damaged or destroyed as a result of a discharge of oil . . . in violation of subsection (b) of § 311.

Section 311(f)(4) specifies the "costs or expenses" entailed in achieving "restoration or replacement" of natural resources damaged or destroyed in an oil spill; it does not impose any general liability upon owners or operators of vessels for natural resource damages, apart from restoration or replacement costs. Consistent with § 311(f)(4) of the CWA, § 311(f)(5) of that Act empowers the President or a representative of a state to act as "trustee of the natural resources to recover for the costs of replacing or restoring such resources." Further, any sums recovered under § 311(f)(4) "shall be used to restore, rehabilitate, or acquire the equivalent of such natural resources."

The regulations promulgated by the Department of the Interior to provide a means of assessing the damages contemplated by § 311(f)(4) contain detailed procedures for calculating damages when using a restoration or replacement approach. Three sections of the regulations--§§ 11.80, .81, and .82--are pertinent.

Section 11.80(c) states that "as part of the Assessment Plan concerning the appropriate measure of damages to be employed during the Damage Determination phase, the authorized official shall use either the restoration methodology provided in § 11.81 . . . or one of the use-value methodologies provided in § 11.83" Further, § 11.80(c) requires "for assessments that use the restoration methodology, a Restoration Methodology Plan ("RMP") as described in § 11.82 . . . shall be prepared"

Section 11.81--"Damage Determination Phase--Restoration Methodology"--§ 11.81(f) unambiguously states that:

The damage amount as measured by restoration or replacement is the cost to accomplish the cost-effective alternative that provides the lost services,

occasioned by an oil spill. More specifically, under § 11.81(c)(1):

restoration or replacement measures are limited to those actions that restore or replace the resource services to no more than their baseline . . . as determined in § 11.72

The "baseline," within the meaning of § 11.72(b)(1)

. . . should reflect conditions that would have been expected at the assessment area had the discharge of oil . . . not occurred, taking into account both natural processes and those that are the result of human activities.

Section 11.81(d)(1) directs that "alternative methods to achieve the restoration or replacement of the resource services shall be developed," while § 11.81(d)(2) provides that "selection of the cost-effective restoration or replacement methodology shall be documented in the RMP as required in § 11.82." In short, § 11.81 limits restoration-based damages to those that are required to return resources to the service levels that would have been expected, absent the spill, taking into account both "natural processes" and other "human activities" which might affect such resource service levels.

Section 11.82 places additional requirements on the RMP. Section 11.82 states that the "purposes of the RMP developed under § 11.82 are to ensure that the restoration or replacement alternative that forms the basis of the measure of damages is cost effective and to serve as a basis for the more detailed restoration or replacement plan that shall be completed after a damage award." Section 11.82(d)(2)(i) states the RMP "shall include a range of restoration and replacement alternatives . . . including a 'No Action Natural Recovery' alternative and other alternatives that reflect varying rates of recovery, management actions, and resource acquisitions." Additionally, § 11.82(f)(1) states the Trustees must select the cost-effective alternative means of achieving restoration.

Given the Trustees' stated goal of restoration and the clear guidance in the regulations as to the requirements for an RMP, the Draft must be modified to include an RMP that identifies alternative restoration strategies, including the "No Action Natural Recovery" alternative, which specifies that the cost-effective alternative will be adopted and incorporates a resource recoverability analysis as required by § 11.73 of the DOI regulations. The present Draft improperly focuses too many studies and resources on injury determination.

The program outlined in the Draft apparently started with the assumption that all resources were injured and that research was needed without regard to the restoration activities which might be undertaken. Such research cannot be squared with the restoration goal.

The Draft should seek restoration to a "without spill" condition. Contrary to the assumptions underlying at least some of the studies described in the Draft, the regulations do not envision a return to a "pristine" environment or the calculation of damages based on the perturbation of such an environment. Instead, § 11.81(c) of the regulations limits restoration or replacement "to those actions that restore or replace the resource services to no more than their baseline" Section 11.71(e) provides that "services include provision of habitat, food, and other needs of biological resources, recreation, other products or services used by humans, flood control, ground water recharge, waste assimilation, and other such functions that may be provided by natural resources."

Thus, restoration is complete when these services are restored, not when a "pristine" condition is reestablished. Moreover, the "proper measure of services is inextricably linked with the economic methodology selected in the Damage Determination phase," and "damages can only be claimed for natural resources with committed use as defined in this rule."² This suggests, consistent with the language of § 11.71(e), a definition of restoration that focuses on the services provided by those resources. The cost-benefit analysis required by § 11.35(c) for restoration also plainly requires a focus upon human use: "The benefits of restoration or replacement . . . shall be the value of the restored uses"

By assuming that the objective of restoration will be a "pristine" condition, the Draft fails to focus upon a return to "without spill" resource service levels. Had the Trustees not made this error, both the content and methodologies utilized by the Trustees' studies would have been far different; instead of focusing on injured resources, the studies would have emphasized the impairment of services provided by those resources.

B. The Draft focuses on a number of issues that are not pertinent to a natural resource damage assessment plan.

The Trustees state that their assessment in this case is based on the CWA and CERCLA but the Draft includes a number of studies that assess damages to third parties rather than the government. The CWA allows reimbursement only to federal and state governments of the costs incurred in the restoration or replacement of natural resources damaged as a result of a spill, while CERCLA § 107(f)(1) makes clear that natural resource damages shall be available solely to sovereigns, not to individuals.

² 51 Fed. Reg., p. 27713.

This focus on damages to the government is discussed in the introduction to the Department of Interior NRDA regulations:³

The losses compensable to a Federal or State Agency acting as a trustee under CERCLA are for uses of the resource by members of the public at large. They do not include any direct or indirect losses suffered by a private commercial user of public resources. Direct private commercial losses appropriately are not recovered by a public body acting for the public at large (p. 27680).

Thus, third parties whose commercial or property interests are impaired as a result of an oil spill or the release of a CERCLA hazardous substance may not pursue natural resource damage claims.

The damage-determination studies ignore this basic requirement. Instead of focusing on the restoration of such resources, these economic studies focus primarily upon commercial losses suffered by the fishing industry and other economic losses that are not properly part of a natural resource damage assessment.

For example, Economic Uses Study 1 refers to the "closures of entire fisheries and various fishery districts . . . as a result of the oil spill," and notes that such closures and reduction of future catches ". . . may affect the prices of fish products for producers and to consumers." The objectives of the study are to "measure the effects of the spill in terms of changes in consumer surplus prices and product prices," and to "analyze the competitiveness of output markets for commercial fisheries affected by the spill" (Draft, p. 190).

Such a study has little, if anything, to do with the calculation of natural resource damages or restoration. For example, some of the salmon fishing areas have been closed this year on grounds having nothing to do with oil spill impacts on salmon. The closure of a fishery for this reason implies nothing about damage to salmon--the resource that fishermen are exploiting. This study accordingly cannot be justified as part of a natural resource damage assessment plan. Even more clearly, Economic Uses Study 2, which seeks to assess the effects of the oil spill as a result of higher labor costs, tender availability, and the movement of fishermen into unaffected areas, is not relevant to natural resource damages or restoration assessment.

The same is also true of Economic Uses Study 4. Although the allegedly injured party is the federal or state government in its capacity as land owner, the purported losses are not of natural resources, but instead, loss of the commercial value of public lands affected by the spill if sold to third parties. Nothing in CERCLA, the CWA nor the DOI regulations supports the recovery of such damages.

³ 51 Fed. Reg., pp. 27674-27753.

Moreover, by conducting studies regarding impacts upon commercial fishery operations and/or diminished market values of state or federally owned lands, while simultaneously pursuing other studies to calculate the damages regarding the natural resources exploited by fishermen or resources residing on such lands, the Draft ignores the prescription against double counting of damages set forth in § 11.84(c)(1) of the regulations.

Of course, third parties are free to pursue state common law or statutory remedies, subject to applicable federal maritime law principles, for injuries to their business or property directly caused by a discharge of oil or hazardous substance. ESC has, accordingly, opened claims-paying facilities to assist fishermen and others whose businesses have been injured as a result of the spill. Moreover, under the TransAlaska Pipeline Authorization Act (TAPAA), 43 U.S.C. § 1653(c), ESC and the TAPAA fund collectively have strict liability of up to \$100 million "for all damages . . . sustained by any person or entity . . . as a result of discharges of oil from" vessels bearing North Slope crude.

C. The Draft fails to comply with DOI regulations.

Although noting the existence of the DOI regulations published pursuant to the CWA and CERCLA for the purpose of determining natural resource damages, the Draft (p. 18) states that "the Trustees have not yet decided whether, or to what extent, to utilize these regulations in conducting the assessment." Further, it reports that the Trustees have not yet "determined whether the potentially responsible parties should participate in the damage assessment or the extent of that participation."

The Draft has departed so fundamentally from both the procedures and substance required by the DOI regulations that the Trustees have significantly circumscribed, if not foreclosed, the option of conducting an assessment in compliance with those regulations.

The Draft does not afford adequate participation of the PRP in the assessment process. The Draft avoids the clear requirements of the regulations concerning the development, content, and timing of an Assessment Plan. It frustrates the cooperative process between Trustees and PRPs envisioned by the regulations. The DOI clearly recognized the special role of early involvement by the PRP in effective resolution of damage cases and designed the assessment process accordingly. The regulations do not contemplate publication of an incomplete and inadequate draft for comment by PRPs and the public after assessment studies were well under way.

Section 11.32(a)(2)(iii)(A) directs PRPs to participate "in the development of the type and scope of the assessment and in the performance of the assessment." No such invitation was extended to the PRPs in this case; they were, instead, on June 6, 1989 invited generally to participate in the "assessment process." ESC accepted that invitation and, pointing to § 11.32(a)(2)(iii)(A), stated that it wished to participate "in the development of the type and scope of the assessment and in the performance of the assessment" in its letter to Trustees on July 5, 1989.

The Trustees responded to ESC's acceptance of the invitation to participate on August 22, by requesting ESC's comments on the Draft on exactly the same basis as members of the public. In these circumstances, the Trustees clearly have not complied with § 11.32(a)(2).

The regulations require that studies are not to be commissioned until after publication of an Assessment Plan. The very fact that the Trustees have attached to the Draft a description of 72 studies, for many of which data-gathering is complete, demonstrates that the Trustees have not complied with § 11.31 of the regulations. As is made clear at § 11.31(a), the Assessment Plan is to be used to inform PRPs and the public "of the scientific and economic methodologies that are expected to be performed during the Injury Determination, Quantification, and Damage Determination phases [Emphasis added.]" One of the basic purposes of an Assessment Plan is to provide "a means of evaluating whether the approach used for assessing the damage is likely to be cost-effective and meets the definition of reasonable costs," within the meaning of the regulations (§ 11.31(a)(2)).

Here, instead of performing these functions, the Draft presents to the PRPs and the public a fait accompli reporting the scientific and economic methodologies that the Trustees have already commissioned and upon which they have already expended millions of dollars. The Assessment Plan, when it is ultimately published after review of the Draft, cannot meet the basic regulatory purpose for which it is intended.

Contrary to the position taken by the United States Department of Justice on behalf of the Trustees, letter from Diane Kelly to John Seddelmeyer, dated September 29, 1989, the studies described in the Draft cannot be justified on the basis of § 11.22 of the DOI regulations. That section permits only the collection of field samples or the initiation of site visits to preserve data and material that are likely to be lost. § 11.22(b). Manifestly, it does not contemplate the expenditure of vast sums of money, such as has occurred here, to survey injury to all resources possibly affected by a spill, to analyze such data, and to base an injury determination upon it.

The Draft gives no assurance that restoration costs will not be unreasonable. In the light of the court's decision in Ohio v. Department of the Interior,⁴ the Trustees are no longer governed by the rule embodied in § 11.35(b)(2), limiting natural resource damage recovery to the lesser of use values or restoration costs. However, the court made clear that restoration costs should be compared to use values. The Draft gives no assurance that, in achieving the "primary objective" of restoration, this principle will be respected. To the extent that the No Action - Natural Recovery Alternative is selected for particular resources, as ESC believes will be generally the case, there is no need to compare restoration costs and use values. If the

⁴ 880F.2d 432 (D. B. Cir. 1989), rehearing denied, September 11, 1989.

Trustees contemplate that there is a chance that some resources will require an active restoration program, the Trustees must ensure that restoration costs are not unreasonable when compared to the lost-use values associated with the resource.

The Draft combines Injury Determination and Quantification phases in the assessment process. Section 11.13(a) of the DOI regulations envisions a planned and phased approach to the assessment of natural resource damages. Section 11.13(e) first requires an injury determination phase to establish whether natural resources have been injured, followed by a quantification phase focusing only on those resources as to which injury occurred. The studies attached to the Draft blur the distinction between the various phases of the assessment process. As a result, funds may be expended in the quantification of damages to resources that were not injured. Also, by combining injury determination and quantification, the Draft eliminates the post-injury-determination-phase review of the Assessment Plan required by § 11.32(f)(1).

The studies described in the Draft are not limited to resources with committed uses. The court in Ohio v. Department of the Interior upheld the requirements that "only committed uses . . . of the resources or services over the recovery period will be used to measure the change from the baseline resulting from injury to a resource," § 11.83(b)(2). As DOI made clear, this requirement prevents an award of damages for "speculative uses."⁵ Neither the introductory section of the Draft nor its description of the 72 studies recognizes this significant constraint on the NRDA process. To the contrary, it appears that in many instances significant sums have been committed for the study of resources for which uses are speculative and as to which the Trustees will not be able to show a committed use--e.g., Economic Uses Studies 4, 8, and 9.

The Draft fails to provide adequate assurance of compliance with CERCLA's and the DOI regulations' proscription of double counting. Both CERCLA § 107(f)(1) and the DOI regulations, §§ 11.15(a)(1)(iii) and 11.84(c)(1), proscribe double recovery and double counting, a directive which the Trustees acknowledge in the Draft (p. 26). However, in numerous ways the Draft shows that this statutory and regulatory requirement is likely to be violated--e.g., Economic Uses Study No. 4, focusing on reductions in the value of public land, while the Trustees elsewhere survey injuries to the natural resources on those lands; the analysis of injury to resources, such as commercial fisheries and those used for subsistence, that are already the subject of private litigation; the failure to identify interdependent services (see § 11.71(b)(4)); and the failure to consider response actions (see § 11.84(c)(2)).

The Draft fails to select a discount rate. DOI's regulations provide that a 10% discount rate shall be used in calculating lost use values, § 11.84(e), a requirement that was specifically upheld by the court of appeals, 880 F.2d at 464-65. The Draft (p. 26) states that the Trustees have not yet decided

⁵ 51 Fed. Reg., p. 27722.

whether to use that discount rate, indicating that Trustees erroneously believe they are free to disregard the rate adopted in the regulations.

The other points developed at length above demonstrate further departure from the DOI regulations For example, the failure to utilize the appropriate restoration methodology in a study whose "primary objective" is restoration and the use of the natural resource damage assessment process to calculate what are essentially commercial damages. There are, in addition, many other respects in which the Draft deviates from the regulations that are described in the response comments concerning the technical and economic studies in Part 3 of this document.

The Trustees have embarked on a procedure for assessing damages that does not comply with the regulations and accordingly will not have the benefit of the rebuttable presumption given to a study that is conducted in accordance with the regulations⁶ or the right to recover assessment costs.⁷

II. FATE AND EFFECTS OF SPILLED OIL

A. General Comments

The discussion on fate and effects (Draft, pp. 11-16) of spilled oil is an oversimplification of the physical, chemical, and biological processes which occur when petroleum is released into the marine environment. Certain important features of different dissipation processes are completely omitted. Those features which are retained are then combined to produce a biased treatment of the subject.

Processes which play important roles in determining the fate and effects of spilled oil are drift, spreading, evaporation, dissolution, dispersion (oil droplets into the water column), photochemical oxidation, emulsification (incorporation of water into the oil phase), microbial degradation (primarily oxidation), sedimentation (adsorption on particulate matter), and stranding on shorelines. These processes have been investigated in connection with numerous spills in tropical, subtropical, and subarctic marine environments and much knowledge has been gained through these investigations that can be transferred to the spill in Prince William Sound. An excellent treatise on this subject appears in a recent National Research Council (NRC) publication.⁸ The effects of petroleum on organisms is also discussed in great detail in the NRC document. The findings represent a consensus on the fate and effects of spilled oil of many scientists from academia, government, and industry.

⁶ CERCLA § 107(f)(2)(C), 43 C.F.R. § 11.10.

⁷ CERCLA § 107(a)(4)(C); 43 C.F.R. § 11.10

⁸ National Research Council, Oil in the Sea: Inputs, Fates, and Effects, National Academy Press, Washington, D. C., 1985.

The authors of the "Fate and Effects of the Spilled Oil" section in the Draft overlook many of these findings. Moreover, the Draft discussion appears to address the fate and effects of oil spilled into the environment as if no action had been taken to remove and recover bulk oil from the water or shorelines. This omission is further compounded in the Draft through misleading statements that the oil will persist "for decades" (Draft, p. 13). The cleanup action taken by ESC through mid-September 1989, has been massive--involving over 1400 boats, more than 11,000 people, and fifty skimmers--to treat almost 1100 miles of shoreline to an environmentally stable condition by removing gross oil contamination. These treated beach segments include all shorelines categorized by ADEC and Coast Guard as having any oil spill impact.

The discussion in the Draft on fate and effects of the spilled oil does acknowledge that a high degree of variability exists concerning the effect of the oil on the environment. This is a key point which will ultimately pervade the entire assessment process. Shoreline impacts will likely be highly localized, site-specific, and limited to only a very small fraction of the Prince William Sound shoreline and much less of Kenai, Kodiak, and Alaska Peninsula shorelines.

B. Specific Comments

Draft, Page 11, "The oil's more volatile and soluble components evaporate into the atmosphere or dissolve into the water." In discussing "evaporate" and "dissolve" the authors give the impression that these may be of equal importance in the dissipation of an oil spill at sea. The NRC document notes that the most soluble hydrocarbons in oil (such as benzene and toluene) are also the most volatile and are likely to be preferentially removed by evaporation, which is typically orders of magnitude faster than dissolution into the water column.⁹

Draft, Page 11, "... small droplets of oil may be beaten into the surface water, thereby increasing both the speed with which it is accommodated in the water and the potential toxicity to plankton and fish." "Accommodate" is a term not ordinarily used by scientists studying the fate and effects of oil. Accommodation in this context apparently represents the sum of petroleum which dissolves (very small) and which disperses (very large). Dispersed oil is much less bioavailable, therefore less toxic, to marine organisms than dissolved oil. The high wave energy in the Gulf of Alaska will help disperse the oil droplets to ever-decreasing concentrations both in the vertical as well as horizontal directions in the water column.

⁹ Ibid, p. 277.

Draft, Page 11, "As much as half of the oil may be washed away within the first 18 months, although pools of oil are likely to collect in hollows among the rocks, where it may remain for years." In high-energy environments, such as the northern Gulf of Alaska, it is likely that much more than fifty percent of the oil will be washed away in this time interval. This quoted statement also completely ignores the effectiveness of the 1989 shoreline cleanup operations which removed bulk oil. Moreover, natural weathering and biological degradation will transform the pools mentioned in this statement into a relatively inert residue having low toxicity.

Draft, Page 11, "On cobble or coarse sand beaches, the oil may sink deeply into the sediments. Wave erosion is less effective in these environments, and slow biodegradation assumes a more important role in removal of the oil." Cobble and coarse sand beaches represent high-energy environments while silts and muds typify low-energy environments.¹⁰ Thus, wave erosion would still be effective in removing oil on affected cobble and coarse sand shorelines. This wave erosion, combined with the great amount of precipitation that falls in September and October in Prince William Sound and adjoining bodies of water, can be expected to remove much of the remaining oil. It is also remarkable nothing is said in the Draft about tidal action in this portion of the fate and effects section. U.S. Department of Interior¹¹ notes that tides along the Gulf of Alaska are semidiurnal with maximum diurnal inequalities of up to 4.4 meters. Since tidal currents are much larger in confined embayments than along the coast, tidal action certainly will play an important role in removing oil from shorelines in impacted areas.

Draft, Page 11, "... some of it (oil) may gradually return to the water, and once again affect the life there." The oil which returns to the water from the shoreline is certainly highly weathered and of extremely low toxicity to marine life. The NRC document notes that most of the toxic effect of petroleum is due to the lower-molecular-weight (C12-C24) n-paraffin compounds and to the monoaromatic fraction (e.g., benzene, toluene, xylenes, etc.).¹² Essentially all of these compounds would have been weathered from the oil by the time it reenters the water.

Draft, Page 13, "... but because muddy bottoms usually are found in low-energy environments (such as wetlands), the stranded oil may persist for decades." It is true that oil may persist for decades in muddy sediments located in highly restricted, low-circulation environments. However, these types of shorelines represent less than 10% of the total shoreline in Prince William Sound, and very little of this type of shoreline was impacted by the spill.

¹⁰ J. Cairns, Jr. and A. L. Buikema, Jr., Restoration of Habitats Impacted by Oil Spills, Butterworth Publishers, Boston, 1984, pp. 12-13.

¹¹ U.S. Department of Interior, Gulf of Alaska/Cook Inlet Sale 88: Final Environmental Impact Statement, Minerals Management Service, Alaska OCS Region, Anchorage, Alaska, July 1984, Vol. 1., p. III-19.

¹² National Research Council, p. 372.

Draft, Page 13. "Tar balls also may be eaten by bottom-feeding fish, possibly tainting their flesh." It is very doubtful that highly weathered oil, such as tarballs, could cause tainting. Lower-molecular-weight hydrocarbons, particularly the monoaromatics, are more likely to cause tainting, but they would have been removed by weathering processes before tarballs were formed.

Draft, Page 13. "Prince William Sound is generally a fiord/estuary system, and not a high-energy, open coastal environment." Although Prince William Sound is not an open coastal environment, it is still a high-energy environment. The abundance of rocky coasts and boulder, cobble, and coarse sand beaches, and the sparseness of fine sand, silty, and muddy beaches, particularly in the assessment area, are indicators of a high-energy environment.¹³

Draft, Page 13. "Oil is likely to be moved deeper into the fiords rather than being flushed out." The Draft suggests that "flushing" of waters does not occur in this environment. The U.S. Department of Interior notes that for the Gulf of Alaska region, "During the winter, prevailing easterly winds cause an onshore transport which causes downwelling, thus flushing the shelf with low-salinity, low-temperature waters."¹⁴ Additionally, flushing is further enhanced by adverse winter weather when wind speeds are likely to exceed 34 knots 10 percent of the time and wind speeds in excess of 100 knots have been recorded accompanying severe storms.¹⁵ This adverse weather, combined with annual precipitation in excess of 200 centimeters (most of which falls as rain in the fall), certainly promotes "flushing" of the Gulf of Alaska and adjoining fiords, bays, and inlets. Royer notes that over the entire year the average rate of freshwater influx into the Alaska Coastal Current, which flows near to shore in the northern Gulf of Alaska, is about 1.2 times the average discharge of the Mississippi River.¹⁶ Royer also notes that more than 320 inches of precipitation falls on Montague Island in Prince William Sound annually.¹⁷

Draft, Page 13. "The entrances to the fiords are sheltered, rocky headlands, where oil may stick to rocks in the intertidal zone." Based on the previous discussion, it seems very unlikely that (1) entrances to fiords in Prince William Sound could be classified as "sheltered", and (2) oil would stick to rocks in the intertidal zone. Moreover, the 1989 cleanup was focused on removing bulk oil from these areas.

¹³ J. Cairns, Jr. and A. L. Bulkema, Jr., Restoration of Habitats Impacted by Oil Spills, Butterworth Publishers, Boston, 1984, pp. 12-13.

¹⁴ U.S. Department of Interior, p. III-18.

¹⁵ Ibid, p. III-16.

¹⁶ T. C. Royer, "Where is the Exxon Valdez Oil Spill Going and Why?" Institute of Marine Science, University of Alaska-Fairbanks Press Release, Fairbanks, Alaska, April 1989.

¹⁷ Ibid.

Draft, Page 13. "With little abrasive wave action, oil could remain in such areas for years, with only slow chemical and biological processes to degrade it." Based on the previous discussions, above, concerning tidal action and adverse weather, it is expected there would be appreciable abrasive wave action on the rocks at the entrances to fiords. This statement also completely ignores shoreline cleanup activities.

Draft, Page 13. "The potential exists for the oil released in the Exxon Valdez incident to persist in and on these Prince William Sound coastlines for many years." This is a misleading statement. Most of the oil has already been removed by the massive cleanup undertaken in 1989. Moreover, there is significant potential that any remaining oil will be removed by the ongoing bioremediation processes and natural phenomena--storms, precipitation, and tides--in a one or two year period.

Draft, Page 14, ". . . when the toxic aromatic components are most concentrated in the upper few meters of the water." It is misleading to state that the toxic aromatic hydrocarbons are mostly concentrated in the upper few meters of the water column during the early stages of a spill. Nothing is said about the competing processes of evaporation and dispersion, which rapidly remove or dilute these hydrocarbons in the water column. Additionally, water-quality measurements taken immediately after the spill, both by ESC and the Trustees, have never identified aromatic hydrocarbon levels above 10 ppb, which is well below acute toxicity levels for fish or other marine organisms.

Draft, Page 14, "The pre-spill population of sea otters in the affected portions of Prince William Sound was estimated at approximately 2,500 animals, with similar or greater numbers along the Kenai and Alaska Peninsulas." Otter population estimates are quite variable and have been quoted in other publications as up to 8,000 animals in Prince William Sound and over 20,000 in the spill-affected areas. Thus, the 2,500 figure quoted appears to seriously understate the total otter population and, thereby, overestimate the spill impact on the total population.

Draft, Page 14, "Terrestrial mammals near the spill in the early days also were exposed to strong petroleum vapors." The statements about exposure of terrestrial mammals to petroleum fumes and vapors are pure conjecture on the part of the Trustees.

Draft, Page 14, "Those marine mammals that do not rely on hair or fur for thermal regulation (whales, porpoises, and harbor seals as opposed to sea otters) appear to be less sensitive to oiling. However, their overall vulnerability is not well known." Concerning the vulnerability of cetaceans (whales and porpoises) to oil, NRC states in its summary of the effects of oil on marine mammals that "Cetaceans were little or only transiently affected by oil exposure."¹⁸

¹⁸ National Research Council, p. 430.

Draft, Page 14. "Many of the birds were killed as the result of direct exposure to the oil. Others may be affected indirectly through loss of habitat or food. Seabirds were just returning to breeding and nesting colonies in the Sound and along the coast. Their success in breeding could be diminished by loss of habitat, loss of food, and the death of eggs and chicks." ESC is not aware that any determination has been made as to the cause of death of recovered dead birds, so this Draft argument is at least premature. Moreover, in discussing the effects of the spilled oil on seabirds, the natural recoverability of seabird populations should be addressed. NRC notes that, "despite various concerns and considering the large losses of seabirds from oil pollution, there may not be a material impact on the total population of a given species."¹⁹

Draft, Page 15. "Recovery of intertidal populations may take many years." While some populations may take many years to recover, the majority of populations will recover relatively quickly. This occurs because the oil remaining in the gravel and among the rocks is highly weathered, geographically dispersed, and essentially non-toxic.

Draft, Page 15. "Pacific herring are second in importance only to salmon among the fishery resources in Prince William Sound Prince William Sound accounts for about half of Alaska's total commercial harvest of pink salmon . . . that could result in lower returns of adult fish in 1991 Four other species of salmon are found in the Sound The production and survival of the 1989 fry from all of these species are at risk, as is the spawning success of adults returning in the fall of 1989 The eggs and larval forms of many species of fish and shellfish were in near-surface waters at the time of the spill. The concentrations of hydrocarbons in the water beneath the floating slicks in Prince William Sound probably were sufficient to kill many of them, raising the possibility of delayed population effects in some species." NRC states that there is no clear indication that commercially important fish stocks have been severely disrupted by either chronic or catastrophic oiling of their environment.²⁰ NRC also states that present census techniques remain too crude to provide clear knowledge of standing fish stocks, while natural variabilities in the stocks probably mask any impacts from petroleum that may exist.

III. CHRONOLOGY

The Draft contains a summary chronology of the spill and response effort. The chronology is a discussion of liability, is not relevant to a damage assessment, and is erroneous in many respects. However since the chronology serves no purpose in the Draft, ESC will not address it in these comments.

¹⁹ Ibid, pp. 434-435.

²⁰ Ibid, p. 15.

PART 3

COMMENTS ON INJURY DETERMINATION/QUANTIFICATION STUDIES

This Part provides comments on the individual Injury Determination/Quantification studies, Restoration and Implementation Plans, Damage Determination studies, related tables, and Appendices A and B described on pages 29-224 of the Draft State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill, August 1989. This response provides both technical and regulatory comments which address information provided in the Draft for all studies listed. Following this general discussion, specific comments appropriate to individual studies are included. All section references are from the DOI NRDA regulations 43 C.F.R. Part 11.

I. COMMENTS CONCERNING ALL STUDIES

ESC agrees that technical and economic studies are necessary for the execution of a natural resource damage assessment and the development of a restoration strategy and plans. Both scientific and economic data are necessary to make reasoned judgments and decisions concerning the actions which might be undertaken to enhance the natural recovery processes which operate on oil spills. Conversely, it is imperative that such studies be closely coordinated with an objective of restoring the environment in a timely manner and data be gathered or measured using valid methodologies. It is not apparent that the Draft meets either of these requirements.

A. The Draft does not demonstrate that the study projects are well designed and incorporate sound statistical methods.

Statistical design of studies is of paramount importance to the validity of the results in at least two respects. First, resource injury determination can only be done using a statistically based process which compares impacted resources to "without spill" conditions at suitable control sites. Second, recovery cannot be defined on an absolute basis such as "pristine" as stated by the Draft. Rather, recovery of the affected resources occurs when impacted and unimpacted areas provide the same levels of resource services.

These same considerations on the statistical design will invalidate many of the studies described in the Draft which rely on historical data to establish the "without spill" conditions for a resource. There are many factors--such as weather, predation, natural diseases, food supplies, etc.--which cause significant interannual variations in population and vitality of resources, and make comparisons with historical data statistically inconclusive.

Without more detailed information on the methodologies proposed in the Draft, it is impossible to evaluate three key statistical aspects which are necessary for good laboratory experimental or field sampling designs. These aspects are control, sample size, and (in many cases) replication.

The presence of controls is the cornerstone of good experimental design and sampling. In those cases where no controls are to be used, the studies appear to be flawed. In those cases where controls are mentioned, lack of adequate information makes it impossible to evaluate if they are satisfactory in quality and quantity. In addition, the criteria for selecting control sites or stations need to be uniformly defined for all studies.

Establishment of good control is particularly important since two recent natural occurrences could have impacted results observed from these studies. First, the 1988-1989 winter was very severe with extended periods of extremely cold weather. This could have significantly decreased population levels and food sources of some species. Second, the 1989 spring was especially dry in Alaska. This reduced the flow of the Alaska coastal current which influences the Prince William Sound ecosystem and could have had a dramatic impact on the trophic food web.

Sample size is a second important aspect of statistical design, since it relates directly to the reliability of the information gathered. In deciding how large a sample should be taken, sample variation must be considered. Before most of the samples were gathered in these studies, preliminary information was probably available to estimate a reasonable sample size. However, none of the studies describe the rationale regarding their chosen sample size. The reason for sample size concern is that conclusions could be drawn from results that are based on inadequate statistical assessments, and hence scientific validity would be lost.

Replication, the identical assessment made on multiple samples of the same item or short-time displaced items (such as water samples) is necessary in most studies to estimate a mean value accurately. A statistical design that does not consider adequate replicate size for each of its assays or bioassays is inadequate.

B. The Draft does not clearly describe how cause and effect will be demonstrated.

In order to demonstrate a clear cause and effect relationship, a link must be established between the spilled oil and the observed differences. This link must demonstrate that hydrocarbons are present, the source of the hydrocarbons is the Exxon Valdez spill, and those hydrocarbons alone are responsible for the observed effects. Many of the studies proposed in the Draft will have difficulty demonstrating exposure to the oil, since there is little, if any, coordination between samples collected for chemical and biological analyses.

C. The studies inappropriately envision use of unweathered Prudhoe Bay crude oil in many studies of biological effects.

Based on the information provided, the proposed toxicological studies apparently intend to use fresh Prudhoe Bay crude, rather than weathered oil. In doing so, they ignore the compositional changes that occur with oil over time. Many natural processes, particularly biodegradation and photo-oxidation, play an important role in determining the eventual fate and effects of spilled oil. The Draft itself recognizes the importance of these processes on biological impact. It states that the oil is usually "... most toxic during the early stages in a spill ..." (Draft, p. 14), but "... the acute toxicity of the remaining oil diminishes" (Draft, p. 13) as the volatile aromatic fraction of the fresh oil is lost.

Moreover, the importance of using weathered, rather than fresh, oil was emphasized in the NRC review on the fate and effects of oil.¹ In addition the DOI regulations (§ 11.62(f)(4)(i)(E)) require that the "... oil or hazardous substance used in the test must be the exact substance or a substance that is reasonably comparable to that suspected to have caused death to the natural population of fish." Thus, if weathered oil is thought to be responsible for harming an organism in the field, confirmatory toxicological data must be done using weathered, and not fresh, oil.

D. The Draft outlines a number of technical and economic studies which are inappropriate for incorporation in the Natural Resource Damage Assessment process.

As noted above, page 2-5, the Trustees cannot recover for damages payable to commercial users of the resource. Many of the studies in the Draft appear to focus on resources that are commercially exploited and which are the subject of claims and litigation. The Trustees will not be able to recover for those same damages in the assessment process due to the prohibition on double counting. Table 3-1 lists the studies having substantial commercial emphasis which are unlikely to be recoverable within the context of the regulations.

E. The Draft does not demonstrate that studies will be cost effective or reasonable.

The purpose of the DOI NRDA regulations is "to provide standardized and cost-effective procedures for assessing natural resource damages" (§ 11.11). This purpose is implemented in the regulations by setting requirements for methodologies which constrain the activities which might be undertaken by Trustees in performing an assessment. Section 11.13(a) states that "the process established . . . uses a planned and phased approach to the assessment of natural resource damages." Section 11.13(c) states, "The Assessment Plan ensures that the assessment is performed in a planned and systematic manner and that the methodologies chosen demonstrate reasonable cost." Section 11.13(e)(1-3) describes the phases in this planned and systematic manner. Further, § 11.31(a)(2) requires that the Plan, "shall be of sufficient detail to serve as a means of evaluating whether the approach used for assessing the damage is likely to be cost effective and meets the definition of reasonable cost."

Section 11.14 defines the terms cost effective and reasonable cost:

(j) "Cost effective" or "cost effectiveness" means that when two or more activities provide the same or a similar level of benefits, the least costly activity providing that level of benefits will be selected.

(ee) "Reasonable cost" means the amount that may be recovered for the cost of performing a damage assessment. Costs are reasonable when: the Injury Determination, Quantification,

¹ It found that "... experiments using unweathered oils do not indicate those responses expected when the same organisms are exposed to aged oils. Experiments designed to assess the impact of oil must take this disparity into account" (National Research Council, p. 136).

and Damage Determination phases have a well-defined relationship to one another and are coordinated; the anticipated increment of extra benefits in terms of the precision or accuracy of estimates obtained by using a more costly injury, quantification, or damage determination methodology are greater than the anticipated increment of extra costs of that methodology; and the anticipated cost of the assessment is expected to be less than the anticipated damage amount determined in the Injury, Quantification, and Damage Determination phases.

Thus, the regulations require that each and every study performed be both cost effective and reasonable. As will be demonstrated in the following comments, many of the studies in the Draft fail to meet either test. In many cases, the studies envision use of expensive techniques which could not be justified as cost effective in comparison to other techniques. These problems are compounded by the failure of the Trustees to justify either expenditures or studies within the context of the reasonable cost requirements of the regulations. Other than references to commercial impacts, which are likely small after payable claims are considered, the Draft provides no basis for the extra costs incurred in many detailed studies in comparison to the expected economic benefits to be obtained; i.e., in most studies none of the required linkage has been made between study costs and expected benefits. Table 3-2 lists studies which are not reasonable or cost effective and appear to be partially or wholly unrelated to NRDA issues, or focused on research activities. These studies should not be fully compensable under the damage assessment. Moreover, such research-related studies appear to be projects which would be conducted in the normal course of government agency activities and would be further excluded from recoupment by § 11.30(c)(2).

F. The Draft deviates from the DOI regulations in many other significant respects.

- Sections 11.30(c)(1) and (2) and 11.60(d)(1) and (2) specify the types and natures of expenditures which are reasonable and necessary for developing the Assessment Plan, conducting the assessment, and developing the Restoration Methodology Plan. In no case do the regulations provide that capital or equipment expenditures are reasonable and compensable by the PRP. Such invalid expenditures are listed in the Draft in the studies listed in Table 3-3.
- The scientific methodologies expected to be used in Injury Determination and Quantification described for the studies are too vaguely identified to meet the requirements of § 11.31(a)(1) and allow analysis of the Draft. Moreover, there is insufficient detail of scientific and economic methodologies to serve as a means of evaluating whether the approach used for assessing the damage is likely to be cost effective and whether it meets the definition of reasonable cost, as required in § 11.31(a)(2).
- The scientific methodologies provided in the Draft do not contain sufficient detail concerning sample and survey designs, numbers and types of samples to be collected, analyses to be performed, and preliminary determination of the recovery period, and other such information, as required in § 11.31(a)(2).

- The geographical areas defined in the studies are broad and lack sufficient detail to determine actual sampling locations within those geographical areas, as required in § 11.31(a)(2).
- The Draft does not demonstrate that the damage assessment has been coordinated to the extent possible with any remedial investigation feasibility study or other investigations, as required in § 11.31(a)(3).
- The Draft does not contain procedures and schedules for sharing data, split samples, and results of analysis with any potentially responsible parties upon request, as required in § 11.31(a)(4).
- Section 11.31(c)(2) requires that an Economic Methodology Determination, as prescribed by § 11.35, be included in the Plan. The Draft fails to meet any of the requirements of § 11.35 with regard to the Economic Methodology. While the recent Court of Appeals decision (Ohio v. Dept. of Interior, 880F.d2 432 (D. C. Cir. 1989) overturned the "lesser of" rule in § 11.35(b)(2), § 11.35 still requires the restoration or replacement to be technically feasible (§ 11.35(b)(3)), and that the Assessment Plan estimate and document the costs of restoration or replacement and the benefits gained from such actions. By failing to address these matters, the Draft is seriously flawed and cannot satisfy the requirements that the assessment be performed at a reasonable cost, as required by § 11.30(b).
- Section 11.34 of the regulations addresses confirmation of exposure. The Draft does provide required information on confirmation as required in § 11.34(a)(1). However, the extensive work undertaken by the Trustees on all aspects of sample acquisition and analyses for baseline or injury is clearly in violation of the limitations on the scope of such work by § 11.34(b)(2) and (3).
- The Draft does not provide sufficient information to determine if the injuries will be well documented, as required in § 11.61(b).
- Insufficient information is provided in the Draft to determine if the methodologies for the Injury Determination phase are based upon cost effectiveness, as required in § 11.61(d)(2).
- The methods used to determine injury to a biological resource require that each of four criteria be met as specified in § 11.62(f)(2). The biological response measured must be a commonly documented response and known to occur in both free-ranging organisms and controlled experiments as a result of exposure to oil or hazardous substance. In addition, the response must be detectable using methods that are practical to perform and which produce scientifically valid results. The Draft does not provide sufficient information to demonstrate compliance with these requirements.
- Insufficient information is provided in the Draft to determine if the objectives considered available information from response actions relating to the oil release, exposed resource, oil characteristics, potential injury and pathway of exposure, as required in § 11.64(a)(2).

- Insufficient information is provided in the Draft to determine if the methodologies selected for Injury Determination are 1) demonstrated to have performance under conditions similar to those anticipated; 2) cost effective; 3) needed to make the determination and will produce data that were previously unavailable; and 4) going to produce data consistent with the quantification phase, as required under § 11.64(a)(3).
- Insufficient information is provided in the Draft to determine if the selected Injury Determination testing and sampling methodologies consider 1) physical state of the discharged oil; 2) duration, frequency, season, and time of release of oil; 3) the range of concentrations of compounds to be analyzed in different media; 4) detection limits, accuracy, precision, interferences, and time required to perform alternative methods; 5) potential safety hazards to obtain and test samples; and 6) cost of alternative methods and other specific guidance, as required under § 11.64(a)(4).
- The Draft does not provide sufficient information on any of the studies to evaluate whether the service reduction quantification, which should be performed according to § 11.71(a), follows the guidelines outlined in § 11.71(b-g).

In addition to the general exceptions cited above, individual studies also deviate from various other provisions of the regulations and from standards of good science. For brevity in the following study discussions, the exceptions will be referred to in the text by the letter convention shown in Table 3-4.

Table 3-1: Assessment Studies Having Substantial Commercial Emphasis

<u>Study</u>	<u>Title</u>	<u>\$, Thousands</u>
F1	Salmon Spawning Area Injury	144.8
F2	Egg and Pre-emergent Fry Sampling	149.1
F3	Coded-Wire Tagging	1943.4
F4	Early Marine Salmon Injury	829.2
F5	Dolly Varden Injury	437.4
F6	Sport Fishery Harvest & Effort	175.9
F7	Salmon Spawning Area Injury, Outside PWS	320.3
F8	Egg & Pre-emergent Fry Sampling, Outside PWS	111.4
F9	Early Marine Salmon Injury, Outside PWS	348.5
F10	Dolly Varden and Sockeye Injury, Lower Cook Inlet	152.6
F11	Herring Injury	374.5
F12	Herring Injury, Outside PWS	60.0
F14	Crab Injury	142.9
F15	Spot Shrimp Injury	60.5
F16	Injury to Oysters	30.5
F17	Rockfish Injury	45.6
F18	Trawl Assessment	738.8
F19	Larvae Fish Injury	413.4
F20	Underwater Observations	550.1
F22	Crab Injury, Outside PWS	111.5
F23	Rockfish Injury, Outside PWS	108.4
F24	Trawl Assessment, Outside PWS	2495.8
F25	Scallop Mariculture Injury	53.8
F26	Sea Urchin Injury	45.0
<u>Economic Studies</u>		
1	Estimated Price Effects on Commercial Fisheries	NA
2	Fishing Industry Costs	NA
3	Bioeconomic Models for Damage Assessment	NA
TOTAL		<u>9,843.4</u>

Table 3-2: Studies That Are Not Completely NRDA Related²

<u>tudy</u>	<u>Title</u>	<u>\$. Thousands</u>
AW2	Injury to Subtidal	883.0
AW4	Injury to Deep Water	378.9
AW5	Injury to Air	106.5
F1	Salmon Spawning Area Injury	144.8
F2	Egg and Pre-emergent Fry Sampling	149.1
F3	Coded-Wire Tagging	1943.4
F4	Early Marine Salmon Injury	829.2
F5	Dolly Varden Injury	437.4
F6	Sport Fishery Harvest & Effort	175.9
F7	Salmon Spawning Area Injury, Outside PWS	320.3
F8	Egg & Pre-emergent Fry Sampling, Outside PWS	111.4
F9	Early Marine Salmon Injury, Outside PWS	348.5
F10	Dolly Varden and Sockeye Injury, Lower Cook Inlet	152.6
F11	Herring Injury	374.5
F12	Herring Injury, Outside PWS	60.0
F14	Crab Injury	142.9
F15	Spot Shrimp Injury	60.5
F16	Injury to Oysters	30.5
F17	Rockfish Injury	45.6
F18	Trawl Assessment	738.8
F19	Larvae Fish Injury	413.4
F20	Underwater Observations	550.1
F22	Crab Injury, Outside PWS	111.5
F23	Rockfish Injury, Outside PWS	108.4
F24	Trawl Assessment, Outside PWS	2495.8
F25	Scallop Mariculture Injury	53.8
F26	Sea Urchin Injury	45.0
MM1	Humpback Whale	226.0
MM2	Killer Whale	200.0
MM3	Cetacean Necropsy	73.0
MM4	Sea Lion	270.0
MM5	Harbor Seal	245.0
MM6	Sea Otter Injury	763.0
MM7	Sea Otter Rehabilitation	108.0
TM1	-Injury to Sitka Black-Tail Deer	87.0
TM2	Injury to Black Bear	139.7
TM3	Injury to River Otter and Mink	287.7
TM4	Injury to Brown Bear	162.7
TM5	Injury to Small Mammals	302.4
TM6	Reproduction of Mink	192.2
B2	Censuses and Seasonal Distribution	565.0
B3	Seabird Colony Surveys	440.0
B5	Peale's Peregrine Falcons	43.5
B6	Marbled Murrelets	115.7
B7	Storm Petrels	135.0
B8	Black-Legged Kittiwakes	190.0
B9	Pigeon Guillemots	109.5

Continued

Table 3-2: Studies That Are Not Completely NRDA Related²
(continued)

<u>Study</u>	<u>Title</u>	<u>\$, Thousands</u>
B10	Glaucous-Winged Gulls	73.0
B11	Sea Ducks	146.0
B12	Shorebirds	166.0
B13	Passerines	<u>59.0</u>
	TOTAL	16,311.20

² Some portions of these studies would not be compensable because they are not cost effective or reasonable or are solely research related.

Table 3-3: Studies With Non-Compensable Capital Equipment Expenditures

<u>Study</u>	<u>Title</u>	<u>\$, Thousands Equipment</u>
CH1	Comprehensive Assessment	871.0
AW1	Geographical Extent in Water	27.5
AW2	Injury to Subtidal	20.0
AW3	Hydrocarbons in Water	25.0
F1	Salmon Spawning Area Injury	11.1
F2	Egg and Pre-emergent Fry Sampling	40.0
F3	Coded-Wire Tagging	407.1
F4	Early Marine Salmon Injury	88.4
F5	Dolly Varden Injury	67.9
F6	Sport Fishery Harvest & Effort	20.0
F7	Salmon Spawning Area Injury, Outside PWS	13.3
F8	Egg & Pre-emergent Fry Sampling, Outside PWS	8.8
F9	Early Marine Salmon Injury, Outside PWS	40.0
F10	Dolly Varden and Sockeye Injury, Lower Cook Inlet	6.4
F11	Herring Injury	113.0
F13	Clam Injury	3.0
F14	Crab Injury	22.0
F15	Spot Shrimp Injury	11.0
F16	Injury to Oysters	6.0
F17	Rockfish Injury	1.0
F18	Trawl Assessment	142.0
F19	Larvae Fish Injury	100.0
F20	Underwater Observations	230.0
F21	Clam Injury, Outside PWS	2.3
F22	Crab Injury, Outside PWS	7.0
F23	Rockfish Injury, Outside PWS	13.0
F24	Trawl Assessment, Outside PWS	67.0
F26	Sea Urchin Injury	3.0
MM1	Humpback Whale	8.0
MM2	Killer Whale	2.0
MM3	Cetacean Necropsy	2.0
MM4	Sea Lion	11.0
MM5	Harbor Seal	9.5
MM6	Sea Otter Injury	395.0
MM7	Sea Otter Rehabilitation	25.0
TM3	Injury to River Otter and Mink	14.0
TM4	Injury to Brown Bear	11.1
TM5	Injury to Small Mammals	31.5
B1	Beached Bird Survey	78.0
B2	Censuses and Seasonal Distribution	288.0
B3	Seabird Colony Surveys	127.0
B4	Bald Eagles	75.0
B5	Peale's Peregrine Falcons	1.5
B6	Marbled Murrelets	30.0
B7	Storm Petrels	10.0
B8	Black-Legged Kittiwakes	85.5
B9	Pigeon Guillemots	30.0

Continued

Table 3-3: Studies With Non-Compensable Capital Equipment Expenditures
(continued)

<u>Study</u>	<u>Title</u>	<u>\$, Thousands Equipment</u>
B10	Glaucous-Winged Gulls	15.0
B11	Sea Ducks	40.5
B12	Shorebirds	10.0
B13	Passerines	2.5
TS1	Chemistry	300.0
TS2	Histopathology	14.0
TS3	Mapping	239.5
RP1	Restoration Planning	30.0
	Total	4252.4

Table 3-4: Regulatory Deviations of Individual Studies

<u>Exception</u>	<u>Comment</u>
A	Insufficient information is provided to determine if the injury results from the discharge of oil based upon the exposure pathway, as required in § 11.61(a), and not as the result of other non-oil spill related phenomena.
B	This study provides an inadequate description of the statistical analysis employed to evaluate the data. Thus, it is impossible to evaluate whether the injury determination will be based on a statistically significant difference in the biological response between the impacted and control areas, as required in § 11.62(f)(3).
C	Insufficient information is provided to evaluate whether this study can adequately determine the exposure pathway, as required in § 11.63. This requires that the following are considered: chemical and physical characteristics of the discharged oil, rate or mechanism of transport, combination of pathways, and demonstration of the presence of oil.
D	Insufficient information is provided to assess whether modeling methods satisfy specific requirements in § 11.63(d).
E	Insufficient detail and lack of documentation of testing methodologies make it impossible to determine whether the methodologies meet criteria listed in § 11.64(a)(3)(i-iv). Only those methodologies shall be selected: a) for which performance under conditions similar to those anticipated at the assessment area has been demonstrated; b) that ensure testing and sampling performance will be cost effective; c) that will produce data that were previously unavailable and that are needed to make the determinations; and d) that will provide data consistent with the data requirements of the Quantification phase.
F	Insufficient detail and lack of documentation make it impossible to determine if specific factors listed in § 11.64(a)(4)(i-vi) were considered when the testing methodologies were selected. These factors include a) physical state of the discharged oil; b) duration, season, and time of the discharge; c) detection limits, accuracy, precision, interferences, and time required to perform alternative methods; and d) costs of alternative methods.

Continued

Table 3-4: Regulatory Deviations of Individual Studies
(continued)

<u>Exception</u>	<u>Comment</u>
G	This study does not provide sufficient information to evaluate if the testing and sampling methods for injury determination meet the requirements of § 11.64(b). These requirements include: adequate description in the Assessment Plan, use of analytical methods which are generally accepted or have been scientifically verified and documented, and use of sampling methods which are generally accepted.
H	Insufficient information and lack of documentation make it impossible to determine whether the study will adequately quantify any injury, as required in § 11.70(a-b).
I	Insufficient information and lack of documentation make it impossible to determine whether the extent of injury, baseline condition, baseline services recoverability, and reduction in service that may result will be adequately estimated, as required in § 11.70(c).
J	Insufficient information is provided to evaluate whether this study adequately satisfies § 11.71 general guidelines on service reduction qualification. This includes whether or not this resource and these methods should have been selected, determining a real extent, and determining services.
K	It is not apparent that direct quantification of the service is consistent with the needs of the economic methodology, as specified in § 11.71(a)(2). Also, it is not apparent that direct quantification of the service can be demonstrated to have resulted from injury to the natural resource, as required in § 11.71(f)(1-3).
L	Lack of documentation makes it impossible to determine whether the testing methodologies selected for the Injury Quantification phase were selected based on the consideration of the following factors: a) degree to which a particular resource or service is affected by the discharge; b) degree to which a given resource or service can be used to represent a broad range of related resources or services; c) consistency of the measurement with the requirements of the economic methodology; and d) technical feasibility or quantification of changes in a given resource or service at reasonable cost (§ 11.71(d)(1-4)).
M	This study does not adequately determine the services provided by the surface water or sediment, as required by § 11.71(h).

Continued

Table 3-4: Regulatory Deviations of Individual Studies
(continued)

<u>Exception</u>	<u>Comment</u>
N	Insufficient information is provided to evaluate whether this study can adequately meet service reduction requirements according to § 11.71(j). This includes determining geographical areas affected, degree of impairment, and period of impairment.
O	The methods used for population estimates are not described in sufficient detail to determine whether standard, widely accepted techniques are employed, as required in § 11.71(1)(5)(i).
P	Insufficient information is provided to determine whether reliable baseline age structure data are available for the population being assessed, as required in § 11.71(1)(5)(ii).
Q	Insufficient information is provided to assess whether mortality estimates follow the regulations in § 11.71(1)(5)(iii). Mortality from single incidents may be used to estimate changes in populations only when baseline population data are available, and when corrections can be made for potential sampling biases. This study provides no information on how the correction factors are determined. Thus, it is impossible to evaluate if they adequately adjust for sampling biases. Additional correction factors may need to be considered. It is also impossible to determine that the adaptation of § 11.71(1)(5)(iii)(A) methods for measuring mortality are adequately documented, as required in § 11.71(1)(5)(iii)(B).
R	This study does not describe any baseline services determination as would be determined in the general guidelines of § 11.72.
S	Insufficient information is provided to determine whether baseline data are selected according to the general guidelines in § 11.72(b). These guidelines require that the baseline data 1) reflect conditions had the release of oil not occurred; 2) include the normal range of physical, chemical, or biological conditions; 3) are accurate, precise, complete, and representative of the resource; and 4) are collected by comparable methods. Also, the baseline data collection is restricted to those data necessary for a reasonable cost assessment.
T	Lack of documentation makes it impossible to determine if baseline data will be obtained as required by § 11.72(b)(2).

Continued

Table 3-4: Regulatory Deviations of Individual Studies
(continued)

<u>Exception</u>	<u>Comment</u>
U	Insufficient information is provided to assess whether the historical data accurately represent baseline conditions, as required in § 11.72(c).
V	Insufficient information is provided to assess whether the areas unaffected by the oil spill, i.e., control areas, satisfy requirements of § 11.72(d). This includes selecting control areas based upon their similarity to the assessment areas and lack of exposure to the release of spilled oil, demonstrating comparability to the assessment area, establishing the normal variability in the characteristics being measured, using comparable methods for the collection of data, and demonstrating values reported are comparable to literature values.
W	This study does not adequately follow the baseline services determination guidelines listed in § 11.72 and, specifically, the surface water resource additional guidelines in § 11.72(g).
X	In addition, insufficient information is provided to assess whether additional guidance on determining baseline services for biological resources under § 11.72(k) is being followed.
Y	Insufficient information is provided to assess whether the resource recoverability will satisfy requirements of § 11.73. This includes estimating recovery time if no restoration efforts are undertaken beyond the response actions, evaluating the technical feasibility of restoration efforts, and estimating the recovery time with any restoration efforts.

II. COMMENTS ON THE COASTAL HABITAT INJURY ASSESSMENT PROGRAM

The coastal habitat study program intends to estimate the effects of the spill and associated cleanup activities in terms of 1) abundance of intertidal and subtidal organisms used as food by valued resource species, 2) contamination of these same food resources by oil, 3) quantification of injury over the entire affected area, and 4) recovery of various habitat types after cleanup treatments.

The cost of the one study (\$5,436,000) in this program is excessive and this study is poorly coordinated with other studies proposed in the Draft. Moreover, because this program does not take into consideration that the only feasible restoration strategy for coastal habitats is natural recovery after beach cleanup is completed, the approach used in this study will neither be cost effective nor meet the definition of reasonable cost.

COMMENTS ON COASTAL HABITAT STUDY NUMBER 1

(CH1) COMPREHENSIVE ASSESSMENT (\$5,436,000)

This study attempts to assess injury to coastal habitat resources by comparing degree of oiling of coastal sediments with changes in biological community composition.

Technical Comments

The study description fails to supply sufficient information to determine that samples for chemical and biological analyses will be collected synoptically and at the same locations. This is critical so that any biological changes can be correlated with levels and compositions of petroleum contamination.

The study provides no information on the following: a) method for extrapolating from study site to the entire impact zone; b) method for relating observed ecological effects to oil content; c) whether all differences between reference and exposed sites will be ascribed to oil; and d) statistical methods for analyzing the data.

There is no discussion on the factors to be considered in developing a "statistically valid site selection and sampling strategy." No rationale is given for the selection of study sites, or how they will be "ground truthed." The randomization method is critical for this type of study and is not specified. Apart from a token reference to § 11.72, there is no discussion of how reference sites will be selected.

In addition, the study refers to "fifteen additional study sites representing light and moderate to heavy oiling in Prince William Sound. . ." Reference sites (with selection criteria specified) are also needed for these Prince William Sound sites. The criteria for selecting the location of the four transects within each sampling site must be described. Even a very careful randomization scheme for site selection can be largely negated by subjective transect selection within the site.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, B, F, G, H, I, M, P, Q, S, T, U, X, and Y shown in Table 3-4 of this document.

III. COMMENTS ON THE AIR/WATER INJURY ASSESSMENT PROGRAM

The Draft describes five studies costing \$2,307,400 (not including analytical cost) to evaluate the injury to the air and water resources. One study focuses on computer modeling of air at a cost of \$106,500. The other four studies evaluate water injury at a cost of \$2,200,900. The water evaluation includes computer modeling, water and sediment analysis, manned submersible visual observations, and biological indicator measurements.

This program does not take into consideration that the only feasible restoration of air/water resources, beyond immediate shoreline cleanup, is natural recovery. The volatile oil components released in the air would quickly dilute to very low concentrations. Likewise, soon after the spill, only background levels of hydrocarbons were detected in the waters of Prince William Sound due to strong natural flushing and other natural processes.

An air/water program this elaborate is not justified. As proposed in the Draft, the overall program is excessive, impractical, and expensive. Many of the techniques employed are not cost effective. In addition, the total program cost of \$2,307,400 is not reasonable when considering that the air/water resources have recovered soon after the spill.

The Draft fails to provide any details of the methodologies used in the studies, making a rigorous review impossible. However, from the brief description available, many of the results obtained will be questionable. Further, the modeling efforts are not necessary and heavily rely on many assumptions which cannot be validated and will most likely generate results that are inconclusive approximations.

COMMENTS ON AIR/WATER STUDY NUMBER 1

(AW1) GEOGRAPHICAL EXTENT IN WATER (\$343,500)

This study attempts to determine the source, geographic extent, and temporal persistence of floating oil.

Technical Comments

The success of this study will depend heavily on the use of visual observations and satellite data acquired during the first three months of the spill. The usefulness and accuracy of these techniques should be demonstrated before proceeding. Some of the problems expected to be encountered include limited spatial coverage, heavy cloud cover causing reduced visibility, and sensors not designed to detect floating oil.

Satellite imagery for the determination of surface-oil concentrations will lead to erroneous results. Satellite images may not have the resolution to determine surface-oil patches. Moreover, due to the existence of natural slicks and especially algal masses floating in the water, false positive results can be a problem using this technique. This could overstate the areal extent of the slick.

Aerial photography or satellite imagery will not likely be able to identify the source of the "surface oil" (e.g., Exxon Valdez natural sheen or diesel from a spill or boat wake). Therefore, the sampling and analysis of slicks will be critical for interpretation of the aerial data; otherwise, misinterpretation of the aerial data is likely.

Insufficient information is provided concerning computer modeling for this study. Concerns include: demonstrating applicability of models used; processes simulated by the model; mathematical and statistical methods used; adaptation, alteration, and documentation of computer code; and validity of model results.

From a cost-effectiveness standpoint, ADEC appears to be proposing development of a similar NOAA model for oil movement through the Sound. Additional modeling should only be completed if it is demonstrated to be a significant improvement over the existing work. If the program is just a refinement of NOAA's maps, then it is overpriced and unnecessary. A key limitation is the qualitative nature of the source documents (the overflight maps). The resulting information is highly qualitative and cannot be used for any quantitative work.

The study of surface oil slicks relates only indirectly to environmental restoration. The assumption cannot be made that surface sheens and slicks are environmentally damaging without information about their chemical composition and toxicity.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, B, C, G, M, W, and Y shown in Table 3-4 of this document.

COMMENTS ON AIR/WATER STUDY NUMBER 2

(AW2) INJURY TO SUBTIDAL (\$883,000)

This study attempts to evaluate injury to subtidal marine sediments by analyzing for petroleum hydrocarbons and visual observations.

Technical Comments

This project is research oriented and actual benefits to either the Injury Documentation or Quantification Phases of the regulations do not justify the high cost of this study.

Limited information is provided concerning methods employed during visual checks for oil in bottom sediments, making it impossible to evaluate the methodology. However, visual observations are very subjective and a strong possibility of biases exists. Additionally, insufficient information is provided to assess the coordination of near-shore sites with intertidal sampling sites. Lack of information provided makes it impossible to evaluate any attempt to scale site-specific results to other broader regions.

A manned submersible cannot be used efficiently to check for oil in bottom sediments. Only massive deposits of oil, forming a visible layer on the bottom, might be detected in this way. Given the large area to be investigated, looking for such deposits with a submersible is neither feasible nor cost effective. Certainly, surface-based sampling approaches are adequate for determining levels in sediments in a more cost-effective manner.

The plan does not provide a means of distinguishing differences in sediment oiling due to geographic variation from those due to the effects of time. Thus, neither geographic nor temporal trends can be determined.

The study plan mentions that TOC analyses will be conducted on "selected samples", but gives no indication how these samples are selected. Similarly, no information concerning analyses of "grain size on representative samples" is given. There is no information provided to determine how samples will be prescreened "prior to full GC/MS analysis in areas with low likelihood of oiling."

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, B, C, G, H, I, M, and Y shown in Table 3-4 of this document.

COMMENTS ON AIR/WATER STUDY NUMBER 3

(AW3) HYDROCARBONS IN WATER (\$595,500)

This study attempts to determine the geographic extent and temporal distribution of dissolved hydrocarbons in water by monitoring water-column and mussel-tissue hydrocarbon concentrations.

Technical Comments

No details are given for methods used to sample water at various depths. It is extremely difficult to collect water-column samples without contamination from surface slicks, sheens, or even vapor-phase hydrocarbons. Unless adequate precautions are taken to avoid such contamination and account for that which did occur, the resulting data on petroleum hydrocarbons in the water column are useless.

The plan description does not specify a schedule for documenting when the mussel cages were set. Mussel cages are of little value in documenting the damage of crude oil more than a few weeks after the spill in that hydrocarbon concentration would be extremely low.

A description of statistical testing methods is necessary, together with a demonstration that the sampling design is adequate. It is improper to use the source of experimental mussels in Southeast Alaska as control sites. In using the mussels as indicators of water quality and bioaccumulation, it would be necessary to know the variability of oil in the mussels before exposure to Sound waters.

Since no adverse effects for mussels are being measured in this study, it is unclear how the bioaccumulation data will be interpreted. It may give relationships between water sample and tissue concentrations of hydrocarbons; however, bioaccumulation is not necessarily a deleterious effect.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, B, C, G, H, I, J, M, X, and Y shown in Table 3-4 of this document.

COMMENTS ON AIR/WATER STUDY NUMBER 4

(AW4) INJURY TO DEEP WATER (\$378,900)

This study attempts to evaluate injury to deepwater (>20 meters) benthic infaunal resources through chemical and biological analyses.

Technical Comments

Injury to deepwater benthic resources is expected to be minimal and very isolated. The high cost of this study is not justified.

The statement, "If injury to these communities is demonstrated . . . violation of state and federal water quality criteria is conclusive," is not valid and is a poor justification of this expensive study.

The details of the sampling, experimental, and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if: standard and widely accepted methods are employed; possible biases are accounted for; surveys accurately represent assessment areas; possible errors in scaling results are accounted for; and results are statistically valid.

It is doubtful that changes in microbial communities can be used to define injury to the benthic biological resource. The study does not state what type and magnitude of change will be used to define injury.

This study needs to address how stations will be compared, since no mention is made of reference stations. Several factors can influence infaunal community structure. It is not defined how petroleum concentration and composition, water depth, sediment grain size, sediment total organic carbon, and other factors are accounted for in determining if changes in community structure are due to oil.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, B, C, G, H, I, J, M, X, and Y shown in Table 3-4 of this document.

COMMENTS ON AIR/WATER STUDY NUMBER 5

(AW5) INJURY TO AIR (\$106,500)

This study attempts to evaluate the injury to air by computer modeling the volatile organic compounds released from the oil, both geographically and temporally, and comparing resultant concentrations to National Institute of Occupational Safety and Health (NIOSH) standards.

Technical Comments

Insufficient information is provided concerning computer modeling for this study. Omissions include demonstrating applicability of models used; processes simulated by the model; mathematical and statistical methods used; adaptation, alteration, and documentation of computer code; and validity of model results.

It is doubtful whether there are sufficient data on air/water temperature, vertical profiles of wind speed and direction with emphasis on near-surface winds, sea-wave height and direction information, etc., to parameterize the air-dispersion models for valid use in the damage assessment. The resulting model system will be extremely complex and many of the rate parameters and coefficients are poorly understood and must be estimated or approximated. Thus, use of such a model to predict the aerial and temporal distribution and concentration of VOC in the air over sea and land is subject to large errors and does not account for normal weathering processes.

The study states it will "allow prediction of possible unhealthful conditions as measured by standards established by NIOSH." NIOSH requirements, besides being chemical-specific, may not be appropriate guidelines since they are for humans, not birds and wild mammals, working for prolonged time periods.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs C, D, H, N, R, and Y shown in Table 3-4 of this document.

IV. COMMENTS ON FISH/SHELLFISH INJURY ASSESSMENT PROGRAM

The Draft describes 26 studies costing \$10,038,400 (not including analytical cost) to evaluate injury to fish, shellfish, and commercial resources. The major emphasis is on studies that involve commercially valuable species such as salmon (\$3,999,300), herring (\$434,500), and other fish caught in trawls (\$3,802,000). Two studies will examine recreational fishing at a cost of \$613,000.

Some studies on fish and shellfish resources are warranted to assess injury and subsequent restoration of these valuable natural resources. However, the proposed studies go far beyond the requirements to identify and quantify damage and become research programs to expand knowledge on the ecology and fisheries of Prince William Sound and adjacent waters. Moreover, these studies do not address restoration, even though restoration is professed to be the primary goal of the Trustees' program.

The overall cost of the fish/shellfish program is not reasonable. The thrust of much of this work is to determine the impact to commercial fishermen, which is not compensable under NRDA since private claims have and will be paid directly to the fishermen. Therefore, any remaining damage will be quite small, and the costs of this study may not be reasonable. The total cost of these fish/shellfish studies is \$9,776,300 (Table 3-2). Moreover, two of the studies (F16 and F25) solely involve commercial resources at a cost of \$84,000. Other proposed studies provide non-NRDA related information. Many of the 26 studies have some research components attributed to them, but three studies (F2, F8, and F20) are completely research oriented at a cost of \$810,600.

The Draft fails to provide any details of the methodologies used in the studies, making a rigorous review impossible. However, from the brief description available, many of the studies appear poorly designed. Poor study design, minimal exposure to hydrocarbons, and the large amount of natural variation in these biological resources, may prevent statistically valid conclusions concerning impact. Even if an impact is detected in the "patchy" highly oiled areas, the primary restoration mechanism is the natural ecological recovery process.

Specific Comments

Page 48, "... 300,000 angler days participating in these recreational fisheries in 1987." The stated number of angler days for Homer and Seward alone differs significantly from Fish/Shellfish Study #6 which states that "during 1987 a total of approximately 215,000 angler days of recreational fishing effort were sustained" in Prince William Sound, Resurrection Bay (Seward), Kachemak Bay (Homer), and Chiniak Bay (Kodiak) combined.

Page 48, "The fisheries impacts of the oil spill were immediate. Commercial fisheries for herring, shrimp, and groundfish in the Sound were closed. Bookings with fishing guides, charter boat operators, and fishing lodges were cancelled. A fishing industry that depended on the reputation of quality born of a pristine Alaska found that reputation potentially tarnished; markets for Alaska seafood were placed in jeopardy." To the extent that these comments concern commercial damages compensable through the claims process, they are not NRDA related.

Page 48, "Most fish and deep-water shellfish die unseen within the water." Fish and shellfish mortalities only occur as a result of the oil if they are exposed to high enough concentrations of oil over a sufficient period of time. The available data measured shortly after the spill show water hydrocarbon concentrations well below reported toxicity limits.

Page 48, "How those deaths of fish and shellfish affect the commercial, recreational, and subsistence values of fisheries is the crux of the assessment of injury to fishery resources." This statement suggests that the Trustees have already assumed that all fisheries are injured and are now being quantified. This is another example of the misapplication of the DOI NRDA regulations. Section 11.13(a) of these regulations first requires an injury-determination phase to establish that the natural resources have been injured. Only after injury is established should the Quantification Phase start.

COMMENTS ON FISH/SHELLFISH STUDY NUMBER 1

(F1) SALMON SPAWNING AREA INJURY (\$144,800)

This study attempts to determine and quantify injury to salmon spawning areas in Prince William Sound by documenting distribution of oil in intertidal habitats and measuring abundance of spawning salmon in intertidal and upstream areas for approximately 100 streams.

Technical Comments

The Concern/Justification section for this study states: "Wild stocks of salmon provide a major fishery in Prince William Sound." The Draft goes on to point out that the value of the 1988 commercial catch of salmon was \$76 million to the fisherman. Thus, the thrust of this study is to determine the impact to commercial fishermen, which is not compensable under NRDA since private settlements have and will be made. Therefore, any remaining damage will be quite small, and the costs of this study may not be reasonable.

The details of the sampling, experimental, and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if standard and widely accepted methods are employed, possible biases are accounted for, surveys accurately represent assessment areas, and results are statistically valid. The timing, location, and duration of sampling should be described since each is a potential source of sampling error. Selection of the 100 sites, from the 211 sites available, is not discussed, nor are the selection criteria given.

This study claims that it "will determine whether salmon have suffered abnormal mortality or changes in abundance as a result of the degree of oiling." The study description provides no statistical basis for comparing abundance levels and provides no methods to differentiate natural phenomena effects. Without such, any results generated will be inconclusive.

Juvenile and adult salmon are unlikely to be adversely affected by petroleum hydrocarbons at concentrations that have been documented to occur in the water column of Prince William Sound. Since there were no immediate fish kills, it is extremely unlikely that any long-term impacts on salmon stocks directly attributable to the spill can be documented.

The linkage between the oil spill and sockeye salmon spawning habitats is vague since they are not known to spawn intertidally.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, B, C, E, F, H, I, O, Q, S, U, V, X, and Y shown in Table 3-4 of this document.

COMMENTS ON FISH/SHELLFISH STUDY NUMBER 2

(F2) EGG AND PRE-EMERGENT FRY SAMPLING (\$149,100)

This study attempts to determine and quantify injury to salmon eggs and pre-emergent fry in Prince William Sound by measuring abundance and overwinter mortality of eggs and fry in study streams.

Technical Comments

The Concern/Justification section for this study states: "Wild stocks of salmon provide a major fishery in Prince William Sound." The same section for Study F1, which covers the same area, cites the value of the 1988 commercial catch of salmon from the same area was \$76 million to the fishermen. Thus, the thrust of this study is to determine the impact to the fishermen, which is not compensable under NRDA since private settlements have and will be made. Therefore, any remaining damage will be quite small, and the costs of this study may not be reasonable.

The relevance of this study for determining the impact of an oil spill in Prince William Sound is highly questionable. The Concern/Justification section of the study description states: "The freshwater survival of Prince William Sound salmon could be adversely affected as a consequence of the presence of oil. [Emphasis added.]" However, it is physically impossible for oil spilled in Prince William Sound to travel upcurrent in a freshwater stream to impact salmon egg survival. Abundance and overwinter mortality for these species in intertidal areas cannot be extrapolated from the freshwater areas proposed for study in this project.

The details of the sampling, experimental, and analytical methods used in this study are not provided in the study description. Therefore, it is impossible to determine if standard and widely accepted methods are employed, possible biases are accounted for, surveys accurately represent assessment areas, and results are statistically valid. Some methods used for sampling spawning areas to determine egg and pre-emergent fry abundance have high sampling error.

The study emphasizes coverage of a maximum number of streams rather than more complete documentation at fewer streams. The location and duration of sampling are not described in the study. Each is a potential source of sampling error which should have been addressed in the study description.

The study description provides little statistical basis for comparing abundance of eggs and pre-emergent fry, tissue hydrocarbon concentrations, or overwinter mortality between control and assessment areas. Without a statistical analysis, any results generated will be inconclusive.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, B, C, E, F, H, I, O, Q, S, U, V, X, and Y shown in Table 3-4 of this document.

COMMENTS ON FISH/SHELLFISH STUDY NUMBER 3

(F3) CODED-WIRE TAGGING (\$1,943,400)

This study attempts to determine and quantify injury to juvenile salmon in Prince William Sound by measuring salmon marine survival rates for streams, estuaries, and hatcheries. The abundance of salmon smolts emigrating from study streams will also be measured.

Technical Comments

The Concern/Justification section for this study states: "Wild stocks of salmon and salmon from five hatcheries provide a major fishery in Prince William Sound." The same section for Study F1, which covers the same area, cites the value of the 1988 commercial catch of salmon was \$76 million to the fisherman. An appreciable portion of the study involves salmon from the five hatcheries in particular. Thus, the thrust of this study is to determine the impact to commercial fishermen, which is not compensable under NRDA since private settlements have and will be made. Therefore, any remaining damage will be quite small, and the costs of this study may not be reasonable.

The details of the sampling, experimental, and analytical methods used in this study are not provided in the study description. Therefore, it is impossible to determine if standard and widely accepted methods are employed, possible biases are accounted for, surveys accurately represent assessment areas, and results are statistically valid. Likewise, the timing, location, and duration of sampling are not described in the study. Each is a potential source of sampling error which should have been addressed in the study description.

Marine survival rates are a function of many factors including winter stream temperature, occurrence of ice in streams, zooplankton densities during spring, and possibly oil contamination. Unless the possible oil-contamination factor can be quantified separately, this study has little meaning in terms of damage assessment. No information is provided on how these differences will be accounted for in this study. There can be very large variations in the survival rates not only among the various species (pink, chum, sockeye, coho, chinook), but also among the various races within a species. For example, survival rates for the Copper River stock of sockeye salmon can differ from that for the Susitna River stock of sockeye salmon in Cook Inlet.

The methods and analyses section of this study description states that, "In accordance with the Quality Assurance program, sufficient samples will be taken to make the sampling error around these estimates as small as practical." The Draft, however, contains only a Quality Assurance program for analytical chemistry (Appendix A), not sample design.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, B, C, E, F, H, I, O, Q, S, U, V, X, and Y shown in Table 3-4 of this document.

COMMENTS ON FISH/SHELLFISH STUDY NUMBER 4

(F4) EARLY MARINE SALMON INJURY (\$829,200)

This study attempts to determine and quantify injury to juvenile salmon in Prince William Sound by examining abundance, growth, feeding habits, behavior, migration patterns, and tissue hydrocarbon concentrations of juvenile salmon in their rearing habitats.

Technical Comments

The Concern/Justification section for this study states: ". . . wild and hatchery stocks [of salmon] were heavily impacted . . . these impacts may have detrimentally affected the viability of salmon production in Prince William Sound and the resultant viability of present fisheries and the related economy." The same section for Study F1, which covers the same area, cites the value of the 1988 commercial catch of salmon was \$76 million to the fisherman. An appreciable portion of the study involves salmon from the five hatcheries in particular. Thus, the thrust of this study is to determine the impact to commercial fishermen, which is not compensable under NRDA since private settlements have and will be made. Therefore, any remaining damage will be quite small, and the costs of this study may not be reasonable.

The details of the sampling, experimental, and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if standard and widely accepted methods are employed, possible biases are accounted for, surveys accurately represent assessment areas, and results are statistically valid. The timing, location, and duration of sampling are not described in the study. Each is a potential source of sampling error which should have been addressed in the study description.

Insufficient information is provided to evaluate if statistically significant differences between effects due to natural phenomena and those due to discharges or spills can be determined. The study description provides no basis for making the pair-wise comparisons. Many factors influence migration, feeding, growth, etc. Unless causation can be shown, any results will be inconclusive. The use of catch-per-unit-effort data is probably meaningless in relation to this damage assessment.

Juvenile and adult salmon are unlikely to be adversely affected by petroleum hydrocarbons at concentrations that have been documented to occur in the water column of Prince William Sound. If there were no immediate fish kills, it is extremely unlikely that any long-term impacts on salmon stocks, directly attributable to the spill, can be documented.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, B, C, E, F, H, I, O, S, U, V, X, and Y shown in Table 3-4 of this document.

COMMENTS ON FISH/SHELLFISH STUDY NUMBER 5

(F5) DOLLY VARDEN INJURY (\$437,400)

This study attempts to determine and quantify injury to Dolly Varden char and cutthroat trout in Prince William Sound by estimating survival and exploitation rates.

Technical Comments

The Concern/Justification section for this study states: "Any reduction in abundance due to the oil spill could cause loss of catch and, ultimately, losses in revenue related to these resources." Thus, some portion of the study involves commercial interests covered by the private claims process, which may not be compensable under NRDA. Residual losses would likely not justify the cost of this study. Moreover, the cost of the study may outweigh the cost of the impact. The study cites 81,000 recreational angler days in Prince William Sound in 1987 as partial justification for conducting this research. However, these were primarily from recreational fishermen attempting to catch salmon. A far smaller subset of recreational fishermen were fishing for Dolly Varden char and cutthroat trout.

The details of the sampling, experimental, and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if standard and widely accepted methods are employed, possible biases are accounted for, surveys accurately represent assessment areas, and results are statistically valid. The timing and duration of sampling are not described in the study. Each is a potential source of sampling error which should have been addressed.

Because both species overwinter and reproduce in freshwater, only juveniles and adults are likely to be in environments where oil may have been present at the surface. However, only low concentrations of oil have been documented in the water column of oil-impacted areas. Thus, it is unlikely that these species will have injury attributable to the oil spill.

Marine/estuarine survival rates are a function of many factors including temperature, abundance of food or predators, and possibly oil contamination. Unless the possible oil-contamination factor can be quantified separately, this study has little meaning in terms of assessing a possible effect resulting from the oil spill.

The study incorrectly assumes that survival rates in the survey and control areas were equal before the oil spill. This is unlikely. Both control areas are on the southern sides of islands, exposed to the Gulf of Alaska. The survey areas are all within Prince William Sound. Control and assessment areas are likely to represent different habitats or ecosystems.

No information is provided on how the large variations in the survival rates for different races are accounted for in this study.

Insufficient information is provided to determine whether the study can detect statistically significant differences between effects due to natural phenomena and those due to discharges or spills. Without a statistical analysis, any results generated will be inconclusive.

Objective C states that the study will, "Assess exploitation rates in recreational fisheries of Dolly Varden char and cutthroat trout overwintering in oiled and non-oiled areas. [Emphasis added.]" No information is provided on how the researchers plan to measure exploitation rates in a recreational fishery. Both species overwinter in freshwater lakes. Since there are no freshwater lakes which have been oiled as a result of this spill, the measurement of exploitation rates provides no information on either detection of injury or its quantification.

The linkage between oil contamination and char and cutthroat trout survival is vague and there is virtually no useful baseline data for comparison.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, B, C, E, F, H, I, O, Q, S, U, V, X, and Y shown in Table 3-4 of this document.

COMMENTS ON FISH/SHELLFISH STUDY NUMBER 6

(F6) SPORT FISHERY HARVEST & EFFORT (\$175,900)

This study attempts to determine and quantify injury to sport fishery harvest and effort in Prince William Sound and Gulf of Alaska by surveying recreational fishermen to determine catch, fishing effort, and possible contamination of fish.

Technical Comments

The Concern/Justification section for this study expresses a concern that "any loss of fish abundance . . . could result in . . . serious loss of revenue to the local communities and to the state." Thus, some portion of the study involves commercial interests covered by the private claims process, which may not be compensable under NRDA. Residual losses would likely not justify the cost of this study.

The details of the sampling, experimental, and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if standard and widely accepted methods are employed, possible biases are accounted for, surveys accurately represent assessment areas, and results are statistically valid. The timing, location, and duration of sampling are not described in the study. Each is a potential source of sampling error which should have been addressed.

The methods section states: "Sport catches will be examined for signs of oil contamination, including unpalatable flesh and residues of oil in the digestive tracts." There is strong suspicion that nonscientific methodologies are being used here, since no information is provided on methods to detect "signs of oil contamination." Standard methods must be employed to avoid introduction of bias. Interviews with sportsmen about damage or injury should be carefully evaluated.

The data generated will be of little or no value for damage assessment. Even if a change in the recreational fishery can be detected, the proposed study has no way of determining the cause.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, B, C, E, F, H, I, J, K, S, U, V, and Y shown in Table 3-4 of this document.

COMMENTS ON FISH/SHELLFISH STUDY NUMBER 7

(F7) SALMON SPAWNING AREA INJURY, OUTSIDE PWS (\$320,300)

This study attempts to determine and quantify injury to pink/chum salmon spawning areas outside Prince William Sound by documenting distribution of oil in intertidal habitats and measuring abundance of spawning salmon in intertidal and upstream areas of 109 streams.

Technical Comments

The Concern/Justification section for this study states: "Wild stocks of pink and chum salmon provide major fisheries in areas outside Prince William Sound . . ." The Draft goes on to point out that the value of the 1988 ". . . commercial catch of wild and hatchery stocks of salmon from the oiled Lower Cook Inlet to the south Alaska Peninsula/Aleutians area was more than \$210 million to the fisherman." Thus, the thrust of this study is to determine the impact to commercial fishermen, which is not compensable under NRDA since private settlements have and will be made. Therefore, any remaining damage will be quite small, and the costs of this study may not be reasonable.

This study should not be conducted as part of the NRDA effort. Juvenile and adult salmon are unlikely to be adversely affected by petroleum hydrocarbons at concentrations that have been documented to occur in the water column of Prince William Sound. Since there were no immediate fish kills, it is extremely unlikely that any long-term impacts on salmon stocks, directly attributable to the spill, can be documented.

The details of the sampling, experimental, and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if standard and widely accepted methods are employed, possible biases are accounted for, surveys accurately represent assessment areas, and results are statistically valid. The timing, location, and duration of sampling are not described in the study. Each is a potential source of sampling error which should have been addressed.

Insufficient information is provided to determine if this study can detect statistically significant differences between effects due to natural phenomena and those due to discharges or spills.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, B, C, E, F, H, I, O, Q, S, U, V, X, and Y shown in Table 3-4 of this document.

COMMENTS ON FISH/SHELLFISH STUDY NUMBER 8

(F8) EGG & PRE-EMERGENT FRY SAMPLING, OUTSIDE PWS (\$111,400)

This study attempts to determine and quantify injury to pink/chum salmon eggs and pre-emergent fry in areas outside Prince William Sound by measuring abundance and overwinter mortality of eggs and fry in study streams.

Technical Comments

The Concern/Justification section for this study states: "Wild stocks of pink and chum salmon provide major fisheries in areas outside Prince William Sound" The same section for Study 7, which covers the same area, cites the value of the 1988 commercial catch of salmon area was more than \$210 million to the fisherman. Thus, the thrust of this study is to determine the impact to commercial fishermen, which is not compensable under NRDA since private settlements have and will be made. Therefore, any remaining damage will be quite small, and the costs of this study may not be reasonable.

The relevancy of this study for determining the impact of an oil spill in areas outside Prince William Sound is highly suspect. The Concern/Justification section of the study description states: ". . . the freshwater survival of salmon may be affected by lower- or higher-than-desired levels of escapement as a consequence of the inability to harvest salmon in traditional fishing areas due to the presence of oil in those areas. [Emphasis added.]" Abundance and overwinter mortality for these species in intertidal areas cannot be extrapolated from the freshwater areas proposed for study in this project.

The details of sampling, experimental, and analytical methods used in this study are not provided in the study description. Therefore, it is impossible to determine if standard and widely accepted methods are employed, possible biases are accounted for, surveys accurately represent assessment areas, and results are statistically valid. Some methods used for sampling spawning areas to determine egg and pre-emergent fry abundance have high sampling error.

This study fails to provide sufficient information to determine if statistically significant differences between effects due to natural phenomena and those due to discharges or spills can be detected.

The study information provided does not explain how other causes of salmon egg and pre-emergent fry mortality will be distinguished from mortality resulting from possible exposure to oil.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, B, C, E, F, H, I, O, Q, S, U, V, X, and Y shown in Table 3-4 of this document.

COMMENTS ON FISH/SHELLFISH STUDY NUMBER 9

(F9) EARLY MARINE SALMON INJURY, OUTSIDE PWS (\$348,500)

This study attempts to determine and quantify injury to young salmon in areas along Kenai Peninsula and in the Kodiak/Shelikov Strait by examining abundance, growth, feeding habits, and tissue hydrocarbon concentrations of juvenile salmon in their nearshore rearing habitats.

Technical Comments

The Concern/Justification section for this study states: "these impacts may have detrimentally affected the viability of salmon production from the Kenai Peninsula and points west and the resultant viability of present fisheries and the related economy." The same section for Study 7, which covers the same area, cites the value of the 1988 commercial catch of salmon was more than \$210 million to the fisherman. An appreciable portion of the study involves salmon from five hatcheries in particular. Thus, the thrust of this study is to determine the impact to commercial fishermen, which is not compensable under NRDA since private settlements have and will be made. Therefore, any remaining damage will be quite small, and the costs of this study may not be reasonable.

This study should not be conducted as part of the NRDA effort. Juvenile and adult salmon are unlikely to be adversely affected by petroleum hydrocarbons at concentrations that have been documented to occur in the water column of Prince William Sound. If there were no immediate fish kills, it is extremely unlikely that any long-term impacts on salmon stocks, directly attributable to the spill, can be documented.

The details of the sampling, experimental, and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if standard and widely accepted methods are employed, possible biases are accounted for, surveys accurately represent assessment areas, and results are statistically valid. The timing, location, and duration of sampling are not described in the study. Each is a potential source of sampling error which should have been addressed.

This study fails to provide sufficient information to determine if it can detect statistically significant differences between effects due to natural phenomena and those due to discharges or spills. The study description provides no basis for making pair-wise comparisons. Many factors influence migration, feeding, growth, etc. Unless causation can be shown, any results will be inconclusive. The use of catch-per-unit-effort data is probably meaningless in relation to this damage assessment.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, B, C, E, F, H, I, O, S, U, V, X, and Y shown in Table 3-4 of this document.

COMMENTS ON FISH/SHELLFISH STUDY NUMBER 10

(F10) DOLLY VARDEN AND SOCKEYE INJURY, LOWER COOK INLET (\$152,600)

This study attempts to determine and quantify injury to Dolly Varden char and sockeye salmon in areas along the Lower Kenai Peninsula by estimating salmon survival rates and extent of oil migration.

Technical Comments

The Concern/Justification section for this study states that these fish are "... caught in sport, commercial, and subsistence fisheries in lower Cook Inlet." Thus, some portion of the study involves commercial interests which are not compensable under NRDA, since private settlements have and will be made. Therefore, any remaining damage will be quite small, and the costs of this study may not be reasonable.

This study should not be conducted as part of the NRDA effort. Dolly Varden char overwinter and reproduce in freshwater, so only juveniles and adults are likely to be present in environments where oil may have been present. This life stage is unlikely to be adversely affected by the concentrations of oil documented in the water column of oil-impacted areas of the Sound. Thus, it is unlikely that Dolly Varden char will have injury attributable to the oil spill.

The details of the sampling, experimental, and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if standard and widely accepted methods are employed, possible biases are accounted for, surveys accurately represent assessment areas, and results are statistically valid. The timing and duration of sampling are not described in the study. Each is a potential source of sampling error which should have been addressed in the study description. The lack of sufficient detail in the methods prevents a discussion of other potential errors or omissions in the methodology.

Insufficient information is provided to determine if this study can detect statistically significant differences between effects due to natural phenomena and those due to discharges or spills.

Marine/estuarine survival rates are a function of many factors including temperature, abundance of food or predators, and possibly oil contamination. Unless the possible oil-contamination factor can be quantified separately, this study has little meaning in terms of assessing a possible effect resulting from the oil spill. The study incorrectly assumes that survival rates in the survey and control areas were equal before the oil spill. This is unlikely. Control and assessment areas are likely to represent different habitats or ecosystems.

No information is provided on how the large variations in the survival rates for different races of the same species are accounted for. The study does not explain how effects on survival caused by the oil spill will be separated from the large inherent variance in survival naturally caused by other factors.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, B, C, E, F, H, I, O, P, Q, U, V, X, and Y shown in Table 3-4 of this document.

COMMENTS ON FISH/SHELLFISH STUDY NUMBER 11

(F11) HERRING INJURY (\$374,500)

This study attempts to determine and quantify injury to herring spawning areas, herring eggs, and juvenile and adult herring in Prince William Sound by estimating the abundance of the spawning herring, egg density, ratio of live to dead eggs, number of newly hatched larvae, and presence of visible abnormalities. In addition, hydrocarbon concentrations will be measured in herring tissue and eggs.

Technical Comments

The Concern/Justification section for this study states: "The Prince William Sound herring stock supports commercial fisheries with a 1988 exvessel value of \$12 million" Thus, the thrust of this study is to determine the impact to commercial fishermen, which is not compensable under NRDA since private settlements have and will be made. Therefore, any remaining damage will be quite small, and the costs of this study may not be reasonable.

The details of the sampling, experimental, and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if standard and widely accepted methods are employed, possible biases are accounted for, surveys accurately represent assessment areas, and results are statistically valid. The timing and duration of sampling are not described in the study. Each is a potential source of sampling error which should have been addressed in the study description.

Insufficient information is provided to determine if this study can detect statistically significant differences between effects due to natural phenomena and those due to discharges or spills.

Insufficient details are given about how lethal and sublethal effects of the oil spill on juvenile and adult herring growth, survival, and reproduction will be measured. These studies may be inconclusive because of the migratory habits of this species.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, B, C, E, F, H, I, O, Q, S, U, V, X, and Y shown in Table 3-4 of this document.

COMMENTS ON FISH/SHELLFISH STUDY NUMBER 12

(F12) HERRING INJURY, OUTSIDE PWS (\$60,000)

This study attempts to determine and quantify injury to herring spawning areas, herring eggs, and juvenile and adult herring in areas along Kodiak and Alaska Peninsula by estimating the abundance of spawning herring and herring eggs and determining the lethal and sublethal effects on egg survival and adult herring growth and reproduction.

Technical Comments

The Concern/Justification section for this study states: "Kodiak and Alaska Peninsula herring stocks support commercial fisheries with a 1988 exvessel value of \$2.8 million and \$0.5 million, respectively" Thus, the thrust of this study is to determine the impact to commercial fishermen, which is not compensable under NRDA since private settlements have and will be made. Therefore, any remaining damage will be quite small, and the costs of this study may not be reasonable.

The details of the sampling, experimental, and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if standard and widely accepted methods are employed, possible biases are accounted for, surveys accurately represent assessment areas, and results are statistically valid. The timing and duration of sampling are not described in the study. Each is a potential source of sampling error which should have been addressed in the study description.

This study fails to provide sufficient information to determine if it can detect statistically significant differences between effects due to natural phenomena and those due to discharges or spills. Insufficient details are given about how lethal and sublethal effects of the oil spill on juvenile and adult herring growth, survival, and reproduction will be measured. These studies may be inconclusive because of the migratory habits of this species.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, B, C, E, F, H, I, O, P, Q, S, U, V, X, and Y shown in Table 3-4 of this document.

COMMENTS ON FISH/SHELLFISH STUDY NUMBER 13

(F13) CLAM INJURY (\$86,200)

This study attempts to determine and quantify injury to clams in Prince William Sound by estimating abundance of live and dead clams, and measuring tissue hydrocarbon concentrations, growth, and recruitment of young.

Technical Comments

The details of the experimental and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if standard and widely accepted methods are employed, possible biases are accounted for, surveys accurately represent assessment areas, and results are statistically valid. The timing and duration of sampling are not described in the study. Each is a potential source of sampling error which should have been addressed in the study description.

This study fails to provide sufficient information to determine if it can detect statistically significant differences between effects due to natural phenomena and those due to discharges or spills. Without a statistical analysis, any results generated are inconclusive.

The study states that necropsy analysis will establish cause of death. Sufficient baseline data may not be available to provide an adequate understanding of "normal" tissues to make such a statement. This may well be impossible when the time of death is unknown. Since uptake of oil can occur in dead invertebrate tissues, the presence of oil alone will not be conclusive.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, B, C, E, F, H, I, O, Q, S, V, X, and Y shown in Table 3-4 of this document.

COMMENTS ON FISH/SHELLFISH STUDY NUMBER 14

(F14) CRAB INJURY (\$142,900)

This study attempts to determine and quantify injury to crabs in Prince William Sound by measuring tissue hydrocarbon concentrations and reproductive factors, and assessing shell abnormalities.

Technical Comments

The brown king crab portion of this study involves commercial resources, which are not compensable under NRDA, since private settlements have and will be made. Therefore, any remaining damage will be quite small, and the costs of this study may not be reasonable.

The proposed studies with brown king crab do not seem feasible and technically justifiable. Brown king crabs are restricted to deep waters where the likelihood of encountering oil, in either water or sediment, is remote.

The details of the sampling, experimental, and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if standard and widely accepted methods are employed, possible biases are accounted for, surveys accurately represent assessment areas, and results are statistically valid. The timing and duration of sampling are not described in the study. Each is a potential source of sampling error which should have been addressed in the study description.

Insufficient information is provided to determine if this study can detect statistically significant differences between effects due to natural phenomena and those due to discharges or spills. Without a statistical analysis, any results generated are inconclusive.

The study does not describe a standard method for obtaining Dungeness crab larvae under laboratory conditions.

This study states that "crabs are known to be very sensitive to hydrocarbons," but the hydrocarbon concentrations in the subtidal region of this spill are over three orders of magnitude lower than what crabs are known to be sensitive to. There seems to be little justification for the biological studies proposed.

There is not a demonstrated cause/effect relationship between limb loss by Dungeness crabs and hydrocarbons.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, B, C, E, F, H, I, O, S, U, V, X, and Y shown in Table 3-4 of this document.

COMMENTS ON FISH/SHELLFISH STUDY NUMBER 15

(F15) SPOT SHRIMP INJURY (\$60,500)

This study attempts to determine and quantify injury to spot shrimp in Prince William Sound by estimating abundance, catch-per-unit effort, and reproductive factors.

Technical Comments

The Concern/Justification section for this study states: "In 1988 the commercial harvest of spot shrimp in Prince William Sound amounted to over \$500,000" Thus, the thrust of this study is to determine the impact to commercial fishermen, which is not compensable under NRDA since private settlements have and will be made. Therefore, any remaining damage will be quite small, and the costs of this study may not be reasonable.

This study should not be part of the NRDA effort. Only very low concentrations of oil have been documented in the water column. Further, adult shrimp are not particularly sensitive to the low concentrations in the water. Thus, it is unlikely that adult shrimp will be adversely affected.

The details of the sampling, experimental, and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if standard and widely accepted methods are employed, possible biases are accounted for, surveys accurately represent assessment areas, and results are statistically valid. The timing and duration of sampling are not described in the study. Each is a potential source of sampling error which should have been addressed in the study description.

Insufficient information is provided to determine if this study can detect statistically significant differences between effects due to natural phenomena and those due to discharges or oil spills. Further, any results generated will be inconclusive in demonstrating a pathway.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, B, C, E, F, H, I, O, S, U, V, X, and Y shown in Table 3-4 of this document.

COMMENTS ON FISH/SHELLFISH STUDY NUMBER 16

(F16) INJURY TO OYSTERS (\$30,500)

This study attempts to determine and quantify injury to oysters in Prince William Sound by examining growth, condition, mortality, and tissue hydrocarbon concentrations.

Technical Comments

The Concern/Justification section for this study states: "There are three oyster farms in the Sound" There are no natural populations of Pacific oysters in Prince William Sound. Thus, this entire study involves commercial resources which are not compensable under NRDA, since private settlements have and will be made. Therefore, any remaining damage will be quite small, and the costs of this study may not be reasonable.

The details of the sampling, experimental, and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if standard and widely accepted methods are employed, possible biases are accounted for, surveys accurately represent assessment areas, and results are statistically valid. The timing and duration of sampling are not described in the study. Each is a potential source of sampling error which should have been addressed in the study description.

Insufficient information is provided to determine if this study can detect statistically significant differences between effects due to natural phenomena, oyster farms, and those resulting from the oil spill.

Data from the Amoco Cadiz oil spill demonstrate that the post-settling Pacific oysters are not at all sensitive to crude oil and few histopathological or biochemical lesions were observed. In fact, growth was actually stimulated because of the increased bacterial biomass available as food, due to increases in populations of hydrocarbon-degrading bacteria.

At the Perry Island mariculture operation, it is extremely unlikely that significant biological effects of the oil on oyster populations will be detected in this study. Mortality, growth, and condition are fairly gross parameters and probably will be relatively insensitive to the oil or too variable to use as indices of biological effects.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, B, C, E, F, H, I, O, Q, S, U, V, X, and Y shown in Table 3-4 of this document.

COMMENTS ON FISH/SHELLFISH STUDY NUMBER 17

(F17) ROCKFISH INJURY (\$45,600)

This study attempts to determine and quantify injury to rockfish in Prince William Sound by assessing population abundance, catch-per-unit effort, and organoleptic (taint) testing.

Technical Comments

The Concern/Justification section for this study states: "A decline in rockfish populations due to the oil spill could harm sport, commercial, and subsistence fisheries by reducing harvest" Thus, some portion of this study involves commercial resources which are not compensable under NRDA, since private settlements have and will be made. Therefore, any remaining damage will be quite small, and the costs of this study may not be reasonable.

It is unlikely that this study will demonstrate an exposure pathway, since only adult rockfish, which are normally in subtidal areas deeper than 20 meters, will be collected.

The details of the sampling, experimental, and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if standard and widely accepted methods are employed, possible biases are accounted for, surveys accurately represent assessment areas, and results are statistically valid. The timing and duration of sampling are not described in the study. Each is a potential source of sampling error which should have been addressed in the study description.

Insufficient information is provided to determine if this study can detect statistically significant differences between effects due to natural phenomena and those related to the oil spill. No information is provided on the criteria used to select the reefs so that they represent adequately the Prince William Sound population.

The organoleptic testing program needs to describe how the taste panels will be chosen and what criteria will be employed. This study will not yield valid results unless trained taste panels are employed under rigorously controlled test conditions.

The study states that they will collect "a sample of any dead fish on the surface or fishing for live fish with hook and line." Visitation to the location of observed fish kills presumes the fish are in the location where they were killed. This is quite unlikely in most places in Prince William Sound. Collecting live fish from the location of some dead fish (on the surface) could be very misleading and inconclusive. Moreover, the use of long-line gear for estimating changes in fish abundance is questionable.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, B, C, E, F, H, I, O, Q, S, U, V, X, and Y shown in Table 3-4 of this document.

COMMENTS ON FISH/SHELLFISH STUDY NUMBER 18

(F18) TRAWL ASSESSMENT (\$738,800)

This study attempts to determine and quantify injury to bottom fisheries (such as Tanner crab, king crab, sidestripe shrimp, halibut, pollock, sablefish, and Pacific cod) in Prince William Sound by conducting trawl surveys to measure population abundances and to collect fish samples for age structure and tissue hydrocarbon analyses.

Technical Comments

The Concern/Justification section for this study states: "Prince William Sound supports bottom fisheries worth several million dollars annually" Thus, an appreciable portion of the study involves commercial resources which are not compensable under NRDA, since private settlements have and will be made. Therefore, any remaining damage will be quite small, and the costs of this study may not be reasonable.

This study should not be conducted as part of the NRDA effort. Since only low concentrations of oil have been observed in the water column, it is unlikely that any adverse effects will be demonstrated.

It is extremely difficult if not impossible to document an impact of an oil spill on stock size and year class strength of a commercial fishery species by conventional stock assessment techniques. Often, there is too much natural variability in space and time in these parameters, so that only really massive, catastrophic changes in abundance and recruitment can be measured using this technique.

Measuring "the incidence of tarballs in the demersal environment and in stomachs of groundfish" is a seriously flawed objective. Fish can swallow tarballs that are caught in the trawl.

The details of the sampling, experimental, and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if standard and widely accepted methods are employed, possible biases are accounted for, surveys accurately represent assessment areas, and results are statistically valid. The timing and duration of sampling are not described in the study. Each is a potential source of sampling error which should have been addressed in the study description.

Insufficient information is provided to determine if this study can detect statistically significant differences between effects due to natural phenomena and those due to discharges or spills.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, B, C, E, F, H, I, O, P, S, U, V, X, and Y shown in Table 3-4 of this document.

COMMENTS ON FISH/SHELLFISH STUDY NUMBER 19

(F19) LARVAL FISH INJURY (\$413,400)

This study attempts to determine and quantify injury to larval fish/shellfish, including pollock, halibut, Pacific cod, black cod, herring, flathead sole, starry flounder, yellowfin sole, Tanner crab, spot shrimp, pink shrimp, and king crab in Prince William Sound by measuring larval density and abundance of spawning fish. Also, larval growth will be compared to water hydrocarbon concentrations.

Technical Comments

The Concern/Justification section for this study states: "All of these species are important to commercial, sport, subsistence, and personal use fisheries." Thus, some portion of this study involves commercial resources which are not compensable under NRDA, since private settlements have and will be made. Therefore, any remaining damage will be quite small, and the costs of this study may not be reasonable.

It is unlikely that concentrations of petroleum in the water column will ever be as high as those that kill marine fish and crustacean larvae in acute laboratory exposures. Also, the oil in the field is weathered and so its toxicity is much less than that of crude oils used in most laboratory toxicity tests.

This project will mostly provide research data on Prince William Sound rather than demonstrate an effect of the spill. The study states that: "These samples will represent the first data collected on the relative abundance of larvae of shellfish and groundfish in the Sound" The study does not assure that the samples collected in April, in advance of the arrival of the oil, were collected using the same methods as later on. The extremely patchy distribution of plankton will make it unlikely that an adequate background or control (non-oiled) data will be available to evaluate the effects of the spill on larval fish.

The details of the sampling, experimental, and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if standard and widely accepted methods are employed, possible biases are accounted for, surveys accurately represent assessment areas, and results are statistically valid. The timing, locations, and duration of sampling are not described in the study. Each is a potential source of sampling error which should have been addressed in the study description.

Insufficient information is provided to determine if this study can detect statistically significant differences between effects due to natural phenomena and those due to discharges or spills.

Without a tight linkage, a clear cause/effect relationship cannot be established and the study does not meet the requirements for assessing injury to a biological resource. There are so many natural environmental and seasonal factors that affect the abundance of larvae in the plankton in a particular location and at a particular time, that changes in larval abundance will be difficult to attribute statistically to the oil spill.

A technically sound approach is not evident for correlating larval abundance to physical oceanographic parameters and concentrations of hydrocarbons in the water column determined on other surveys.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, B, C, E, F, H, I, O, Q, S, U, V, X, and Y shown in Table 3-4 of this document.

COMMENTS ON FISH/SHELLFISH STUDY NUMBER 20

(F20) UNDERWATER OBSERVATIONS (\$550,100)

This study attempts to determine and quantify injury to brown king crab, spot shrimp, rockfish, and halibut in Prince William Sound and areas outside Prince William Sound by conducting visual observations for oil on the bottom and recording general abundance of fish and shellfish using manned or remote operated submersible vehicles.

Technical Comments

The study as described may generate good natural-history data, but little of use in direct support of the NRDA. It is simply a search for some oil over thousands of square miles of bottom with a tool designed to look at very small areas in great detail. Given the proposed technical scope and costs for this project it is doubtful that petroleum can be detected in bottom sediments at a reasonable cost using ROVs or manned submersibles. The data that the investigators propose to use to verify their visual observations will provide more credible evidence of possible oil contamination at a much lower cost.

Only large quantities of petroleum physically coating the bottom would be detected by video cameras on an ROV or visual observations from a manned submersible. Such massive deposits of oil have not been reported anywhere in the Sound or the Gulf of Alaska resulting from this spill. Given the nature of the spilled oil and the environmental conditions at the spill site, if such deposits do occur, they are likely to be of very limited areal extent. Therefore, it is not reasonable to spend large sums of money to look for such deposits in submersibles.

This study is not reasonable since it is mainly research oriented and does not directly support the damage assessment as it pertains to the fishery resources of the vicinity. Moreover, exposure to oil and its possible effects can be more directly demonstrated by other studies.

The concept of this study is seriously flawed. It is purely observational, will not produce any quantitative data, and lacks detailed methodology. Use of visual observations to select sampling locations for oiled versus non-oiled comparisons is very subjective. The possibilities for producing biased, statistically invalid results are immense. Moreover, it is difficult to see how comparable estimates can be obtained between oiled and non-oiled areas when "transect density will be increased where evidence of oil is found."

The study is based on the assumption that random transects in the vicinity will show the extent of tarballs and weathered oil in the deep habitats which support demersal fisheries. The coverage of this type of vehicle is so limited that 60 days of painstaking effort would cover only a minuscule portion of the extensive areas described.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, C, E, F, H, I, S, U, V, and Y shown in Table 3-4 of this document.

COMMENTS ON FISH/SHELLFISH STUDY NUMBER 21

(F21) CLAM INJURY, OUTSIDE PWS (\$108,800)

This study attempts to determine and quantify injury to clams outside Prince William Sound by estimating abundance of live and dead clams and measuring tissue hydrocarbon concentrations, growth, and recruitment of young.

Technical Comments

According to the Draft (p. 9), "currents and winds moved the oil (in the form of mousse and tarballs) out of Prince William Sound and along the coast of the Kenai Peninsula toward Kodiak Island and the entrance to Cook Inlet." The Draft later states: ". . . the aromatic constituents of petroleum tend to be acutely poisonous. These same components (benzene, toluene, xylene, naphthalene) also are among the first to dissipate. As they evaporate and dissolve, the acute toxicity of the remaining oil diminishes (p. 13)." Thus, the beaches proposed to be studied in this project were impacted by weathered oil. Any possible effects to bivalves would result from this weathered oil.

The details of the sampling, experimental, and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if standard and widely accepted methods are employed, possible biases are accounted for, surveys accurately represent assessment areas, and results are statistically valid. The timing and duration of sampling are not described in the study. Each is a potential source of sampling error which should have been addressed in the study description.

Insufficient information is provided to determine if this study can detect statistically significant differences between effects due to natural phenomena and those resulting from the oil spill.

The study states that necropsy analysis will establish cause of death. Sufficient baseline data may not be available to provide an adequate understanding of "normal" tissues to make such a statement. This may well be impossible where the time of death is unknown. Since uptake of oil can occur in dead invertebrate tissues, the presence of oil alone will not be conclusive.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, C, E, F, H, I, O, P, Q, S, U, V, X, and Y shown in Table 3-4 of this document.

COMMENTS ON FISH/SHELLFISH STUDY NUMBER 22

(F22) CRAB INJURY, OUTSIDE PWS (\$111,500)

This study attempts to determine and quantify injury to crabs outside Prince William Sound by measuring tissue hydrocarbon concentrations, reproductive factors, and assessing shell abnormalities.

Technical Comments

The Concern/Justification section for this study states: "The diverse marine habitats of Kodiak Island, Cook Inlet, and the Aleutian Islands support a wide variety of commercial, sport, and subsistence crab species. Dungeness crab support commercial fisheries in Cook Inlet and near Kodiak Island valued at \$4 million annually. The commercial values, when included with the subsistence and sport harvests, make this species extremely valuable." Thus, the thrust of this study is to determine the impact to commercial fishermen, which is not compensable under NRDA since private settlements have and will be made. Therefore, any remaining damage will be quite small, and the costs of this study may not be reasonable.

Clearly, the expense of this project is not warranted, since damage to the crab is expected to be minimal. Moreover, it is unlikely that an exposure pathway can be demonstrated, because oil in the subtidal regions is expected to be minimal and spotty outside of Prince William Sound. Further, even if oil were present, it would be a highly weathered crude oil, which would not be expected to cause injury.

The details of the sampling, experimental, and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if standard and widely accepted methods are employed, possible biases are accounted for, surveys accurately represent assessment areas, and results are statistically valid. The timing, location, and duration of sampling are not described in the study. Each is a potential source of sampling error which should have been addressed in the study description.

Insufficient information is provided to determine if this study can detect statistically significant differences between effects due to natural phenomena and those resulting from the oil spill.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, B, C, E, F, H, I, O, S, U, V, X, and Y shown in Table 3-4 of this document.

COMMENTS ON FISH/SHELLFISH STUDY NUMBER 23

(F23) ROCKFISH INJURY, OUTSIDE PWS (\$108,400)

This study attempts to determine and quantify injury to rockfish, halibut, and lingcod along the Lower Kenai Peninsula by assessing population abundances and tissue hydrocarbon concentrations.

Technical Comments

The Concern/Justification section for this study states: "These species are also harvested by commercial and subsistence fisherman." Thus, some portion of this study involves commercial resources which are not compensable under NRDA, since private settlements have and will be made. Therefore, any remaining damage will be quite small, and the costs of this study may not be reasonable.

It is unlikely that this study will demonstrate an exposure pathway, since only adult rockfish, which are normally in subtidal areas deeper than 20 meters, will be collected.

The details of the sampling, experimental, and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if standard and widely accepted methods are employed, possible biases are accounted for, surveys accurately represent assessment areas, and results are statistically valid. The timing and duration of sampling are not described in the study. Each is a potential source of sampling error which should have been addressed in the study description.

Insufficient information is provided to determine if this study can detect statistically significant differences between effects due to natural phenomena and those due to discharges or spills.

It is unlikely that an exposure pathway can be demonstrated for this study, since no oil is expected in the subtidal regions (>20 meters) outside of Prince William Sound where adult rockfish reside. Further, even if oil were present, it would be a highly weathered crude oil, which would not be expected to cause injury.

As discussed for Fish/Shellfish Study #20, the use of an ROV to detect oil in bottom sediments is neither reliable, reasonable, nor cost effective.

The organoleptic testing program needs to describe how the taste panels will be chosen and what criteria will be employed. This study will not yield valid results unless trained taste panels are employed under rigorously controlled test conditions.

The study states that they will collect "a sample of any dead fish on the surface or fishing for live fish with hook and line". Visitation to the location of observed fish kills presumes the fish are in the location where they were killed. This is quite unlikely in most places in Prince William Sound. Collecting live fish from the location of some dead fish (on the surface) could be very misleading and inconclusive. Moreover, the use of long-line gear for estimating changes in fish abundance is questionable.

Regulatory Comments

This study deviates from the regulations, as described by paragraphs A, B, C, E, F, H, I, O, Q, S, U, V, X, and Y shown in Table 3-4 of this document.

COMMENTS ON FISH/SHELLFISH STUDY NUMBER 24

(F24) TRAWL ASSESSMENT, OUTSIDE PWS (\$2,495,800)

This study attempts to determine and quantify injury to fish/shellfish, including Tanner crab, red king crab, halibut, pollock, and sablefish outside Prince William Sound by conducting trawl surveys to measure population abundances, and to collect fish samples for age determinations, tissue hydrocarbon analyses, and reproductive potential.

Technical Comments

The Concern/Justification section for this study states: "Groundfish and crab fisheries yield multi-millions of dollars annually for species such as" Thus, an appreciable portion of the study involves commercial resources which are not compensable under NRDA, since private settlements have and will be made. Therefore, any remaining damage will be quite small, and the cost of this study may not be reasonable.

The excessive expense of this study also makes it unreasonable, since damage to these resources is expected to be minimal. Moreover, it is unlikely that an exposure pathway can be demonstrated because oil in the subtidal regions is expected to be minimal and spotty outside of Prince William Sound. Further, even if oil were present, it would be a highly weathered crude oil, which would not be expected to cause injury.

The details of the sampling, experimental, and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if standard and widely accepted methods are employed, possible biases are accounted for, surveys accurately represent assessment areas, and results are statistically valid. The timing and duration of sampling are not described in the study. Each is a potential source of sampling error which should have been addressed in the study description.

Insufficient information is provided to determine if this study can detect statistically significant differences between effects due to natural phenomena and those due to discharges or spills.

Measuring "the incidence of tar balls in the demersal environment in stomachs of groundfish" is a seriously flawed objective. Fish will swallow tarballs that are caught in the trawl.

It is extremely difficult if not impossible to document an impact of an oil spill on stock size and year class strength of a commercial fishery species by conventional stock assessment techniques. Often, there is too much natural variability in space and time in these parameters, so that only really massive, catastrophic changes in abundance and recruitment can be measured using this technique.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs A, B, C, E, F, H, I, O, P, S, U, V, X, and Y shown in Tables 3-4 of this document.

COMMENTS ON FISH/SHELLFISH STUDY NUMBER 25

(F25) SCALLOP MARICULTURE INJURY (\$53,800)

This study attempts to determine and quantify injury to scallops in Kodiak waters by comparing growth, survival, and tissue hydrocarbon concentrations at several sites.

Technical Comments

The Concern/Justification section for this study states: "Weathervane scallops form the basis of a commercial fishery based primarily out of Kodiak." In fact, Part IV of the Assessment Plan itself lists the title for this project as "Scallop Mariculture Injury." The study states that "Results will be analyzed to estimate the effects of the spill on the stocks of wild scallops that support active commercial fisheries in this area. [Emphasis added.]" No natural stocks of these scallops will be studied. Thus, the entire study seemingly involves commercial resources which are not compensable under NRDA. Damage to wild scallops is expected to be minimal and the cost of this study may not be reasonable.

The assertion in the study description that the "oil spill has put this program at risk" is unsupported. The entire study is based on the assumption that damage has occurred and, without further supporting evidence, this assumption appears invalid.

Scallops are subtidal benthic bivalves and are mainly found in waters deeper than 30 meters. Their habitat renders them unlikely to encounter potentially toxic concentrations of petroleum hydrocarbons in the ambient medium. Although significant amounts of oil, primarily in the form of mousse, did reach the vicinity of Kodiak, the concentrations of oil in the water column, especially near the bottom, have been extremely low or undetectable. Thus, scallops in the vicinity of Kodiak should not be considered to be at significant risk of exposure to ecologically significant concentrations of toxic fractions of petroleum.

Wild scallop populations are probably less at risk than mariculture scallops. Wild scallops live on top of the sediments whereas mariculture scallops are held higher in the water column. If mariculture scallops are studied, for the reasons stated above it will not be feasible to extrapolate results to stocks of wild scallops in the area.

The details of the sampling, experimental, and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if standard and widely accepted methods are employed, possible biases are accounted for, surveys accurately represent assessment areas, and results are statistically valid. The timing and duration of sampling are not described in the study. Each is a potential source of sampling error which should have been addressed in the study description.

Insufficient information is provided to determine if this study can detect statistically significant differences between effects due to natural phenomena and those due to discharges or spills.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs A, B, C, E, F, H, I, O, Q, S, U, V, X, and Y shown in Tables 3-4 of this document.

COMMENTS ON FISH/SHELLFISH STUDY NUMBER 26

(F26) SEA URCHIN INJURY (\$45,000)

This study attempts to determine and quantify injury to sea urchins off Kodiak Island by assessing sea urchin abundance, roe production, condition, reproductive abnormalities, tissue hydrocarbon concentrations, and toxicity to larvae.

Technical Comments

The Concern/Justification section for this study states: "Green sea urchins support a rapidly growing commercial fishery in Kodiak with an exvessel value of \$152,000 in 1988." Thus, the thrust of this study is to determine the impact to commercial fishermen, which is not compensable under NRDA since private settlements have and will be made. Therefore, any remaining damage will be quite small, and the cost of this study may not be reasonable. Moreover, some portion of this work is unnecessary since it duplicates information collected in the Coastal Habitat Study.

The details of the sampling, experimental and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if standard and widely accepted methods are employed, possible biases are accounted for, surveys accurately represent assessment areas, and results are statistically valid. The timing and duration of sampling are not described in the study. Each is a potential source of sampling error which should have been addressed in the study description.

Insufficient information is provided to determine if this study can detect statistically significant differences between effects due to natural phenomena and those due to discharges or spills.

According to the Draft (p. 9), "currents and winds moved the oil (in the form of mousse and tar balls) out of Prince William Sound and along the coast of the Kenai Peninsula toward Kodiak Island and the entrance to Cook Inlet." The Draft later states that "... the aromatic constituents of petroleum tend to be acutely poisonous. These same components (benzene, toluene, xylene, naphthalene) also are among the first to dissipate. As they evaporate and dissolve, the acute toxicity of the remaining oil diminishes (p. 13)." Thus, by the time the spilled oil reached the Lower Kenai Peninsula, it was highly weathered. Wild sea urchins off Kodiak could not be exposed to the toxic, volatile aromatic compounds because they were no longer present in the oil.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs A, B, C, E, F, H, I, O, P, Q, S, U, V, X, and Y shown in Tables 3-4 of this document.

V. COMMENTS ON MARINE MAMMALS INJURY ASSESSMENT PROGRAM

The Draft describes seven studies costing \$1,885,000 to evaluate the injury to marine mammals (\$499,000 for whales and porpoises, \$515,000 for sea lions and seals, and \$871,000 for sea otters). Five species have been selected for intensive study and roughly six additional species will be included in a more general assessment.

For all the studies, inadequate details for sampling, experimental and analytical methods are presented in the study descriptions.

These studies are not reasonable. Previous studies on the effects of oil spills on whales and porpoises would not justify the cost of the cetacean studies proposed in this Draft.

The proposed studies do not address how information gained will be relevant to restoration. The program does not take into consideration that the only feasible restoration of most marine mammal resources, beyond immediate shoreline cleanup, is natural recovery.

COMMENTS ON MARINE MAMMALS STUDY NUMBER 1

(MM1) HUMPBACK WHALE (\$226,000)

This study attempts to assess the injury from the oil spill to humpback whales in Prince William Sound, Southeast Alaska, and the Kodiak Archipelago by determining population numbers and distribution.

Technical Comments

This study will not determine if humpback whales have "abandoned" Prince William Sound. Movements of whales are poorly understood. Since individual whales from the Sound have been seen in southeastern Alaska, such movements after the spill constitute only ambiguous evidence of abandonment.

Moreover, any change in numbers and/or distribution of humpback whales observed from surveys may not necessarily be attributed to exposure to oil.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs A, B, C, H, I, O, U, V, X, and Y shown in Tables 3-4 of this document.

COMMENTS ON MARINE MAMMALS STUDY NUMBER 2

(MM2) INJURY TO KILLER WHALES (\$200,000)

This study attempts to assess the injury from the oil spill to killer whales in Prince William Sound, the Kodiak Archipelago, and Southeast Alaska by determining population numbers and distribution.

Technical Comments

This study certainly will add to the knowledge of the life history and social behavior of killer whales. However, the relevance of the study to the impacts of the oil spill is not apparent.

The proposed study will be unable to separate the effects of oil from the effects of temporary disturbance and other factors. Killer whales are irritable (in the physiological sense) and highly mobile, migratory, large mammals. Also, insufficient information is provided on the Sound-wide movements of killer whales to determine if a cause/effect relationship to the oil spill can be demonstrated.

The locations of the "principal areas" mentioned in the Draft to be surveyed are not provided.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs A, B, C, H, I, O, U, V, X, and Y shown in Tables 3-4 of this document.

COMMENTS ON MARINE MAMMALS STUDY NUMBER 3

(MM3) CETACEAN NECROPSY (\$73,000)

This study attempts to assess the injury from the oil spill to cetaceans (whales and porpoises) by performing necropsies on stranded animals.

Technical Comments

Insufficient information is provided to determine whether surveys will be conducted often enough to document the approximate time of stranding and whether full necropsies will be conducted on all dead or stranded cetaceans as soon as possible after location of the carcass. Necropsies must emphasize the identification of cause of death, not just the presence of hydrocarbons. Pathway must be established.

The number of carcasses found is not an indication of impact from the oil spill, but rather is a reflection of the intensity of effort to find beached carcasses. Baseline data for comparison of stranding rates during pre-spill and post-spill periods are not available. Historical records of strandings and beached carcasses along the Alaska coastline are quite limited.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs A, B, C, H, I, V, and X shown in Tables 3-4 of this document.

COMMENTS ON MARINE MAMMALS STUDY NUMBER 4

(MM4) INJURY TO SEA LIONS (\$270,000)

This study attempts to assess the injury from the oil spill to Steller sea lions in Prince William Sound and the Gulf of Alaska by estimating the number of sea lions using rookeries and haulouts, documenting premature birthing rates, estimating pup production and mortality on rookeries, and determining presence of hydrocarbon contamination and histopathological effects in sea lions.

Technical Comments

Continued decline in pupping found as a result of this study cannot be attributed to the oil spill since, as the study description mentions, sea lions are already in a state of decline.

It will not be possible to determine the effects of the oil spill on the Steller sea lion population in the northern Gulf of Alaska, since little is known about their population dynamics.

It will not be possible to accurately compare estimates of the number of sea lions using rookeries and haulouts obtained through aerial photography with any historical data base, recent or past. Aerial photographs yield point-in-time counts only, while the number of sea lions using any particular haulout may vary (by hundreds) hourly.

The study provides no description of the methods for measuring premature birthing rates. Premature pupping was documented at several haulout areas and rookeries during OCSEAP studies in the late 1970s; however, no conclusions were ever developed about the cause.

The study does not describe the method for estimating pup production. The pup counts will yield information on pup production in 1989, but will yield no information how this relates to the impact of the oil spill.

None of the pup mortalities can be attributed to the oil spill without the benefit of direct observation of the death and the immediate necropsy of the carcass.

Statistical design is missing in the study description. Information about estimated number of sites is lacking. Insufficient information is provided to assess the precision and accuracy of the data collected by the photo surveys.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs A, B, C, H, I, O, U, V, X, and Y shown in Tables 3-4 of this document.

COMMENTS ON MARINE MAMMALS STUDY NUMBER 5

(MM5) INJURY TO HARBOR SEALS (\$245,000)

This study attempts to assess the injury from the oil spill to harbor seals in Prince William Sound and adjacent areas by evaluating numbers of harbor seals in oiled and non-oiled areas, measuring reproductive success and pup survival, and examining tissues of seals for contamination and histopathologic effects.

Technical Comments

It will not be possible to attribute to the oil spill any additional decline in the numbers of harbor seals counted in 1989 since, as noted in the study description, there has been a 40% decline in the number of seals at major haulout sites over the last five years.

With the methods proposed in this study, it will not be possible to evaluate the effects of the oil spill on the distribution of harbor seals at haulouts within the Sound during pupping and molting seasons. Though change in distribution of harbor seals may occur, it will not be possible to ascribe that change either to the spilled oil or to other factors.

The study provides no information on the statistical validity of the shoreline surveys. No estimate is made of the number of sites. No information is provided on the number or location of sites sampled, the number of replicates obtained, or sampling design.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs A, B, C, H, I, O, U, V, X, and Y shown in Tables 3-4 of this document.

COMMENTS ON MARINE MAMMALS STUDY NUMBER 6

(MM6) INJURY TO SEA OTTERS (\$763,000)

This study attempts to assess the injury from the oil spill to sea otters in Alaska by comparing numbers of live and dead sea otters in oiled and non-oiled areas, estimating populations, including decline, of live otters in the region and documenting presence/persistence of hydrocarbons/toxins in live and dead sea otters.

Technical Comments

The cost of this study (\$763,000) does not seem reasonable, particularly considering the fact that no consideration is given to how to restore this resource to a level it would have been if the spill had not occurred. Much of the work proposed in this study is of a research nature, rather than NRDA related.

Insufficient information is provided to assess the adequacy of the methods for detecting and quantifying injury to sea otter populations. No information is provided whether sea otter populations are increasing or declining in the affected areas.

Statistical design is lacking in the study description. No information is provided on the number of sites (oiled and non-oiled), the number of samples collected, nor the number of replicates. No information is provided on the criteria for selecting non-oiled control areas.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs A, B, C, H, I, O, U, V, X, and Y shown in Tables 3-4 of this document.

COMMENTS ON MARINE MAMMALS STUDY NUMBER 7

(MM7) SEA OTTER REHABILITATION (\$108,000)

This study attempts to assess the fate of sea otters oiled and rehabilitated as a result of the spill by monitoring their movement, behavior, and survival via radio transmitters.

Technical Comments

This study is not cost effective because of its serious overlap with Study MM6 and the invalid methods used to establish pathway.

Neither the objectives nor methods address the issue of possible effects of implanted transmitters on the survival and behavior of sea otters.

There is no explanation of where sea otters will be released (in previously oiled but cleaned areas; in areas where they were captured; in unoiled areas), nor is there any mention of how sea otters will be located (airplane surveys, boat surveys, etc.). The timing of the location efforts is too vague--"often enough to evaluate survival"--to be informative.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs H, I, and Y shown in Tables 3-4 of this document.

VI. COMMENTS ON THE TERRESTRIAL MAMMALS INJURY ASSESSMENT PROGRAM

The Draft describes six studies costing \$1,171,700 (not including any analytical cost) to evaluate the injury to terrestrial mammal resources. Nineteen terrestrial mammal species have been identified as potentially impacted. Five species (Sitka black-tailed deer, brown bear, black bear, river otter, and mink) have been selected for intensive study and nine species for a general assessment. The intensive studies account for \$677,100 or about 58% of the total for terrestrial mammals.

This program fails to consider that the only feasible restoration of terrestrial mammal resources, beyond immediate shoreline cleanup, is natural recovery.

It is unlikely that population studies for terrestrial mammals can demonstrate an oil spill related injury. Another serious flaw with this program lies in its inability, by the methodologies described, to establish any exposure pathway to the spilled oil. Thus, the studies appear not to be necessary or cost effective.

From the extremely brief descriptions available for the individual studies, many of the studies appear poorly designed and will produce questionable conclusions.

All of the terrestrial mammal studies provide inadequate descriptions of the statistical analyses employed to evaluate the data. It is impossible to evaluate whether any identified injury will be based on a statistically significant response between impacted and control areas.

COMMENTS ON TERRESTRIAL MAMMALS STUDY NUMBER 1

(TM1) INJURY TO SITKA BLACK-TAIL DEER (\$87,000)

This study attempts to assess the injury from the oil spill to Sitka black-tailed deer in Prince William Sound by quantifying the number of dead deer per unit area on oiled and non-oiled islands and determining if tissue and rumen contents have been contaminated by oil.

Technical Comments

Since no pathway of exposure to the spilled oil has been established, this study is clearly not related to the NRDA process and should not be included in the Draft.

The timing and location (i.e., islands selected) of transect sampling for deer carcasses are not described. These are critical to fulfilling the objectives of this study. Use of only one affected island and one control island will limit the applicability of study results to other areas.

With the current design of the study, there is no way to know whether the deer collected for tissue hydrocarbon analyses were exposed to oil, since deer are not usually in the affected habitat (tidal areas) during August. Thus, the study will not be able to demonstrate a clear cause and effect relationship.

The need to determine the number of dead deer with rumen contents in the lungs is not explained.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs A, B, C, H, I, O, U, V, X, and Y shown in Tables 3-4 of this document.

COMMENTS ON TERRESTRIAL MAMMALS STUDY NUMBER 2

(TM2) INJURY TO BLACK BEAR (\$139,700)

This study attempts to assess the injury from the oil spill to black bear in Prince William Sound by determining mortality rates in heavily oiled habitats, determining changes of productivity of females in the oil-contaminated areas, and calculating population declines.

Technical Comments

There are too many unknown variables to be able to attribute the decline of black bear populations to adverse changes in viability, resulting from oil contamination. Differences in habitat, food habits, and population dynamics (especially dispersal) among oiled and control areas will seriously compromise any interferences and simulations from the population modeling effort described for this study.

The study description provides no statistical basis for inferring changes in the black bear population from a population model. No information on the sensitivity of the model to initial input conditions or on the accuracy and precision of the model predictions is presented.

The mainland of the Kenai Peninsula cannot be used as a "control" area. The habitats in oiled areas of Prince William Sound are not comparable in habitat with the mainland area of the Kenai Peninsula.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs A, B, C, H, I, O, Q, U, V, X, and Y shown in Tables 3-4 of this document.

COMMENTS ON TERRESTRIAL MAMMALS STUDY NUMBER 3

(TM3) INJURY TO RIVER OTTER AND MINK (\$287,700)

This study attempts to assess the injury from the oil spill to river otter and mink in Prince William Sound by determining mortality and documenting any declines of populations and changes in distributions.

Technical Comments

The cost of this project appears excessive and not reasonable. Sampling procedures of this study (i.e., eight animals killed per month per site) will likely result in more mortalities in these species than have been recorded as spill related. River otters and mink should be studied only if there is convincing evidence that they were exposed to oil and that they were impacted.

No specific sites, only general areas, are provided for consideration as sample and control locations. It is not stated whether there is one site/area or several sites per area. It is also unclear if Kenai and Alaska Peninsulas will be treated in the same way as sites closer to the spill.

The objectives of 1) determining mortality and documenting any declines of river otter and mink populations and 2) determining changes in distribution of river otter and mink, and changes in their food habits in oiled and non-oiled habitats are not achievable because of the lack of baseline data necessary for comparison.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs A, B, C, H, I, O, Q, U, V, X, and Y shown in Tables 3-4 of this document.

COMMENTS ON TERRESTRIAL MAMMALS STUDY NUMBER 4

(TM4) INJURY TO BROWN BEAR (\$162,700)

This study attempts to assess the injury from the oil spill to brown bears on the Alaska Peninsula by determining mortality rates in heavily oiled habitats, determining changes of productivity of females in the oil-contaminated areas, and calculating population declines.

Technical Comments

The study description provides no statistical basis for comparing brown bear mortality, abundance, or productivity between oiled and non-oiled areas. An inherent problem with many monitoring programs, even when they are properly designed, is their inability to detect statistically significant differences between effects due to natural phenomena and those resulting from man's interaction.

This study fails to provide details of an adequate statistical analysis. The only hint of a control is that tissue and scat samples will be collected "from uncontaminated areas." Apparently, no non-oiled site will be surveyed for brown bear mortality, abundance, or productivity. The study provides insufficient information on sampling design and no information on whether replicate samples will be obtained.

Mortality and productivity of brown bears in the oil-affected area and control area cannot be compared since habitat use and population characteristics of the marked bears in two areas are likely dissimilar.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs A, B, C, H, I, O, Q, U, V, X, and Y shown in Tables 3-4 of this document.

COMMENTS ON TERRESTRIAL MAMMALS STUDY NUMBER 5

(TM5) INJURY TO CARNIVORES AND SMALL MAMMALS (\$302,400)

This study attempts to assess the injury from the oil spill to carnivores and small mammals outside Prince William Sound by determining changes in abundance, by performing necropsies on dead mammals, and by analyzing tissues for hydrocarbons.

Technical Comments

This project is not cost effective, since the likelihood of measurable effects occurring to populations of these species is very small. Any mortality as an immediate effect of the spill would quickly be recovered through recruitment of individuals from adjacent areas. In addition, studying populations of these animals will yield inconclusive data on the effects of the spill since there is so much natural variation in their populations.

The magnitude of the study leaves the methods and analyses unfocused. The objective of determining the direct effects of oil on carnivores and small mammals is so vague that it could encompass anything from mortality to feeding behavior.

The study methods do not address objectives and are sketchy and haphazard. For instance, scent stations can only provide an index, not a direct measure, of abundance. This method is of questionable utility for any NRDA study since it was developed in arid and semi-arid areas of the western U.S. and is untested in the wet maritime climate of coastal Alaska.

The study emphasizes abundance, but nowhere is it stated how abundance in affected habitats will be compared with baseline or control data.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs A, B, C, H, I, O, Q, U, V, X, and Y shown in Tables 3-4 of this document.

COMMENTS ON TERRESTRIAL MAMMALS STUDY NUMBER 6

(TM6) REPRODUCTION OF MINK (\$192,200)

This laboratory study attempts to assess the effect of ingested oil from the spill on mink reproduction and to extrapolate the results to other mammals with similar reproductive systems.

Technical Comments

This laboratory study is not cost effective for an NRDA-related program because: 1) there is no justification for a two-year feeding program since it is impossible to comprehend an environmental scenario which a two-year study would mimic; and 2) mink's delayed implantation may not be representative of typical reproductive biology of the majority of terrestrial mammals potentially impacted.

This laboratory study cannot be justified for damage assessment unless there is accurate information available on the amount and condition of oil ingested by minks during the spill.

In the study description nothing is said about using weathered oil rather than fresh oil. Mink and other mammals in affected areas were exposed to oil that has weathered over time; therefore, each stage of reproduction was not affected by oil with the same characteristics.

There is no description of types of statistical analyses nor of criteria for determining numbers of replicates overall (or even by type of assay to be completed).

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs H, I, and Y shown in Tables 3-4 of this document.

VII. COMMENTS ON THE BIRD INJURY ASSESSMENT PROGRAM

The Draft describes fourteen studies costing \$2,755,700 (not including any analytical cost) to evaluate the injury to the bird resources. One study estimates waterbird mortality for \$258,000. Two studies survey bird populations for \$1,005,000. The remaining eleven studies total \$1,492,700 and collect more general information and detailed data on particular species.

Some bird studies are needed, but this program is not focused on information necessary to restore bird resources and goes far beyond collecting information necessary to assess injury. Instead, the multiple studies appear to be a research program designed to expand the information available on the many different species in the area, thus ignoring the proper use of indicator species as required in the regulations. Because of the research focus, much of this program is not NRDA related.

A detailed program such as this is clearly not warranted. Because of natural variability, the mobility of birds, the migratory nature of some species, and the vast area of interest, any conclusions on injury to birds attributable to the oil spill can only be a rough approximation. Further, when considering the large, healthy populations of bird species unimpacted by the spill, the primary restoration mechanism is natural recovery.

The Draft fails to provide any details of the methodologies used in the studies, making a rigorous review impossible. However, from the brief description available, many of the studies appear poorly designed and will produce questionable conclusions. Although it is stated that "many studies will use unaffected control areas for comparison" (p. 144), poor study design may make these comparisons statistically invalid.

COMMENTS ON BIRD STUDY NUMBER 1

(B1) BEACHED BIRD SURVEY (\$258,000)

This study attempts to estimate bird mortality related to the oil spill by applying correction factors to actual bird mortality observed.

Technical Comments

The details of the experimental and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if: standard and widely accepted methods are employed; possible biases are accounted for; surveys accurately represent assessment areas; possible errors in scaling results are accounted for; and results are statistically valid. The study neither defines nor explains how the "minimum mortality" will be used in the final "overall mortality of waterbirds" estimate. In addition the number, locations, and methods of the "systematic survey" should have been provided in the Draft since this information was readily available.

There is insufficient information presented in the Draft to evaluate whether the methodological and analytical strategies are sound. The objectives require the implementation of flotation and scavenging experiments. These types of studies require assumptions and subjective determinations, and it is critical that more detail be provided and reviewed by all concerned parties. Also, the means by which adjustments to total mortality from the oil spill will be made to account for natural mortality will need careful and expert consideration.

There is no mention of any results being statistically validated. Without adequate statistical design, any results generated will be inconclusive.

Considering the high degree of subjectivity of this study and the objective to calculate "overall mortality in conjunction with bird population surveys and seabird colony censuses," there is a strong possibility the external influences of these other studies will dictate correction factors, thus compromising the usefulness of this study. Moreover, any mortality estimates will be nothing more than rough order-of-magnitude approximations.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs A, C, Q, S, and U shown in Tables 3-4 of this document.

COMMENTS ON BIRD STUDY NUMBER 2

(B2) CENSUSES AND SEASONAL DISTRIBUTION (\$565,000)

This study attempts to determine the distribution and abundance of migratory birds by surveys.

Technical Comments

This is one of several studies assessing bird population impacts. The information generated from this study may overlap with other studies. This study and/or possibly some of the other similar studies are more research oriented and not necessary to assess natural resource damages as required in the NRDA regulations.

The details of the experimental and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if: standard and widely accepted methods are employed; possible biases are accounted for; surveys accurately represent assessment areas; possible errors in scaling results are accounted for; and results are statistically valid.

Insufficient information is provided to evaluate if this study can determine that any reduction observed in oiled areas represents actual mortality or simply movement out of the area.

Details on the statistical treatment of the data are not provided in this study; thus it is impossible to determine if any results will be conclusive. Conclusions may be compromised by the intention of using unproven "new" aerial survey techniques and historical data as a basis for injury determination.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs A, B, C, G, H, I, O, R, S, V, X, and Y shown in Tables 3-4 of this document.

COMMENTS ON BIRD STUDY NUMBER 3

(B3) SEABIRD COLONY SURVEYS (\$440,000)

This study attempts to determine the population of seabird nesting colonies by surveys.

Technical Comments

This is one of several studies assessing bird population impacts. The information generated from this study may overlap with other studies. This study and/or possibly some of the other similar studies are more research oriented and not necessary to assess natural resource damages, as required in the NRDA regulations.

The details of the experimental and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if: standard and widely accepted methods are employed; possible biases are accounted for; surveys accurately represent assessment areas; possible errors in scaling results are accounted for; and results are statistically valid.

This study focuses on cliff-nesters and ignores crevice- or burrow-nesters. An unstated assumption that cliff-nesters and burrow/crevice-nesters are affected equally by the spill and its aftereffects is not tenable. Hence, no simple extrapolation to these birds should be done.

Although this study mentions that some results will be evaluated using statistical procedures, more details of the statistical components being used are necessary to evaluate the study design. One or two surveys conducted sometime during the previous 17-year period are scarcely an adequate base on which to calculate possible reductions in breeding colony sizes that can be related to oil spill effects.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs A, B, C, G, H, I, O, S, U, V, X, and Y shown in Tables 3-4 of this document.

COMMENTS ON BIRD STUDY NUMBER 4

(B4) BALD EAGLES (\$445,000)

This study attempts to assess the injury from the oil to bald eagles by surveying populations, examining nest and eggs, radio-tagging 60 eagles, analyzing blood samples, and necropsying dead eagles.

Technical Comments

This study is ambitious and methods are not described adequately to evaluate their potential to determine the impacts of oil on bald eagles. It is uncertain if the degree of impact measured is equivalent only to the degree of oiling, or if it also will include characteristics such as short-term avoidance of disturbed areas.

Manipulative methods such as trapping and tagging 60 eagles and collecting blood samples might influence behavior. It is not clear from information provided how these effects can be discerned from oil-related effects. Further, in the analysis of blood samples "to determine contaminant concentrations" there is no definition of what contaminants are.

There is no mention of any results being statistically validated. Without a sound statistical design, any results generated will be inconclusive. In particular, "data from a remote nesting site" implies only a comparison of one such site is made and is likely to be inconclusive.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs A, B, C, G, H, I, O, S, U, V, X, and Y shown in Tables 3-4 of this document.

COMMENTS ON BIRD STUDY NUMBER 5

(B5) PEALE'S PEREGRINE FALCONS (\$43,500)

This study attempts to assess the injury from the oil spill to Peale's peregrine falcons by surveying populations, examining nest and eggs, banding adults, and analyzing feathers and blood.

Technical Comments

This is one of several studies assessing bird population impacts. The information generated from this study is only marginally important to either a damage assessment or recovery efforts. Moreover, since few of the raptors recovered by bird search teams were falcons, and since a substantial raptor study also exists, this study is not necessary or reasonable.

The details of the experimental and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if: standard and widely accepted methods are employed; possible biases are accounted for; surveys accurately represent assessment areas; possible errors in scaling results are accounted for; and results are statistically valid.

The survey techniques of this study deviate from previous studies in that they cover new "suspected nesting territories" on which no historical data are available and they use new methods such as helicopter surveys when previous surveys were conducted from boats. This makes any historical comparisons scientifically invalid.

Further, peregrines are not particularly easy to locate. Surveys, especially using new techniques, need to be performed with particular care to avoid any mistaken conclusions based on inadequate field effort.

The study will utilize methodologies (helicopter observation, trapping of adults in nets, blood sampling, and inspection of nests) to draw conclusions about injuries to these species. There is no indication that these intrusive methodologies will be performed on control groups, so results from this study will be inconclusive.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs A, B, C, G, H, I, O, S, U, V, X, and Y shown in Tables 3-4 of this document.

COMMENTS ON BIRD STUDY NUMBER 6

(B6) MARBLED MURRELETS (\$115,700)

This study attempts to assess the impact from the oil spill to marbled murrelets by surveying populations, checking breeding activity, and analyzing 10 birds for contaminants.

Technical Comments

This is one of several studies assessing bird population impacts. The information generated from this study may overlap with other studies. This study and/or possibly some of the other similar studies are research oriented and not necessary to assess natural resource damages, as required in the NRDA regulations.

The details of the experimental and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if: standard and widely accepted methods are employed; possible biases are accounted for; surveys accurately represent assessment areas; possible errors in scaling results are accounted for; and results are statistically valid.

The use of "on-land watches" for determining breeding activities is unconventional. Furthermore, the visibility in most areas of the Sound is often too poor to allow for adequate visual counts.

Although this study mentions some results will be evaluated using statistical procedures, more details of the statistical components being used are necessary to evaluate the approach. In particular, a control size of only one non-oiled site may be too small to be valid statistically.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs A, B, C, G, H, I, O, S, U, V, X, and Y shown in Tables 3-4 of this document.

COMMENTS ON BIRD STUDY NUMBER 7

(B7) STORM PETRELS (\$135,000)

This study attempts to assess the impact from the oil spill to the reproductive success of fork-tailed storm petrels and other species by searching colonies, analyzing birds and addled eggs, and analyzing fresh eggs. Storm petrels are used as an indicator species representing shearwaters and fulmars (seabirds).

Technical Comments

This is one of several studies measuring reproductive success and, thus, population impact. The information generated from this study may overlap with other studies. This study and/or possibly some of the other similar studies are research oriented and not necessary to assess natural resource damages, as required in the NRDA regulations.

The details of the experimental and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if: standard and widely accepted methods are employed; possible biases are accounted for; surveys accurately represent assessment areas; possible errors in scaling results are accounted for; and results are statistically valid.

The determination of "persistence of crude oil in the marine environment" by extrapolation of oils in storm-petrel stomachs is extremely questionable. Likewise, the extrapolation from storm petrels to "other species with similar distribution and feeding behavior" is questionable, considering the other species are fulmars (which eat anything and scavenge from fishing boats) and shearwaters (which could be contaminated anywhere between Alaska and their southern hemisphere breeding grounds). In addition, they generally do not feed at the surface, as do storm petrels.

There is no mention of any results being statistically validated. Without a statistical analysis, any results generated will be inconclusive.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs A, B, C, G, H, I, N, Q, S, U, V, X, and Y shown in Tables 3-4 of this document.

COMMENTS ON BIRD STUDY NUMBER 8

(B8) BLACK-LEGGED KITTIWAKES (\$190,000)

This study attempts to assess the impact from the oil spill to the reproductive success of black-legged kittiwakes by surveying colonies, analyzing liver tissue of dead birds, and analyzing eggs and prey samples of kittiwakes. Kittiwakes are used as an indicator species representing non-scavenging gulls (for example: mew gulls, sabines, and other seabirds).

Technical Comments

This is one of several studies measuring reproductive success and, thus, population impact. The information generated from this study may overlap with other studies. This study and/or possibly some of the other similar studies are research oriented and not necessary to assess natural resource damages, as required in the NRDA regulations.

The details of the experimental and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if: standard and widely accepted methods are employed; possible biases are accounted for; surveys accurately represent assessment areas; possible errors in scaling results are accounted for; and results are statistically valid.

Use of black-legged kittiwakes as an "indicator species" is not a good choice because this species undergoes tremendous interannual variations in reproductive performance in the Bering Sea and Gulf of Alaska. Since the species had reproductive failures in the Gulf within the last five years, a breeding failure in 1989 would provide inconclusive results.

Although this study mentions some results will be evaluated using statistical procedures, more details of the statistical components being used are necessary to evaluate the study design.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs A, B, C, G, H, I, N, S, U, V, X and Y shown in Tables 3-4 of this document.

COMMENTS ON BIRD STUDY NUMBER 9

(B9) PIGEON GUILLEMOTS (\$109,500)

This study attempts to assess the impact from the oil spill to the pigeon guillemots and other species by surveying populations, examining nest sites, and analyzing birds, eggs, and prey samples of pigeon guillemots. Pigeon guillemots are used as an indicator species representing puffins, auklets, and murre (seabirds).

Technical Comments

This is one of several studies measuring reproductive success and, thus, population impact. The information generated from this study may overlap with other studies. This study and/or possibly some of the other similar studies are research oriented and not necessary to assess natural resource damages, as required in the NRDA regulations.

The details of the experimental and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if: standard and widely accepted methods are employed; possible biases are accounted for; surveys accurately represent assessment areas; possible errors in scaling results are accounted for; and results are statistically valid.

Comparison with pre-spill data does not establish "a direct link to diminished populations." Cause-effect needs to be established, other factors eliminated, and results statistically verified before any relationship to the oil spill is conclusive.

Extrapolating data on pigeon guillemots to puffins, auklets, and murre is unsound. Although they are all alcids, they differ widely in foods, breeding habits, and other aspects of life history.

The first part of the methods section indicates there will be population censusing; however it is not mentioned in the objectives. This census information significantly overlaps information generated in other studies, and is not needed to assess damages as required by the NRDA regulations.

Observations of "chick-feeding" for five hours will provide inconclusive information for the damage determination process and should not be performed. Inconclusive results will be obtained if "chick feeding rates" are used to "determine if prey is less abundant in oiled areas than in non-oiled areas" as stated in the objectives.

The objectives state the investigators will check if "petroleum hydrocarbons are present in adult pigeon guillemots, unhatched eggs, dead chicks, or prey." However, there is no indication of any control parameters; without such, all results are inconclusive. There is no mention of any results being statistically validated.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs A, B, C, G, H, I, J, S, U, V, X, and Y shown in Tables 3-4 of this document.

COMMENTS ON BIRD STUDY NUMBER 10

(B10) GLAUCOUS-WINGED GULLS (\$73,000)

This study attempts to assess injury from the oil spill to glaucous-winged gulls and other species by surveying a nesting colony, examining nest sites, and analyzing chicks and egg samples. Glaucous-winged gulls are used as an indicator species representing scavenging birds such as herring gulls and scavenging passerines (seabirds).

Technical Comments

This is one of several studies measuring reproductive success and, thus, population impact. The information generated from this study may overlap with other studies. This study and/or possibly some of the other similar studies are more research oriented and not necessary to assess natural resource damages, as required in the NRDA regulations.

This study focuses on Egg Island, which actually is quite far east of the spill areas. Since no other "oiled" data will be collected by this study, this study is only of research value and will have no conclusive benefit for a damage assessment.

The details of the experimental and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if: standard and widely accepted methods are employed; possible biases are accounted for; surveys accurately represent assessment areas; possible errors in scaling results are accounted for; and results are statistically valid.

The statement, "Since the Exxon Valdez oil spill, a high percentage of glaucous-winged gulls observed have been oiled," is of questionable validity. Other observations in the most heavily oiled area of Prince William Sound suggest the oiling rate is far less than 1%. This is not a high percentage.

This species does not adequately represent "the scavenging birds, such as herring gulls and scavenging passerines." For example, gulls may be oiled on the water or on beaches; passerines may be oiled only on beaches.

Insufficient information is provided on the statement "Future research will likely be compromised by oil spill effects."

Although a connection between raw Prudhoe Bay crude and problems in gulls has been shown, no studies have been done on the effects of weathered Prudhoe Bay crude and problems in gulls. Most of the volatile aromatic (i.e., most toxic) fractions were gone by the time the gulls were affected. Hence an across-the-board extrapolation of effects from raw oil (laboratory studies) to those from weathered oil is not valid.

There is no mention of any results being statistically validated. Without a statistical analysis, any results generated are inconclusive.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs A, B, C, G, H, I, N, S, U, V, X, and Y shown in Tables 3-4 of this document.

COMMENTS ON BIRD STUDY NUMBER 11

(B11) SEA DUCKS (\$146,000)

This study attempts to assess the injury from the oil spill to sea ducks by collecting ducks and analyzing food items in gut samples.

Technical Comments

This is one of several similar studies. This study and/or possibly some of the other similar studies are research oriented and not necessary to assess natural resource damages as required in the NRDA regulations.

The details of the experimental and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if: standard and widely accepted methods are employed; possible biases are accounted for; surveys accurately represent assessment areas; possible errors in scaling results are accounted for; and results are statistically valid.

The objective to "develop a data base describing food habits of sea ducks" is irrelevant to assessing oil effects for an injury damage assessment. Although possible hydrocarbon levels may be documented, this study fails to describe any methodology which would conclusively identify what the individual or population effects might be. Thus, it will provide no information useful to a damage assessment.

There is no mention of any results being statistically validated. Without a statistical analysis, any results generated are inconclusive.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs A, B, C, G, H, I, N, S, U, V, X, and Y shown in Tables 3-4 of this document.

COMMENTS ON BIRD STUDY NUMBER 12

(B12) SHOREBIRDS (\$166,000)

This study attempts to assess the injury from the oil spill to shorebirds by surveying populations, watching bird behavior, and tagging shorebirds.

Technical Comments

This is one of several similar population impact studies. This study and/or possibly some of the other similar studies are research oriented and not necessary to assess natural resource damages as required in the NRDA regulations.

The details of the experimental and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if: standard and widely accepted methods are employed; possible biases are accounted for; surveys accurately represent assessment areas; possible errors in scaling results are accounted for; and results are statistically valid.

There is little likelihood that the objectives will be fulfilled in their entirety. Sampling will have to be both intensive and extensive to fulfill these stated objectives. It will require a complete head count of each species of shorebird throughout Prince William Sound and in oiled areas so that "total numbers" and "proportions" can be estimated. Such a census is technically infeasible to accomplish.

Information obtained from measuring the amount of time that individual birds spend in oiled areas will not be conclusive. This does not determine "the amount of time individual shorebirds are exposed to contaminated beaches," as stated in the objectives. It only measures the amount of time a bird is spending in an oiled area; time spent on other, non-oiled beaches will not be observed so this methodology is flawed.

There is no mention of any results being statistically validated. Without a statistical analysis, any results generated are inconclusive.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs A, B, C, G, H, I, N, S, U, V, X, and Y shown in Tables 3-4 of this document.

COMMENTS ON BIRD STUDY NUMBER 13

(B13) PASSERINES (\$59,000)

This study attempts to assess the injury from the oil spill to passerines and other non-game birds by surveying populations, observing behavior, and examining bird and prey samples of passerines.

Technical Comments

This study is research oriented and not necessary to assess natural resource damages as required in the NRDA regulations.

The details of the experimental and analytical methods used in this study are not available in the description provided. Therefore, it is impossible to determine if: standard and widely accepted methods are employed; possible biases are accounted for; surveys accurately represent assessment areas; possible errors in scaling results are accounted for; and results are statistically valid.

Although this study mentions some results will be evaluated using statistical procedures, no details are provided in the study description.

It is questionable if the objective to relate "hydrocarbon levels in tissue" to effects on passerines can be achieved. With the limited information provided in the Draft, this study does not have the scope to adequately relate hydrocarbon levels in tissue to "changes in relative abundance and distribution of birds in the Sound."

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs A, B, C, G, H, I, N, S, U, V, X, and Y shown in Tables 3-4 of this document.

COMMENTS ON BIRD STUDY NUMBER 14

(B14) EXPOSURE TO NORTH SLOPE OIL (\$10,000)

This study attempts to assess the effects of oil exposure on migratory birds by reviewing existing literature and devising and implementing laboratory or field experiments.

Technical Comments

Insufficient information and lack of documentation make it impossible to determine what "relevant information" is being reviewed, what criteria will determine "adequacy of past studies in representing the current situation," and what type of birds will be analyzed.

Regulatory Comments

This study states, "Based on review and evaluation of existing information, staff will devise and implement laboratory or field experiments." This intentionally avoids the regulations by creating and implementing laboratory and field experiments without proper documentation, demonstrated need, assurance of following NRDA regulations, and proper review and comment period by Trustees, principal responsible parties, and the public.

The study deviates from the regulations, as described by Paragraphs B, H, I, U, and Y shown in Tables 3-4 of this document.

VIII. COMMENTS ON THE TECHNICAL SERVICES PROGRAM

The Draft describes three technical service studies costing \$3,360,200. One study focuses on hydrocarbon analytical support services and analysis of distribution and weathering of spilled oil at a cost of \$2,300,000. The other two studies cover histopathology and mapping methodologies at combined costs of \$1,060,200.

The analytical chemistry study is sizable, but few details are provided for the different analytical methods. It is impossible to determine if this analytical support is cost effective. No estimates are given for the number of samples to be analyzed, either in the total assessment program or in individual studies.

The "Methods and Analyses" Section of the analytical chemistry study is completely unacceptable in terms of content. No procedures for generating analytical data of acceptable quality are presented either in this section or in QA/QC document listed in Appendix A of the Plan. Lack of information makes it impossible for concerned parties to review the methodologies to ensure that quality data are being generated.

The other technical service studies on histopathology and mapping also suffer from lack of details provided in the study descriptions. This inadequate documentation makes it impossible to determine if the proposed methodologies meet the very specific criteria listed in § 11.64(a)(3).

COMMENTS ON TECHNICAL SERVICES STUDY NUMBER 1

(TS1) CHEMISTRY (\$2,300,000)

This study attempts to provide quality-controlled analytical chemistry support for the resource-oriented studies.

Technical Comments

The total cost of this study is enormous, yet virtually no information on the chemistry analytical program is presented. Since the study fails to provide even the estimated number of samples being analyzed, it is impossible to assess a rough cost-per-sample value. At the very minimum there should be a list of the number and types of analyses from each component study, which can be consolidated and costed in TS1.

The study fails to provide even a general description of any methods which are used in the chemical analyses. The Methods and Analyses section is completely unacceptable in terms of content. The statement, "Procedures set forth for generating analytical data of acceptable quality are included in the QA/QC document listed as Appendix A," is incorrect. There are no procedures provided anywhere in the Draft on this matter. It is also stated that "changes in analytical methodology . . . shall be validated . . . to the satisfaction of the Analytical Chemistry Group." This process does not allow opportunity for review by other concerned parties to ensure valid data are generated. The whole system contains no accountability, and data generated are likely to be of questionable quality.

Another major flaw of this study is its isolation from the field studies. There is no description anywhere in the Draft of how intrasite variability will be taken into account to ensure that the appropriate number of replicate samples are taken at each site for analyses to describe any changes over time and area in a statistically significant manner. There is no point in putting a great deal of effort into ensuring accuracy and precision to +/- 15% if the field sampling plan is unsound.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs E, F, G, and L shown in Tables 3-4 of this document.

COMMENTS ON TECHNICAL SERVICES STUDY NUMBER 2

(TS2) HISTOPATHOLOGY (\$440,200)

This study attempts to provide histopathology support for the resource-oriented studies.

Technical Comments

This is not really a separate study. Rather, it represents a specific component of many of the other studies. Details of the methods are not given. Consequently it is impossible to know if standard histological methods will be used.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs E, F, L, and T shown in Tables 3-4 of this document.

COMMENTS ON TECHNICAL SERVICES STUDY NUMBER 3

(TS3) MAPPING (\$620,000)

This study attempts to provide mapping and data base support for all studies described in the Draft.

Technical Comments

Because of lack of details, it is not known what will be the products of this study and whether the study will be cost effective.

No information is given on scale of maps, whether the data base will be pertinent, whether the maps can be used to determine levels of hydrocarbons in the sediments or in the water column, and whether the maps will show the area and levels of impact by chosen hydrocarbon levels.

Regulatory Comments

The study deviates from the regulations, as described by Paragraphs E and F shown in Tables 3-4 of this document.

IX. COMMENTS ON ECONOMIC USES STUDY PROGRAM

The Draft contains proposals for nine separate studies of economic uses. The study proposals exhibit the following shortcomings:

Inadequate documentation. None of the studies is properly documented. The individual study plans lack specificity, contain inadequate study designs, and provide no integration among the economic studies or between the economic and science studies.

Unrelated to restoration. The economic study plans do not address restoration which is referred to in the Draft as "the primary objective of the state and federal trustees." The economics studies have no relevance to the development of restoration techniques and strategies.

Double counting. The proposals for economic uses studies abound with instances of clear double counting of damages. Examples include studies designed to quantify damages to commercial fisheries which are covered by private claims and litigation, attempts to account separately for land values and land use damages, and separate assessment of "intrinsic value" damages which consist of values measured by other studies. Further, various studies propose to measure damages that are not within the responsibilities of the Trustees.

Neither cost-effective nor reasonable cost. The Draft includes a budget of \$2,800,000 for the economic studies, but does not indicate how the funds would be allocated among the studies. No budget management plans are provided, and no basis to support the costs is given. The budget is excessive and cannot be efficiently spent in the period to February 28, 1990. Given the lack of damages or extremely small damages projected for a number of these studies, study costs are unlikely to be reasonable.

COMMENTS ON ECONOMIC USES STUDY NUMBER 1

ESTIMATED PRICE EFFECTS ON COMMERCIAL FISHERIES (Cost Unspecified)

Economic Uses Studies 1, 2, and 3 are intended to estimate private losses suffered by the commercial fishing and processing industries. The plan for Study 1, like the plans for the other economic uses studies, lacks sufficient detail for an evaluation of the analysis or the methodologies employed. The "soundness of the scientific approach," an important consideration mentioned in the assessment plan, cannot be determined from the proposal.

The proposed study is devoted to estimates of private use losses. It does not consider restoration. Private claims for reduced earnings are subject to private litigation, and do not fall under the aegis of the Trustees.

The study plan fails to identify any relevance of fish prices to damages covered by NRDA regulation. No valid economic or legal relationship exists between degree of competition in output markets and damages related to public trusteeship. Moreover, the study plan confuses the concepts of consumer surplus and product price.

ESC has already mitigated income losses resulting from the spill by reimbursing commercial fishing and processing industry workers for lost wages and/or profits (net income) plus unavoidable costs in fisheries which have been postponed, cancelled, or less successful than predicted. Additional offsets have been provided by engaging displaced resources (labor and equipment) in spill cleanup. Little or no damages can be anticipated from this study and any costs associated with conducting the study are most likely unreasonable.

COMMENTS ON ECONOMIC USES STUDY NUMBER 2

FISHING INDUSTRY COSTS (Cost Unspecified)

The plan for Study 2 also lacks sufficient detail for evaluation of the analysis or the methodologies employed. Like Study 1, Study 2 does not address restoration. It is intended to estimate damages suffered by commercial fishermen. Such damages do not come under the Trustees' jurisdiction. Private claims for reduced earnings are subject to private litigation, and do not fall under the aegis of the Trustees.

Some fishing industry costs have risen due to increased demand for limited Alaskan resources (including labor and equipment) employed in the spill cleanup effort. Even assuming arguendo, contrary to the limitations of CERCLA and NRDA regulations, that the trustees could recover for the economic losses suffered for these reasons by commercial fishermen, such losses were more than offset by the general gains in the Alaskan economy associated with compensation and procurement expenditures in support of the cleanup. In any event, the degree of competition in input markets is not relevant to damages claims.

ESC has already mitigated income losses resulting from the spill by reimbursing commercial fishing and processing industry workers for lost wages and/or profits (net income) plus unavoidable costs in fisheries which have been postponed, cancelled, or less successful than predicted. Additional offsets have been provided by engaging displaced resources (labor and equipment) in spill cleanup. Little or no damages can be anticipated from this study so costs of the study are, most likely, unreasonable.

COMMENTS ON ECONOMIC USES STUDY NUMBER 3

BIOECONOMIC MODELS FOR DAMAGE ASSESSMENT (Cost Unspecified)

Many of the comments on Studies 1 and 2 also apply to Study 3. Specifically, the study plan lacks detail sufficient to evaluate the analysis or the methodologies employed. The plan's vagueness makes it impossible to evaluate the "soundness of the scientific approach" to be employed in the study. ESC agrees that technical and economic studies are necessary for the execution of a natural resource damage assessment and the development of restoration strategy and plans. Both scientific and economic data are necessary to make seasoned judgements and decisions concerning the actions which might be undertaken to enhance the natural recovery processes which operate on oil spills. Conversely, it is imperative that such studies be closely coordinated within an objective of restoring the environment in a timely manner and data be gathered or measured using valid methodologies. It is not apparent that the Draft meets these final requirements on coordination and valid methodologies.

Further, like the first two economic studies, Study 3 makes no reference to restoration. Its intent is to develop tools which might help assess damages sustained by commercial fishermen which do not fall within the Trustees' jurisdiction. Private claims for reduced earnings are subject to private litigation, and do not fall under the aegis of the Trustees. Moreover, ESC has already mitigated income losses resulting from the spill by reimbursing commercial fishing and processing industry workers for lost wages and/or profits (net income) plus unavoidable costs in fisheries which have been postponed, cancelled, or less successful than predicted. Additional offsets have been provided by engaging displaced resources (labor and equipment) in spill cleanup.

There is the possibility of overestimating (double counting) damages if short-term biomass estimates are based on commercial fishermen's catch rate/harvest data. As evidenced this year, recreational fishermen, who compete for a fixed stock of fish directly with commercial fishermen, experience net gains when commercial fishery effort is reduced. These sportfishing gains offset, to some degree, the reductions in commercial harvest estimated by models of the type described in the study plan. Care must be taken to evaluate such benefits accruing in all sectors of the economy not captured by the model.

Damages from a correctly specified study are unlikely to be significant. Bioeconomic modeling, however, can be very costly. It is not clear that such costs would be reasonable.

COMMENTS ON ECONOMIC USES STUDY NUMBER 4

EFFECTS OF THE OIL SPILL ON THE VALUE OF PUBLIC LANDS (Cost Unspecified)

The study plan lacks sufficient detail for an evaluation of the analysis or the methodologies employed. The plan's vagueness makes it impossible to evaluate the "soundness of the scientific approach."

Justification for Study 4 is based on extension of Trustee responsibility to the role of proprietor rather than representative of the public trust. Such extension is not supported by CWA, CERCLA, or regulation.

The study does not address restoration.

The study will double count vis-a-vis resource losses calculated elsewhere, since land values are based on property use and non-use values, reductions of which are being calculated in other studies. For example, Coastal Habitat Study No. 1 will determine injury to tidal and subtidal lands, while this study seeks to determine the diminished lease or sale price for such lands.

Reduced land values become actual Trustee losses only if sales actually take place (or were planned to) before restoration is complete and if the natural recovery period extends beyond the period in which new uses will occur. In addition, increased land values in other areas and lease/permit sales to spill-cleanup and research-related activities must be taken into account as damage offsets.

Because of the vast supply of near substitutes for almost any parcel of property in Alaska, the "scarcity value" for lands in Alaska is low. In addition, most of the impacted area consists of state and federal lands and is rarely subject to sale. Therefore, the compensable damages to land values are expected to be very low. Consequently, study costs are unlikely to be reasonable.

COMMENTS ON ECONOMIC USES STUDY NUMBER 5

ECONOMIC DAMAGES TO RECREATION (Cost Unspecified)

The study plan is very vague about how recreational activities and options are being affected by the spill. The general nature of the impacts needs to be clarified before empirical studies can be done.

The study does not address restoration. It can be applicable to use losses only to the extent that private commercial damages, such as tourism and commercial recreation industry losses, are not included in the study. These private damages are being recovered via ESC's claims process and through private litigation.

Not all valuation methodologies mentioned in this study are applicable. The study provides no explanation as to which methodology will be used or how the various methodologies will be employed. Contingent valuation methods, for example, are not applicable because the recreation services provided by the resources are not unique and substitute options are reasonably available.

Data on changes in recreational participation might be misleading for two reasons. First, reductions in participation in some areas may be matched by increases in others; reporting only the losses would considerably overstate damages. Second, short-term response to the spill may exaggerate the likely long-term effect, due to both natural recovery of the resources and diminishing adverse publicity over time. In addition, it is possible that visits increase due to the publicity, desire of some to view the spill (as has happened this year), and increased income resulting from cleanup employment (which allows Alaskans greater recreation opportunities).

While some recreation losses are possible, ESC is not able to compare those damages with study costs since this study plan, like the other economic use studies, does not include budget information.

COMMENTS ON ECONOMIC USES STUDY NUMBER 6

LOSSES TO SUBSISTENCE HOUSEHOLDS (Cost Unspecified)

The study plan seems to overstate the possible problems related to cleanup activities and attendant economic effects. Some subsistence households might have been injured by the spill while others benefitted from the opportunity to supplement their incomes by working on the cleanup.

The study makes no reference to techniques or strategies for restoration of services used by subsistence households.

The study plan ignores private litigation initiated by native corporations and ESC relief efforts to deliver food and materials to subsistence villages. Subsistence activities are private endeavors in which harvest value constitutes income. This is the economic position set forth by private litigation and confirms that losses to subsistence households do not come under jurisdiction of the Trustees.

Damage estimates are likely to be overstated due to overlapping loss categories. It is unclear how the study will separate "subsistence losses" from "damage to subsistence property" since subsistence losses only occur when resources used by subsistence households are impacted.

The study must identify those who gained from the spill (via increased opportunities to earn labor and rental--including quasi-rent--income) as well as those who lost. For example, higher food prices for subsistence uses may be more than offset by higher incomes generated by cleanup-related jobs. Thus, income gains from employment in the cleanup effort, which may have caused inflation in some local areas, may represent net benefits and explain (through revealed preference) why subsistence households ceased to rely on traditional sources.

Study costs cannot be compared with expected damages since projects are not individually budgeted. It is likely, however, that the net damages will be very low (or even negative) given the offsets provided by ESC's relief efforts (food and material delivery to isolated subsistence villages in the aftermath of the spill) and income gains from cleanup work.

COMMENTS ON ECONOMIC USES STUDY NUMBER 7

STUDY OF LOSS OF INTRINSIC VALUES DUE TO THE EXXON VALDEZ OIL SPILL
(Cost Unspecified)

Considerable uncertainty surrounds the measurement of non-use or intrinsic damages given the state of the art in contingent valuation survey work. It is unlikely that a defensible study can be done, given the complexity of the situation.

The categories listed represent an exhaustive list of overlapping non-use value concepts. None of those concepts, however, apply to the present short-term disturbance of the environment; rather those concepts are founded on the premise of irreversible resource damage or development which precludes some future use. It is not clear that they apply at all when reversibility or restoration is considered.

It is unlikely that a meaningful contingent valuation study measuring intrinsic value losses can be carried out. It will be difficult to specify 1) the precise resources affected by the spill, 2) similar resources that remain unspoiled, and 3) how long the effects may be felt (natural recovery process). These and other problems are likely to yield estimates that are indefensible.

Study costs cannot be compared with expected damages because projects are not individually budgeted. Damages could be quite small given the natural ability of the resource to recover. Consequently, study costs are unlikely to be reasonable.

COMMENTS ON ECONOMIC USES STUDY NUMBER 8

ECONOMIC DAMAGE ASSESSMENT OF RESEARCH PROGRAMS AFFECTED BY
THE EXXON VALDEZ OIL SPILL (Cost Unspecified)

There is no indication in applicable law or regulation that Trustee responsibility extends to assessment of possible loss of research activities. The study plan provides no indication of the studies that were affected, except for one involving tagging fish in Prince William Sound.

The study plan does not clarify how scientific study delays will be valued. As to future lost opportunities, any approach taken will be wholly speculative (indefensible) and involves uncommitted use of the resource. Also, there have been significant research opportunities afforded by the spill. There are dozens of ongoing studies costing many millions of dollars, which will provide data and scientific research activities and learning that would not have come forth in the absence of the spill.

Study costs cannot be compared with expected damages since projects are not individually budgeted. Given the offsetting benefits, however, expected damages will certainly be very small. Consequently, the study costs are unlikely to be reasonable.

COMMENTS ON ECONOMIC USES STUDY NUMBER 9

SURVEY OF ARCHAEOLOGICAL SITES IMPACTED BY THE
EXXON VALDEZ OIL SPILL (Cost Unspecified)

There are no clear legal or regulatory terms which appear to extend Trustee responsibility to assessment of damages to archaeological sites.

The study plan provides no indication of how damaged study sites will be valued. Restoration costs may exceed any value associated with sites. The study plan suppositions of damages due to upland site erosion or inland oil contamination appear unfounded.

The key to assessing the significance of any losses will be an accurate assessment of the importance of the sites. Also, there is the possibility that the reduction in value of known and unknown archaeological sites will be double counted in other studies.

The question of how to value the reduction in benefits imposed by a short-term aberration to the resource is also pertinent. There may be no realized losses if no archaeological research is (or was planned to be) undertaken prior to recovery.

Study costs cannot be compared with expected damages since projects are not individually budgeted. Expected damages, however, given the offsetting benefits, are expected to be very small and study costs are unlikely to be reasonable.

X. COMMENTS ON THE RESTORATION PLANS PROGRAM

The Draft describes one study for \$500,000, which attempts to focus on a restoration strategy designed to identify specific actions which will be taken to restore the ecological health of Prince William Sound and other affected areas.

This program of major importance appears to have major shortcomings in its conception. Greater thought should have been given at the inception of the program to the methods by which it could be conducted and its data requirements. By doing so at the start, modifications could have been made to assessment studies that would ensure that appropriate and adequate data are available for this restoration planning effort.

There are no clear definitions of terms (e.g., injury, restoration, ecological health) which are often used in the program description. Their meanings are critical for understanding the program and its intended results.

COMMENTS ON RESTORATION STUDY NUMBER 1

(RP1) RESTORATION PLANNING (\$500,000)

This study attempts to develop strategies, schedules, and plans for restoring the ecological health of Prince William, and other affected areas, to conditions that existed prior to the Exxon Valdez oil spill.

Technical Comments

There is a conceptual error in this study. The Trustees repeatedly say that restoration should proceed to "pre-spill" conditions. This is not consistent with NRDA regulations which define recovery as a return to baseline services and further define baseline services as reflecting conditions that would pertain to the affected area had the spill not occurred. This apparent lack of understanding will likely lead to invalid decisions regarding restoration.

Many of the investigations proposed in this study provide static data rather than dynamic data needed for assessing predictive changes and for the development of a restoration plan.

The lack of modeling efforts and the failure to indicate that statistical analysis will be incorporated into this restoration planning effort raise serious concern about its adequacy. The traditional approach for such restoration planning activities would be the development of models that predict the fate of oil remaining in the environment and the expected population changes, both natural and as impacted by oil in the environment. Such models would include consideration of natural recovery as a viable restoration alternative.

Regulatory Comments

Absence of any detail in the description of this study makes it impossible to determine if it is intended to address DOI NRDA regulations §§ 11.73, 11.80 through 11.82, or 11.93.

There is no discussion about estimating the time needed for each injured resource to recover to baseline condition, as required in § 11.73(a).

There is no discussion of the amount of time needed for recovery if no restoration efforts are undertaken beyond response actions, as required in § 11.73(a)(1).

There is no discussion of the preparation of a Restoration Methodology Plan, as required in § 11.80(c).

Nothing is said in the study description about the consideration of alternative methods to achieve restoration, as required in § 11.81(d)(1).

Nothing is said about the use of an Economic Methodology Determination for defining whether restoration and/or replacement costs will form the basis of the measure of damages, as required in § 11.82(a).

XI. COMMENTS ON APPENDIX A

ANALYTICAL CHEMISTRY QUALITY ASSURANCE/QUALITY CONTROL

The Draft does not contain sufficient information on the sampling and analytical methodologies to allow for a review of the technical rigor of the approaches. However, the Draft often cites study-specific Standard Operating Procedures (SOPs) used by individual agencies. These and other pertinent information such as audits and reports should be made available to the PRPs and public so appropriate reviews can be made. Standards from the National Institute of Standards and Technology used for intercalibration exercises should also be made available to PRPs for purposes of uniformity.

Information assuring that sample collection activities are being conducted appropriately is insufficient. It is impossible to determine if the plan for field assessment includes assurance that samples are collected from the indicated location and that appropriate controls and control areas are designated. In addition, it cannot be determined if sufficient protection of sample integrity exists to preclude inadvertent oiling of collected samples or loss of volatiles, etc.

Due to the sudden and rushed nature of these studies it is questionable if in the early stages of the spill the State/Federal agencies have required "each analytical laboratory" to demonstrate its capability "prior to the initiation of work."

A "unique" sample identification usually implies a single, controlled identification system that at the time of sampling absolutely restricts multiple assignments of individual sample numbers. From the information provided it cannot be determined if this is guaranteed across the entire Trustees' program.

The list of petroleum hydrocarbon compounds (p. 219) which are to be considered for identification and quantification is insufficient and scientifically suspect for use in an oil spill program. A good portion of the listed PAH compounds either are not found in petroleum at detectable levels, or are minor constituents.

The Draft fails to acknowledge a documentation standard.

The Draft states that in the intercalibration exercise "unacceptable performance will result in the discarding of the associated data." However, "associated data" are not defined, there is no description of criteria for laboratory disqualification, and it is not clear what or how much information could be lost for "unacceptable performance."

XII. COMMENTS ON APPENDIX B

HISTOPATHOLOGY GUIDELINES

The Draft does not contain sufficient information on the histopathological guidelines to allow for a rigorous review of their approaches. However, the Draft cites "standard protocols for necropsy and preservation of tissue sample" shall be used during the assessment studies. It further specifies "different protocols have been designed to accommodate the different groups of animals encountered." These protocols and other pertinent information such as audits and reports should be made available to the PRPs and public so appropriate reviews can be made.

The introduction clearly acknowledges that a "definitive diagnosis often does not result from histological examination." It should be further noted that chemical analysis provides the only conclusive means to determine the presence and source of oil.

The interpretation of results does not describe if a sufficient number of samples will be read by a pathologist blinded to possible oil exposure information for each species to ascertain the statistical validity of the diagnosis.

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EXXON VALDEZ OIL SPILL
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See reference paper
for list of supporting
material.



UNIVERSITY OF ALASKA FAIRBANKS

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October 30, 1989

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Gentlemen:

I am pleased to have this opportunity to provide some comments on the public review draft of the State/Federal Natural Resource Damage Assessment Plan and Restoration Strategy for the Exxon Valdez Oil Spill.

My first comment relates to the "Note" that appears on the un-numbered page prior to page 29 and that reads as follows: *"Each of the following studies contain a description of one year costs. These are projected obligations accrued for the onset of the project through February 28, 1990, and includes all field and analysis activities. Budgets are presented in 1,000's of dollars."* My comment is that when we prepared our portion of the damage assessment plan we were asked to provide 3 - 5 year budgets for all of the field and analysis activities, and the previous editions of the "plan" included 3-5 year budgets. It is important for us to mention this matter in that University of Alaska Fairbanks (UAF) did not receive monies needed for work on damage assessment until August of 1989, and cannot possibly conduct adequate injury assessment studies (field and laboratory) in far less than one field season. Obtaining a true picture of the damage assessment requires sample collections and data analysis beyond the short period which would occur if funding stops in February. A realistic plan should include the budgets for 3-5 years as originally proposed through this review process.

Com.	Topic	Issue	Sug.	Sort
1	4	0201		2

The UAF is one of the major participants in the Coastal Habitat Injury Assessment Study described on pages 29-33 of the plan. On page 32, the Alaska Department of Fish and Game and the U.S. Forest Service are listed as the lead agencies while the cooperating federal agencies are listed as EPA, NOAA, and U.S. Department of the Interior. The cooperating State agencies are listed as the Department of Environmental Conservation and the Department of Natural Resources. The budget given is for the Alaska Department of Fish and Game and the U.S. Forest Service. It concerns me that the UAF with its two participating institutes (Institute of Arctic Biology [IAB] and Institute of Marine Science [IMS]) is not included among the list of cooperators. In contrast, on pages 134 and 135, is the description of Terrestrial Mammal Study Number 3 entitled "Assess the effect of the Exxon Valdez oil spill on river otter and mink in Prince William Sound" and the UAF is listed (page 135) as a State cooperating agency and the amount of the contract, \$36,000 to the IAB, is identified in a footnote to the budget. Similarly, Terrestrial Mammal Study Number 6 entitled "Influence of Oil Hydrocarbons on Reproduction of Mink," is described on pages 140-142. The lead agency is listed as the Alaska Department of Fish and Game and the cooperating agency as the University of Alaska Fairbanks (IAB). On page 142 under Budget, it is indicated that the study will be conducted by the UAF under contract to the Alaska Department of Fish and Game.

Com.	Topic	Issue	Sug.	Sort
2	6	0100		2

UNIVERSITY OF ALASKA FAIRBANKS

INSTITUTE OF ARCTIC BIOLOGY

In light of the precedent of the two proposals cited above, we would like clarification of the budget for the Coastal Habitat Study Number 1 entitled "Comprehensive Assessment of Injury to Coastal Habitats" on pages 30-33, particularly the fact that the University of Alaska Fairbanks is not referenced in the budget portion of the study. Also, we have no clear indication as to the duration of the study.

Com.	Topic	Issue	Sug.	Sort

I noticed that there is no mention in this plan of the proposal by the IAB/UAF to measure the biochemical and physiological confirmation of exposure in selected mammals and invertebrates to North Slope crude oil spilled in Prince William Sound. This proposal was recommended for funding in earlier versions of the plan, and is of unquestionable importance in the successful conclusion of natural resource damage assessment related to the oil spill. The studies proposed will tell us, for instance, whether animals died or became sick due directly to exposure to oil in their environment. This confirmation of exposure can then be used in economic models to determine cost assessments for the loss of natural resources. It also will be possible to determine how long after an oil spill it takes for the biochemical parameters of animals living in exposed areas to return to normal levels. The analytical techniques we will use are not being used by others so there will be no duplication of effort. These techniques provide an inexpensive alternative to hydrocarbon analysis for continued monitoring. The expertise at IAB and IMS in analytical chemistry and pathology was ignored by the Trustees. I am attaching a copy of this proposal for your perusal in the event that the omission of this extremely important study was simply inadvertent (Attachment 1).

Com.	Topic	Issue	Sug.	Sort
3	4	0100		2

Earlier on in the planning for damage assessment it was decided that the U.S. Fish and Wildlife Service (Department of the Interior) would conduct all of the studies of the sea otter. However, we do not find in your plan the important project earlier proposed by the University of Alaska Fairbanks on the extent to which the spill has reduced the genetic stock of the sea otter in Prince William Sound, e.g., to the point that its continued existence as a genetic entity may be endangered. It would seem that this study is another example of an inadvertent omission of an important part of the damage assessment plan.

Com.	Topic	Issue	Sug.	Sort
4	4	1680		2

Thank you for this opportunity to provide you with some comments on the public review draft of the plan. We look forward to receiving information on the second and successive years of the studies.

Sincerely yours,

Francis S. Williamson
Francis S.L. Williamson
Director

FSLW/sw
Attachment
cc: Brian Rogers
Vera Alexander

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EXXON VALDEZ OIL SPILL
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October 30, 1989

Trustee Council
P.O. Box 20792
Juneau, Alaska 99802

Re: Comments on Draft Natural Resource Damage Assessment
Plan for the Exxon Valdez Oil Spill

Dear Ladies and Gentlemen:

These comments on the draft assessment plan are filed in behalf of the Alaska Sportfishing Association and others who have filed a class action in behalf of those who recreationally use the area and resources affected by the Exxon Valdez oil spill. That class, referred to as the "Use and Enjoyment Class" in the litigation, seeks creation of an environmental restoration and mitigation fund and does so under both damage and injunctive theories. It does not seek individual recovery for class members. The recreational uses include not only sport fishing, which is a common activity that overlaps many of the recreational uses, but also includes sea kayaking, sailing, motor boating, camping, wildlife viewing, hunting, and similar consumptive and nonconsumptive uses of the geophysical and biological resources impacted by the spill. Therefore, these comments address many of the resources that are of importance directly or indirectly to those who use and enjoy Prince William Sound and other affected areas.

The Use and Enjoyment Class adopts the comments of the National Wildlife Federation and Wildlife Federation of Alaska, except as added to below.

I. GENERAL COMMENTS

A. The Cut-Off Date

The most glaring inadequacy in the plan is the cut-off of all studies in February 1990 unless further work is authorized. Many of the studies require longer periods of

Gen.	Topic	Index	Page
1	4	0201	2

assessment in order to determine injury and assess damages. Therefore, the plan risks greatly underestimating the actual injuries and damages. ↑

B. Absence of Any Damage Assessment based on Restoration

The plan assesses damages only through assessing the loss of use values and non-use values. This is an incomplete measure of damages and is legally insufficient.

The fundamental objective of the assessment process under CERCLA and the Clean Water Act is restore, replace and acquire the equivalent of the injured resources, both geophysical and biological. The draft plan fails to serve this objective in that it neglects any assessment of damages based on the costs of restoration, replacement and acquisition of equivalent resources, habitats or lands. Instead, the plan only refers to development of a restoration plan and fails to articulate whether costs of restoring, replacing or acquiring will be part of the measure of damages as required.

Con.	Topic	Issue	Sug.	Sort
2	3	0151		2

In Ohio v. Department of the Interior, No. 86-1529 (D.C. Cir., July 14, 1989), the court held that restoration cost is the basic measure of damages plus lost use values. Ohio at 45. The court specifically rejected Interior's regulation requiring that damages be the "lesser of" restoration costs or lost use values. Ohio, at 55.

Nevertheless, the assessment plan focuses exclusively on lost use values as the measure of damages and thus effectively still retains a "lesser of" approach. Lost use is not an inappropriate element; it is simply an incomplete measure. As the sole source of measurement of damage, it does not comply with the Ohio decision.

Therefore, the plan would benefit from an additional study that measures damages in terms of restoration costs, so that total damages would be restoration cost (meaning restoration, replacement and acquisition of alternative habitats) plus lost use values.

Con.	Topic	Issue	Sug.	Sort
18	3	2295		2

The plan says only that a restoration plan will be developed, including cost estimates for restoration projects. This is not the same as a damages assessment based on restoration.

We realize that restoration in a narrow sense may not be feasible for many of the biological resources injured.

Therefore, we urge the trustees to look broadly at acquisition of replacement habitats and resources that bear some relationship to the injuries suffered by the biological resources, the geophysical resources, the services they provide and use and non-use values they provide.

The Use and Enjoyment Class urges that the trustees immediately initiate such a plan and the assessment of damages based on restoration, replacement and acquisition in addition to damages based on lost use and non-use values.

C. Lack of Detail and Public Comment

Most of the study descriptions are so lacking in detail that they frustrate public comment about the design of the studies. The draft plan fails to identify studies already underway, sampling protocols, data collected. Therefore, the Use and Enjoyment Class does not waive any right to make additional or contradictory comments at a later time when more details become available. In addition, we request that the trustees establish a more open process to facilitate further comment throughout the assessment process.

Com.	Topic	Issue	Exp.	Est.
3	3	0102		2

D. Exxon should not participate in the damage assessment.

The plan says that the trustees have not decided whether potentially responsible parties, Exxon and other defendants, should be allowed to participate in the damage assessment. The Clean Water Act and CERCLA both require the trustees to assess damages. 33 U.S.C. 1321(f)(4)-(5); 42 U.S.C. 9607(f). The responsible parties may act only in a ministerial role. Ohio at 73.

Com.	Topic	Issue	Exp.	Est.
4	5	0207		2

E. A regulatory discount rate appears inappropriate in this instance.

The recreational demand for areas affected by this spill has been increasing rapidly in recent years, as ADF&G use figures indicate. Therefore, any measure of damages must take into account the projected increases in demand. If projected increases cannot be estimated without uncertainty, then it only makes sense to adjust or eliminate the assumed discount rate, as permitted by the Ohio, at 69, in its discussion of the authority, 43 C.F.R. 11.84, of the trustees to adjust for uncertainty in assumptions.

Com.	Topic	Issue	Exp.	Est.
5	3	0142		2

F. General Absence of Laboratory Modeling

Most of the biological studies are field surveys. Few laboratory studies are planned to simulate conditions in the field. Where the study design does not permit extensive field work or where only a few sights are used for field survey, we would urge that laboratory simulations be undertaken.

Com.	Topic	Issue	Sug.	Sort
19	3	0240		2

G. Inconsistency in the methods used to model amounts of oil over time.

The air/water studies have the goal of creating an integrated model over time of the fate of the oil, but it is not clear that the studies are consistent with each other in focusing in the parameters of quantity, volume, concentration, distribution, persistence, composition and time. For example, it is not clear that either Air/Water Study No. 2 or the Coastal Habitat Study address the quantity of oil and hydrocarbons that end up in the marine sediment or the intertidal zone, while Air/Water Study No. 1 address the quantity of floating oil. If an inconsistency of focus such as this occurs across these studies and across what should be common parameters, then it may make difficult the job of creating a total model. The Air/Water studies, and also the coastal habitat study should be re-examined to facilitate creating such a model.

Com.	Topic	Issue	Sug.	Sort
6	5	1200		2

H. Absence of Assessment of Damage to Recreation Industry and other businesses outside of the commercial fishing industry.

CERCLA requires that damages measured for purposes of the Clean Water Act and CERCLA must take into account all uses of the injured resource. 42 U.S.C. 9651(c). The assessment plan totally neglects tourist industry uses of the resource. Taxidermists, charter boat operators, water and air taxi services, guides, lodges and similar businesses have suffered from the spill. These damages should be assessed, since they are use values just as much as commercial fishing, recreation and subsistence.

Com.	Topic	Issue	Sug.	Sort
7	3	0111		2

I. Budget for Economic Studies

The absence of a budget breakdown for the economic studies does not facilitate public comment. Among the economic studies, the contingency valuation studies, particularly Economic Uses Study No. 5 (recreation) and Economic Uses Study No. 7 (Intrinsic values) deserve substantial budgets to accomplish the complex survey work

Com.	Topic	Issue	Sug.	Sort
8	3	2200		2

needed. We expect that the budgets for those studies are substantial and that they will not be cut to facilitate studies that provide less prospect for recoveries that will serve the purposes of restoration, replacement and acquisition. Nevertheless, we urge that all budgets be disclosed.

J. Lack of Attention to Sublethal Effects

Many of the biological studies ignore sublethal effects and focus exclusively on population surveys and causes of mortality. Throughout the biological studies we urge greater attention to sublethal effects, such as mutagenic, reproductive, predation effects arising from the spill.

Com.	Topic	Issue	Sug.	Score
9	3	0111		2

II. SPECIFIC COMMENTS

A. Coastal Habitat and Air/Water Studies

The plan would benefit from describing how these studies will be coordinated with the economic uses studies and the restoration plan. These studies obviously form a foundation for estimating long term biological impact. However, the plan should make clear that they also will relate geophysical impact to the economic uses studies -- i.e. that the mere fact of oiled shorelines, habitat aside, is an injury that should be measured in these studies and assessed as part of Economic Uses Study Nos. 5 (recreation) and 7 (intrinsic values). The trustees should be careful to include both biological and geophysical injury determined in these studies in the contingent valuation studies in order to avoid undervaluation.

Com.	Topic	Issue	Sug.	Score
10	3	1100		2

Similarly there is no mention in the restoration plan of how these studies will be used to support the restoration plan, including acquisition of habitat. That needs to be addressed.

Com.	Topic	Issue	Sug.	Score
11	3	2100		2

The coastal habitat study says it will address toxicity at several different trophic levels, but detail is lacking. Algae, phytoplankton, zooplankton, microbiota and other organisms at the bottom of the food web need to be addressed in these studies.

Com.	Topic	Issue	Sug.	Score
12	3	1100		2

B. Fish Studies

These studies are frequently lacking in attention to sublethal effects, such as genetic mutation, reproductive

Com.	Topic	Issue	Sug.	Score
13	3	1300		2

failure, behavioral abnormalities, disease, increased predation, deformities. See 43 C.F.R. 11.62. The studies also are limited to species for which there are human use values; they should be expanded to include non-use species in order to avoid underestimating the damage assessment in the intrinsic value study.

Many of these studies cannot be completed by the February 1990 deadline.

Fish Studies 1, 2, 7, 8 would benefit from laboratory control studies to support the impact on eggs and fry.

Fish Studies 3, 4 and 9 would benefit from control studies in simulated laboratory environments to control marine variables, such as natural predation and mortality at sea.

Fish Study 5 (Char and Trout) ignores sublethal effects. This study also seems to ignore the lack of control of exposure in the coastal waters thorough which juvenile and adult char and trout migrate. The study also suffers from few study areas, and would benefit from controlled laboratory simulations.

Fish Study 6 -- more detail should be given; other tissue samples in addition to stomach contents should be taken.

Fish Studies 7 and 8 -- laboratory control studies would benefit these studies, as in nos. 1 and 2.

Fish Study 11 -- Kelp growth should be measured, since there have been reports of reduced kelp growth in oiled areas.

Fish Study 17, 18, 19 -- We adopt NWF comments.

C. Marine Mammal Studies

Marine mammals are tremendously important to the recreationists of the affected areas, yet the plan gives them short shrift, lack of detail in the study designs and lack of budget. Sublethal effects need to be examined more fully. See NWF comments. More attention should be given to prey species. The cut-off date undermines the ability to assess long term effects.

D. Terrestrial Mammals

Com.	Reg.	Spec.	Exp.	Cost
14	3	1600		2

There is so little money in these studies, little effect will be detected.

Com.	Topic	Issue	Sug.	Sort
15	4	1700		1

E. Bird Studies

Again, these studies ignore sublethal effects. These studies focus mostly on immediate effects and reproductive success. Long term effects are neglected.

Com.	Topic	Issue	Sug.	Sort
16	3	1800		2

Bird Study 14 on migratory birds appears grossly underfunded for the work described.

In other respects we adopt NWF's comments.

F. Economic Uses Studies

Our focus here is chiefly on economic uses studies 5 (recreation) and 7 (intrinsic values), though a two other comments should be addressed.

Com.	Topic	Issue	Sug.	Sort
17	3	2200		2

First, these studies need to be supplemented with a study addressing the market impact the spill has had on tourist businesses and other business outside of the commercial fishing industry. (See General Comments.)

Second, creating bioeconomic models, as in Economic Uses Study No. 3, may be useful for other user classes than just commercial fishing.

Economic Uses Study No. 5 seems to have several problems. First, current users may have existence, option and bequest values in addition to consumer surplus values. Yet, this study focuses only on consumer surplus.

Com.	Topic	Issue	Sug.	Sort
20	3	2250		2

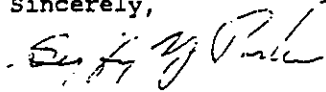
Second, the existence, option and bequest values of actual users may be substantially larger than those of nonusers. However, in ignoring existence, option and bequest values of users, this study effectively lumps those values for users in with the existence, option and bequest values of nonusers in Economic Uses Study No. 7, thereby losing track of these substantially larger values for the recreational use class and thereby underestimating the total value, regardless of whether that value is measured in study 5 or 7. The result is most likely to be an underestimate of damage in Economic Uses Study No. 5.

Com.	Topic	Issue	Sug.	Sort
21	3	2270		2

Third, in Economic Uses Study No. 5 there is no description of how a survey respondent is determined to be a

recreational user or not a recreational user -- i.e., is a respondent who recreated in the impacted area two years before the point of survey still a user? Those with the most diminished consumer surplus may be those who recreated previously and will never again go. How will they be surveyed? One method might be to rely partially on the names of respondents in the raw field creel survey and mail survey data for past years. Those records should be available for past years.

Sincerely,



ADLER, JAMESON & CLARVAL
By: Geoffrey Y. Parker

See pg 2 for
Comment 18

See p 4 for 19
p 7 for 20
p 7 for 21

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78000 VALDEZ OIL SPILL
TRUSTEE COUNCIL
ADMINISTRATIVE RECORD

Katherine G. Halgren
167 N. W. 73rd St.
Seattle, WA 98117
(206) 782-0763
October 30, 1989

Trustee Council via FAX (907) 278-7022
Natural Resource Damage Assessment Plan
PO Box 20792
Juneau, Alaska 99802

Dear Trustee Council:

In response to the August 1989 Public Review Draft of the State and Federal Natural Resource Damage Assessment Plan (Plan), I offer the following thoughts and comments:

My primary concern is for the human inhabitants in the immediate spill zone. The Plan mentions "Terrestrial mammals near the coast where exposed to hydrocarbons by breathing fumes...."[1]; the human aspect has only been addressed with regard to economic value and resource use. Can we afford to ignore this exposure to humans?

Gen.	Volume 1			
1	3	013	X	2

"Trustees also may recover the cost of assessments to determine injury to the resource and the dollar value required as compensation for that injury, 42 USC 9607(a)(4)(C)"[2] The Plan does not address Part(D) of 42 USCA 9607(a)(4) as it pertains to the people living in the area at the time of the spill and those actively involved in the emergency response.

North Slope crude "naturally contains significant quantities of toxic metals including vanadium, nickel, chromium, and zinc. The oil is also highly toxic because it is about 25 percent aromatics, which are generally considered the most toxic hydrocarbon components. As it degrades through physical, chemical, photochemical and biological processes, additional toxic materials are likely to be generated."[3]

What effects did the attempted burnings have on the air and was there any injury to the people of Tatitlek? Why were pregnant women evacuated while others were left to experience the ill affects of the burning techniques and dispersants which caused death on beaches at Elamar and Tatitlek (starfish, mussels, etc). No oil contamination was found but these beaches are located close to areas used for dispersant trials in the early days of the spill. Surely the health of the people should be studied to watch for possible long term effects on dispersants on the human populations.

I would like to encourage the trustees to continue studies beyond February 28, 1990 with as many inquiries as possible. As the Draft states, "Hundreds of miles of coastlines and islands along this route have received oil from this discharge, and large quantities of oil remain at sea." [4] The spill is still very dynamic as headlines five months after the incident proclaim "Massive bird die-off hits gulf" [5]. Throughout the Plan there are references to the uncertainty of the effects of the spill over time. Any one of the following should be justification enough to continue:

Scm. 10201 X 0
2 4 10201 X 0

"...the stranded oil may persist for decades." [6]

"oil is likely to be moved deeper into the fjords rather than being flushed out....The potential exists for the oil released in the "Exxon Valdez" incident to persist in and on these Prince William Sound coastlines for many years." [7]

"Herring do not return to their natal areas to spawn until they are at least three years old." [8]

"...could result in lower returns of adult fish in 1991." [9]

"The production and survival of the 1989 [salmon] fry from all of these species are at risk, as is the spawning success of adults returning in the fall of 1989." [10]

"...possibility of delayed population effects in some species." [11]

Participation in this assessment by potentially liable parties should be minimal. It is a little like asking the fox how many chickens are left in the chicken coop.

3 1 0207 X 1

Exxon's research tends to disagree with the general scientific community as experienced at the Conference on the Alaska Crude Oil Spill and Human Health, held on July 29,30, 1989 in Seattle, Washington.

The chronology in the Plan also shows Exxon's bias. "This action was successful, but there was not enough equipment left to contain the oil or protect other areas" [12] is absolutely untrue. Citizens were able to locate boom one week later; all that was needed was a purchase order for the equipment to be shipped on a flight arranged by Ted Billings from Alaska State Senator Kertulla's office.

A week after that shipment there was still equipment available in Seattle and Anchorage. It was only lack of purchase that kept equipment in warehouses and vans rather than containing or removing the oil.

I would like to see the following points added to the chronology:

The quantity of oil intentionally pumped from tanks aboard the "Exxon Valdez" in attempts to float the crippled vessel, a listing of which tanks, especially non damaged tanks, and the time at which the pumping started.

The location and time where the ballast water from the "Exxon Baton Rouge" was pumped prior to lightering crude oil from the "Exxon Valdez."

A list of chemicals used in attempts to burn or disperse the oil, as well as locations of the tests so that potentially toxic effects to natural resources can be monitored.

The refusal of assistance from the Russian Oil Skimmer in the first week when it would have been very effective removing oil from the water.

When reviewing all the facts on this tragedy please keep in mind one sentence: "At 70 hours - the point at which the (contingency) plan stated a spill of more than 200,000 barrels would be picked up - no more than 3,000 barrels had been recovered." [13]

Thank you for considering my input for the implementation of the Plan.

Very truly yours,

/s/

Katherine G. Halgren

Com.	Topic	Issue	Page
4	3	0109 X	2

References:

- [1] Plan, P. iii Para 1
- [2] Plan, P. 16 Para 2
- [3] Plan, P. 233 Para 2
- [4] Plan, P. 239 Para 2
- [5] Oil Spill Chronicle Vol. 1 No. 8, August 29, 1989, Valdez AK.
- [6] Plan, P. 13 Para 1
- [7] Plan, P. 13 Para 3
- [8] Plan, P. 15 Para 2
- [9] Plan, P. 15 Para 3
- [10] Plan, P. 15 Para 4
- [11] Plan, P. 15 Para 5
- [12] Plan, P. 8 Para 6
- [13] State of Alaska Winter Operations Plan 1989-1990 Initial Response to the Spill under the subtitle "Was Help Really on the Way?" Paragraph 2

**Kodiak
Area
Native
Association**



402 Center Avenue
Kodiak, Alaska 99615
Phone (907) 486-5725

October 27, 1989

The Trustee Council
Post Office Box 20792
Juneau, Alaska 99802

To Whom It May Concern:

On behalf of the Kodiak Area Native Association we would like to introduce ourselves for further involvement.

Due to the economic and social impact in our seven villages on Kodiak Island it is imperative that the study concerning the impact within our Native communities be developed as soon as possible. This study will help ensure us that no further loss will be felt in our heritage or subsistence way of life.

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Sincerely,

KODIAK AREA NATIVE ASSOCIATION
GARY N. ARENSON, PRESIDENT

August Aga, Oil Spill Coordinator



15.2.1

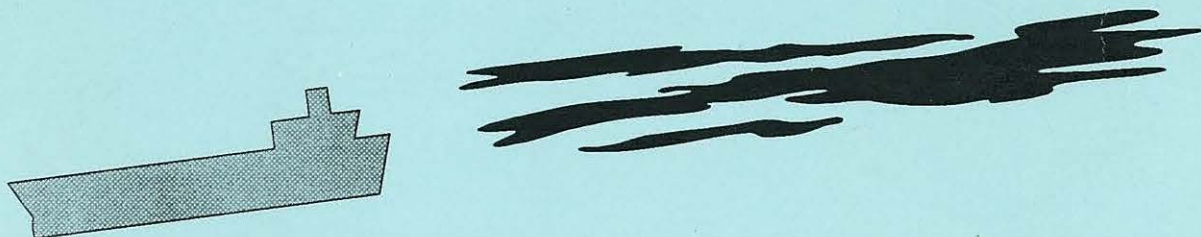
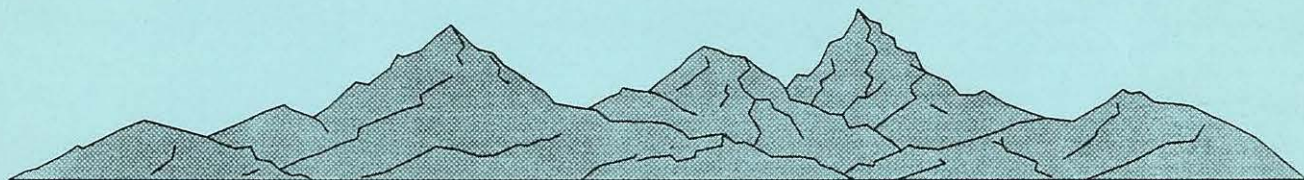
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EXXON VALDEZ OIL SPILL
TRUSTEE COUNCIL
ADMINISTRATIVE RECORD

An Analysis of the State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill

prepared by
National Wildlife Federation

joined by
Wildlife Federation of Alaska
Trustees for Alaska
Alaska Center for the Environment
Sierra Club Legal Defense Fund

October 30, 1989



Michele Straube and Erik D. Olson
with David Campbell, Ph.D., Rudy Rosen, Ph.D., and Ann Rothe

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Wildlife Federation of Alaska

Jimmy Jackson, President

**An Analysis of the State/Federal
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October 30, 1989

**by
Michele Straube and Erik D. Olson
with David Campbell, Ph.D., Rudy Rosen, Ph.D., and Ann Rothe**



**National Wildlife Federation
1400 16th Street, N.W.
Washington, D.C. 20036**

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I. INTRODUCTION

... How do you weigh the forever cost of this catastrophe? ... I could go on, but what may be of most concern, ultimately, is those things that are not obvious, and often not visible. It's not just the otters, or the birds, or the herring, or the magical beauty of Prince William Sound. It's the countless invertebrates that live in the ocean and on the shores, it's the diatoms, the phytoplankton and zooplankton, the amphipods, the mollusks and crustaceans, the little fish, the bigger fish that eat them, and on and on through the food chain. It's the system.

... Sometimes I wonder just how many more shocks the environment can take before something goes remarkably, irreversibly sour. Because once something is gone from this planet -- any creature, any species, any system -- no matter how many billions of dollars we throw at it, we will never be able to bring it back.

Sylvia A. Earle, on leaving Prince William Sound, April 1989; excerpted from Wallace, White, "Her Deepness", The New Yorker, July 3, 1989, pp. 64-65.

The National Wildlife Federation ("NWF"), is the nation's largest nongovernmental conservation organization, with over 5.8 million members and supporters. The Wildlife Federation of Alaska, a non-profit organization with statewide membership, is affiliated with the National Wildlife Federation, and is dedicated to conservation, education and protection of the natural environment. Trustees for Alaska is a non-profit environmental law firm based in Anchorage, Alaska which protects natural resources and the environment of Alaska on behalf of its more than 1000 members. The Alaska Center for the Environment is a non-profit grassroots membership organization focusing on environmental issues in South Central Alaska. The Sierra Club Legal Defense Fund is a non-profit corporation created to support lawsuits brought on behalf of citizens' organizations to protect the environment. These commenters will be referred to jointly as the "Environmental Groups".

The Environmental Groups submit these comments on the August 1989 public review draft of the State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez oil spill ("draft assessment plan"). The Environmental Groups hereby join and incorporate by reference to the extent consistent with these comments, the comments of the Natural Resources Defense Council (NRDC) and the Defenders of Wildlife.

NWF has been involved in the development of the Federal natural resource damage assessment program since its inception. Most recently, NWF, along with ten states and two additional public interest groups, successfully challenged the Federal natural resource damage assessment regulations. As a result of our lawsuit, the

regulations were remanded to the Department of Interior for revision and repromulgation on three points critical to the Exxon Valdez assessment plan: (1) to incorporate the "clearly expressed intent of Congress" that "restoration costs ... be the basic measure of recovery for harm to natural resources" under both CERCLA and the Clean Water Act; (2) to include assessment procedures and valuation methodologies that "capture fully all aspects of the loss," whether or not the natural resource is used by humans or traded in the marketplace; and (3) to clarify how they apply to privately-owned resources in which there is some government interest. State of Ohio et al. v. Department of the Interior, 880 F.2d 432 (D.C.Cir. 1989).

NWF, WFA, and NRDC are also plaintiffs in a suit filed in Alaska Superior Court against Exxon, Alyeska Pipeline Service Company, and each right-of-way holder. This suit demands, among other things, that Exxon and the Alyeska consortium companies be required to establish a trust fund, to be overseen by independent experts, to pay for certain actions, including but not limited to: the short- and long- term study and compilation of all injuries and all damage done by the Exxon Valdez spill; removal or containment of contaminants; full restoration or replacement of injured resources; acquisition of resources similar to those lost; acquisition of resources to compensate for diminution in all values of injured resources; and, full compensation for all lost use, intrinsic and other values of the injured resources. This suit also seeks other equitable and legal relief, including punitive damages. Moreover, several environmental organizations, represented by the Sierra Club Legal Defense Fund in Juneau, have filed suit in the Federal District Court in Anchorage seeking relief under the Clean Water Act and the Resource Conservation and Recovery Act for certain environmental remedies and penalties under those laws in the wake of the Exxon Valdez spill.

The relief sought in those cases obviously is complementary with and broader than the activities that will be contemplated by this damage assessment plan, however we are commenting in part to seek to assure that the Trustee Council's assessment plan and future activities are coordinated to the extent possible with the relief sought and granted in Court. We also hereby request that we be fully involved in the development and implementation of the Trustee Council's restoration plan to assure maximum coordination of efforts.

Moreover, quite frankly, our review of the draft plan raises deep concerns. The draft is so inadequate that serious questions arise as to whether the Trustee Council intends to carry out its statutory and public trust obligations to assure restoration, replacement, and acquisition of resources equivalent to those injured by the spill.

The Environmental Groups are shocked by the superficiality of the draft assessment plan's descriptions of proposed actions, and at the lack of detail provided about each proposed study. The cursory descriptions of proposed assessment and valuation activities often preclude intelligent review or meaningful comment, making a mockery of the public participation process. To add insult to injury, the Department of Interior and the Trustee Council have prevented public access to any current information about the studies already underway (such as research plans, sampling protocols, data collected, or analysis of results), and have proceeded to conduct the first

six months of assessment activities without any public scrutiny. Due to the gross generality of the draft assessment plan, and the lack of access to existing information that could provide additional detail, the Environmental Groups do not waive their right to make additional or contradictory comments about the proposed studies or assessment approach at a later time. In addition, the Environmental Groups expect, and respectfully request, that public comment will continue to be solicited throughout the assessment period.

The proposed assessment plan is legally inadequate in several respects. As a result, the natural resource damages resulting from the Exxon Valdez oil spill will probably be significantly undervalued, and full restoration¹ of the natural resources and the services they provided will not be accomplished. In the comments below, several of the most important generic problems with the draft assessment plan are raised. The Environmental Groups then comment on each set of studies, to the extent that the information provided made review and comment feasible. Our comments conclude with a discussion of the Trustees' legal obligation to provide increased public participation in both development and implementation of the Exxon Valdez assessment plan.

The fundamental objectives of the draft assessment plan must be changed to reflect the statutory requirements for natural resource damage assessments, as articulated by the D.C. Circuit in the Ohio decision. The restoration planning process must be initiated immediately, and restoration options and costs for all affected natural resources determined. The Trustees must make a firm commitment to carrying out a restoration plan, as is required by law. All potential injuries to all natural resources, including damage to the ecosystem regardless of human use, must be fully explored. Finally, studies to determine the short- and long-term effect of the oil spill on natural resources must continue long beyond the February 1990 date mentioned in the draft assessment plan.

¹ As discussed in § II.B of these comments, CERCLA and the Clean Water Act require that natural resource damages be used to restore, replace or acquire the equivalent of the injured resources. The term "restoration" is used as shorthand to refer to all three components of the statutory requirement.

II. TRANSCENDENT PROBLEMS WITH THE DRAFT ASSESSMENT PLAN
A. The Proposed Studies Will Not Provide the Information Necessary to Calculate Natural Resource Damages According to the Statutory Measure of Damages

The appropriate measure of damages for natural resource damage assessments under CERCLA and the Clean Water Act has been litigated in detail. The U.S. Court of Appeals for the D.C. Circuit, in an unappealed decision, determined that "restoration [cost] is the basic measure of damages, but damages can exceed restoration costs in some cases."² Ohio v. Interior, 880 F.2d at 450. The draft assessment plan does not reflect the statutorily mandated measure of damages. Rather, it appears to be designed to calculate natural resource damages in accordance with the regulations expressly overruled by the D.C. Circuit.

Prior to the Ohio decision, the Federal natural resource damage regulations required trustees to calculate natural resource damages according to the lesser of: restoration or replacement costs, or diminution in use values. 43 C.F.R. § 11.35(b)(2) (before remand). Furthermore, the pre-appeal regulations incorporated a "hierarchy" of assessment methods that virtually excluded Trustee recovery for any natural resource values other than direct human use values (e.g. market values). 43 C.F.R. § 11.83(c) (before remand). The U.S. Court of Appeals for the D.C. Circuit specifically overruled the "lesser of" rule, as well as the hierarchy's limitation to direct human use values, saying that both concepts were contrary to Congressional intent. In the words of the Court, the measure of damages for natural resource damage assessments performed under CERCLA and the Clean Water Act includes: (1) "restoration [as] the basic measure of damages...", 880 F.2d at 450, plus, (2) "use values for natural resources [derived] by summing up all reliably calculated use values, however counted, so long as the trustee does not double count," Id. at 464; and "other factors in addition to use values," so that prima facie, option and existence values "ought to be included in a damage assessment." Id. at 464.

Thus, natural resource damages calculated for the Exxon Valdez oil spill should be the sum of restoration costs for all injured resources, the sum of all reliably calculated lost use values during restoration, and all non-use values. The draft assessment plan will provide inadequate information to calculate any of the three natural resource damage components.

Although the draft assessment plan does not reference the "lesser of" rule, there is similarly little mention of restoration costs. Restoration costs are mentioned briefly in the plan's introduction as a measure of damages. Plan, p. 24. Yet, restoration costs are not included anywhere as a subject for study. It is the Environmental Groups' impression that upon the completion of every study proposed in the draft assessment

² As do the Environmental Groups throughout these comments, the court used the term restoration "shorthandedly" to include restoration, replacement, or acquisition of equivalent resources. Ohio v. DOI, 880 F.2d at 441.

plan, absolutely no information on restoration costs will have been developed. Since restoration costs are the statutory floor for calculating recoverable natural resource damages, the Trustees may have no legal basis for assessing damages against Exxon and other responsible parties after millions of dollars have been spent on the assessment studies. Beyond being a violation of the express provisions of the statutes, this would be a breach of the Trustees' fiduciary responsibilities.

The February 1990 cease date for many of the studies in the draft assessment plan will foreclose the opportunity for the Trustees to calculate lost use values during restoration, unless legally defensible extrapolations of long-term lost use can be made from this summer's data. See also discussion in § II.C., infra.

Finally, many sections of the draft assessment plan demonstrate the Trustees' limited focus on direct human use values. In addition to overlooking a potentially critical universe of recoverable natural resource damages, the failure to include all values (use and non-use, consumptive and non-consumptive) is contrary to the court's ruling in the Ohio case. By statute and the court's decision, all lost services provided by natural resources must be assessed, whether the services benefit humans directly, indirectly or are provided to the ecosystem as a whole. Yet the focus of virtually every injury determination study is narrowly anthropocentric. For example, there are no overall studies investigating effects of the oil spill on the functioning of the ecosystem, such as impacts on microbial action, algal growth, growth of plankton, growth of benthos, or contaminant cycling through the food web. The coastal habitat study, for example, was designed to investigate food for "valued resource species", to determine the effect on "higher order organisms of economic importance", and to collect data on species that "provide services directly to humans". Plan, p. 29.

The plan's illegal focus on narrowly-defined direct human use values to determine natural resource injury may stem from the acknowledged difficulty of quantifying injuries that are not related to human use of a resource. As described above, however, quantification of natural resource damages is not limited to economic human use value methodologies, nor are the economic methodologies limited to use value calculations. There are at least two other ways to quantify natural resource injury, regardless of direct human use -- restoration cost and contingent valuation. Restoration cost is not included in the draft plan. Further, since no descriptions are given of the contingent valuation studies to be performed under Economic Studies 5-7, we cannot determine whether the surveys will be sufficient to capture the important non-use values of injured natural resources.

In order to fully recover for all natural resource injuries covered by CERCLA, the Clean Water Act, and the public trust doctrine, the full range of natural resource injury (including ecological damage) must be determined. In addition, the natural resource damage assessment will not be complete or meet statutory requirements until restoration costs for each natural resource injury have been estimated, long-term lost use values during restoration calculated, and all non-use values are considered.

B. The Draft Assessment Plan Does Not Meet the Statutory Objective of a Natural Resource Damage Assessment to Replace, Restore or Acquire the Equivalent of Injured Natural Resources

Restoration costs are a component of natural resource damages because both CERCLA and the Clean Water Act require that the damages recovered must be used to restore, replace or acquire the equivalent of the injured resources. CERCLA § 107(f)(1); CWA § 311(f)(5) (trustees must use recovery to "restore, rehabilitate or acquire the equivalent of" injured resources). The primary objective of a natural resource damage assessment is to allow trustees to recover funds to restore the natural resources to their pre-release condition, and if that is not possible, to acquire equivalent resources providing the lost services. Recoveries in excess of restoration or replacement costs also must be used to acquire resources equivalent to those injured. While the dollar figure of a natural resource damage assessment can exceed restoration costs, as discussed in the previous section, restoration of the injured natural resources and the services they provided is the minimum end-product of the natural resource damage assessment process.

The draft assessment plan appears to include restoration as an afterthought, or as an optional future activity. See, Introduction to Plan, p. 27. Neither the injury assessment studies, nor the economic value studies, collect the information needed to fully explore restoration options or restoration cost. The ongoing assessment activities also do not reflect timely consideration of the statutory restoration objective.

Equally important is the draft assessment plan's total neglect of the third component of the statutory objective, namely acquisition of equivalent resources. There is absolutely no discussion in the plan concerning the Trustees' intentions for natural resources and their services which cannot be restored or replaced. For example, for those beaches that are likely to become essentially "paved" with asphalt as the oil weathers, and therefore may be unrestorable, the Trustees must be developing assessments and plans to acquire for protection some equivalent resources that will provide similar services to people and the ecosystem.

The Trustees must investigate restoration options and estimate restoration costs; clearly, the Trustees must provide restoration, replacement, or acquisition of equivalent resources for each natural resource injury. For studies which use indicator species to determine injury (e.g., certain bird studies), restoration must be provided for each species within the class of species intended to be represented by the indicator species. Similarly, for natural resources providing multiple services (e.g., beaches and intertidal zones providing habitat for shellfish, fish, invertebrates, marine and terrestrial mammals, and many other species) each of the lost services must be recreated through restoration, replacement or acquisition of equivalent resources.

The Environmental Groups suggest that the possibility of on-site restoration must be considered as soon as natural resource injury is suspected. If a determination is made that an injured natural resource or lost service cannot be restored within the spill area, immediate steps should be taken to identify equivalent resources and to acquire

them. Pristine marine habitats similar to Prince William Sound are few, and many (such as Bristol Bay) are threatened with imminent development. In order to fulfill their statutory restoration obligations, the Trustees must consider restoration options simultaneously with injury determination, and act quickly to accomplish restoration or acquisition of equivalent resources. Examples of possible equivalent resources are provided with our comments on resource-specific injury assessment studies.

C. The Time Period for All Studies is Grossly Inadequate to Determine Short- and Long-Term Injury to Natural Resources Affected by the Exxon Valdez Oil Spill

The draft assessment plan provides that it, "is essentially a one-year plan":

No further studies will be conducted after February 28, 1990, except those approved by the Trustees upon recommendation of the Trustee Council and scientific and legal groups as being necessary to promote restoration and to support assessment of legally recoverable natural resource damages.

Plan, p. i. It is ludicrous to suggest that both short- and long-term injury resulting from the largest oil spill ever in this country affecting a heretofore pristine area which the plan itself describes as the "largest undeveloped marine ecosystem in the United States" can be determined in less than one year, by February 28, 1990. At best, this would mean an assessment would be based on ten months' of data. Realistically, much less than 10 months worth of data will be available. All agencies' initial focus after the March 24 spill was on immediate spill reaction and cleanup. In addition, with winter weather arriving around mid-September, little data collection is possible between now and the February 1990 drop-dead date. The Environmental Groups are very concerned that data available from the 1989 sampling season alone will support only a very minimal natural resource damage assessment, compared to the enormous natural resource injuries that resulted from the spill, and that will continue to occur for years into the future.

A one-year assessment plan clearly violates the Trustees' public trust obligations to protect and preserve the public resources within their jurisdictions. The trustees' fiduciary responsibilities cannot be discharged without an assessment of both short- and long-term natural resource injury, as a basis for restoration efforts and damage quantification. The circumstances of the Exxon Valdez oil spill, and the type of natural resources affected, highlight the need for years, possible decades, of studies.

The Exxon Valdez oil has travelled far and has saturated many parts of the environment of Prince William Sound. Hundreds of miles of beaches were oiled, yet only a tiny fraction of these beaches enjoyed "treatment" efforts; oil remains under the surface layer of even the "treated" beaches. Very little of the total volume of oil spilled has been removed from the environment. We can expect oil to remain in the Prince

William Sound environment for many years, continually affecting natural resources during that entire time. See, Ecological Study of the Amoco Cadiz Oil Spill, Report of the NOAA-CNEXO Joint Scientific Commission (1982); National Academy of Sciences, Oil in the Sea: Inputs, Fates and Effects, (1985); Plan, pp. 20, 19.

The effects of oil on certain natural resources may be delayed and may not manifest themselves until after the first year. Reproductive effects, survival rates, and decreased longevity may all be effects of the oil spill which cannot be observed until possibly 10-20 years after the spill event. It may take several years for food chain effects to manifest themselves; e.g., birds affected by a decrease in plankton and fish populations. Plan, p. 143. Subtle impacts on population, and interactions between species that are changed by the spill may take many years to discover. Long-term changes in species makeup of the impacted ecosystem, for example, may require over a decade of studies. Finally, it could take years of surveillance to determine the cause of the die-off of grey whales, harbor seals and sea lions this year, and to determine whether a long-term decline in population will result.

Many of the species affected by the Exxon Valdez spill are seasonal users of Prince William Sound. Plan, p. 143. The long-term effects on such species can therefore not be determined until they revisit the spill area. Many migratory birds, for example, will not return to the Sound until Spring of 1990, several months after the February drop-dead date. Herring present during the oil spill may not return to spawn for three years. Plan, p. 15. Many exposed salmon likewise will not return for years.

Little is known about the long-term effects of oil on certain natural resources; e.g., the effects of prolonged exposure of certain marine mammals to oiled waters or tainted food supplies. Without prior research and information about long-term effects, it will be difficult if not impossible to extrapolate such effects from less than a year's worth of sampling and analysis.

Finally, many of the study descriptions themselves anticipate long-term data collection. Several of the economic value studies will use a survey method, which is time consuming to develop, implement and analyze. (Economic Studies 5-7.) We cannot understand how contingent valuation surveys that will provide meaningful results can be completed by February 1990. One stated purpose of the coastal habitat injury assessment is to determine the recovery of various habitat types after clean-up. Plan, p.29. Since clean-up of the spill has not been completed, this aspect of the study cannot even begin before February 1990. Further, since full recovery of habitat such as oiled beaches can take years, possibly decades, and in some cases may never occur, a February 1990 drop-dead date completely undermines the study's objective.

The Environmental Groups agree that the studies should be reevaluated periodically, to review the scope of existing studies and to consider whether additional investigation is warranted. This approach is entirely different, however, from the automatic termination of studies after ten months presented in the draft assessment plan. The Trustee Council must overhaul its approach, both in light of its public trust

obligations and the defensibility of any future assessment.³ The public should be integrally involved in all decisions to terminate studies, or to change the scope or focus of a study.

D. Exxon Should Not Be Allowed to Participate in Any Portion of the Damage Assessment

The draft assessment plan states that the Trustees have not yet decided "whether, or to what extent, potentially responsible parties (PRPs) should participate in the damage assessment." Plan, p. iii. The Environmental Groups strongly object to any Exxon⁴ participation in data collection, analysis, or any other aspects of the natural resource damage assessment. Exxon's sole role in the natural resource damage assessment should be as a member of the public, with the same rights of review and comment as are provided to interested persons such as the Environmental Groups.

It goes without saying that potentially responsible parties have an inherent conflict of interest; they cannot be expected to objectively collect and analyze natural resource injury and economic value data, which will be used to impose what may be a multi-billion dollar assessment on themselves. Indeed, some might argue that the corporate officers of Exxon owe a fiduciary responsibility to their stockholders to minimize the size of the damages assessed, placing them in direct and irreconcilable conflict of interest with the public Trustees who have an obligation to assure full recovery of the damages to which they are entitled. For these reasons, both CERCLA and the Clean Water Act require that the Trustee perform the assessment and calculate natural resource damages. CERCLA § 111(h)(1) ("damages ... [to] natural resources ... shall be assessed by Federal officials designated by the President ..." under the NCP); CERCLA § 107(f) ("[t]he President of the authorized representative of any state shall act on behalf of the public as trustee of such natural resources to recover for such [natural resource] damages"); Clean Water Act § 311(f)(4) ("costs of removal ... shall include any costs or expenses incurred by the Federal Government or any State government in the restoration or replacement of natural resources damaged or destroyed ..."); Clean Water Act § 311(f)(5) ("[t]he President, or the authorized representative of

³ Exxon has been actively gathering natural resource injury data since March 24. The Trustees' natural resource injury and economic studies must be viewed in light of their multiple purposes: (1) to assess natural resource injuries as the basis for restoration efforts; (2) to support a natural resource damage assessment; (3) to serve as evidence in support of the Trustees' assessment, and (4) to rebut Exxon's data. Termination of many of the studies in February 1990 may seriously jeopardize the data's effectiveness in serving each of these purposes.

⁴ For purposes of these comments, we use the name "Exxon" to refer to any and all parties potentially responsible for natural resource damages from the Exxon Valdez oil spill.

any State, shall act on behalf of the public as trustee of the natural resources to recover for the costs of replacing or restoring such resources").

In reviewing the Federal natural resource damage regulations, the D.C. Circuit affirmed the portion of the rules permitting PRP participation in an assessment, but relied heavily on the Department of Interior's assertions that "[t]he PRP 'functions in a strictly ministerial role. The final choice of methodologies rests solely with the authorized official.'" Ohio v. Interior, 880 F.2d at 467. More importantly, however, the Court made it clear that the decision to allow PRP participation in an assessment must be made by the Trustee case-by-case, in conformance with the trustee's fiduciary obligation to protect and preserve the natural resources:

The Trustee has absolute authority to direct and control the PRP in the assessment function: that should be enough to permit flexibility while still retaining ultimate accountability with a public trustee.

Ohio v. Interior, 880 F.2d at 467.

Exxon participation in this particular natural resource damage assessment would be contrary to the trust responsibilities of the Departments of the Interior, Agriculture and Commerce, and the State of Alaska. Trust law establishes fundamental fiduciary duties on the part of the Trustee; one of those is to protect the corpus of the trust. Another fiduciary duty is to avoid conflicts of interest, and to fully recover damages on behalf of the beneficiary public in order to restore or replace lost or injured resources, and to recover for other injuries when the corpus is destroyed or injured. See, e.g., In re Steuart Transportation Co., 495 F.Supp. 38 (E.D. Va. 1980); Maryland v. Amerada Hess, 350 F.Supp. 1060 (D. Md. 1972); NOAA, The Use of Economic Analysis in Valuing Natural Resource Damages at 71-76 (1984); W. Rogers, Environmental Law, 172 (1977); Sax, The Public Trust Doctrine in Natural Resource Law, 68 Mich. L. Rev. 471 (1970).

This case is clearly not appropriate for PRP participation, even on a limited basis. Implicit in the D.C. Circuit's decision was the reality that PRP participation requires a cooperative effort between the Trustee and the PRP. Such cooperation is not the reality of the Exxon Valdez spill. The State of Alaska, one of the Trustees participating in the draft assessment plan, has filed suit against Exxon; the requested relief includes a request for, among other things, punitive damages and certain natural resource damages. It is a clear conflict of interest for a defendant to perform the studies which will determine the total dollar figure of the recovery against it. No reasonable Trustee, Trustee's attorneys or Court would ever allow this to happen. Moreover, Exxon recently filed a counterclaim against the State of Alaska, alleging that much of the damage done by the spill resulted from the State's refusal to approve the use of dispersants. This hardly bodes well for "cooperative" efforts by Exxon and the Trustees.

Finally, the responsible parties in the Exxon Valdez case have repeatedly demonstrated their bias against full protection of the public and its natural resources. Exxon's clear conflict of interest with respect to cleanup and natural resource damages makes it an abuse of discretion, and a violation of fiduciary responsibility, for the

trustees to even consider allowing Exxon participation in the assessment. In late September, Exxon's internal decision to cease all cleaning activities after mid-September 1989 was uncovered. At Congressional hearings, however, Exxon agreed to revisit the issue in Spring 1990 to determine whether there was any need for additional cleanup. Because Exxon claims to have already spent \$1.3 billion in response to the Exxon Valdez spill, their motivation appears to be to limit any and all additional costs. In addition, it has been alleged that Exxon told its workers to treat beaches to the high mean tide line, whether or not oil was present higher up on the beach. Although Exxon reportedly provided no reason for selecting this arbitrary line for incomplete treatment, we can only assume that it was an attempt at cost control or an unfounded belief that Exxon's legal liability extended no further. Exxon has been only marginally helpful on the natural resource damage assessment itself. It "volunteered" to pay only \$15 million towards the assessment, less than half of the Trustees' estimated costs for the first ten months' studies alone.⁵

Alyeska Pipeline Company, the consortium of seven additional responsible parties, has continually refused to assist in long-term cleanup activities for the Exxon Valdez spill despite its legal obligation under its Contingency Plan to do so. Proposed Probable Cause, Findings and Recommendations of the State of Alaska, Before the National Transportation Safety Board, Docket No. DCA 89 MM 040, p. 97 (7-17-89). In August of this year, Alyeska also announced that its involvement in any future spills would be restricted to an "initial" response, leaving the bulk of cleanup responsibility to the tanker or cargo owner. New York Times, 10-18-89, p. A16. The clear motivation of Exxon and other responsible parties in the cleanup activities for the Exxon Valdez spill has been to cut costs and avoid liability, as is well illustrated by Exxon's recent counterclaim against Alaska. We can expect no different behavior for the natural resource damage assessment. This certainly is not the formula for an objective and comprehensive natural resource damage assessment which fully protects and preserves the public trust in the natural resources of Prince William Sound.

If the Trustee Council is concerned about funding for continued natural resource damage assessment activities, the Environmental Groups suggest the following options:

- Federal and State Trustees should request additional appropriations for the assessment from Congress
- State Trustees should request additional appropriations for the assessment from the State legislature and Congress
- All Trustees should file cost recovery or other actions against Exxon and other responsible parties immediately, and obtain declaratory injunctive relief for future assessment costs.

⁵ The \$35 million estimated cost figure for assessment studies through February 1990 itself underestimates the true cost of comprehensive injury determination and economic valuation studies for the Exxon Valdez spill.

E. No Discount Rate Should Be Applied to the Exxon Valdez Natural Resource Damage Assessment

The draft assessment plan indicates that "[t]he [discount] rate to be used as a basis for calculating the final damage claim against the potentially responsible parties has not yet been determined by the Trustee Council." Plan, p. 26. Especially in light of the unique ecosystem affected by the spill, no discount rate (or a discount rate of zero) should be used to calculate natural resource damages for the Exxon Valdez oil spill.

There are many risks associated with discounting future natural resource damages to present value, many of which were acknowledged by the D.C. Circuit.⁶ As resources become scarcer over time, and the demand for them increases, their value will also increase. Similarly, restoration costs may rise faster than the general price level. Indeed, the D.C. Circuit noted that Trustees "should take into account the possibility that the value of a particular restoration project will increase over time, as a function of scarcity, faster than the rise in general price level." Ohio, 880 F.2d at 465. Since these future increases in value or cost cannot be predicted with precision, and do not act like non-resource values for "widgets" that are normally discounted, any discounting to present value can result in significant underrecovery. For many natural resource injuries, there may be no way to value them fully. The draft assessment plan's description of bird injury assessment studies frankly acknowledges that "[a]ssessment of injury to birds, therefore, will be understated." Plan, p. 145. Thus, the undervaluation inherent in the natural resource damage assessment process will simply be magnified by discounting an inadequate damage amount to present value.

A discount rate requirement also runs directly against the grain of the Trustees' fiduciary obligations to future generations. Because of the importance of future generations of potential users, many economists believe that no discount rates should be applied where a public Trustee is recovering for injuries to natural resources. As has been pointed out:

discount[ing] the resource value to present value ... tends to reduce to insignificance the importance of the next generation's concerns. Some of the assumptions underlying this technique can be questionable when valuing natural resource damages.

Yang, "Valuing Natural Resource Damages: Economics for CERCLA Lawyers," 14 Env'tl. L. Rep. 10311 (Env'tl. L. Inst., Aug. 1984).

⁶ Although the D.C. Circuit did not overturn the 10% discount rate contained in the Federal natural resource damage regulations, it did note that the Department of Interior was free to revise the discount rate at any time in the future. The Court also expressed concern that assessments reflect the increased future value associated with resources that become scarcer over time. Ohio v. Interior, 880 F.2d at 464-65.

Discounting to "present value" is particularly inappropriate in the case of a spill of this magnitude in the unique Alaska ecosystem devastated by the Exxon Valdez oil. Discounting is justified only when there are ready substitutes for widely available marketed good. In the case of Prince William Sound, the Alaska Peninsula, Kodiak Island, and the other unique and pristine ecosystems affected by this spill, there are no ready substitutes. Thus, it is theoretically as well as practically inappropriate to discount future losses to present value, because these resources cannot readily be replaced with other easily purchased goods. Where, as in Alaska, the resources injured are unique, future demand for them undoubtedly will increase, future generations will want access to such resources, and uncertainties are large and essentially unpredictable (other than that values will increase substantially as the resource becomes more scarce), discounting is inappropriate.

F. The Trustees Need to Collect and Analyze Adequate Numbers of Samples

The Environmental Groups are very concerned by the recent decision limiting researchers to 10 samples for timely tissue hydrocarbon analysis. Moreover, we are deeply concerned by reports that other limits have been placed on the number of samples to be taken and analyzed. We have also heard that all marine and terrestrial mammal studies except sea otters may terminate in January 1990, because the minimal data gathered this year may not conclusively show injury.

From a scientist's perspective, conclusions about injury ideally should be based on a representative number of samples (samples per animal, and total number of animals sampled), as well as a level of analysis sufficient to identify the presence of oil and a relationship between injury and the oil spill. Samples also should be taken over an adequate geographical and temporal distribution if possible. From a lawyer's perspective, the natural resource damage assessment for the Exxon Valdez spill will be easiest to defend in court if it is supported by statistically significant conclusions.

The Trustees (presumably in reaction to perceived financial constraints) may be "penny wise", but "pound foolish". The entire assessment exercise will be a disaster (environmental, financial, public relations and public trust disaster) if the assessment produced after spending tens of millions of dollars cannot be defended in court or in negotiations with responsible parties. The Trustees have a fiduciary obligation to: (1) discover the full extent of damages to public trust resources caused by the oil spill; (2) restore, replace or acquire the equivalent of the injured natural resources; and (3) recover the costs of doing so from Exxon. The Trustees' recent actions, as well as the budgets proposed in the draft assessment plan, clearly violate the public trust duties.

In addition, and of more immediate importance, any decision to terminate studies in February 1990 must be based on adequate information about the presence of oil in the environment and its effect on individual species. If the Trustees improperly limit the number of samples taken or analyzed before February 1990, or limit the level of analysis, they may conclude, based upon an inadequate data base, that the Exxon Valdez oil spill did not cause certain environmental or ecological injuries, when further studies

would have confirmed the existence of such injuries. As discussed in the sections on resource-specific studies, many of the effects of the oil spill are long-term or cumulative, and cannot be determined in the year of the spill. Multi-year sampling for all studies should continue to confirm any preliminary study conclusions about the lack of injury.

III. COMMENTS ON PROPOSED STUDIES IN DRAFT ASSESSMENT PLAN

A. Coastal Habitat and Air/Water Studies

1. Lack of Detail

The coastal habitat and air/water studies provide no details about sampling or measurement methods, and do not describe the timing or frequency of sampling. It is therefore impossible to determine whether the study results will support reliable or defensible conclusions of injury to natural resources. This is particularly critical, since these six studies form the factual basis for many of the injury determinations to be made in the later-described species-specific injury assessment studies and economic valuation studies. If the coastal habitat or air/water studies provide incomplete, inaccurate or scientifically insignificant data, the injury assessment could be substantially weakened. Unless sampling and measurement methods are well-designed and implemented, the Trustees risk spending \$35 million dollars (prior to February 1990) for a damage assessment that might not stand up in court (or support negotiations). It is simply not possible to know from the descriptions of the studies whether these methods are adequate.

The meager study descriptions provide no indication that sampling methods will be the same across studies (compatible sampling methods for the coastal habitat and air/water studies, and compatible methods between the coastal habitat and air/water studies and the resource-specific studies). Again, adequate Standard Operating Procedures for these studies are important to valid, defensible injury determinations.

There is also inadequate information to determine whether comprehensive sampling and analysis will be done at a few representative locations, or less detailed analysis will be conducted at numerous locations. Since these studies should be used to discover gross and subtle effects of the oil spill on various habitats (ranging from identifying tar balls in the water column to investigating bacteria), the Trustees should consider, in addition to broad-scale studies, concentrating on characterizing fully a few carefully selected representative samples of each type of habitat.

2. Arbitrary February 1990 Deadline

The coastal habitat and air/water studies cannot serve their avowed purposes if they are terminated prematurely after February 1990. Multi-year sampling probably is necessary to document: (1) temporal persistence of oil and its components in the environment; (2) cause and effect relationship between many injuries and the oil spill; (3) recovery of the environment with and without cleanup efforts; (4) the effect (success or failure, and harm) of cleanup measures (such as steam cleaning), and (5) the fate and transport of oil in different parts of the environment (e.g. adsorbed to shallow sediments, diffused in water column, in shallow tidal pools, beneath the surface or beaches, etc.) It is an implicit assumption of most of the six studies that they will continue over a period of years.

It is well-known that oil can persist in the environment for many years. We note that evidence of oil remains in the subsurface sediments 20 years after the West Falmouth oil spill. Degradation of oil in cold environments is particularly slow; as the National Academy of Sciences has noted, "generally, the rate and extent of hydrocarbon biodegradation [is] severely restricted at low water temperatures." Oil in the Sea at 304 (1985). Under their trust obligations, the Trustees must therefore assess the continual injury (short-term and cumulative) occurring as long as the Exxon Valdez oil remains in the spill area. The initial foundation of such a complete assessment is an investigation of the presence of oil and its components in the environment over time.

3. Limited Definition of Injury to the Environment and the Need for Ecosystem-Based Studies

The ostensible purpose of the coastal habitat and air/water studies is to determine injury to the environment which serves, among other things, as habitat to wildlife. The study descriptions mention in several places that data demonstrating a violation of federal or state water quality standards or volatile organic compound (VOC) standards "constitutes de facto evidence that ... uses protected under regulation have been jeopardized." Plan, p. 42. While this may be true as a legal matter, contamination levels far below such standards may be injurious to many organisms. The draft assessment plan acknowledges that low levels of contamination can injure fish and wildlife. For example, "ingestion of small amounts of crude oil are known to have effects on reproductive hormones of birds." Bird Study 5. "Bioassays using crude oil from Prudhoe Bay and elsewhere have shown that exposure to concentrations as low as a few parts per billion in seawater will cause loss of limbs in Tanner crab, immediate death of eggs and larvae of herring, and death of Dungeness crab and shrimp." Plan, p. 48. Indeed, negative impacts ranging from chromosomal aberrations to behavior disorders and chronic toxicity have been documented in many species at low levels of exposure to oil and to oil-dispersant mixtures. See, NAS, Oil in the Sea at 369-548 (and references cited therein) (1985); NAS/National Research Council, Using Oil Dispersants on the Sea (1989).

Comparing "a few parts per billion" exposure to the water quality standard of 10 ppb raises the concern that these studies are merely trying to identify gross contamination of the environment. Exposure of marine mammals (e.g., sea otters) to VOC emissions from oil lying on the water surface can cause serious respiratory problems, and possibly death. It is therefore incorrect to use lax air emission standards based on human exposure from industrial sources and processes as the standard for "injury" in the Exxon Valdez case, although in the absence of any data on impacts of VOCs on marine mammals or other organisms, such human-based standards may merit consideration. In order to determine the full extent of injury to all natural resources, these studies must document any detectable presence of oil in the study area, no matter how small.

The draft plan's descriptions of these six studies reflects an unlawful focus on human use values. The purported reason for studying coastal habitat, air and water is to determine the presence of oil in the habitat used by "valued resource species" and

"higher order organisms of economic importance". Plan, p. 29. The law is clear, however, that all values (consumptive and non-consumptive, use and intrinsic) must be reflected in a natural resource damage assessment. Ohio, 880 F.2d at 463-64. In order to capture all values and all lost services, the groundwork must be laid in these studies which should document the presence and persistence of oil at all levels of the environment -- from the bottom to the top of the food web and of the beach, water, and sediment columns.

The studies should also investigate ecosystem health, including primary and secondary productivity. Ecosystem studies could be performed annually for five years, bi-annually for several years thereafter, and less frequently (perhaps every three years) for as long as oil or its constituents are present in the Prince William Sound environment. (See NRDC comments).

4. Lack of Coordination Between Coastal Habitat, Air/Water Injury Assessment Studies, Economic Value Studies and Restoration Plan

The study descriptions do not mention whether or how these six studies will be coordinated with the economic valuation studies. The data on coastal habitat, air and water is described solely as an input for species-specific injury determination studies, which themselves are then the inputs for the economic valuation studies. Without access to any of the results from this year's data collection, we are unable to suggest precisely how additional coordination could be accomplished. If, however, the data reflects extensive oil contamination at all levels of the ecosystem, this fact alone could be an important effect (injury) to be included in the surveys under Economic Studies 5-7 (recreation, subsistence and intrinsic values). The Trustees should be very careful to incorporate evidence of injury found in these six studies in relevant economic studies, to avoid undervaluation of the natural resource injury to the extent possible.

Restoration of habitat will be an important feature of any restoration plan. There is no discussion of how the data collected in these six studies will be used to develop a restoration plan, or to estimate restoration costs. Assuming that habitats have been destroyed, and that effects of the oil spill can be found even at the lowest levels of the food web, these habitats and the ecosystem functions of all injured organisms will have to be restored or replaced, or their equivalent acquired, for the mandatory restoration provisions of CERCLA and the Clean Water Act to be met.

5. Missing Studies

A study should be conducted to compare, to the extent feasible, the hydrocarbon concentrations in intertidal and subtidal habitats pre- and post-spill. It is our understanding that some historical baseline information exists for mussels and sediments in the Prince William Sound area, thus potentially providing important evidence with which to demonstrate causation of natural resource injury by the Exxon Valdez oil spill.

The air study relies primarily on assumptions of VOC release rates from the spill, and modeling, rather than direct sampling to determine the exposure to VOC emissions

resulting from the release. Many of the "clean-up" activities, including beach treatment and possible incineration have resulted, and will continue to result, in exposure of wildlife and humans, to heavy equipment, aircraft, and many other intrusions as well as air emissions. The Air/Water studies should document continuing air emission releases, whether from lingering oil, treatment or restoration activities.

The Environmental Groups are surprised that no studies have been proposed to explore the potential human health risks attendant with the Exxon Valdez oil spill and cleanup efforts. The draft assessment plan should include at least one study to estimate current and future risk to human health from all potential exposure pathways, including at a minimum ingestion of contaminated seafood, inhalation of air emissions or vapors, and absorption through the skin by cleanup workers or natural resource damage assessment researchers.

Finally, as noted earlier, there is a clear need for an ecosystem-wide study of the impacts of the spill on the food web, and on the species and population makeup in the wake of the spill. See, NAS, Oil in the Sea, at 436-448 (1985). Such a "big picture" study apparently is not envisioned by the plan, which focuses heavily upon developing injury assessments for species with direct human use values. This would severely undervalue the affected environment and ecosystem.

6. Study-Specific Comments

Despite the coastal habitat study's objective to provide information "on potential petroleum exposure either from contaminated food or through direct uptake from the environment," it is unclear whether the proposed study will provide all relevant (such as resilience, resistance, stability, species diversity) information. At a minimum, the study should provide information on fish prey species, planktonic invertebrates, planktonic algae, and bacteria, as well as primary and secondary productivity. Why will bioassays be performed for arthropods only? The study should address acute and chronic toxicity for organisms from several different trophic levels (including algae, phytoplankton, zooplankton, and microbiota).

Algae and plankton are an extremely important component of the Prince William Sound ecosystem. Recent research also indicates that bacteria play a very important role in the food chain. The full extent of injury to specific species, or injury to the Prince William Sound ecosystem as a whole, cannot be determined unless a comprehensive coastal habitat study is performed. In addition, restoration efforts for many species cannot be successful if their habitat (and the plankton, algae and bacteria that form the foundation of the food chain) has not been fully restored. For example, fish can be restocked in "clean" areas and survive, but fail to reproduce due to residual low-level ecosystem contamination. The Great Lakes region is an example of this phenomenon, where scientists suspect that low levels of contaminants in the ecosystem are having a negative effect on fish reproduction. Injury at all levels of the ecosystem must be determined in order to develop and implement successful restoration strategies.

More specific comments on the coastal habitat and air/water studies can be found in comments submitted by the Natural Resources Defense Council, which are incorporated herein to the extent not inconsistent with the Environmental Groups' comments.

B. Fish/Shellfish Studies

After review of the fish study descriptions, it appears that all injuries to all fish species potentially affected by the Exxon Valdez spill will not be determined. For most fish species, the focus of the assessment is limited to lethal impacts. In addition, the species to be studied are limited to those of commercial significance or of demonstrable recreational value (human use values). As a result, a natural resource damage assessment based solely on these studies limited to a handful of species will seriously undervalue the natural resource injuries caused by the spill.

1. Lack of Detail

The Environmental Groups have found it difficult to review the fish study proposals, because they lack detailed descriptions of study methodology and study scope, and do not discuss the various options for study considered. There may be easily explained rationales for the selected approaches, but we are unable to comment on their validity.

2. Arbitrary February 1990 Deadline

The arbitrary February 1990 study termination date is incompatible with the objectives of many or all of the fish studies, and will significantly limit the usefulness and defensibility of the data collected. The Environmental Groups understand that many or all of the fish studies were originally designed to continue for 3-6 years. Their termination in February 1990 is unexplained, and unreasonable. There are many reasons why long-term assessment of injury to fish is required.

A return to spawning grounds is an essential element of several studies. At a minimum, the "return" to spawning grounds cannot be determined until later in 1990. For many species, the fish hatched during 1989 will not return to their spawning grounds in Prince William Sound for two-five years. The long-term effect of the oil spill on fish reproduction thus cannot be determined in a 10-month study.

In addition, many fish have a variable life history in terms of the time spent in fresh water and at sea. The fish therefore need to be monitored over the course of a life cycle, in order to determine the full effect of the oil spill on behavior patterns.

The effects of oil in the marine environment can be measured for years after a spill. For example, oysters (an indicator species) studied after the grounding of the Amoco Cadiz continued to show levels of hydrocarbons in their tissues for seven years after the spill. Similarly, many lethal and sub-lethal impacts of oil have been

documented in marine ecosystems that persist for many years, including long-term perturbations in entire invertebrate populations, death of vulnerable stages of fishes' life cycles, metabolic perturbations, decreased growth, increased vulnerability to disease, reduced ability to repair tissues, and increased vulnerability to parasites in fish and certain other species. See, e.g., NAS, Oil in the Sea, at 383-548 (1985).

Thus, the Trustees must recognize that any injury to oysters (and all other species they are representative of) will continue for many years. The studies should include at least several years' data collection in the injury assessment and economic studies and dollar damage assessment, or a significant percentage of the injury to fish/shellfish could remain undocumented.

Oil remains in the reefs, sediments and water column of Prince William Sound, and is likely to remain for many years. Consequently, fish not exposed to oil during 1989 will be exposed during subsequent years. In addition, fish that were exposed during 1989 will be exposed again during 1990 and beyond. To accurately reflect the full scope of injury to the fish/shellfish resource, studies must be repeated each year to quantify the universe of fish affected by recent exposure to the Exxon Valdez oil. In addition, studies must address the cumulative impacts of long-term exposure by the fish present in the Sound during 1989.

3. Limited Definition of Injury to Fish

The types of injuries to fish and shellfish included in the 26 proposed studies are grossly inadequate. The studies almost totally ignore any sublethal impacts on fish, and frequently focus more on the impact of the oil spill on the people who fish than on the fish themselves. As public trustees of the natural resources, the Trustees' concern during injury determination should be all potential impacts of the oil spill to fish and the environment and ecosystem which support the fish. The changes in harvest or use of fish, while important, are relevant primarily for purposes of quantifying a portion of the impact (out-of-pocket economic loss studies). Such changes do not necessarily or completely document sublethal impacts to fish.

The studies taken as a whole do not appear to systematically investigate all potential impacts for each species of fish and shellfish. Not uniformly included in many of the fish studies are disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including reproduction) or physical deformations. See, injury determination criteria for biological resources, 43 C.F.R. §11.62(f)(1)(i). Yet, it is well documented in scientific literature that each of these impacts can be found in fish as a result of oil spills. See, Injury to Fish and Wildlife Species, Type B Technical Information Document, U.S. Fish and Wildlife Service, June 1987 (PB88-100169). Sublethal effects such as fin erosion, fish neoplasm, reduced fish reproduction, histopathological lesions should be included in the proposed study designs. The studies also should evaluate any resultant developmental problems, reductions or dysfunctions in growth, metabolism, and behavior impacts on food web microbes, plankton, macrophytes, benthic and intertidal invertebrates, and fish, whether or not they have direct human use value.

possible. Since such actions are, however, the statutory minimum of the Trustees' responsibilities, the Environmental Groups assume that restoration plans will be developed concurrently with injury assessment studies, and that restoration costs will be calculated as the minimum measure of damages.

Restoration requirements for the fish and shellfish resources affected by the spill emphasize the importance of performing comprehensive ecological studies to determine direct toxicity and trophic level interactions. While fish can be restocked to levels that allow rehabilitation of the population, the restocked fish may themselves pose a hazard to other natural resources (fish-eating animals) or humans. To the extent that any constituents of the oil bioaccumulate in fish tissue, restocking without full restoration of the fish habitat (food supply) may have long-term secondary effects. The human impacts can be measured using EPA's guidance manual for assessing human health risks from chemically contaminated fish and shellfish, to be published shortly.

If the Trustees consider restocking as a restoration option, the Prince William Sound fish populations should not be restocked with foreign genetic material. An intensive restoration program should be based on hatchery work with remnant wild stocks, or instream enhancement of remnant wild stock.

5. Missing Studies

The most likely impacts of oil contamination on fish and shellfish populations (and their food) will be the subtle long-term changes in survival (at various life stages) and reproduction. Some studies seem designed to look only at gross impacts -- the fish are dead, fish are obviously oiled and dying or fish are packed with tar balls. Other studies look at differences in numbers of fish available at a given period -- something that is hard to predict in years before the spill -- and make comparisons between fish suspected of being oiled and fish not oiled. No studies appear designed to identify the subtle long-term changes in survival and reproduction. See, NAS, Oil in the Sea, at 383-424 (1985).

The studies proposed for salmon generally are weak and will not detect the full extent of injuries to this important resource. In general, the salmon studies do not look at contaminant body burdens nor do they look closely enough at impacts to the various life stages. Data collected may fail to predict long-term population declines. In addition, the gross nature of studies proposed will make it very difficult to detect subtle adverse impacts based upon the data collected. Use of laboratory/hatchery studies, in addition to field measurements, would be preferable.

No work, or very little, is proposed for prey species of principally studied fish. Numerous smaller species of fish, planktonic invertebrates, and algae were affected by the oil spill. These species have value as food in the intricate predator-prey web that allows for proper development of fish species such as salmon. The only work on algae is included in the section on green sea urchins; even that study is limited to looking at attached algae (kelp). It is unclear how extensively the coastal habitat study will investigate ecosystem/food chain effects. Whether included as part of the coastal

The Environmental Groups are encouraged that the acceptance criteria found in the federal regulations (43 C.F.R. 11.62(f)(2)) are not mentioned in the draft assessment plan. We urge the Trustees not to tie their hands with these overly rigid, often impossible to comply with, and scientifically unfounded, acceptance criteria. We suggest that the Trustees use the traditional tort law causation standard. See, Restatement 2d of Torts, §431 (1965) (showing that it is more likely than not that the defendant's "conduct is a substantial factor in bringing about the harm").

The Trustees should be particularly aware of the potential difficulties of demonstrating absolutely ironclad causation for injuries to fish from the Exxon Valdez oil spill. The proposed studies seem based on questionable assumptions about the significance of oil found in the vicinity of fish. Because fish are mobile, the causal link between fish injury and the oil spill often can best be determined by knowing where a fish has been, rather than by where a fish was caught. For example, a fish could spend considerable time in a heavily oiled area, and then swim to a clean area from which it is caught for analysis, or vice versus. A scientist could then draw the conclusion that fish in "clean water" are contaminated, thus providing evidence that some fish are "naturally" contaminated with hydrocarbons, and the oil spill did not contribute to such elevated contaminant levels. While this example may be simplistic, it illustrates the basic point that fish are mobile and must be considered as such. The Trustees must consider this reality when doing gross capture studies such as those described in the draft assessment plan by assuring that any "control" studies indeed are not affected by the spill. Where distributions are unknown, mark distribution studies should be considered to determine the extent of migratory pattern that might be encountered.

4. Lack of Coordination Between Fish/Shellfish Injury Assessment Studies, Economic Value Studies and Restoration Planning

Some of the fish studies are described as inputs into one or more of the economic studies. Several of the fish studies do not indicate the relevance of the data gathered to the assessment process, or whether they will be used in an economic valuation study. The information provided on coordination of the fish studies with other aspects of the draft assessment plan is totally inadequate for coherent review or intelligent comment.

The sampling and analysis approaches may differ significantly between the studies, for no apparent reason. Studies of the same species conducted in and outside of Prince William Sound (e.g., Fish Studies 18 and 24, trawl studies) have different sampling objectives. One study will analyze stomach contents, while another will not. Many of the other studies on the species are described so vaguely, that the exact sampling and analysis intentions of the studies cannot be compared.

No attempt has been made by the Trustees to integrate the fish injury assessment studies with the required restoration plans, or restoration cost analysis. The draft plan gives no indication that the fish or shellfish injuries documented will be reversed in the restoration process, or that such injuries will be economically quantified to the extent

habitat study or fish studies, the data is critical to a complete natural resource damage assessment, and to successful restoration efforts.

Of course, in urging that a "big picture" food web and ecosystem impact study be completed, we recognize that full ecosystem analysis probably cannot be done given the proposed scope of sampling. The draft assessment plan looks somewhat superficially over a very large geographic area with only a limited number of samples of a few of the more "important" species. The Trustees should consider looking more closely at the entire food web in smaller geographic areas, and extrapolating what they find to the entire impact area. Major impacts on microbial action, algal growth, growth of plankton, growth of benthos, cycling through the food web of contaminants, growth, metabolism, behavior, and other subtle effects could be better addressed in a more focused study. Factors such as microbial growth or bacteria analysis are extremely important in understanding impacts as a result of the oil spill because of the tremendous potential shifts in the balance in "typical" relationships between these organisms and organisms further up the food chain.

6. Fish Study 1: Salmon Spawning Area Injury

This study must extend beyond the February 1990 deadline. This is a rather complicated study that can easily be confounded by key variables such as fishing pressure changes. All assumptions made must be clearly specified in the course of assessing results.

7. Fish Study 2: Egg and Preemergent Fry Sampling

The Trustees should consider conducting controlled laboratory studies to look at the overwinter mortality of eggs to pre-emergent fry, in addition to or instead of conducting the studies as proposed, *in situ*. If impacts are detected as a result of the proposed analysis of hydrocarbon content in alvins, an assessment of what these results will mean to future generations should be undertaken.

8. Fish Study 3: Coded-Wire Tagging

Sample sizes listed in this study appear to be low. Thus, it may be difficult to draw conclusions by comparing the limited number of streams and hatchery facilities, some heavily oiled and some not. In addition, this study looks at gross impacts. The Trustees should consider taking fewer fish and examining them more closely in a controlled environment than to conduct the gross examination proposed, looking at exposed versus non-exposed fish.

Work on mortality and chronic effects could be done with greater control over confounding variables in a laboratory or experimental environment. In addition, the methodology proposed (looking at survival rates at harvest of fish) may prevent the Trustees from identifying subtle effects of the oil spill on fish. Due to the confounding effects of natural factors that vary by year and by area, the proposed studies may only show the presence or absence of extreme anomalies (gross differences between oiled and

non-oiled). The study should be looking for subtle differences, such as small percentage changes in viability of eggs or fertility of sperm. It is this type of change that will have a profound long-term effect on the viability of the salmon population.

In addition, salmon may either distribute themselves evenly and mix with other stocks (spawning groups) or they may maintain fairly discrete groupings while at sea. One group may be subjected to differing environmental factors (and contamination-independent differences in survival and growth) than another group. If one group is oiled and the other non-oiled, then differences in growth/survival as a result of oil-related impact may be masked by differences resulting from natural causes. Unless gross differences between oiled and non-oiled groups exist, it could be erroneously concluded that exposed fish have a higher survival rate than non-exposed fish. Natural factors could enhance the survival of impacted fish, while differing natural factors elsewhere could adversely impact unexposed fish. In essence, the methodology proposed limits the conclusions that can be drawn from this study, and may not meet the stated study objectives.

9. Fish Study 4: Early Marine Salmon Injury

Objectives for this study appear appropriate. Documenting fish kills within the study area will be extremely difficult. Fish kills are hard to detect and are easily missed. Luck plays perhaps the greatest factor in whether or not this aspect of the study will yield useable or reliable results.

The proposal to look at food resources is helpful, but no sampling or assessment methodology is described in this study or elsewhere in the draft assessment plan that will provide an evaluation of fish food resources, especially planktonic food, which is very important to juvenile salmon.

Coded wire tag studies which will provide an assessment of fish movement may yield information useful in helping to sort out the confounding factors discussed as problems in Fish Study 3. This will require very sophisticated analysis, however, which is not described in the draft assessment plan.

10. Fish Study 5: Dolly Varden Injury

Reference is made in Fish Study 5 to how greatly fish survival can be affected as a result of impacts to prey species. As discussed previously, however, no work is proposed (or appears to have been done) to assess impacts of the oil spill on prey.

In general, this study is of fairly limited scope. There should be an additional examination of the fecundity of fish and survival of egg through juvenile life stages, between exposed and non-exposed groups of fish. Survival work can be done in the laboratory or hatchery. Inspection for anomalies -- gross and subtle -- should be part of the study.

Objective C (looking at exploitation rates) is unnecessary and unless accompanied by careful analysis and supported by additional data may provide misleading results. There may be better ways to measure fish impacts than to find out how good (or bad) the fishing is. Detailed assessment of catch data will be difficult since recreational fisheries are variable and influenced by many, difficult to control, factors. In addition, the confounding effects of mobility of fish must be considered.

In general, Fish Study 5 will provide a gross estimate of mortality of relatively large fish (the most hardy stage in the fish's life cycle). Unstudied will be long-term chronic effects, such as heart and kidney disease, cancer, damage to gills, gut, vertebrae, eye lenses, stomach, brain and olfactory organs, and many other sublethal impacts well documented in the literature. See e.g., NAS, Oil in the Sea, at 420-24 (1985). Also unmeasured will be the impacts on reproduction. The Trustees should consider an analysis of body burdens of hydrocarbons and other potential oil-spill related toxics. An estimate of long-term population impacts could be made based on predicted impacts, using existing experimental work.

11. Fish Study 6: Sport Fishery Harvest and Effort

This is the first study purporting to "estimate" the presence of body burdens of hydrocarbons. The level of detail, however, is unacceptable. The gross analysis should be replaced by actual measurement of hydrocarbon content in a statistically sufficient sampling of organs and flesh. Relative concentrations can then be compared between groups of fish, producing much more reliable and defensible results.

12. Fish Study 7: Salmon Spawning Area Injury, Outside PWS

The gross method of analysis (simple counts of live and dead salmon by species, and egg and pre-emergent fry densities) does not provide a close enough look at what is happening to draw conclusions beyond gross impacts as a result of hydrocarbon presence. The study should measure the contaminant body burden of spawning adults, and bring eggs and fry into a controlled environment to watch them develop. Abnormalities in development should be assessed and compared between exposed and non-exposed groups. Egg and fry survival should be compared between groups. The natural differences between spawning and rearing areas that could confound the study can best be factored out in a controlled environment. The type of work suggested is not very difficult or expensive, yet the increased reliance one can place on the data after conducting such work is well worth the additional effort. If possible, field measurements ideally should be taken to "confirm" the more controlled laboratory/hatchery analyses.

13. Fish Study 8: Egg and Preemergent Fry Sampling, Outside PWS

As in Fish Study 7, a closer look at eggs and fry is needed to provide a greater measure of reliability. In addition, juvenile fish should be subjected to a more thorough analysis of growth. For maximum information (perhaps necessary if impacts as a result of oil exposure are subtle), the Trustees should consider examining the daily growth

rings of otoliths, which provide the age of fish, to determine an estimate of daily growth rate. Comparison can then be made between growth of fish in exposed and unexposed groups.

14. Fish Study 9: Early Marine Salmon Injury, Outside PWS

A more rigorous examination of juvenile growth is warranted.

15. Fish Study 10: Dolly Varden and Sockeye Injury, Lower Cook Inlet

Fish Study 10 is the first to mention the importance of zooplankton in the food chain of fish. Direct reference is made here to copepods. There is, however, no plan to assess the impact on copepod populations or any other assessment on food sources for the fish under study. It is unclear whether the coastal habitat study will provide the necessary data. Objective A is important. It should be considered that Objective C (comparison of marine survival rates of sockeye salmon in oiled areas with known survival rates prior to the spill) could be confounded by natural factors during the year of study.

Fish Study 10 is clearly a multi-year study, making the February 1990 deadline for completion of this study ludicrous. All fish should be analyzed for body burdens of hydrocarbons, whenever and wherever there is likelihood of contact.

The information provided by a comparison of marine survival rates for both stocks to data collected before the oil spill will be useful only if gross anomalies are found. Subtle effects on marine survival will not be captured, and should be studied through the development of additional information or data.

16. Fish Study 11: Herring Injury

This study provides for a much more detailed analysis than the previous studies proposed for salmon. The salmon studies could benefit from redesign. The Fish Study 11 design should permit valid comparison between exposed and non-exposed groups, and should allow analysis of population trends in a way that will be useful in determining actual impacts, and making some estimates regarding long-term population consequences.

17. Fish Study 12: Herring Injury, Outside PWS

From the available superficial description, this appears to be a well-designed study.

18. Fish Study 13: Clam Injury

From what we can discern from the summary description, this appears to be a well-designed study.

19. Fish Study 14: Crab Injury

Based on the simplified description provided, this appears to be a well-designed study. Especially important is the assessment of abnormalities in newly formed crab shells, and examination of reproductive factors such as fecundity, egg loss, and condition and development through time. This is exactly the kind of work that should be conducted for salmon, but which is not included in the aforementioned proposed studies.

20. Fish Study 15: Spot Shrimp Injury

From the brief description, this appears to be a well designed study. Unlike many other studies, this study addresses lethal and sublethal impacts. It measures hydrocarbon concentrations in the target species (shrimp) and looks at factors such as egg fecundity, mortality, and sublethal effects in oiled and non-oiled areas.

21. Fish Study 16: Injury to Oysters

From the brief description, this also appears to be a well designed study. It is the first use of any sort of quasi-controlled analysis found in the draft assessment plan. Three oyster farms will be compared. Existing growth data will be compared to data collected after the spill. The use of "experimental techniques" and control populations is well justified, given the probable subtle nature of oil impact. Consideration should be given to using similar methodologies for other fish and shellfish species.

22. Fish Study 17: Rockfish Injury

This study appears to be well conceived. Analysis of hydrocarbon burdens is included in the study plan. An assessment of the effects on reproduction as a result of hydrocarbon loading should also be included. For example, impacts such as fecundity, egg and larval abnormalities, and survival should be assessed. In addition, research should focus on identifying any possible long-term chronic effects that decrease survival of exposed fish.

23. Fish Study 18: Trawl Assessment

This study is primarily a simple fish assessment involving fish sampling by trawl. While few details are provided, it appears to be a well designed study, yet simple in concept. In addition to fish sampling for gross anomalies and gross reductions in number, tissue and organ samples will be collected for analysis of hydrocarbon content and apparent injuries. Of course, it is critical that an adequate number of samples be collected and analyzed. This greatly expands the value of this study, relative to many of the fish-specific studies.

24. Fish Study 19: Larvae Fish Injury

This study appears to be well designed based on the limited description. It is difficult to work with a multi-species mix of larval fish. In addition to the studies

contemplated, the Trustees should consider conducting an age-growth study of larvae, looking at daily growth rings of otoliths to determine age. Such analysis will allow an examination of subtle differences in "fitness" between oiled and non-oiled larvae. Conducting such a study will provide tremendously valuable fine-tuned information, without having to resort to internal examination or any type of forensic analysis. Minute differences in fitness between groups of fish can nevertheless be detected.

25. Fish Study 21: Clam Injury, Outside PWS

This study appears well designed, but more details are needed to fully evaluate it.

26. Fish Study 22: Crab Injury, Outside PWS

This study appears well designed, but again, more details are needed to fully evaluate it.

27. Fish Study 23: Rockfish Injury, Outside PWS

This study relies on the detection of fish kills. Fish kills are extremely hard to detect and luck plays a great deal in success. Otherwise, Fish Study 23 provides a good design to detect the presence of oil-impacted fish. The study appears to be relatively weak, however, in assessing what the presence of hydrocarbons means in terms of current and future population impacts. The study would be stronger if more detailed analysis of impacted fish were conducted, especially if the Trustees were to correlate hydrocarbon loads and known effects (from laboratory work).

28. Fish Study 24: Trawl Assessment, Outside PWS

This study will provide a rather gross analysis of effects in terms of population impacts. The methods appear to be good; the study should yield useful information assuming that the skeletally-described study in fact will be well designed and carried out.

29. Fish Study 25: Scallop Mariculture Injury

This is, in general, a good study, although again, more details are needed. There appears to be no proposed assessment of impacts on reproductive potential. Additional analysis will allow an assessment of long-term effects on population size.

30. Fish Study 26: Sea Urchin Injury

While this study is among the best fish study presented, it is again impossible to fully comment upon it in light of the sparse description provided.

C. Marine Mammal Studies

Although the study descriptions are brief, the Environmental Groups are very concerned that the budgets provided for the marine mammal studies are inadequate to locate a significant number of affected marine mammals, or to provide the sampling and analysis necessary to properly determine the extent of injury. The small budgets, combined with the difficulties inherent in studying sublethal and long-term impacts in protected species, virtually assure that the marine mammal portion of the natural resource damage assessment will fail to detect the full impact of the spill on marine mammals, and thus that marine mammal damage will be significantly undervalued.

1. Lack of Detail

As with the other studies, the marine mammal study descriptions are sadly lacking in detail on study methodologies, such as time and frequency of sampling and analysis, and timing and frequency of locating potentially affected animals. The Environmental Groups understand that each field researcher will be limited to submitting only 10 samples for timely analysis. This number is absurdly low for any study, but potentially fatal to attempts to detect the full extent of injuries in the case of marine mammals. Under this limitation, data can be submitted for few samples (e.g., liver, stomach content, muscle tissue) of three animals, or one sample from ten different animals. In either case, it is questionable whether the sample results will be sufficient to detect or fully document impacts of the spill on one of the richest marine mammal ecosystems on earth.

We cannot overemphasize the importance of having clear methods, lucid hypotheses and fixed end-points in the research plans for marine mammal studies, to avoid wasting money for statistically questionable and otherwise unreliable studies that are of an insufficient level of resolution to detect subtle or difficult to discern impacts, or that will be attacked as statistically insignificant. The study design must clearly anticipate how perturbations will be measured, and how an effect's relationship to the oil spill will be determined.

In addition, as the Trustees are undoubtedly aware, it is preferable to gather fresh samples for necropsy (e.g., viral and bacterial samples at the time of death) in order to isolate the cause of death. This requires steady monitoring of the coast to locate carcasses, perhaps as frequently as several times a week. The study descriptions are too vague to determine whether adequate surveys and sampling will be conducted to fully document the impact on marine mammal population, or to relate marine mammal injuries to the oil spill. The budgets are not broken into enough detail to determine whether sufficient airplane and boat surveying support has been provided. At a cost of approximately \$300/hour for twin-engine aircraft (in great demand for virtually all the injury assessment studies), it is doubtful whether the budgets proposed will be adequate to locate marine mammals (especially cetaceans) in a timely manner to guarantee full necropsy results.

2. Arbitrary February 1990 Deadline

It is absurd to think that complete data on lethal and sublethal impacts to marine mammals can be collected during ten months after the spill; as proposed, the studies will significantly underestimate impacts on marine mammals. The Environmental Groups understand that portions of the sea otter study are just getting under way, thus there may be less than 4 months of data by the February 1990 deadline. Other studies, such as whale necropsies, have apparently been discontinued for the Winter.

These are long-lived animals, many with birth and death rates smaller than for most other animals. Due to their mobility and small total populations, there is great difficulty in locating the affected marine mammal population. For these reasons, it has taken multiple years to develop baseline information, to the extent that it exists. One-year cetacean studies, for example, cannot be expected to give an accurate portrait of distribution or abundance, and therefore likely will underestimate the impacts of the spill. Cetacean studies conducted in the Farallon Islands, and off Barrow, Alaska, have confirmed that humpback populations can vary significantly from year to year, so that one could readily conclude from a one year study that no impact or minimal impact had occurred, when in fact significant impacts may be documented by a multi-year investigation. Since marine mammal populations in the Sound vary year-to-year, and the effect of the oil spill on prey species is likely to be long-term, studies to determine the lethal and sublethal effects of the oil spill on marine mammals must continue beyond February 1990.

The research teams themselves (and the study descriptions) assume that the marine mammal projects will continue for at least 3-4 years. Several experts consulted by NWF opined that marine mammal studies should continue for at least 10-15 years, in order to document long-term injury from the Exxon Valdez oil spill.

3. Limited Definition of Injury to Marine Mammals

It is not clear that the studies will be investigating lethal and sublethal impacts for each marine mammal species. Although we understand that it is difficult to study impacts such as disease, cancer, genetic mutations, physiological malfunctions or physical deformations for living protected species, every effort should be made to gather relevant data wherever and whenever possible. Moreover, certain sublethal impacts are documented in certain marine mammals, including increased vulnerability to predation, interference with baleen functioning, interference with thermoregulation and metabolism, and aberrations in hematological parameters or enzyme activity (adrenal steroid exhaustion, for example), renal or other organ dysfunction, or even serious eye damage. NAS, Oil in the Ocean, at 424-30 (1985). It is our understanding that autopsies were not systematically performed during 1989 on dead marine mammals such as whales or sea lions. Unless remedied, this failure could seriously hamper the Trustees' ability to assess and recover for all potential injuries to marine mammals, including those listed in 43 C.F.R. §11.62(f)(1).

We also urge the Trustees to develop data to document injury resulting from both the oil spill cleanup efforts.

Again, the Environmental Groups are encouraged that the acceptance criteria found in the federal regulations (43 C.F.R. 11.62(f)(2)) are not mentioned in the draft assessment plan. As noted before, we urge the Trustees not to tie their hands with these overly rigid, often impossible to comply with, scientifically unfounded, acceptance criteria. We suggest that the Trustees use the traditional tort law causation standard. See, Restatement 2d of Torts, §431 (1965) (showing that it is more likely than not that the defendant's "conduct is a substantial factor in bringing about the harm").

4. Lack of Coordination Between Marine Mammal Injury Assessment Studies, Economic Valuation Studies and Restoration Planning

The draft assessment plan does not indicate how the seven marine mammal studies will be coordinated, how data relevant to multiple marine mammal species will be shared, or how these seven studies will be used to determine injury for the more than 25 species of marine mammals found in Prince William Sound. There also appears to be no coordination between the marine mammal studies and other proposed injury assessment studies for prey species, such as fish and shellfish. Data gathered and conclusions reached should be shared between the study teams, so that the marine mammal researchers can make injury determinations on the basis of relevant data not collected directly under the marine mammal studies.

The marine mammal studies are cited as inputs for those economic value studies using survey techniques (Economic Studies 5-7, recreation, subsistence and intrinsic values). While this is appropriate, the marine mammal studies should also be used to develop restoration plans, and to estimate the statutorily mandated measure of damages - restoration costs.

Restoration efforts for marine mammals must include restoration of their Prince William Sound habitat and prey species. This, in turn, requires restoration of the entire ecosystem to the extent possible, since many prey species (e.g., shellfish eaten by sea otters) themselves feed at the lower end of the food chain. If full restoration of Prince William Sound is determined to be infeasible, the Trustees must consider acquiring equivalent resources elsewhere.

The Environmental Groups suggest that options for equivalent resources include protection of other marine mammal habitats that are threatened by development or human activity. For example, the Cordell Bank area, near the Gulf of the Farallones Marine Sanctuary could itself be declared a sanctuary, thus protecting it from oil exploration and development. Similar actions could be taken to protect the offshore parklands of the Olympic National Park from oil and gas leasing. The Trustees could buy back the leases for Bristol Bay. Or marine mammal habitats in Southeast Alaska, such as Frederick Sound or the Alexander Archipelago, could be protected from human

interference through purchase of logging or other development rights. Finally, actions could be taken to control high-seas drift-net fisheries, thus providing long-term increases in certain marine mammal and other affected populations.

The Trustees also should be considering the development of management plans for marine mammals in Prince William Sound and contingency plans for future oil spills to avoid impacts on marine mammals; designation of sections of Prince William Sound and other areas as a sanctuary and elimination of all tanker traffic; and acquisition of habitat or development or harvesting rights for marine mammals or their prey, to assure protection.

5. Missing Studies

As noted earlier, we recommend careful field studies be undertaken, if they have not already been initiated, to determine sub-lethal long-term and chronic effects on marine mammals. Such studies must be supported by adequate autopsies and histopathological and other analytical work.

Most of the more than 25 species of marine mammals found in and around Prince William Sound are not specifically described as being included in the plan's studies, and we are therefore deeply concerned that they will be overlooked by the Trustees. While we recognize that many of the small cetaceans are difficult to study, and little baseline data may be available, the Trustees must nevertheless attempt to determine injury to these species to the extent possible. In addition, all species must be included in restoration planning. The limited focus on only a subset of the potentially affected marine mammal species underscores the serious undervaluation that will result from the Exxon Valdez natural resource damage assessment.

6. Marine Mammal Study 1: Humpback Whale

What proportion of the 40-50 animals appear in Prince William Sound in a given year? How many years of study were required to find the 40-50 animals? A decrease in the animals using the Sound in one year (found through an increase in effort) could easily and incorrectly be dismissed as yearly variation. Multi-year studies are needed.

Objective A is achievable as long as one remembers that all whales will not be counted or identified.

Objective B is unclear. The Trustees should consider putting more effort into the Sound and Kodiak area studies, which should reveal whale distribution on a much finer and more sensitive scale.

Objective C is the key to the damage assessment. Yet, the hypothesis and methods are not explained. How will this be done?

The emphasis on individual identification methods of animals is sound and has the highest chance of revealing subtle changes in distribution and abundance. The key

to success in this project will be the quality of past data. Thorough data are available from Southeast Alaska, a region biologically isolated from and unaffected by the spill; competent, but unfortunately limited effort, has been conducted in the Sound area. To our knowledge, no photo identification work and limited surveys have been conducted near Kodiak. With this weak "control" (the "before" picture), it will be difficult to measure anything less than serious gross impact; more subtle impacts will be overlooked.

7. Marine Mammal Study 2: Killer Whale

This study has a clear justification. As a predator near the top of the food chain, killer whales may be sensitive to large-scale changes in the Sound ecosystem. A multi-year study is critical.

Objectives A-C might be achieved, largely due to the quantity and quality of past research. Objective D is the key to the damage assessment. Yet, the hypothesis and methods are not explained. How will this be done?

Why was Kodiak not included in the survey? Kodiak was affected by the spill, and we believe previous data exist. Excluding Kodiak from this and other marine mammal studies is unjustified and may lead to a substantial underestimate of the spill's impacts.

8. Marine Mammal Study 3: Cetacean Necropsy

The determination of cause of death of cetaceans is notoriously difficult. Often the carcass is found days or weeks after death. Microbial enthusiasm sometimes renders the necropsy as unpleasant as it is futile. Autolysis starts shortly after death; the insulating blubber forms a kind of crock pot that incubates a disheartening array of microbes. While such studies can be done, the Trustees should recognize the difficulty of determining definitively the cause of death in the case of beached cetaceans. Inferences that document oil exposure -- e.g. tarballs or oil on baleen -- may be sufficient to conclude that oil was, more likely than not, a factor in the cetacean's death, which is all that is required to be proved under the law.

9. Marine Mammal Study 4: Sea Lion

The study description does not indicate the size and adequacy of the "before" data existing on seal lions. A multi-year study is critical.

This study seems to be designed to succeed. Much of the data will be collected by ADF&G, the organization that has the largest "before" data set.

How will effects of a documented population trend towards decline be separated from the effects of oil contamination? The Trustees should be careful of dismissing a reduction in numbers as the continuation of a trend, rather than as the result of petrochemical poisoning.

10. Marine Mammal Study 5: Harbor Seal

This study seems to be designed to succeed. Much of the data will be collected by ADF&G, the organization that has the largest "before" data set.

How will effects of a documented population trend towards decline be separated from the effects of oil contamination? The Trustees should be careful of dismissing a reduction in numbers as the continuation of a trend, rather than as the result of petrochemical poisoning.

11. Marine Mammal Study 6: Sea Otter Injury

We recognize that long-term and chronic effects in marine mammal studies can be difficult, expensive and time-consuming to isolate, yet we believe that Objectives A-C are achievable. Objective B should be clearer. For example, what long-term effects will be determined?

The scope of this work is breathtaking. Can this many animals be tagged without significantly disturbing the remnant population? The Trustees should consider using minimum targets for tagging, rather than maximum (up to 100) numbers.

The Trustees should be careful of drawing incomplete or incorrect conclusions, based solely on where an otter was found for study. Many areas were emptied of sea otters directly after the spill through death and rescue efforts, but have now been repopulated with otters. Without knowing the returning otters' life history, the data they provide will not fully document the extent of injury to otters surviving the plume of the oil spill. The discussion of methods and analysis are too superficial to allow meaningful review.

How many sites will be studied? What type of surveys and equipment will be used? We assume that receivers with autologging capability will be used at unobserved sites, and that receivers will be aboard all boat and aircraft surveys. The Trustees should be careful that the study yields a large amount of useable data, rather than becoming a lesson in logistics.

There is one major problem that is not addressed. What percent of the sea otters that die from oil are ever recovered? The number of carcasses found in the freezer is merely a minimum body count, and a significant underestimate. The Trustees must devise a method of estimating the percentage recovery of sea otter carcasses. We describe one possible crude method. Some otter carcasses could be instrumented, tossed into the Sound, and observed to determine how many are ultimately found on a beach through existing routine search efforts. In addition, observers' (those who polished rocks and recovered sea otters) ability to locate otter bodies that have beached could be tested by placing some oiled carcasses on or near oiled and non-oiled beaches. Similar studies are needed to determine the recovery rates for carcasses of other species, including other terrestrial and marine mammals and birds. From these crude experiments, one could probably measure a recovery of far less than 10-30%. While

more refined methods are undoubtedly possible, this concept of underrecovery is critical to a complete natural resource damage assessment.

12. Marine Mammal Study 7: Sea Otter

The Environmental Groups are pleased to see a study evaluating the effect of cleanup measures on wildlife, but the description of the study is so inadequate that it is difficult to understand exactly how it will be carried out. See, Comments of Defenders of Wildlife. More "rehabilitation" efforts on other creatures should be evaluated.

D. Terrestrial Mammals Studies

1. Lack of Detail

The terrestrial mammals studies provide no indication of sampling locations or methods, and do not describe the timing or frequency of sampling. It is therefore impossible to determine whether the study results will be statistically significant, or will support reliable or defensible conclusions of injury to natural resources.

2. Arbitrary February 1990 Deadline

The terrestrial mammal studies themselves reflect a multi-year sampling and analysis effort. Terrestrial Mammal Studies 2 and 4 seek to document the effects for bears of "subtle long-term population reductions as chronic effects of hydrocarbons stored in fats are expressed." Similarly, the mink reproduction experiment (Terrestrial Mammal Study 6) assumes over two years preparation (feeding mink with oil-contaminated food) before chronic effects will be studied.

A February 1990 termination of terrestrial mammal studies would significantly limit the data available to determine long-term injury. Since many mammals use tidal areas that were oiled this year during the spring, long-term behavior changes cannot be identified until at least one additional spring passes. Further, many of the mammals under study hibernate, and are no longer available for observation prior to February 1990. Effects on reproduction also will not be seen until they emerge from hibernation.

3. Limited Definition of Injury to Terrestrial Mammals

The proposed studies focus on terrestrial mammals that are of "value" to humans, presumably subsistence, recreational or intrinsic value. There are nevertheless many other mammals affected by the oil spill, for which no injury determination studies are provided. To fulfill their trust obligations, the Trustees must determine short- and long-term injury to all terrestrial mammals, from rodents, to Soricidae (shrews), to bats, to lagomorphs (e.g. hares). The assessment plan should specify how injury to all mammals potentially affected will be determined. See, Defenders of Wildlife comments.

Apparently missing from all the terrestrial mammals studies, including the laboratory experiment using mink, is an evaluation of sublethal effects from the oil spill listed in 43 C.F.R. §11.62(f)(1). The Trustees should be assessing all injuries to terrestrial mammals, including death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (in addition to reproduction) and physical deformations. These injuries are known to occur as a result of oil spills. See, "Injury to Fish and Wildlife Species," Type B Technical Information Document, U.S. Fish and Wildlife Service, June 1987 (PB88-100169).

As with the previously discussed studies, we urge the Trustees not to tie their hands with the overly rigid, often impossible to comply with, scientifically unfounded, acceptance criteria found in 43 C.F.R. §11.62(f)(2). We suggest that the Trustees use the traditional tort law causation standard. See, Restatement 2d of Torts, §431 (1965) (showing that it is more likely than not that the defendant's "conduct is a substantial factor in bringing about the harm").

4. Lack of Coordination Between Terrestrial Mammals Studies, Economic Value Studies and Restoration Planning

Although the laboratory studies on minks (Terrestrial Mammal Study 6) purports to develop data relevant for the remaining five studies, no means of coordination is specified. Similarly, no coordination is specified between these terrestrial mammal studies and other injury assessment studies on their prey species. Such coordination is important to allow the Trustees to document all potential injury to terrestrial mammals, whether input data is gathered under the terrestrial mammal studies or not.

The terrestrial mammals studies are described as inputs into one or more of the three contingent valuation economic studies; namely, Economic Studies Nos. 5-7 measuring recreational, subsistence and intrinsic values. The study results are also critical for development of the restoration plan, yet no coordination for that effort is specified. In addition, these studies must be used as an input to calculate restoration costs, the statutorily-mandated measure of damages.

There are multiple restoration options for injuries to terrestrial mammals resulting from the Exxon Valdez spill. One obvious option is restoration of the habitat supporting the species. In the case of oiled beaches, this may not be feasible. The Environmental Groups urge the Trustees to consider alternative restoration measures, such as protection of new habitat for the injured species. For example, the trustees could obtain title or conservation easements to land that serves as habitat for injured prey species, or that are habitat for injured terrestrial mammals.

5. Study-Specific Comments

We join and incorporate the terrestrial mammal study comments submitted by Defenders of Wildlife, to the extent consistent with these comments. We also are extremely disturbed by reports indicating that the black bear study data collection has

not been undertaken as proposed. If correct, this is a serious problem; immediate commencement of data collection is imperative.

E. Bird Studies

After review of the sketchy study descriptions, the Environmental Groups are extremely concerned that all injuries to all bird species potentially affected by the Exxon Valdez spill will not be determined, and that the natural resource damage assessment will seriously undervalue the injury to birds caused by the spill.

1. Lack of Detail

As with all the proposed studies, the one- or two-page summary of each study is grossly insufficient for an understanding of what actions are actually contemplated, or to allow for meaningful analysis of the studies' effectiveness in determining short- and long-term injury to birds. Since few details are provided about sampling or analysis methodology, no conclusions can be reached about the statistical significance of data collected. Since the geographic scope of the studies is not described, we cannot evaluate whether injury to birds will be assessed for all areas potentially affected by the oil spill. Further, the "control areas" are not identified, making it impossible to determine whether they are in fact comparable to the oiled areas under study, and whether they will produce the most reliable comparative data. We have been denied access to data collected in 1989 or to information on the extent and quality of existing baseline data, and the variability between years, making it difficult to review whether sampling protocols or injury determination methods are adequate to document injury.

2. Arbitrary February 1990 Deadline

The arbitrary February 1990 study termination date is incompatible with the objectives of many of the bird studies. The Environmental Groups are surprised to see that studies originally designed to extend from 3-5 years have all been reduced to 10-month projects. It is difficult to imagine how the Trustees can make this proposal with a straight face. Ten-month studies, ending only a few months before the next spring migration influx or reproduction season, cannot gather enough data to draw reliable conclusions on migratory patterns, population reduction or recovery, reproductive success, or survival rates, all purported objectives of many of the 14 bird studies. For example, we have learned that glaucous-winged gulls sustained high mortality among the subadult population. This mortality would have a big impact on breeding, but would not be discernable if the study ended after the 1989 breeding season. In addition, many of the beaches that birds use as staging areas are still heavily oiled, possibly resulting in additional short-term behavior changes during 1990. These natural resource injuries are all critical to a complete natural resource damage assessment, and will not be studied under the current approach.

The February 1990 termination date is also of great concern because of the potential incompleteness of the data actually collected in 1989. It is our understanding

that some of the projects were begun many months after the anticipated starting date, and data collection remains incomplete. Field studies in 1990 and beyond are therefore especially important, to develop adequate evidence that will demonstrate the connection between the oil spill and the long-term injuries.

3. Limited Definition of Injury to Birds

The nature of the injuries to birds addressed in the draft assessment plan is far too limited, and does not even follow the provisions of 43 C.F.R. 11.62(f)(1), referenced in the draft plan as the guideline for injury determination for birds. The bird studies focus almost exclusively on lethal impacts. Carcass counts (death) are included for virtually all species to be studied. Reproductive effects are included for only selected species (e.g., bald eagles and peregrine falcons), possibly selected because of their emotional appeal to humans. Studies that document the efficiency of the carcass recovery efforts -- which likely are far less than 10% -- should be a high priority. Apparently not included in the bird studies are disease, behavioral abnormalities, cancer, genetic mutations, other physiological malfunctions, or physical deformations. All injuries to birds, including those listed in 43 C.F.R. 11.62(f)(1) should be studied and included in future restoration plans.

The Environmental Groups are encouraged that the acceptance criteria found in the federal regulations are not mentioned in the draft assessment plan. Again, we urge the Trustees not to tie their hands with these overly rigid, often impossible to comply with, scientifically unfounded, acceptance criteria. We suggest that the Trustees use the traditional tort law causation standard. See, Restatement 2d of Torts, §431 (1965) (showing that it is more likely than not that the defendant's "conduct is a substantial factor in bringing about the harm").

4. Lack of Coordination Between Bird Injury Assessment Studies, Economic Value Studies and Restoration Planning

Each of the bird studies is described as an input into one or more of the three contingent valuation economic studies; namely, Economic Studies Nos. 5-7 measuring recreational, subsistence and intrinsic values. It is not clear, however, how the economic studies will consider the injury to birds documented in a study using an indicator species. The economic value must be calculated for each bird species injured, as extrapolated from the indicator species data.

Economic value studies are not the only use that should be made of the study results documenting injury to birds. The study results are critical for development of the restoration plan, yet no coordination for that effort is discussed. Restoration plans must also address all bird species for which the indicator species study documented injury. The plan does not identify the larger group of species represented by the indicator species. Finally, these bird injury studies must be used as an input to calculate restoration costs, a statutorily-mandated measure of damages.

There are multiple restoration options for injuries to birds resulting from the Exxon Valdez spill. Restoration of populations in many oiled areas may not be successful because of introduced predators, such as the arctic fox. The Environmental Groups urge the Trustees to consider alternative restoration measures, such as enhancement of other populations of the same species in other areas, or protection of new habitat for the injured species.

We mention only a few possibilities of equivalent resources for the Trustees' consideration. The Trustees could obtain title or conservation easements to land that serves as overwintering or staging areas for injured species. They could purchase commercial development rights for critical habitat areas, and logging rights in the Chugach National Forest, (e.g., Chugach Corp. holdings on Montague Island). They could obtain conservation easements for large stands in MacLeod Harbor or Patton Bay that provide habitat for nesting marbled murrelets and tree-nesting ducks such as mergansers. Similar opportunities should be investigated in Southeast Alaska. The numerous private land holdings throughout Prince William Sound should be reviewed for their importance as wildlife habitat, and title purchased or conservation easements obtained to protect the habitat.

Another option is to buy back the oil and gas development leases in Bristol Bay. While these options are not "tit for tat" replacement of the Prince William Sound resource or restoration of the damage caused by the Exxon Valdez oil, they are measures that can serve to decrease the cumulative (even synergistic) impacts of past and future threats to the affected bird populations from human activities such as oil spills. They can therefore provide long-term benefit to the natural resources injured as a result of the Exxon Valdez spill.

5. Missing Studies

A number of important groups of birds have not been included in the planned studies. Hardest hit of all seabirds were the Barren Island murres. Except in general abundance and distribution surveys, murres have been excluded. In addition, the draft plan does not include studies on cormorants or loons, despite earlier plans to do so. Finally, soft-substrate shorebirds should be examined west of Prince William Sound. Impacts on these shorebirds and on their prey in soft substrates could be significant. Studies must be undertaken to estimate the impacts of the spill on these species, or the assessment will significantly undervalue the spill's impacts on birds.

6. Bird Study 1: Beached Bird Surveys

Objectives A and B should integrate data collected by Exxon capture boats to the extent they are determined to be reliable. This may be the intent, but it is not clear from the project description whether the study will rely solely on data collected by the USFWS and ADF&G.

Beach surveys were particularly intensive in 1989. How does the effort of 1989 compare with the effort of previous surveys conducted from 1977 to 1988? Is there

adequate information on the effort to draw accurate conclusions from post-spill survey data, as stated in Objective D?

A single season of observations immediately after the spill will be inadequate to meet Objective E.

7. Bird Study 2: Migratory Bird Surveys

How soon after the spill were migratory bird surveys initiated? Timing is critical. Without more information on the surveys already completed, it is difficult to determine whether Objective A can be met adequately. How has the study integrated the impacts of oceanographic factors that may have affected seabird distribution and abundance in 1989? How good are the baseline data to be used in Objective B?

It will not be possible to determine recovery rates (Objective C) after a single breeding season. Moreover, such population impacts cannot be determined until the birds hatched in 1989 return to breed. As many species of seabirds have delayed reproduction, it will be some years before recovery rates can be assessed adequately. Has the study design taken into account the possibility that age of first breeding will be affected if a large proportion of adults died in 1989?

8. Bird Study 3: Seabird Colony Studies

A 1990 survey is essential to determine declines in seabird numbers (Objective A). Not only is it important to examine numbers of returning birds, but because 1989 was an aberrant breeding year, a second year is necessary. Is the only control the lack of oiling at a nesting colony? Aren't there other factors that must be taken into account to make certain that unoiled sites serve as adequate controls, such as beach profiles and colony size?

Objective B should be stressed and should be as creative as possible. Possible strategies for restoring populations should include habitat acquisition and protection, predator control, and minimizing the impacts on seabirds from fisheries. Restoration should not be limited to those colonies that were directly affected by the spill, but should be expanded to include restoration or protection of other colonies of the same species.

9. Bird Study 4: Bald Eagles

The decline or recovery of bald eagles cannot be measured after a single year. In addition, Objective A aims to determine a rate of change. Is there a known rate from historical data? If not, it will not be possible to determine how the oil spill affected that rate of population change.

Because of the lack of information about the progress of the study, it is difficult to judge whether additional years are necessary to achieve some of the other objectives. For example, was productivity measured in oiled and unoiled areas during 1989

(Objective B)? Were data from the Exxon Eagle Team integrated to the extent those data are determined to be reliable? To evaluate oil-related winter mortality, the study proposes to fit 60 eagles with transmitters. Was this done already? If not, what sorts of data will be used to measure winter survival? Are Exxon Eagle Team data valid and available for Objective F?

10. Bird Study 5: Peregrine Falcons

A 1990 survey will be required to complete this study. It is our understanding that there were no peregrines occupying breeding sites in Prince William Sound in 1989, which simply would preclude accomplishing Objectives B and C for that area.

11. Bird Study 6: Marbled Murrelets

As with other studies attempting to determine population declines, a 1990 survey (at least) of breeding colonies will be necessary to achieve Objective A. Are there good pre-spill data for all of the areas to be surveyed?

12. Bird Study 7: Fork-tailed Storm Petrels

We are concerned that the methods planned (but not stated in the proposal) to assess Objective B are not adequate. We understand that the field work was to consist of 2-3 weeks during the incubation period to find active nests, and 2-3 weeks late in the nestling period to check reproductive success. If this indeed is the schedule to be followed, the study may not yield important information on the percentage of eggs that failed to hatch and why. Although hatching success will be monitored and addled eggs will be collected, the study should also attempt to determine whether eggs failed to hatch because they were addled, infertile, abandoned, or contaminated. Likewise, the methods should include determining the proportion of nestlings that fail to fledge and why. The amount of fat reserves is apparently critical in determining whether a young bird leaves the nest or survives after fledging. The study should address whether the birds fail to fledge because they didn't have sufficient fat reserves, were abandoned, were oiled or fed contaminated food. Establishing the causal link between reproductive failure and oil pollution is key, to the extent it is possible.

The study should be continued beyond 1989 and should be expanded geographically to get better results on the persistence of crude oil in the environment. Because storm petrels breed from Prince William Sound to the Aleutians, continued and more widespread sampling of these colonies would enable better monitoring of the persistence of oil.

13. Bird Study 8: Black-legged Kittiwakes

1989 appears to have been a particularly poor year for kittiwake reproductive success. Special care must be taken to seek to document impacts that can be attributed to the oil spill. Will all 26 sites be monitored? If not, how will control sites be selected? Although Objective C will involve analyzing petroleum contamination of eggs,

the study should examine the percentage of eggs that failed to hatch and determine why. The proposal states that contaminated adults may not feed their chicks. Will the study assess the impacts on chicks from inadequate food supply as separate from contaminated food?

14. Bird Study 9: Pigeon Guillemots

Although guillemots can provide good data on local oil conditions in Prince William Sound, this study cannot claim to "represent puffins, auklets, and murre," as puffins and murre breed largely in other areas, and therefore this assumption could lead to a significant underestimation of impacts on other species.

It is unclear how colony areas will be "surveyed for degree of oiling," as guillemots are black and external oiling will be difficult to assess.

15. Bird Study 10: Glaucous-winged Gulls

Because of the distance of Egg Island from the major impacts of the spill, a study of this colony may not provide the most comprehensive data possible. Impacts from oiling are most likely to be seen among immature gulls, which tend to stray from the colony. Adults are more likely to remain in the vicinity of the colony. It is our understanding that a big loss in the subadult population has already been observed. This points to the need to continue this study, and others, beyond 1989. The impacts on the subadult population will not have appeared as an impact on reproductive success in 1989.

16. Bird Study 11: Sea Ducks

We understand that funding for this study was not released until quite recently. This is unfortunate because it may have precluded gathering of data on birds that Summer in the Sound and around Kodiak, when oil contamination would have been greatest. Nonetheless, it can provide valuable data because it is one of the few studies that focuses on over-wintering birds. The February deadline will have to be extended in order to complete contaminant analysis on samples taken this winter.

17. Bird Study 12: Rocky Intertidal Shorebirds

We understand that studies for shorebirds were not initiated until mid-June. This is too late to have provided certain information needed to assure fulfillment of many of the study's objectives, and therefore this study may significantly underestimate the spill's impacts on affected species. This study excludes surfbirds, which do not nest in the Bering Sea, from Objective G. Impacts on shorebirds from contaminated prey could be felt for years, and the study must continue beyond 1989.

18. Bird Study 13: Passerines

We understand that as of mid-September, the passerine study had not been initiated. Although some species are year-round residents, much information from the critical period following the spill has been lost. Although information on secondary contamination would be valuable, the samples may be of limited usefulness if they have not already been collected. This study must be salvaged by intensive monitoring and data collection next year, and by researching any available baseline data.

19. Bird Study 14: Effects of Exposure to Oil

There is not enough information in this proposal to understand what "devise and implement laboratory or field experiments" means. However, the budget alone precludes significant experimental work on the effects of oil. The budget may not even be adequate to cover Objective A (literature review). Laboratory and field studies easily require in excess of \$100,000 to be carried out properly. This budget is a gross underestimate for literature review and actual experimentation.

F. Technical Services

The technical services studies are the linchpin of the entire natural resource damage assessment. The credibility and defensibility of the Exxon Valdez assessment will depend in large part on the extent of sampling and the validity of sample analyses. Many economic value studies, regardless how sophisticated and well-designed, could result in undervaluations if the input data (injury determinations) are inaccurate or inadequate. Likewise, the conclusions about injury to specific resources will only be as reliable as the data (e.g., tissue samples and necropsies) supporting it.

The success of the technical services studies is a function of both number of samples analyzed and the level of timely analysis. The Environmental Groups are extremely concerned that the budgets proposed for Technical Services Studies 1 and 2 appear to be grossly inadequate to document the full extent of the injury to the Prince William Sound resources in a scientifically acceptable or legally supportable manner. Our concern is aggravated by recent Trustee actions limiting researchers to submission of ten tissue samples each for timely hydrocarbon analysis. Exxon has been actively collecting samples since the spill, and will undoubtedly continue to do so in an effort to demonstrate that injuries confirmed are not related to the Exxon Valdez oil spill. The Trustees risk failure in court if they have insufficient or incomplete evidence of injury and cannot tie the injuries to the oil spill.

The universe of potential samples to be taken and analyzed is enormous. Hundreds of miles of beaches have been oiled by the spill. Over 1000 square miles of seawater and sediments have been contaminated. It is estimated that over 34,000 bird, 1,000 sea otter and 12 whale carcasses have been found since the spill. Representative samples of just the existing storehouse would greatly exceed the limited technical services budgets provided. If, as the Environmental Groups have demanded, all studies continue into future years, greatly increased budgets should be provided to assure that

enough samples can be taken to provide a representative view of the resource in question, and that all analyses required to determine the injuries, including all those listed in 43 C.F.R. § 11.62(f)(1), can be performed.

Neither the injury assessment study descriptions, nor the technical services study descriptions, provide details about the numbers and types of samples to be analyzed, or the locations from which they will be taken. It is therefore impossible to determine whether the sampling to be conducted in any one study is adequate to document the distribution of hydrocarbons in the ecosystem, or to measure accurately contaminant or enzyme levels in the species' tissues. It is clear, however, that the budgets outlined for technical services are totally inadequate to reach comprehensive conclusions of injury for all the studies proposed. Environmental sampling can easily cost several \$100/sample to \$1000 or more to document the precise levels of various hydrocarbons at levels that are biologically significant. The cost of enzyme studies can range from the \$100s to \$1,000s to fully document the impacts of the oil spill in a particular geographic region or a particular species. With a budget of \$2.7 million for chemistry and histopathology it will be difficult to support statistically significant conclusions for all proposed studies. This takes on particular importance when one considers that Exxon is conducting a broad sampling effort that undoubtedly will be used to discredit the Trustees' assessment.

To stay within the budgets proposed, the Trustees may be required either to severely limit the number of samples to be analyzed, or to limit analysis to gross levels of contamination by a few specific hydrocarbons (or total hydrocarbons), or both. Recent instructions to field researchers indicate that such limitations have already been imposed. This result is totally unacceptable, and could compromise the Trustees' ability to assess the full extent of injury to natural resources from the Exxon Valdez spill, as they are required by law to do. In addition, incomplete sampling and analysis could directly undercut the Trustees' legal case for damages, and may prevent or complicate full recovery of the natural resource damages owed by Exxon, or the assessment costs incurred by the Trustees.

The Environmental Groups are pleased to see that QA/QC will be provided for all sample analyses, but are concerned that there is no description of what the QA/QC plan will be, of what field auditing methods will be used, who will be doing such audits, what Standard Operating Procedures are being used, what types of sampling techniques and preservation techniques are contemplated, or how sites are selected. It is equally important to QA/QC all field studies. We urge the Trustees, in conjunction with EPA, to develop standardized QA/QC programs for all field studies, following established procedures where they exist (e.g., ASTM, EPA draft guidelines for conducting ecological effects assessments).

G. Economic Value Studies

1. Lack of Detail

The economic value studies suffer more than most proposed studies from lack of detail about purposes and methodologies. Studies to determine the value of natural resources and to quantify natural resource damage are sophisticated, complicated, and often controversial. The information provided in the draft assessment plan precludes peer review of the proposed studies. Since the total budget for the economic value studies is \$2.8 million dollars through February 1990 alone, (an average of \$14,000 per day since the spill), it could be considered irresponsible to proceed with these studies on the basis of the scant design planning reflected in the draft plan.

No information is presented on which agency, or which contractors, will be performing each study. EPA is a collaborative agency for the natural resource damage assessment effort, and should be considered seriously as a lead agency for economic studies.

Further, the budget is not broken down by study. Since the validity and defensibility of any economic study depends largely on the credibility and experience of the study team, and the resources provided to perform a study, we are unable to comment whether the Trustees' money is being well-spent in these efforts. For example, contingent valuation is the only economic methodology available to quantify intrinsic values. Yet, few natural resource economists in the United States have practical experience designing contingent valuation studies in natural resource damage cases. Such studies can easily cost as much as \$5 million to develop and conduct a detailed and comprehensive contingent valuation survey. The total budget for all economic studies is about half of the possible cost of only one contingent valuation study. Further, it is likely that intrinsic values will represent a large proportion of the economic damages assessed for the Exxon Valdez oil spill. See, e.g., Natural Resource Damage Assessments conducted for the Eagle Mine Facility and Idarado Mining & Milling Complex in Colorado. For these among other reasons, the Environmental Groups are very concerned that the economic studies may result in serious undervaluation of natural resource damages from the Exxon Valdez oil spill.

No details are provided on study methodologies. Economic Value Study 5 (recreation) identifies three different methodologies, without specifying whether one or all of them will be used. We are particularly concerned about the studies using contingent valuation or survey methods (Economic Value Studies 5-7). It is critical to the defensibility of the damage assessment that the survey instrument be carefully designed and free of bias. See, Ohio, 880 F.2d at 474-80. The Environmental Groups suggest that the survey instruments be developed with a focus group, to ensure understandability and completeness. To the extent that multiple surveys will be conducted (e.g., separating subsistence values from recreational and intrinsic values), focus groups should be convened that are representative of the recipients of each survey.

Finally, the study descriptions do not reflect how damages assessed under the plan will be collected by multiple Trustees, or divided between plaintiff classes and Trustees. In considering this issue, the Trustees should bear in mind their legal obligation to use all damages recovered for public injuries to natural resources (including long-term injury to ecosystem productivity) to restore, replace or acquire the equivalent of such resources, regardless of whether state or federal Trustees recover the damage money. In addition, the Trustees should devise an efficient and cost-effective method to ensure that damages assessed for private losses (e.g., lost use of commercial fisheries) are distributed appropriately.

2. Arbitrary February 1990 Deadline

It is inconceivable that the economic value studies described can be completed by February 1990. Some may not even be initiated (beyond design) by that date. Many of the studies (e.g., Economic Studies 3, 5-7) will rely at least upon preliminary results from the resource-specific injury assessment studies. If we accept for purposes of argument that these injury assessment studies will end in February 1990, the economic value studies cannot begin in earnest until that date. As we have argued earlier in these comments, however, the injury assessment studies should continue for years, possibly decades, to document all long-term injury resulting from the spill. The full array of economic value studies therefore cannot be completed until after at least the preliminary injury assessment studies are completed.

In addition, many of the study methodologies are themselves time-consuming. The contingent valuation survey method, for example, should take longer than four months⁷ to design, let alone implement. Imposition of any termination date on the economic value studies is counterproductive to the objective of a natural resource damage assessment -- namely to calculate accurately and completely the economic loss associated with an oil spill.

3. Limited Definition of Injury in Economic Value Studies

The Environmental Groups are concerned that the unlawfully limited focus of the injury assessment studies on human use values and short-term lethal effects will be aggravated by limiting the scope of the economic value studies.

The Trustees cannot assign zero estimates to non-use values. To prevent this result, the plan should direct researchers to use more than one valuation technique if necessary to measure damages to a resource or attribute that generates more than one good or service, without double counting. See, Ohio, 880 F.2d at 463-64.

Changes in human behavior, as a result of perceptions of the damages should also be considered for evaluation. Gardner Brown has noted that there is substantial

⁷ It is our understanding that contingent valuation surveys have not yet been initiated.

evidence that hundreds of thousands of potential vacationers did not come to the noninjured portions of the Brittany Coastline after the Amoco Cadiz oil spill in 1978. The potential tourists suffered economic losses by vacationing in less attractive sites or paying more for similar quality vacations. This loss, termed "natural resource slander" by Professor Brown, should be addressed in the Exxon Valdez economic value studies.

The assessment should provide the Trustees with a qualitative and quantitative description of the damages to the ecosystem -- the complex interactions of the invertebrates that live in the ocean and on the shores, the diatoms, the phytoplankton and zooplankton, the amphipods, the mollusks and crustaceans, which in turn may feed the small fish, the bigger fish and so on through the food web. The damages to the non-monetary ecological, cultural, and aesthetic properties of the resources of Prince William Sound are not trivial. The oil spill has significantly affected these attributes. Economic measurements techniques exist to estimate these damages in monetary terms; the total value of these damages could well overshadow the damages that can be estimated by other methodologies.

The study, analysis, and presentation of the quantitative and qualitative changes in the non-monetary ecological, cultural, and aesthetic properties of the affected resources will help the assessment and the Trustees in several ways by:

- providing information and functional relationships for the valuation of the economic use and non-use values, e.g. lost recreation values from bird and mammal watching;
- facilitating monetary estimates of some of these losses through contingent valuation methods, e.g. cultural effects on the way of life of residents of Prince William Sound; and
- presenting additional evidence for negotiating settlement of the restoration, mitigation, and compensation amounts.

The current and future scarcity of the affected resources should be evaluated in order to better estimate value. The work plan should include tasks to describe substitutes for damaged resources, e.g., recreation sites, habitat, etc. Scarce resources, such as whales, are generally more valuable than abundant resources.

Analysis of changes in quality of a resource can be helpful in the determination of economic values. V. Kerry Smith has estimated the elasticity of quality for recreational fishery benefits in Albermarle and Pamlico Sounds in North Carolina to be between +0.4 and +0.6. That is, for every 10% decline in quality, recreation benefits decline between 4% and 6%. For some heavily damaged resources in Prince William Sound, such as entire fisheries that are closed, or if the ecosystem is irreversibly impaired, the quality elasticity coefficient may approach 1.0.

4. Lack of Coordination Between Economic Value Studies, Natural Resource Injury Assessment Studies, and Restoration Planning

Many of the proposed individual scientific studies of coastal habitat, marine mammals, etc. appear to be an end in themselves, rather than a systematic approach to determining the magnitude, duration, and functional relationships of the damages. Moreover, the proposed economic studies appear to have little connection to the scientific studies. Planning the injury impact studies, as well as carrying them out, should be an iterative process. Natural resource scientists will be undertaking studies to provide information for economists. Injury assessment studies in the natural resource damage assessment plan should explain how their results will be integrated with the objectives of estimating the cost of restoring or replacing lost goods and services, the acquisition of resources similar to those lost, and the residual losses of future goods and services that are not likely to be restored or replaced. Many of the studies described (briefly) in the draft plan are not focused toward assessing and valuing resource damages.

Economists and natural scientists should work together to determine the long-term (possibly forever) cost of this catastrophe. The plan assumes that each profession is myopic. The economic literature on valuing goods and services from natural resources would be helpful to natural resource scientists in preparing their work plans. See, e.g., Yang, et al.; NOAA, The Use of Economic Analysis in Valuing Natural Resource Damages (1984). The U.S. Forest Service supports ongoing research in recreational economics at universities. Many members of this "W-133 group" are available to assist the damage assessment team. In addition, the Benefits Evaluation Branch at the Washington, D.C. headquarters of the Environmental Protection Agency also has skills and experience in dealing with non-market traded attributes of natural resources.

Although the requirements of the damage assessment are complex, matrices' displays would help the managers integrate the various disciplinary studies. "A Procedure for Evaluating Environmental Impact" USGS Circular 645, Luna Leopold et al., 1971, is the seminal report on the matrix approach. The draft assessment plan fails to show the relationships among the studies and treats dissimilar aspects of the plan the same.

The Plan should lay out a detailed, yet flexible, schedule of tasks and activities for the economic studies and outline their relationship to the scientific studies. The work plan for the economic studies is too brief. It should describe what techniques and methods are to be used and include a bibliography of the relevant literature.

5. Missing Studies

None of the economic value studies attempt to quantify the economic damages caused to human health as a result of the oil spill. The Environmental Groups find it ironic that an assessment plan that focusses so strongly on human uses of the natural resources totally ignores human health effects resulting from the oil spill. In addition, as

discussed in detail previously, there is no study proposed that will estimate the cost of restoring, replacing, or acquiring equivalent resources, the most basic measure of damages under the law. Ohio, 880 F.2d at 444.

6. Economic Value Studies 1-3: Commercial Fisheries, Fishing Industry Costs, Bioeconomic Models

These three studies are portions of the tasks necessary to evaluate the economic losses as a result of damages to public resources that involve commercial fisheries. The steps to value these damages should be all under the heading, "commercial fisheries." The subheadings should be a listing of all the affected commercial fin and shellfish.

The objective is to measure the changes in consumers' and producers' surplus (rent) as a result of the oil spill. This will require estimates of shifts in supply (cost) and demand curves. Determination of price effects should be an outcome of other steps, not a primary task of the evaluation activity. Nevertheless, the estimation of price effects is important especially for calculating losses in consumer surplus. We would expect that prices will rise for fish species for which the harvesting in Prince William Sound has been historically a significant share of the market.

Although some, or all of the private damages, to the commercial fishing industry may be recovered by private lawsuits, the plan should direct that all of the losses as a result of damages from the spill to commercial fisheries be estimated and valued. The private lawsuits will not capture all of the restoration and residual costs, and the lost consumer surplus of the spill.

The U.S. Water Resources Council's Principles and Guidelines, 1983, Sections 2.9.1-11, contains a brief step-by-step evaluation methodology for calculating the benefits of improvements to the commercial fishery infrastructure that can be adapted to evaluate damages from the oil spill. These guidelines are of limited help in evaluating lost consumers' surplus.

Scott Matulich has evaluated the decline in the Alaskan King Crab industry in a paper that provides a thought provoking model for bioeconomic studies of the commercial fishing industry (Department of Agricultural Economics, Washington State University, Pullman WA 99164 Ph. (509) 335-1607).

7. Economic Value Study 4: Value of Public Land

The valuation of changes in the value of public land will be difficult to calculate because the literature on the appropriate methodology is limited. The confidence interval of the range of estimates may be large. Therefore, the work plan should develop methodologies and subject them to review by qualified economists.

8. Economic Value Study 5: Recreation

This study should estimate the growth in recreational activities that would have occurred without the oil spill, rather than assuming that 1988 participation rates would have continued in the future. The Trustees should hire consultants who have extensive experience in evaluating outdoor recreation and/or peer reviewed publications in the field. Experienced practitioners will be able to reduce the time necessary to complete the studies and generate acceptable estimates. Nevertheless, many of these studies will take two to three years to complete and analyze.

9. Economic Value Study 7: Intrinsic Values

In designing the contingent valuation surveys to capture intrinsic values, the Trustees should be careful to address all natural resource injuries, not just those that have immediate emotional appeal (e.g., sea otters, bald eagles). Prince William Sound's existence as a pristine, intact ecosystem which supported a food chain unaffected by human intervention (pre-spill) represents a significant portion of the area's intrinsic value. Conversely, the economic value studies must capture the loss associated with injury to the food chain and ecosystem, in particular the potential synergistic effects of such injury. In addition, the survey design should address the uncertainty about long-term impacts of the oil spill, so that human perceptions of the oil spill's effects are captured accurately and completely.

Economists have performed several travel cost studies in Alaska, mostly on recreational fishing. Because much of the loss is intrinsic, the Contingent Valuation Method should be employed. The assessment should use both willingness to accept and willingness to pay approaches in order to obtain a range of values. The response of over 65,000 people donating to NWF's Alaska Fund since the Exxon Valdez oil spill, are an indication that people are willing to pay something for existence and option values of the resources of Prince William Sound.

The contingent valuation surveys should be conducted throughout the United States. The Exxon Valdez oil spill is a disaster that created a global sense of loss, due to its location and the unique sensitivity of the environment affected. We recognize, however, that conducting surveys of the global community is impractical. It is crucial to survey the entire United States, however, regardless of logistical difficulties. Prince William Sound was the only area of its kind -- an easily accessible pristine marine environment abundant with unique wildlife viewing and recreation opportunities. As a result, the entire nation felt, and continues to feel, a strong sense of loss and outrage as a result of the area's inundation with over 11 million gallons of highly toxic oil. This intrinsic value for the Prince William Sound resource can only be captured through nationwide surveys.

The Trustees should also consider conducting and analyzing the contingent valuation surveys for intrinsic value in subgroups, to capture fully the varying levels of

loss possibly felt by discrete populations with distinct relationships to the Sound. Three potential subgroups come to mind immediately: the entire nation, Alaska residents, and subsistence users.

10. Economic Value Study 9: Archaeological Sites

The spill's impact on archaeological sites should be included as a component of the contingent valuation studies performed in Study 7 to determine intrinsic values. Alternatively, a contingent valuation study specific to archaeological sites could be developed, that targets the Alaskan Native, and the scientist/ archaeologist populations for surveying.

H. Restoration Study

It is ironic that the most important aspect of the natural resource damage assessment process -- restoration -- has the most cryptic (one-page) description of all the studies. The Environmental Groups hope that this does not reflect a cavalier attitude on the Trustees' part towards their statutory and fiduciary duties to restore, replace or acquire the equivalent of injured resources.

The first objective -- to "incorporate ecological concepts and ecosystems perspectives in the overall restoration recommendations" -- is gratuitous and totally unclear. The restoration plans must be designed to restore the productivity of the entire affected ecosystem, and cannot be limited to restoring or replacing human uses provided by the natural resources. Indeed, as discussed in greater detail in our comments on resource-specific studies, restoration efforts for human uses (e.g., restocking of fish) will not necessarily enjoy long-term success unless the ecosystem (from the bacteria up the food chain) has been restored first. To this end, each of the natural resource injury assessment studies should be investigating options for restoration of lost use, populations and habitat (the study descriptions use the word "or"). The existing boilerplate regarding restoration in the objectives section of the studies seems to have been added as a last minute afterthought, with no thought given to actually considering restoration in the study protocols themselves.

The restoration study description does not mention several critical concepts: natural resource, restoration and replacement cost, and acquisition of equivalent resources. All studies, including natural resource injury assessment, economic value, and the restoration planning effort must consider the ability of the resource to recover, and the time necessary for recovery. If recovery (whether naturally or through restoration efforts) is anticipated, the economic value studies should quantify all lost use and other diminutions in value (e.g. option and existence values) until recovery or restoration is complete. The restoration plan should contain an estimate of the time to recovery. If recovery is not anticipated, or if recovery may exceed restoration costs (which it will under the Ohio formulation of damages), the restoration plan must investigate acquisition of equivalent resources.

Restoration cost is, of course, a statutory minimum measure of damages. It is therefore a critical component of any restoration plan.

The restoration plan must include plans to restore, replace or acquire the equivalent of each natural resource injured. The concept of injury includes all lost services provided by the natural resource. The economic valuation of damages should include the existence of a resource, in addition to all lost uses until restoration is complete. See, Ohio, 880 F.2d at 464. The objective of restoration efforts should thus be to replace lost resources, as well as lost services, or where direct replacement or long-term rehabilitation is not likely, acquire equivalent resources and services.

Whenever restoration or rehabilitation is determined to be infeasible, as with many of the oiled beaches, the Trustees should immediately work to identify equivalent resources. This is particularly true of resources that are important (and valued) for the services they provide for other natural resources. Taking oiled beaches as an example, the Trustees should currently be evaluating options available to replace the habitat services provided by oiled beaches for birds, terrestrial and marine mammals, and other species. We have provided some suggestions of alternative resources available for acquisition in the context of our comments on resource-specific injury assessment studies. Included are concepts such as purchase of timber and oil leases or other development rights, legal protection (sanctuary or wilderness designation) for sensitive habitat areas, cessation of activities outside of Prince William Sound that threaten migratory species, and reductions or elimination of allowed drift net fishing to reduce pressures and stress on the Alaskan ecosystem affected by the spill. Since many opportunities to acquire easements or development rights for these alternative resources will be lost if not acquired quickly (e.g. Bristol Bay leases, Chugach timber cutting rights), prompt action is urgently needed to identify and secure equivalent resources providing the services affected by the Exxon Valdez oil spill.

IV. THE PUBLIC MUST CONTINUE TO BE INVOLVED IN DEVELOPMENT AND IMPLEMENTATION OF ALL STUDIES

Virtually every person with whom the Environmental Groups have discussed the draft assessment plan has complained about the superficiality of the study descriptions. The public, including experts in the field of natural resource damage assessment (biologists and economists), has been unable to understand what the Trustees plan to do to identify and quantify natural resource damages resulting from the Exxon Valdez oil spill, or how they plan to do it. Many members of the public will nevertheless attempt to comment extensively on the draft plan, because of their overwhelming concern for the natural resources in once-pristine Prince William Sound.

The public participation provided to date for the natural resource damage assessment process is woefully inadequate and violates federal law. Significant decisions regarding study design and scope have been made (and significant federal funds spent) without any prior public review or comment. If the Trustees disregard the public outcry, and stick with their decision to terminate studies in February 1990, many of the studies will receive no public review whatsoever. Since sampling for most studies has already been completed for the season, this could result in a natural resource damage assessment being prepared for the worst oil spill in U.S. history, termed by many as an environmental catastrophe, without benefit of any peer review. Given the relative youth of the science and economics of natural resource damage assessments, this shortsightedness on the Trustees' part may prove fatal to their ultimate success in collecting full damages from Exxon.

The Trustees' actions in the Exxon Valdez case are directly contrary to the minimal public participation procedures provided in the federal natural resource damage regulations, which themselves have been the subject of substantial controversy because of the inadequate public participation opportunities. See, Ohio, 880 F.2d at 467-68. Under the regulations, the Assessment Plan (containing proposed studies and methodologies) must be made available for public comment review at least 30 days "before the performance of any methodologies contained therein." 43 C.F.R. §11.32(c)(1) (emphasis added). Further, any significant modifications to the assessment approach or studies described in a plan must be made available for public review and comment "before tasks called for in the modified plan are begun." 43 C.F.R. §§11.32(e)(2)(i), 11.32(f)(3) (emphasis added). The assessment plan to be implemented must reflect the Trustees' responses to the public comments. 43 C.F.R. §11.32(c)(2). CERCLA requires no less. See, e.g., CERCLA §117.

Despite this clear mandate to involve the public before any significant assessment activities are undertaken, and to consider the public's comments in deciding how to perform the assessment, the Trustees have in essence planned, implemented and completed the entire Exxon Valdez natural resource damage assessment before receiving public comment (if we take the February 1990 termination date at face value). While we recognize that some data collection must begin prior to the solicitation and analysis of public comment to avoid data loss, it is unacceptable to essentially have completed most or all of the data collection and study design without consulting the public. The

Trustees have refused to provide the Environmental Groups and other interested persons access to data collected, analysis results, more detailed research plans, or any other information that would facilitate informed public comment. The Trustees' insular approach to the most complicated and extensive natural resource damage assessment ever is both bad science and bad policy.

Development and implementation of a natural resource damage assessment plan involving millions in federal funds and the public trust also violates the Administrative Procedure Act (APA) 5 U.S.C. § 551, et seq.; and the National Environmental Policy Act (NEPA) 42 U.S.C. § 4331-4335; 40 C.F.R. § 1501.1-1501.2 (Council on Environmental Quality NEPA rules emphasizing importance of early public participation); Thomas v. Peterson, 753 F.2d 754, 760 (9th Cir. 1985) (early public participation in NEPA process important and required). Furthermore, in the event Exxon has played any role in the development or implementation of the draft assessment plan, the APA has been further violated. See, e.g., 5 U.S.C. §553; K.C. Davis, Administrative Law Treatise §6:1, 6:18, 13:0 (1978 and 1982 Supp.) (APA and basic fairness require that interested persons be provided some opportunity to respond to adverse arguments presented by other persons in agency proceedings).

The Environmental Groups recognize that it would be impractical to require the Trustees to revise and republish the draft assessment plan prior to undertaking any of the studies described therein. The Trustees cannot, however, be allowed to circumvent public participation requirements on the basis of practicality or time limitations. Indeed, increased public participation (possibly beyond legal requirements) is appropriate to counteract the unlawful actions taken to date in performing assessment studies without any public review.

At a minimum, prior public review and comment on the Exxon Valdez natural resource damage assessment activities must be solicited at the following stages:

- development of detailed research or study plans for any of the proposed studies
- decision to end or abort any study, including decision to abide by the February 1990 termination date
- decision to pursue additional studies; public review should include detailed research or study plans
- development of restoration plans⁸
- initiation and pursuit of settlement discussions with potentially responsible parties

⁸ Note that the draft assessment plan anticipates additional public review and comment at the restoration plan development stage. Plan, p. 27.

-- development of proposed natural resource damage assessment

In addition, the public should be given access to detailed study designs and to the data collected and analysis results, as they become available, in order to provide informed public comment on the assessment as it progresses. Moreover, data collected and analysis results should be released whenever a decision to terminate a study is contemplated.

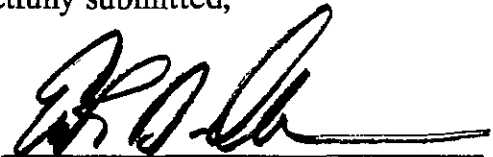
V. CONCLUSION

These comments highlight significant flaws in the draft natural resource damage assessment plan for the Exxon Valdez oil spill. They identify legal inadequacies in the overall approach, as well as suggestions for improvements in individual study designs. The Environmental Groups recognize that time is of the essence in proceeding with the assessment, and therefore do not suggest that the draft assessment plan be reissued for additional public comment. Rather, the Trustees should release for further comment the detailed study designs or should incorporate suggested changes immediately in all future activities under the plan. In addition, increased public participation should be provided, as discussed in the previous section.

Respectfully submitted,



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ON BEHALF OF:

NATIONAL WILDLIFE FEDERATION
WILDLIFE FEDERATION OF ALASKA
TRUSTEES FOR ALASKA
ALASKA CENTER FOR THE ENVIRONMENT
SIERRA CLUB LEGAL DEFENSE FUND

The National Wildlife Federation has discussed the draft assessment plan with many interested persons in preparing these comments. We thank the following experts for their assistance in development of this document, without any implication that they have reviewed or approved its contents, or that they represent NWF's views on all issues discussed in this document.

Partial List of Expert Reviewers on NWF's Behalf:

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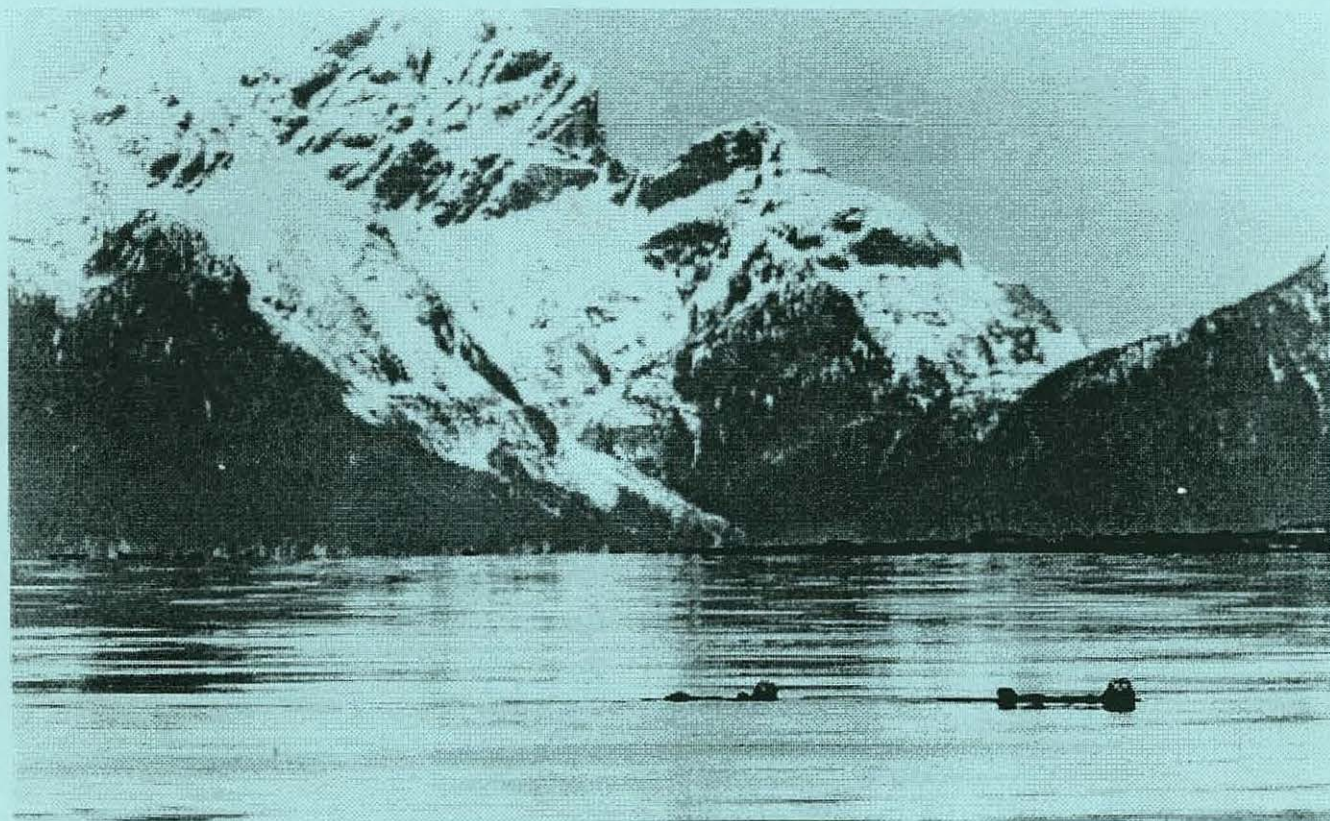
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Otters in Prince William Sound



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**Alyeska Pipeline Service Company's
Comments on
STATE/FEDERAL
NATURAL RESOURCE DAMAGE
ASSESSMENT PLAN
FOR THE EXXON VALDEZ OIL SPILL
August 1989
(Public Review Draft)**

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TRUSTEE COUNCIL
ADMINISTRATIVE RECORD

Alyeska pipeline
SERVICE COMPANY

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October 28, 1989

BY AIR COURIER

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The Honorable Robert A. Mosbacher
Secretary of Commerce
14th Street and Constitution Avenue, N.W.
Washington, D.C. 20230

Gentlemen:

I enclose Alyeska Pipeline Service Company's comments on the draft State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill, dated August 1989.

We look forward to hearing from you with respect to these comments.

Very truly yours,



Alfred T. Smith
General Counsel

lms

xc: Trustee Council

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INTRODUCTION AND SUMMARY

A. Overview

Alyeska Pipeline Service Company ("Alyeska") submits the following comments on the "State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill," dated August 1989 (the "Draft Plan"). Alyeska is the operator of the Trans-Alaska Pipeline System ("TAPS"), through which crude oil flows from Prudhoe Bay, Alaska, to the pipeline terminus located near Valdez, Alaska. From the Valdez terminal, oil tankers owned and operated by other companies transport North Slope crude oil to refineries located in the Lower 48 states. On March 24, 1989, one of those tankers, the Exxon Valdez, ran aground on Bligh Reef, spilling approximately 10.9 million gallons of crude oil into Prince William Sound.

Alyeska and its employees are saddened by the spill and its aftermath. From the company's inception, Alyeska has committed itself to operating TAPS in a manner that minimizes risks to public health and the environment. Now, Alyeska finds itself wrongly identified as potentially responsible for natural resource damages resulting from the Exxon Valdez oil spill.

Alyeska did not cause the spill, nor is it liable for damages to natural resources caused by the spill.¹ Nonetheless, the State of Alaska and the federal government trustees (the "Trustees")² notified Alyeska that they were planning to conduct a natural resource damage assessment, identified Alyeska as a "potentially responsible party," and requested comments from Alyeska on the Draft Plan. Although the Trustees mislabeled Alyeska as a potentially responsible party, Alyeska is commenting on the Draft Plan in response to the Trustees' request. As with any other citizen who cares about the quality of the environment, Alyeska strongly supports performance of a scientifically valid, cost-effective assessment.

Com.	Topic	Issue	Sug.	Sort
1	5	0100		2

Com.	Topic	Issue	Sug.	Sort

¹The Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA") expressly exempts "petroleum, including crude oil," the substance spilled from the Exxon Valdez. 42 U.S.C. § 9601(14). In addition, Alyeska is not a liable party under CERCLA within the meaning of 42 U.S.C. § 9607(a). Liability under the Clean Water Act extends only to the owner of the vessel from which the oil was spilled, and not to Alyeska. 33 U.S.C. § 1321.

²CERCLA provides for designation of federal and state "trustees" who are authorized to assess natural resource damages and press claims for the recovery of such damages, both under CERCLA and the Clean Water Act.

Com.	Topic	Issue	Sug.	Sort
2	5	0100		2

Com.	Topic	Issue	Sug.	Sort
3	5	0200		2

Alyeska's overall comment on the Draft Plan is that it does not comply with applicable legal requirements, does not follow disciplined procedures and use methods designed to produce a valid assessment, will not result in an accurate assessment of natural resource injuries resulting from the spill, and will not assist in the preparation of an appropriate plan to restore those resources in a cost-effective manner.

Com.	Topic	Issue	Sug.	Sort
4	2	0130 0150		2

A fundamental deficiency of the Draft Plan that makes it difficult for Alyeska or anyone else to evaluate it fully is its lack of detail. The Draft Plan fails to provide sufficient information about the methodologies and procedures the Trustees plan to use in the assessment process, or about how (or whether) the many studies outlined in the Draft Plan interrelate with one another and are intended to proceed in a planned and systematic manner to achieve the Trustees' objective. As a consequence, Alyeska's comments on the Draft Plan are necessarily limited in scope and cannot be exhaustive.

Com.	Topic	Issue	Sug.	Sort
5	3	0162		2

B. The Assessment Planning Process

The purpose of a natural resource damage assessment is to determine legally recoverable damages resulting from the loss of public use of natural resources. The Trustees may not assess or recover private damages.

Under mandate from Congress, the Department of Interior ("Interior") promulgated the Natural Resource Damage Assessment Regulations, 43 C.F.R. Part 11 (the "NRDA Regulations" or the "Regulations"). The Regulations lay out a logical, straightforward process for the Trustees to follow in performing the assessment of natural resource injuries, restoration methods, and damages. The first step of the process, the "preassessment phase," is to identify the resources likely to have been adversely affected by the spill, in order to avoid studies not likely to lead to the assessment of recoverable damages.

Com.	Topic	Issue	Sug.	Sort
6	5	0202		2

Following the preassessment phase, the Trustees are supposed to prepare a comprehensive assessment plan, which is to ensure that the Trustees will carry out the assessment in a "planned and systematic" manner, at a "reasonable cost," using "cost-effective" methods. The Regulations require the Trustees to complete the plan and submit it for review before performing any of the assessment studies. The assessment plan must specify and require the most accurate and credible damage assessment methodologies available that will yield reproducible and verifiable results using well-defined and accepted statistical criteria.

The first step in performing the assessment itself, the "injury determination phase," requires the Trustees to study the resources they previously identified as likely to have been injured

Note bold words

by the spill to determine which resources have in fact been injured.

Once the Trustees establish the fact of injury and causation (and not before), they are permitted to proceed to the "quantification phase," during which they quantify the difference between the level of services provided by the resources injured as a result of the oil spill and the "baseline" level of services that would have existed had the spill not occurred. An essential part of this quantification is that the Trustees estimate accurately the time it will take for resources to recover to their baseline levels.

In the final step, the "damage determination phase," the Trustees must evaluate technically feasible restoration alternatives, including the natural recovery alternative. Recoverable restoration-based damages equal the cost of accomplishing the most cost-effective restoration alternative.

C. Summary Of the Draft Plan's Deficiencies

Unfortunately, the Draft Plan neither complies with the Regulations nor proceeds in some other manner to satisfy the objectives of the Regulations. It fails to set forth procedures, studies and scientific methods necessary to an accurate and enforceable damage assessment. The Trustees concede that they commenced the studies outlined in the Draft Plan "[b]ecause of the need to act expeditiously in the wake of the accident" 54 Fed. Reg. at 33618 (Aug. 15, 1989). Actions taken by the Trustees shortly after the spill were, presumably, stopgap measures designed to collect time-critical field data. They are no substitute, however, for a well-planned, thorough and methodological assessment process. The assessment process now underway and outlined in the Draft Plan will result in a damage assessment that is invalid and unenforceable.

The following is a summary of major identifiable deficiencies in the Draft Plan. Alyeska cannot evaluate each of the 72 studies outlined in the Draft Plan because, in violation of the Regulations, the terse outlines of those studies are wholly inadequate to enable a reviewer to assess, for example, the need for the studies, whether they employ appropriate methodologies and procedures, whether they will be conducted for a reasonable cost, and whether they are appropriately coordinated with other studies to achieve the Trustees' objective.³ Accordingly, Alyeska's

³Alyeska has not commented on the section of the Draft Plan entitled "Fate and Effects of the Spilled Oil" (Draft Plan at 11) or the section entitled "Chronology of the Spill." Draft Plan at 6. The "Fate and Effects" section ignores the substantial body
(continued...)

Com.	Topic	Issue	Sug.	Sort
7	3	0130		2

Com.	Topic	Issue	Sug.	Sort
8	3	0102		2

0107

Com.	Topic	Issue	Sug.	Sort
9	3	0108		2

0109

comments are limited to those it is able to make on the basis of the incomplete information contained in the Draft Plan.

1. The Trustees Must Follow The NRDA Regulations.

As a matter of law, the Trustees are required to follow the NRDA Regulations. Their failure to do so will render the entire assessment process unlawful. Even if the Regulations were not legally binding, they embody Interior's determination of the "best available procedures" for assessing natural resource damages. At a minimum, the Trustees must not depart from those procedures without good cause.

Com.	Topic	Issue	Sug.	Sort
10	5	0200		2

2. The Draft Plan Lacks Essential Details And Documentation.

To ensure that the assessment plan is "performed in a planned and systematic manner," is "cost-effective," and is "conducted at a reasonable cost," the Regulations require the assessment plan to identify and document all scientific and economic methodologies and statistical procedures in sufficient detail to permit evaluation. 43 C.F.R. §§ 11.30(b) and 11.31(a). The Draft Plan is neither detailed nor well-documented and, as a result, neither PRPs nor the public can properly evaluate it, and certainly they cannot provide the "independent review" that the Trustees requested.

Com.	Topic	Issue	Sug.	Sort
11	5	0102		2

3. The Trustees Denied Potentially Responsible Parties Any Involvement In Preparing The Assessment Plan.

In violation of the Regulations, the Trustees denied those they labeled "potentially responsible parties" any opportunity to participate in developing the scope and design of the assessment plan. 43 C.F.R. § 11.32(a)(2). The failure to permit such involvement taints the objectivity of the assessment process and is, at least in part, responsible for the deficiencies in the Draft Plan.

Com.	Topic	Issue	Sug.	Sort
12	3	0206		2

4. The Draft Plan Ignores Restoration.

Though the Trustees identify restoration as the "primary objective" of the damage assessment process, the studies outlined in the Draft Plan largely ignore that objective. The Regulations

Com.	Topic	Issue	Sug.	Sort
13	3	0152		2

³(...continued)

of knowledge about the effects of a crude oil spill in a marine environment (the section contains no citation whatever to relevant scientific literature), and also ignores the impact of cleanup measures conducted for months after the spill. As drafted, the section is neither accurate nor objective, and does not advance the assessment process. The "Chronology of the Spill" section is unnecessary to the assessment plan. It is also incomplete, misleading and unfairly prejudicial to Alyeska.

From page 3
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require the development of a Restoration Methodology Plan, and prescribe detailed procedures for determining resource recovery periods and evaluating restoration alternatives. See, e.g., 43 C.F.R. §§ 11.73(c) and 11.82. The Draft Plan fails to follow these procedures. Unless the Trustees conduct studies that will assist in determining the natural recovery period and feasible cost-effective restoration alternatives, the Trustees cannot accurately determine restoration-based damages. Moreover, any damages for lost use values will be limited to losses during the interim recovery period, and that is sufficient reason by itself why none of the nine Economic Uses Studies should proceed until the Trustees have estimated the time to recovery.

Com.	Topic	Issue	Sug.	Sort
14	3	0163		2

5. The Draft Plan Fails To Follow The Phased Approach Required By The Regulations.

To achieve an orderly assessment at a reasonable cost, the Regulations restrict the assessment process to the assessment of natural resource injuries caused by the spill. The Regulations establish a logical, four-step process to achieve that goal: the preassessment screen, the injury determination phase, the quantification phase, and the damage determination phase. By failing to do proper preassessment screening as required by the Regulations, the Trustees commenced numerous expensive studies of natural resources that were probably not even injured by the spill. The Trustees should stop these studies immediately. Moreover, the Draft Plan proposes to conduct the injury determination phase and the quantification phase simultaneously, in violation of the Regulations. Finally, the Draft Plan proceeds with damage determination studies before the Trustees have determined factors essential to that phase (e.g., the estimated recovery time of the injured resources). The net result is a process that is not planned and systematic, not cost-effective, not likely to be performed at a reasonable cost, and not in compliance with applicable laws and regulations.

Com.	Topic	Issue	Sug.	Sort
15	3	0203		2

Com.	Topic	Issue	Sug.	Sort
16	3	0204		2

Com.	Topic	Issue	Sug.	Sort
17	3	0130		2

6. The Draft Plan Adopts An Incorrect Definition Of "Baseline" Conditions.

The Regulations limit restoration-based damages to those costs necessary to restore natural resource services to their "baseline" --the condition that would have existed had the spill not occurred. 43 C.F.R. § 11.14(e). Thus, the definition of baseline is critical to the calculation of damages. The Draft Plan erroneously refers to baseline as the "pre-spill" condition, thereby ignoring the well-accepted fact that resource levels vary significantly over time as a result of naturally occurring conditions. Incorrect use of the pre-spill conditions as a baseline will result in improper quantification of damages and an invalid assessment.

Com.	Topic	Issue	Sug.	Sort
18	3	0151		2

7. The Draft Plan Unlawfully Proposes To Study Private Losses.

In direct violation of CERCLA, the Clean Water Act, and the Regulations, the Draft Plan unlawfully proposes to assess private losses from the spill. The Trustees must immediately cease any ongoing assessment of private losses. The law permits them to assess only damages resulting from the loss of public use of natural resources.

Com.	Topic	Issue	Sug.	Sort
19	3	0132		2

8. The Draft Plan Fails To Include Measures That Will Avoid Double Counting And Double Recovery Of Damages.

CERCLA and the Regulations expressly prohibit double counting and double recovery of damages. The Draft Plan is not structured to avoid double counting of damages, despite the Trustees' assurance to the contrary.

Com.	Topic	Issue	Sug.	Sort
20	3	0133		2

9. The Draft Plan Fails to Specify Reliable Statistical Methods.

Many scientific studies founder because of lack of care and knowledge at the study design phase to ensure the selection of statistically valid methods. For that reason, the Regulations require that study proposals must contain detailed descriptions of statistical sampling methodologies. The Draft Plan fails, however, to provide the detail necessary to analyze the statistical reliability of the proposed studies.

Com.	Topic	Issue	Sug.	Sort
21	3	0103		2

10. The Draft Plan Fails To Provide For Documentation And Preservation Of All Field Data, Data Analysis And Damage Calculations.

The Draft Plan fails to provide adequately for documentation and preservation of field samples and other data as required by the Regulations. 43 C.F.R. §§ 11.31(a)(1), 11.31(a)(4), and 11.31(b)(2). Failure to comply with the Regulations' requirements in this respect will prevent or materially impair review of the study methods and data by other experts to determine whether the study results are verifiable and scientifically sound.

Com.	Topic	Issue	Sug.	Sort
22	3	0104		2

11. The Draft Plan Fails To Select A Discount Rate.

The Draft Plan should state the discount rates the Trustees propose to use and explain the basis for selecting those rates.

Com.	Topic	Issue	Sug.	Sort
23	3	0142		2

D. Conclusion

The Trustees have a fiduciary obligation to conduct an assessment process that is objective, scientifically valid, and reasonable in cost. Alyeska strongly supports such a process. The Regulations embody procedures, criteria and appropriate methods for

fulfilling the Trustees' obligation, but the Trustees have departed from the Regulations in many critical respects. The planning process to date, and the Draft Plan, are so procedurally and substantively deficient that they will produce an invalid and unenforceable assessment.

Com.	Topic	Issue	Sug.	Sort
24	3	0130		2

In the absence of a proper assessment plan that addresses each of the deficiencies described in these comments, the Trustees should suspend all ongoing assessment studies and should initiate no additional studies unless and until they have completed a proper planning process.

Alyeska hereby requests that the Trustees make available for review by all PRPs all work plans, citations to any existing literature and data on which the Draft Plan relies, and all other information regarding each study in the Trustees' possession or control, including all sampling, analytical and quality assurance/quality control data related to study activities performed to date.

Com.	Topic	Issue	Sug.	Sort
25	6	0100		2

I. THE TRUSTEES MUST FOLLOW THE NRDA REGULATIONS

A. Overview

CERCLA requires the President to promulgate regulations that "identify the best available procedures to determine such [natural resource] damages." 42 U.S.C. § 9651(c)(2) (emphasis added). Interior spent years studying, developing and litigating the natural resource damage assessment procedures set forth in the Regulations.⁴ Now, confronted with assessing damages resulting from the Exxon Valdez oil spill, Interior and the other Trustees inexplicably are undecided whether, or to what extent, they will follow the NRDA Regulations. Draft Plan at 17-18.

The Trustees state that they expect the assessment procedures will "largely parallel" the Regulations (Draft Plan at 24). As recently as September 1989, counsel for the Trustees asserted that the Trustees have conducted the damage assessment process "in a manner consistent with the regulations." Letter from Dianne H. Kelly, of the Department of Justice, to John Seddelmeyer, dated September 29, 1989. But neither the Draft Plan nor the planning process used by the Trustees "largely parallels" or is "consistent with" the Regulations, and none of the many departures from the Regulations are necessary to comply with law.

The Trustees must follow the Regulations. The consequences of their continued disregard of the Regulations are grave, jeopardizing the entire assessment process.

Com.	Topic	Issue	Sug.	Sort
26	3	0130		2

⁴In January 1983, Interior issued an Advance Notice of Proposed Rulemaking seeking comment from the public concerning how to approach development of the regulations. 48 Fed. Reg. at 1084 (Jan. 10, 1983). In August 1983, Interior issued a second Advance Notice of Proposed Rulemaking, summarizing the comments received in response to the January notice. 48 Fed. Reg. at 34768 (Aug. 10, 1983). In January 1985, under court order for failing to adopt natural resource damage assessment regulations in timely fashion, New Jersey v. Ruckelshaus, C.A. No. 84-1668 (D.N.J. Dec. 12, 1984), Interior invited public comment and meetings between interested persons and Department officials involved in drafting the regulations. Interior published a proposed rule in December 1985, 50 Fed. Reg. at 52126 (Dec. 20, 1985), and adopted a final rule after extensive public comment in August 1986. 51 Fed. Reg. at 27674 (Aug. 1, 1986). The regulations were challenged in federal court by multiple parties, including several states, national environmental groups and industry associations. Ohio v. Department of Interior, 880 F.2d 432 (D.C. Cir. 1989).

Com.	Topic	Issue	Sug.	Sort
27	5	0130		0

B. CERCLA Requires The Trustees To Comply With The Regulations.

Section 301(c) of CERCLA states that the President or his designee "shall promulgate regulations for the assessment of damages for injury to, destruction of, or loss of natural resources" 42 U.S.C. § 9651(c)(1). Interior fulfilled this statutory mandate in 1986, 51 Fed. Reg. at 27674 (Aug. 1, 1986), and updated the Regulations in 1988 to incorporate changes mandated by the Superfund Amendments and Reauthorization Act ("SARA"). 53 Fed. Reg. at 5165 (Feb. 22, 1988).

*See bolding - their
emphasis implies
non-compliance*

As enacted initially in 1980, CERCLA expressly stated that assessments must be performed in accordance with the Regulations: "In accordance with such regulations, damages for injury to, destruction of, or loss of natural resources . . . shall be assessed. . . ." CERCLA § 111(h)(1) (1980) (emphasis added). Congress could have left greater discretion to the Executive Branch by directing the President to issue guidelines, recommendations or a report. Instead, Congress directed the President to adopt formal regulations for conducting natural resource damage assessments that "identify the best available procedures to determine such damages" 42 U.S.C. § 9651(c)(2). Congress also specified certain procedures (the type A and type B protocols) and types of damages to be included in the Regulations, 42 U.S.C. § 9651(c)(2), and it required the President to review and revise the Regulations as appropriate every two years. 42 U.S.C. § 9651(c)(3).⁵ By their very nature, such regulations impose binding constraints. Batterton v. Marshall, 648 F.2d 694, 702 (D.C. Cir. 1980) (regulations "narrowly constrict the discretion of agency officials by largely determining the issue addressed"); Pacific Gas & Electric Co. v. Federal Power Commission, 506 F.2d 33, 38 (9th Cir. 1974) ("A properly adopted substantive rule establishes a standard of conduct which has the force of law.").

Com.	Topic	Issue	Sug.	Sort
28	3	0130		2

The legislative history of CERCLA shows Congress realized the importance of adhering to regulations that require use of uniform assessment procedures and that Congress intended trustees to follow those procedures. The Senate report states:

Investigations by the Committee . . . revealed the need for an improved, fair and expeditious mechanism for dealing with natural resource damages caused by releases of hazardous materials. The principal hindrance to attaining such a mechanism was the absence of a standardized system for assessing such

⁵Recognizing that knowledge regarding natural resource damage assessments is evolving, Congress required the Executive Branch to update the Regulations on a regular basis to ensure they remain the "best available procedures" for assessing such damages. S. Rep. 848, 96th Cong., 2d Sess. 86 (1980).

damage which is efficient as to both time and cost.

The reported bill provides in section 6(e) [now Section 301] that those agencies with management and protection responsibilities over natural resources should standardize a process through regulation for assessing damages to those resources.

S. Rep. 848, 96th Cong. 2d Sess. 85 (1980) (emphasis added). See also United States v. Reilly Tar & Chemical Corp., 546 F. Supp. 1100, 1119 (D. Minn. 1982) ("The legislative history indicates that the provisions regarding promulgation of regulations and assessment by federal officials were intended to provide a standardized method for determining natural resource damages that would be efficient in both time and cost."). Moreover, Congress funded several years of research into the scientific and economic methodologies of natural resource damage assessment to ensure that the Regulations would incorporate "the most accurate and credible damage assessment methodologies available." S. Rep. 848, 96th Cong., 2d Sess. 85. If government trustees were free to ignore the Regulations, the very reason Congress required promulgation of the Regulations--to ensure a standardized assessment process--would be defeated.

#28

There is no indication in the legislative history that Congress ever intended or imagined that trustees would be free to disregard the Regulations. As initially enacted, CERCLA provided a "rebuttable presumption" to assessments performed by federal agencies in accordance with the Regulations. Congress provided no such rebuttable presumption to states, even though Congress required states to follow the Regulations when performing assessments. As the Senate Report declares: "There is nothing in this bill that precludes a State from carrying out its own natural resource damage assessments, provided that the State conforms its assessments to the regulations issued under section 6(e)(1) of this Act." S. Rep. No. 848, 96th Cong. 2d Sess. 87 (1980) (emphasis added). Clearly, Congress intended the Regulations to be binding on federal agencies as well as on states.

Thus, Congress recognized a distinction between compliance with the Regulations (which it required) and obtaining the rebuttable presumption (which it did not make available to states).

It was not until 1986 that SARA amended Section 107(f) of CERCLA to allow a rebuttable presumption to attach to assessments performed by state trustees in accordance with the Regulations. At the same time, SARA also added language permitting Indian tribes to perform assessments, but did not provide that a rebuttable presumption will attach to such assessments even if they follow the Regulations. See 53 Fed. Reg. at 5166, 5167 (Feb. 22, 1988). This further exemplifies the distinction between compliance with the Regulations and obtaining the rebuttable presumption.

In 1986, Congress enacted SARA and recodified the damage assessment process into what is now Section 107(f), 42 U.S.C. § 9607(f). While the language was changed, there is no suggestion in SARA's legislative history that Congress intended to change the Regulations from binding to optional.

Interior takes the position that the NRDA Regulations are optional,⁷ but it provides no citation of authority for the extraordinary proposition that trustees are free to ignore the Regulations except "in those instances where a trustee chooses to use the process contained in the rule to conduct an assessment to obtain a rebuttable presumption." 53 Fed. Reg. at 5170 (Feb. 22, 1988).

Interior's position conflicts not only with the statute and its legislative history, but also with the interpretation of the

⁷Interior stated in the introductory section of the Regulations that "[t]he assessment procedures in this part are not mandatory." 43 C.F.R. § 11.10. Interior reiterated this view in its Federal Register comments on the Regulations, but made no attempt to reconcile its position with the language of the statute or the legislative history. See 51 Fed. Reg. at 27694 (Aug. 1, 1986) and 53 Fed. Reg. at 5168-69, 5170 (Feb. 22, 1988).

In Ohio v. Department of the Interior, 880 F.2d 432 (D.C. Cir. 1989), the court stated:

Under the Act, a trustee seeking damages is not required to resort to the Type A or Type B procedures, but CERCLA as amended provides that any assessment performed in accordance with the prescribed procedure is entitled to a rebuttable presumption of accuracy in a proceeding to recover damages from a responsible party.

880 F.2d at 439.

The parties in Ohio did not litigate the binding nature of the NRDA Regulations, and the above-quoted statement is dictum. Moreover, the quoted statement refers only to the "Type A" and "Type B" assessment procedures defined in the Regulations. The Regulations give trustees broad flexibility in deciding whether Type A or Type B procedures should be followed in any given incident. 43 C.F.R. § 11.33. The Ohio court never questioned that the generic sections of the Regulations are binding, including the sections governing preassessment screening, involvement of PRPs in the planning process, and the required detailed contents of an assessment plan.

#28

Environmental Protection Agency ("EPA"). Prior to SARA, CERCLA authorized certain claims against the Superfund for natural resource damages. In 1985, EPA adopted regulations governing such claims, recognizing that the Regulations would be binding when published: "Section 111(h)(1) [now Section 107(f)(2)] provides that injury to natural resources resulting from releases of hazardous substances shall be assessed by designated Federal officials in accordance with regulations to be promulgated under section 301(c) of CERCLA." 50 Fed. Reg. at 51212 (Dec. 13, 1985) (emphasis added).

#28

Congress did not require Interior to invest years of effort and extraordinary expense to develop the "best available procedures" for natural resource damage assessments, 42 U.S.C. § 9651(c)(2), in the expectation that a government damage assessment team assembled in response to the Exxon Valdez oil spill would be free to pick which, if any, of the Regulations it might choose to follow. To the contrary, Congress requires adherence to the Regulations. The Trustees' failure to comply with the Regulations will void the assessment. See 5 U.S.C. § 706 ("The reviewing court shall . . . (2) hold unlawful and set aside agency action, findings and conclusions found to be . . . (D) without observance of procedure required by law"); Reuters Ltd. v. F.C.C., 781 F.2d 946, 950 (D.C. Cir. 1986) ("it is elementary that an agency must adhere to its own rules and regulations"); Batterton v. Marshall, 648 F.2d 694, 711 (D.C. Cir. 1980); Confederated Tribes v. F.E.R.C., 746 F.2d 466, 474 (9th Cir. 1984), cert. den. 471 U.S. 1116 (1985).

C. The Trustees Should Follow The Regulations Even If CERCLA Permits The Exercise Of Discretion.

Even assuming for the sake of argument that CERCLA permits the Trustees to exercise discretion in deciding whether to comply with the Regulations, the Trustees cannot use assessment methods or procedures that vary from those contained in the Regulations unless (1) applicable law requires such variance, or (2) facts in the record affirmatively demonstrate that compliance with the Regulations would produce a clearly erroneous result and the alternate procedures used by the Trustees are scientifically and economically valid.

Com.	Topic	Issue	Sug.	Sort
29	3	0/50		2

As required by Congress, Interior intended that the Regulations embody the "best available procedures," developed through years of research, drafting, and public participation in Interior's rulemaking process. Covering some 60 pages of text, the Regulations prescribe procedures, criteria and scientific methods that govern every aspect of the assessment process, from subjects as general as the considerations to be used to decide whether to do a Type A or Type B assessment, to subjects as specific as the biological responses to be used to determine when physiological malfunctions are the result of exposure to oil. 43 C.F.R. §§ 11.33

and 11.62(f)(4)(v). At the same time, Interior drafted the Regulations to provide substantial flexibility to accommodate the multitude of resources potentially at issue and the evolving nature of scientific and economic methods. 51 Fed. Reg. at 27675 (Aug. 1, 1986) ("The rule seeks a balance between controlling the potential costs of assessments and the need for flexibility in designing the assessment.").

The recent letter from the Trustees' attorney to Exxon Company appears to concede that the Trustees should follow the Regulations unless applicable law requires otherwise:

You can appreciate the need for flexibility in using the regulations in light of the recent decision in Ohio v. United States Department of Interior, No. 86-1529 (D.C. Cir. July 14, 1989). Heretofore, the trustees have conducted the damage assessment process in a manner consistent with the requirements of the regulations. They reserve the right, however, to deviate from the regulations as is necessary to conduct a complete and accurate damage assessment consistent with applicable law.

Letter from Dianne H. Kelly to John Seddelmeyer, dated September 29, 1989 (emphasis added). Alyeska does not object to the Trustees' departure from those few provisions of the Regulations that the Ohio court held violative of CERCLA. The Trustees cannot, however, justify their departure from the balance of the Regulations. The Draft Plan does not explain or demonstrate why the procedures, criteria and methods provided in the Regulations are not fully adequate for the Exxon Valdez assessment. Absent such a demonstration, the Trustees must, and should, adhere to the NRDA Regulations.

II. THE DRAFT PLAN LACKS ESSENTIAL DETAILS AND DOCUMENTATION

In order to ensure that the assessment plan is "performed in a planned and systematic manner," is "cost-effective," and is "conducted at a reasonable cost," the Regulations require a plan to be detailed and well-documented. 43 C.F.R. §§ 11.30(b) and 11.31(a). The Draft Plan is neither. As a result, neither PRPs nor the public can properly evaluate the Draft Plan, and certainly they cannot give it the "independent review" referenced in the Trustees' request for public comments.

The Regulations specifically require the assessment plan to identify and document the use of all the scientific and economic methodologies and statistical analyses that are expected to be performed during the assessment process in sufficient detail to

note bolding

Com.	Topic	Issue	Sug.	Sort
30	2	0130 0102		2

Com.	Topic	Issue	Sug.	Sort
31	3	0102		

0107

0107

permit evaluation of the Plan's likely cost-effectiveness and compliance with the Regulations' reasonable cost requirements. 43 C.F.R. § 11.31(a). The Trustees state they will employ procedures "largely parallel" to those outlined in the Regulations, Draft Plan at 24; they state that each study outlined in the Draft Plan "was determined to be acceptable" according to criteria described on page 23 of the Draft Plan; they state that they will fund additional studies only upon a finding that "a study is required to support assessment of legally recoverable natural resource damages, is fully justified scientifically, and is consistent with the ultimate objective of restoration of the ecology of the affected area." 54 Fed. Reg. at 33618 (Aug. 15, 1989). Having established criteria for reviewing the studies, the Trustees solicited comments on the Draft Plan to "ensure," among other things, "that . . . the methodologies are given an independent review and that the appropriate methodologies are chosen for the assessment; and that the costs of assessment are reasonable." 54 Fed. Reg. at 33619 (Aug. 15, 1989); 54 Fed. Reg. at 39586 (Sept. 27, 1989).

The summary outlines of studies contained in the Draft Plan do not permit such review. By any standard--whether measured against the Regulations, some procedures "largely parallel" to the Regulations, or the specific criteria expressed by the Trustees--the outlines of the proposed studies are inadequate. Indeed, they do not even meet the standards that apply to grant applications for scientific studies. No thoughtful scientist would consider submitting a grant proposal as vague and ill-defined as the terse descriptions accompanying each of the proposed 72 studies.

As an example of the problem, the following is the complete description of the proposed model of damages, sampling technique, and testing technique to be employed in Economic Uses Study Number 9:

A model will be established for the kinds of cultural resources impacted, the degree of impact, and the physical setting in which it occurred. A representative sample of each type of cultural resource affected will be researched, and archeological tests will be conducted.

Draft Plan at 200. This description leaves more questions unanswered than answered. What kind of model will be used? What

Com.	Topic	Issue	Sug.	Sort
32	3	2290		2

sampling techniques will be employed? What kinds of tests will be conducted?

As a further example, none of the study descriptions includes any mention--let alone a detailed description--of the proposed methods and analyses for identifying restoration strategies. As a consequence, those responsible for implementing each study may either do nothing to achieve the Trustees' "primary objective" of restoration or be left to develop procedures for considering restoration strategies on an uncoordinated, ad hoc basis. The reviewer of the Draft Plan can only speculate.

Particularly troublesome is the near total absence of references to existing scientific literature and data. It is that existing body of knowledge that is supposed to provide the basis for numerous critical choices that the Regulations require be made and documented in the assessment plan, such as the Economic Methodology Determination, the preliminary determination of recovery periods, and the selection of injury determination and quantification methods that satisfy the Regulations' strict criteria. 43 C.F.R. §§ 11.35, 11.62, 11.64, 11.70, 11.73.

Also absent from the Draft Plan is the kind of budgetary detail required for anyone, Trustees or PRPs, to evaluate likely cost-effectiveness or reasonableness of costs, as required by law. Any kind of normal budgeting process requires sufficient detail to identify major individual cost items, compare alternatives, and consider possible cost reductions. Again, even grant proposals require far more than is contained in the Draft Plan and the individual study descriptions. As an example, the Economic Uses Study section of the Draft Plan proposes nine studies, with no lead agency, and with an aggregate estimated budget of "approximately \$2.8 million"--unallocated among the nine studies. Draft Plan at 189.

The law requires a careful, accurate, and cost-effective assessment of the natural resource damages resulting from the Exxon Valdez oil spill. For the Trustees to perform the assessment with credibility and at a reasonable cost, they must devote substantial planning, forethought and coordination to the process prior to the commencement of the studies, and they must document in detail the procedures they expect to use. As Interior stated in the Preamble to the Regulations, the assessment plan should function as a type of "quality assurance plan" for the assessment process:

⁴Presumably, prior to including studies in the Draft Plan, the Trustees received information regarding each study from scientists proposing to conduct the study. Accordingly, Alyeska has requested access to all study work plans and other study information in the possession or control of the Trustees.

Com.	Topic	Issue	Sug.	Sort
33	3	0152		2

see footnote next

34↓ at bottom

Com.	Topic	Issue	Sug.	Sort
35	3	0108		2

Com.	Topic	Issue	Sug.	Sort
36	3	2300		2

2200

2

Com.	Topic	Issue	Sug.	Sort
37	3	0200		2

see next page

Com.	Topic	Issue	Sug.	Sort
34	6	0100		2

The Assessment Plan itself is intended to function as a type of "quality assurance plan" for the entire assessment. Where specific Quality Assurance Plan requirements have not been previously developed for a phase of the assessment, the Assessment Plan should contain sufficient detail to allow review, as mandated in § 11.32(c)(1), of the accuracy of all procedures expected to be used in the assessment process.

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51 Fed. Reg. at 27702 (Aug. 1, 1986). In violation of the Regulations and contrary to sound scientific methodology, the Draft Plan contains no assurance of quality, ensuring an inaccurate result.

III. THE TRUSTEES DENIED POTENTIALLY RESPONSIBLE PARTIES ANY INVOLVEMENT IN PREPARING THE ASSESSMENT PLAN

The NRDA Regulations require the Trustees to permit substantial involvement by PRPs in the assessment planning process. Here, the Trustees did not give the PRPs any opportunity to participate in developing the Draft Plan, and the Trustees compounded that failure by conducting most of the studies before submitting the Draft Plan to the PRPs and the public for review.

Section 11.32(a)(2)(iii)(A) of the Regulations requires the authorized official to send a notice inviting "the participation of the potentially responsible party . . . in the development of the type and scope of the assessment and in the performance of the assessment." The authorized official then must allow at least 30 days from that notice "before proceeding with the development of the Assessment Plan or any other assessment actions." Section 11.32(a)(2)(iii)(B). The Ohio court confirmed that "[p]otentially responsible parties must thus be indulged significant opportunities for involvement and input into the assessment process." 880 F.2d at 480, n. 108.

Interior explained the reasons for PRP involvement to the Ohio court:

[Interior] explains that PRPs merit more involvement in the pre-assessment process than does the general public because PRPs have a stake in the cost-effectiveness of the assessment methods chosen. [Interior] also contends that involvement of PRPs early in the process will tend to promote settlement of natural resource damage claims.

880 F.2d at 468.

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38	3	4206		2

On June 6, Alyeska received a notice from the Trustees inviting it to participate in the "assessment process." Alyeska responded by denying that it should be labeled a potentially responsible party but expressing its desire to participate in the assessment process and to provide substantive input into development of the Plan. Though the Regulations required the Trustees to wait at least until July 5 before proceeding with the development of the assessment plan or with any other assessment actions, 43 C.F.R. § 11.32(a)(2)(iii)(B), the Trustees had, in fact, already substantially completed the Draft Plan before sending the FRP notices. Indeed, by June 23, more than two weeks before the Regulations permitted the Trustees to proceed with developing the plan, the Trustee Council had unanimously approved the Draft Plan. See Letter of July 17, 1989, from Don W. Collinsworth, Alaska Department of Fish and Game, to the three federal Trustees. Further exacerbating the problem, and in violation of Section 11.32(c)(1) of the Regulations, Interior announced on August 11 that "virtually all of the studies" set forth in the Draft Plan "are well underway"--though the Draft Plan was not even distributed for public review until August 22. 54 Fed. Reg. at 33618 (Aug. 15, 1989). Merely giving FRPs, along with the general public, the opportunity to comment on the Draft Plan at this time is inadequate and contrary to Interior's expressed views. See 51 Fed. Reg. at 27703 (Aug. 1, 1986). By denying FRPs an opportunity to develop the type and scope of the assessment, the Trustees violated the Regulations and seriously impaired the objectivity and validity of the assessment process.

IV. THE DRAFT PLAN IGNORES RESTORATION

The Trustees have identified restoration as the "primary objective" of the damage assessment process.¹ Thus, under the Regulations, restoration should provide the framework within which the Trustees quantify damages, "at least where restoration is feasible and can be performed at a cost not grossly disproportionate to the use value of the resource." Ohio v. Department of the Interior, 880 F.2d 432, 446 (D.C. Cir. 1989). Inexplicably, however, the Draft Plan is heavily skewed toward measurement of lost uses that are not shown to be consistent with any restoration objective. The Draft Plan contains no Economic Methodology Determination or Restoration Methodology Plan as required by Sections 11.35 and 11.82 of the Regulations. The Plan also fails to require a resource recoverability analysis under Section 11.73, which calls upon the Trustees to project the rate at which restoration alternatives such as natural recovery are expected to return resource-dependent services to their baseline

¹Draft Plan, Executive Summary at i; 54 Fed. Reg. at 33618 (Aug. 15, 1989).

Com.	Topic	Issue	Sug.	Sort
39	3	0150		2

← 0151 0
 ← 0152 0
 39a 3 0106 2

levels. In short, the Draft Plan fails to develop a unified, cost-effective assessment plan consistent with its own restoration objective and the Regulations.

The 72 studies identified in the Draft Plan include no substantive analysis of restoration methods or timing. Indeed, none of the Trustees' study acceptance criteria stated in the Draft Plan even mentions the word "restoration." Draft Plan at 22-23. In contrast to this approach, the Trustees have announced that they will fund additional research conducted after February 28, 1990, only if a study is "fully justified scientifically, and is consistent with the ultimate objective of restoration of the ecology of the affected area." 54 Fed. Reg. at 33618 (Aug. 15, 1989) (emphasis added). Thus, the Trustees apparently have opted to sever restoration analysis from the damage assessment process now taking place.

The relevant statutes and regulations under which the Trustees' damage assessment must proceed do not permit such bifurcation. Restoration planning is an integral part of the injury quantification and damage determination process. CERCLA requires that the Regulations must identify procedures for measuring damages that "shall take into consideration factors including, but not limited to, replacement value, use value, and ability of the ecosystem or resource to recover." 42 U.S.C. § 9651(c)(2) (emphasis added). # 39

In enacting CERCLA, Congress intended restoration planning to proceed simultaneously with, and as a part of, damage assessment. Likewise, the Senate Report accompanying CERCLA explains that "no restoration action concerning resource damage may take place until a plan outlining the steps to be taken has been developed and adopted The process of developing such a plan will be of great assistance in avoiding unnecessary costs involved in restoring, rehabilitating, or replacing natural resources." S. Rep. No. 848, 96th Cong., 2d Sess. 85 (1980). Senator Stafford, the leading author and sponsor of CERCLA, underlined the need for the assessment plan to focus on restoration at the outset, stating that natural resource damages could be pursued only after "a restoration plan is developed." 126 Cong. Rec. S 15008 (daily ed. Nov. 24, 1980).

By failing to make restoration an integral component of the Draft Plan, the Trustees have failed to satisfy the Regulations and the very objective that the Trustees state they intend to accomplish. The 72 studies, projected to cost some \$35 million, should not commence merely with the hope that they may assist in achieving restoration. Instead, the Trustees must specifically consider the information and data that will be essential to assessing the technically-feasible and cost-effective restoration means. Because the Draft Plan fails to include a restoration objective from the outset in the assessment process, implementation

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of the Plan will result in a costly, wasteful and inefficient effort that will not yield a useful product.¹⁰

A. The Draft Plan Fails to Include an Economic Methodology Determination.

The Draft Plan fails to incorporate the Economic Methodology Determination required under Section 11.35 of the Regulations, which is critical to an integrated assessment approach. Despite the repeated statements of the Trustees that their goal is "expeditious restoration of the ecology of the affected area," see, e.g., 54 Fed. Reg. at 33618 (Aug. 15, 1989), the Draft Plan contains no estimate of the costs of various feasible restoration alternatives, including natural restoration, and the benefits to be derived from each.

Inclusion of an Economic Methodology Determination at an early stage of the assessment process has very significant implications for the design of the data collection studies used in the injury determination, quantification and damage determination phases. Interior cautions that "[t]he [outcome of the Economic Methodology Determination] will affect the choice of methodologies to be selected in the Quantification phase and to a lesser extent in the Injury Determination phase. Therefore, the rule requires the [Economic Methodology Determination] at an early stage" 51 Fed. Reg. at 27679 (emphasis added).

The only specific discussion of economic valuation methodologies is found at page 24 of the Draft Plan, which simply states that "[e]conomic damages may be calculated as the cost of restoring or replacing the resources, or resource services, injured by the spill in addition to the value of the goods and services reduced or lost as a result of the spill (also referred to as the 'diminution of use values')." This cursory statement does not satisfy the requirements of Section 11.35, nor does it cast any light on how the planners intend to implement restoration-directed research methodologies.

¹⁰The NRDA Regulations stipulate that in order for an assessment plan to achieve cost-effectiveness:

a well-defined objective must be specified. For example, the objective of restoration or replacement is the return to the baseline level of services provided by the resource. Once an objective is defined, cost-effectiveness means that the authorized official must choose the least expensive management or other actions that achieve the objective.

51 Fed. Reg. at 27690 (1986) (emphasis added).

Com.	Topic	Issue	Sug.	Sort
41	3	0141		2

Com.	Topic	Issue	Sug.	Sort
42	3	0105 0152		2

Com.	Topic	Issue	Sug.	Sort
43	3	0141		2

0130

Com.	Topic	Issue	Sug.	Sort
44	3	0130 0152		2

Com.	Topic	Issue	Sug.	Sort
40	5	0150		2

B. The Draft Plan Fails to Include A Restoration Methodology Plan.

Section 11.82 of the Regulations requires that the method chosen for restoration must result from an evaluation performed in a Restoration Methodology Plan. The purposes of the Restoration Methodology Plan are "to ensure that the restoration or replacement alternative that forms the basis of the measure of damages is cost-effective and to serve as a basis for the more detailed restoration or replacement plan that shall be completed after a damage award." 43 C.F.R. § 11.82(b).

The Draft Plan includes no Restoration Methodology Plan.¹¹ None of the restoration-related information required by the Regulations is anywhere to be found in the Draft Plan. See 43 C.F.R. § 11.82(d). Inevitably, the Draft Plan lacks sufficient detail for PRPs and the public to determine whether "the restoration . . . alternative that forms the basis of the measure of damages is cost-effective" 43 C.F.R. § 11.82(b).

C. The Draft Plan Fails to Assess Natural Recovery As Potentially The Best And Most Cost-Effective Means Of Restoration.

A key requirement of the Regulations and the Restoration Methodology Plan is that the Trustees include a No Action-Natural Recovery Alternative that estimates the ability of the resource to recover without additional cleanup actions being taken. 43 C.F.R. § 11.82(d)(2)(i). In drafting the Regulations, Interior recognized that natural recovery may well be the soundest and most cost-effective restoration alternative:

¹¹Those portions of the Draft Plan that address restoration discuss only a prospective "Restoration Plan" that "will be written . . . as soon as injuries to resources are sufficiently evaluated." See Draft Plan at 26-28, 185-87. The Draft Plan treats this "Restoration Plan" as quite separate from the damage assessment process; it is aimed solely at describing the manner in which any monetary damages to be recovered shall be used to restore injured natural resources: "restoration plan elements will be developed, as soon as practical, after specific natural resource injuries have been sufficiently evaluated." Draft Plan at 27 (emphasis added).

The discussion in the Draft Plan appears to be directed to a post-assessment phase Restoration Plan, which is prescribed in Section 11.93 of the Regulations. The Restoration Methodology Plan required in Section 11.82 and discussed above is quite distinct from--and is required in addition to--the Section 11.93 Restoration Plan that describes post-damage assessment activities.

Com.	Topic	Issue	Sug.	Sort
45	3	0152		2

0102

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Com.	Topic	Issue	Sug.	Sort
47	3	0105		2

See next page

Com.	Topic	Issue	Sug.	Sort
46	3	0151		2

0202

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The Department points out that the statute requires consideration of natural recovery periods. In order to determine the most cost-effective restoration alternative, the authorized official acting as trustee must also consider effects on services, lost use values, and other economic considerations of the Damage Determination phase. In considering these factors, it is possible that natural recovery may be the cost-effective alternative.

51 Fed. Reg. at 27718 (Aug. 1, 1986) (emphasis added).

In the case of the Exxon Valdez spill, it is likely that the most cost-effective and environmentally sound restoration program will be to rely on natural recovery processes in lieu of additional human intervention.¹² Unlike hazardous and toxic chemicals that may persist in the environment or may bioaccumulate, crude oil is

¹²Particularly in the dynamic, high energy environment of Prince William Sound, there is reason to be optimistic that the initial adverse effects of the spill may be rectified fairly quickly through natural recovery. Furthermore, even to the extent that restoration with additional human intervention is possible, many scientists, environmental managers and planners would question its value. Current concepts of restoration ecology would hold that:

[T]he principle of homeostasis also rejects expensive and elaborate restoration projects, which strive to replicate the site's prior condition. This "boutique" restoration supplants ecology's balance with humankind's view of how nature should look. Although all of the restored resources may be organic, the result is as artificial as plastic trees. Once a site has been altered, by humans or otherwise, its natural fate is modified. Only by letting nature take its course can people fulfill the important objective of natural homeostasis. Consequently, a relatively simple, minimalist restoration that cleanses the site of excessive human-made stress is best.

F. Cross, Natural Resource Damage Valuation, 42 Vanderbilt L. Rev. 269, 341 (1989) (emphasis added). See also, J. Krutilla & A. Fisher, The Economics of Natural Environments, 45 (1975); Johnson & Bradshaw, Ecological Principles for the Restoration of Disturbed and Degraded Land, in 4 Applied Biology 149 (T. Coaker ed. 1979).

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Com.	Topic	Issue	Sug.	Sort
48	1	0105		2

See also p. 17 - The same subject

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49	1	0105		2

a relatively non-toxic, naturally occurring organic material that is readily subject to volatilization, photochemical oxidation, dispersion, dissolution, emulsification, sedimentation, chemical degradation and biodegradation. Oil spills have been studied extensively by government, industry and academia. Experience with the Santa Barbara oil spill in 1969, the Amoco Cadiz oil spill in 1978, and numerous other large crude oil spills, indicates that natural recovery will lead to rapid restoration of the environment. The Draft Plan fails to consider data and analyses from past spills, other oil spill-related research, and data collected from the Exxon Valdez spill in order to determine the ability of the resource to recover without additional actions being taken beyond those that are being or have been conducted.¹³

Studies included in the Draft Plan also do not account for the cleanup efforts performed by Exxon and the State of Alaska. Cleanup of spilled oil is the principal available means of artificial restoration. Furthermore, the Regulations require that the effects of such response actions must be considered. 43 C.F.R. § 11.84(c)(2). Much has been learned about the effectiveness of cleanups conducted after other spills, and the Trustees should consider that knowledge.

D. The Draft Plan Fails To Incorporate Resource Recoverability Analysis.

The Draft Plan also fails to include a "resource recoverability analysis," which is required by the Regulations and essential to the assessment process. Section 11.73 requires the Trustees to estimate the time needed for each injured resource to recover to the baseline state. Without establishing the estimated recovery period, measurement of economic damages simply becomes impossible. If, for example, the Trustees estimate incorrectly that natural recovery will take ten years when in fact it will take two years, the Trustees might select an artificial restoration alternative at a cost grossly disproportionate to the value of the natural resource services lost during the two-year period of actual restoration. In such a case, the Trustees would be unable to recover the cost of the improper method.

In addition, Section 11.84(g)(2)(ii) of the Regulations expressly states that the diminution of use values should be estimated only after the recovery rate is estimated:

¹³Further, the Trustees should not consider additional human intervention unless it is justified by a thorough, well-documented evaluation of artificial restoration techniques currently available in the biological and physical sciences, engineering and other management sciences, and the long-term and indirect impacts of such restoration alternatives. See 43 C.F.R. § 11.82(2)(iii).

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Com.	Topic	Issue	Sug.	Sort
50	3	0105		2

0108

Com.	Topic	Issue	Sug.	Sort
52	3	0108		2

Com.	Topic	Issue	Sug.	Sort
53	3	0106		2

Com.	Topic	Issue	Sug.	Sort
51	3	0152		2

0105

A recovery rate should be selected for this analysis that is based upon cost-effective management actions or resource acquisitions, including a "No Action-Natural Recovery" alternative. After the recovery rate is estimated, the diminution in use values should be estimated.

43 C.F.R. § 11.84(g)(2)(ii) (emphasis added). Simply put, it is impossible to calculate any form of economic damages without first specifying over what time period those damages are being sought.

The Draft Plan's damage assessment studies are fatally flawed by the omission of the critical recovery time variable. For example, the Economic Uses Studies (Draft Plan at 189-201) purport to measure damages without specifying the time period over which the damages will be experienced. Those studies cannot proceed in the absence of a resource recovery analysis.¹⁴

V. THE DRAFT PLAN FAILS TO FOLLOW THE PHASED APPROACH REQUIRED BY THE REGULATIONS

The Draft Plan describes an approach to damage assessment that fails to follow the logical, four-step process established by the Regulations--the preassessment phase, the injury determination phase, the quantification phase and the damage determination phase. This fundamental deficiency ensures that the basic purpose of having a plan--to ensure a "planned and systematic" assessment at a reasonable cost--will not be achieved.

A. The Trustees Failed to Perform an Adequate Preassessment Screen.

The preassessment screen is a review of available information to assist the Trustees in identifying potential exposure pathways and potentially affected resources so that an assessment plan can be designed to study only those resources that are likely to have been affected by the spill. 43 C.F.R. §§ 11.20-11.25. The Regulations prescribe criteria that must be met and factors that must be considered before preparing the assessment plan and proceeding with the assessment. Had the Trustees conducted an adequate preassessment screen, many of the 72 studies included in

¹⁴A further reason the Trustees should not conduct any economic studies in the absence of, among other things, a resource recovery analysis because the Trustees should not assess types of damages that either do not exist on an interim basis, or that will be so insignificant or speculative as to be incapable of reliable measurement or insufficient to justify the costs of assessment (e.g., bequest, option and existence values).

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Com.	Topic	Issue	Sug.	Sort
54	3	2200		2

55 at bottom ↓

Com.	Topic	Issue	Sug.	Sort
56	3	0202		2

Com.	Topic	Issue	Sug.	Sort
57	3	0203		2

0130

Com.	Topic	Issue	Sug.	Sort
55	3	0106		1

the Draft Plan would not have been done. For example, Fish/Shellfish Study No. 24 proposes to spend \$2 million to study shellfish and groundfish outside of Prince William Sound, despite the fact that injuries to such fisheries are extremely unlikely. See also, e.g., Marine Mammals Studies and the benthic infauna study discussed in Section C below.

B. The Draft Plan Improperly Combines The Injury Determination Phase And The Injury Quantification Phase.

The planned assessment approach established under the Regulations clearly distinguishes between the concepts of "injury" and "damage." See 51 Fed. Reg. at 27682 (Aug. 1, 1986). Injury determination under the Regulations requires that there has been a "measurable adverse change" in the resource being studied, 43 C.F.R. § 11.14(v), and that the adverse change be shown to have resulted from the oil spill. Sections 11.62 through 11.64 set forth specific criteria and testing and sampling methods for determining whether an "injury" has occurred.

The injury determination phase outlined in the Regulations is designed to ensure that "only assessments involving well documented injuries resulting from the discharge of oil or release of a hazardous substance proceed through the type B assessment." 43 C.F.R. § 11.61(b) (emphasis added); see also, 43 C.F.R. §§ 11.13(e)(1) and 11.61(a)(1). The Regulations explicitly require the Trustees to conduct a review at the end of the injury determination phase in order to determine which natural resources have been injured as a result of the oil spill and whether and how to proceed with the quantification phase. 43 C.F.R. §§ 11.32(f) and 11.61(e). Unless the Trustees determine, after this initial phase, that an injury as defined in the Regulations has in fact occurred with respect to a particular resource, "no further assessment actions are to be taken and no assessment costs will be recovered." 51 Fed. Reg. at 27679 (Aug. 1, 1986).

The Draft Plan ignores this screening process by proceeding in an undisciplined manner with the injury determination and quantification phases simultaneously. As a result, a number of the 72 studies will try to quantify injuries to resources not likely to have been measurably injured by the Exxon Valdez spill.

C. The Draft Plan Assessment Will Not Be Conducted At A Reasonable Cost.

A major risk associated with combining injury determination and quantification into a single process, as the Draft Plan does, is that considerable expense will be incurred by attempting to quantify resource levels for which no verifiable injury is subsequently found to exist, thereby violating the Regulations' mandate that the assessment process be conducted at a "reasonable cost." See 43 C.F.R. § 11.13(c) (the assessment must be "performed

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Com.	Topic	Issue	Sug.	Sort
58	2	0204		2

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Com.	Topic	Issue	Sug.	Sort
59	2	0204		2

Com.	Topic	Issue	Sug.	Sort
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Com.	Topic	Issue	Sug.	Sort
60	2	0107		2

0130

in a planned and systematic manner" and the methodologies chosen must "demonstrate reasonable cost"); § 11.30(b) (assessment plan phases must be conducted "at a reasonable cost").¹⁵ For example, the Draft Plan targets seven different studies to identify and quantify possible injuries to marine mammals--including two separate studies that contemplate, among other things, identifying and tracking literally every killer whale pod and every individual humpback whale "in and adjacent to" Prince William Sound. (Marine Mammals Studies Nos. 1-2, Draft Plan at 114-117). Such studies clearly would be wasteful in light of the large body of scientific research and publications demonstrating that many of the posited adverse effects on these species are not likely to have occurred. Similarly, Air/Water Study No. 4 proposes to study benthic infauna residing in waters more than 20 meters in depth, even though it is very unlikely that significant amounts of oil even sunk to such areas. By collapsing the determination and quantification of such unverified injuries, the Draft Plan ensures substantial waste of public funds.

#60

D. The Damage Determination Studies Are Premature

No damage determination studies should proceed until, at the earliest, the injury determination/quantification phases are substantially complete and resource recovery periods have been estimated for each resource. Any other procedure violates the Regulations and good sense. See 43 C.F.R. §§ 11.80-11.84.

Com.	Topic	Issue	Sug.	Sort
62	1	0205		2
		0130		0

VI. THE DRAFT PLAN ADOPTS AN INCORRECT DEFINITION OF "BASELINE" CONDITIONS

The Regulations require an assessment to "determine the physical, chemical, and biological baseline conditions and the associated baseline services for injured resources at the assessment area" that would have existed had the spill not occurred, and to compare that baseline with the post-spill level of services provided by the resources injured as a result of the spill. 43 C.F.R. § 11.72(a).

Com.	Topic	Issue	Sug.	Sort
63	2	0131		2

The Draft Plan departs from the Regulations' definition of the appropriate baseline by incorrectly using "pre-spill" conditions as the standard against which actual (damaged) conditions should be compared. Draft Plan at 22 and 26. The distinction between

¹⁵Any costs incurred to quantify resources that are found, at the conclusion of the research, to have been unaffected or insignificantly affected by the oil spill would be per se unreasonable and not recoverable from the FRPs. Responsible parties cannot be required to pay for new developmental research necessary to meet the acceptance criteria, or any other research. 51 Fed. Reg. at 27702.

Com.	Topic	Issue	Sug.	Sort
61	2	0107		2
		0206		2

"pre-spill" conditions and "without spill" conditions is very important, because a baseline defined in terms of pre-spill conditions ignores factors that would have influenced the quantity or quality of a resource had the spill not occurred. 43 C.F.R. § 11.14(e).¹⁶ These factors become increasingly important with the passage of time from the date of the spill, as both natural factors--such as ecological succession and natural cyclical changes in the biological resource populations--and human activities influence resource levels. See 51 Fed. Reg. at 27679 (Aug. 1, 1986). Studies will reveal other exogenous factors that would have altered pre-spill conditions dramatically, and the assessment must consider this information.¹⁷

#63

The Draft Plan further departs from the Regulations by treating baseline as if it could be determined with certainty. Because the baseline is a projection of what would have occurred under a hypothetical set of conditions, the Trustees must acknowledge and account for the inherent uncertainty of such projections. The Preamble to the Regulations points out: "A baseline should allow for comparison with the normal range of variation, rather than being constrained to a single measurement." 51 Fed. Reg. at 27688 (Aug. 1, 1986). The Regulations themselves advise the Trustees that "uncertainty should be handled explicitly

Com.	Topic	Issue	Sug.	Sort
65	2	0131		2
0130				0

¹⁶Baseline data should reflect conditions that would have been expected at the assessment areas had the discharge of oil or release of hazardous substances not occurred, taking into account both natural processes and those that are the result of human activities. 43 C.F.R. § 11.72(b)(1).

¹⁷The Preamble to the Regulations explains:

For almost any parameter being measured, variability is expected, whether that parameter is a physical measurement, such as concentration of an ion in ground water, or a biological measure, such as population levels of an animal species. Some of those parameters may be relatively constant, or vary on an annual cycle; others can be expected to vary cyclically and dramatically, such as "four-year cycles" of lemmings or "ten-year cycles" of lynx, where populations may vary from nearly zero to many thousands in a given area over the course of a fairly regular cycle. Other parameters may change gradually in one direction, as do population changes of many species during ecological success, or show random and unpredictable changes.

51 Fed. Reg. at 27688.

Com.	Topic	Issue	Sug.	Sort
64	5	0131		0

in the analysis and documented. The uncertainty should be incorporated in the estimates of benefits and costs." 43 C.F.R. § 11.84(d)(1). The Draft Plan fails to comply with this provision of the Regulations.

65

A related problem arises from the Draft Plan's failure to indicate how, if at all, the assessment will measure reductions in baseline services provided by natural resources, as opposed to changes in the underlying natural resources themselves. Though the Regulations expressly require that the quantification phase of the assessment should measure the effects of a spill in terms of the change in the level of services that injured resources provide, 43 C.F.R. §§ 11.70 and 11.71, the Draft Plan does not indicate whether, or how, it proposes to do so. See, e.g., Draft Plan at 24.

Com.	Topic	Issue	Sug.	Sort
66	3	0131		2

VII. THE DRAFT PLAN UNLAWFULLY PROPOSES TO STUDY PRIVATE LOSSES

CERCLA, the Clean Water Act and the Regulations permit the Trustees to assess and recover damages only for the cost of restoring public uses of natural resources, not losses from privately owned natural resources or private uses of natural resources. It is apparent, however, that a number of the studies in the Draft Plan propose to assess private losses.

CERCLA defines "natural resources" to mean resources "belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States . . . any State or local government, any foreign government, any Indian tribe, or, if such resources are subject to a trust restriction on alienation, any member of an Indian tribe." 42 U.S.C. § 9601(16). This definition "limits the damages compensable to authorized officials to the loss to the general public" 51 Fed. Reg. at 27695 (Aug. 1, 1986). Trustees are limited still further to recovering damages only for "committed" public uses of natural resources, a "committed use" being defined in the Regulations as either "a current public use; or a planned public use of a natural resource for which there is a documented . . . commitment established before the discharge of oil" 43 C.F.R. § 11.14(h); see also Ohio v. Department of the Interior, 880 F.2d at 461.

Com.	Topic	Issue	Sug.	Sort
67	2	0132		2

Congress specifically considered and rejected permitting recovery for private losses.¹⁸ Thus, Trustees may not include

¹⁸Early drafts of CERCLA would have permitted recovery for damage to private property. See H.R. 7020, 96th Cong. 2d Sess. § 5 (1980) (damages to include "all damages for personal injury, injury to real or personal property, and economic loss, resulting (continued...)

Com.	Topic	Issue	Sug.	Sort
68	5	0132		2

losses suffered by private users of natural resources in a natural resource damage assessment. 51 Fed. Reg. at 27696; Ohio v. Department of the Interior, 880 F.2d at 459-61; accord, Lutz v. Chromatex Inc., 29 ERC 2045, 2049 (M.D.Pa. 1989).¹⁷

The Draft Plan unabashedly ignores the prohibition on assessing private losses: "The studies outlined in the assessment plan are designed to quantify adverse effects that may be reimbursed--regardless of who might be reimbursed--by the potentially responsible parties." Draft Plan at 18 (emphasis added). Though the Draft Plan's descriptions of the various proposed studies are so vague that detailed evaluation is impossible, several of the studies appear on their face to propose studying private losses allegedly caused by the spill. For example:

- Economic Uses Studies Nos. 1, 2 and 3. Economic Uses Study No. 1 studies "Estimated Price Effects on Commercial Fisheries." Draft Plan at 190. Economic Uses Study No. 2 studies "Fishing Industry Costs." Draft Plan at 191. Economic Uses Study No. 3 quantifies the "effects of the oil spill on fishery resources and the commercial fisheries" Draft Plan at 192. The Draft Plan provides no explanation how these studies are relevant to anything other than the assessment of commercial losses suffered by private parties.

Com.	Topic	Issue	Sug.	Sort
70	2	0132		2

Com.	Topic	Issue	Sug.	Sort
71	3	2270 2220		1

2230

¹⁸(...continued)
from such release or threatened release"). Congress rejected this language and provided only for recovery of damage resulting from the loss of committed public uses of natural resources.

¹⁹Trustees must carefully limit assessment studies to those necessary to assess recoverable damages resulting from loss of the general public's use of natural resources. As Interior stated in the Preamble to the Regulations:

During an assessment, studies of injury or damage that do not directly contribute to the determination of a dollar value for the injured resource should not be part of the damage claim.

51 Fed. Reg. at 27682 (Aug. 1, 1986). Indeed, in sharp contrast to the criteria for including studies in the Draft Plan (see Draft Plan at 22-23), the Trustees announced in a recent Federal Register notice that "[a]dditional studies will be funded only upon a finding that a study is required to support assessment of legally recoverable natural resource damages" 54 Fed. Reg. at 33618 (Aug. 15, 1989) (emphasis added).

Com.	Topic	Issue	Sug.	Sort
69	3	0133		2

Private litigants have already filed numerous lawsuits seeking damages for losses allegedly incurred by the commercial fishing industry as a result of the spill.

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- Economic Uses Study No. 4. This studies the effects of the spill on the value of public land, and includes within its scope the use value of private commercial enterprise such as mining, logging and gravel extraction.
- Economic Uses Study No. 6. This studies losses to subsistence households. To the extent these are recoverable losses, they are private not public, and are beyond the scope of this assessment process. Private litigants have filed several lawsuits seeking damage for losses to subsistence households.
- Economic Uses Study No. 7. This studies the loss of "intrinsic values," including "option value," "existence value," and "bequest value," without any attempt to define any such public loss.
- Economic Uses Study No. 8. This assesses damages to research programs affected by the spill, including research by "private groups."²⁰
- Economic Uses Study No. 9. This assesses damages to archaeological sites. Archaeological sites are not "natural resources" within the meaning of CERCLA or the Regulations, and thus are not properly the subject of this assessment process. Moreover, the study makes no distinction between sites on public or private land.
- Fish/Shellfish Study No. 16. This studies the impact of the spill on three private commercial oyster farms. Any injuries to those oyster farms are beyond the proper scope of this assessment process.
- Fish/Shellfish Study No. 25. This studies potential injury to the commercial scallop fishery based out of Kodiak. Any damages are beyond the scope of this process.
- Fish/Shellfish Study Nos. 1, 7, 11, 12, 15, 22, 24 and 26. These studies emphasize the substantial

Com.	Topic	Issue	Sug.	Sort
72	5	2240		2

6132

Com.	Topic	Issue	Sug.	Sort
73	2	2260		2

0132

Com.	Topic	Issue	Sug.	Sort
74	2	2270		2

0132

Com.	Topic	Issue	Sug.	Sort
75	5	2280		2

76 ↓ at bottom

Com.	Topic	Issue	Sug.	Sort
77	2	2290		2

Com.	Topic	Issue	Sug.	Sort
78	2	1460		2

Com.	Topic	Issue	Sug.	Sort
79	2	1550		2

Com.	Topic	Issue	Sug.	Sort
80	3	1300 0132		2

Com.	Topic	Issue	Sug.	Sort
76	2	0107		2

²⁰Alaska does not concede that research projects are among the natural resource services for which damages are recoverable.

commercial value of the subject resource and the alleged financial losses to be experienced by commercial fisheries if the spill adversely affects the abundance of the resource. The Trustees must ensure that these studies are restricted so they study only public losses.

#80

The studies mentioned above exemplify the Draft Plan's failure to observe the statutory boundary between assessing damages sustained by private interests and natural resource damages sustained by the general public.²¹

The Trustees should immediately discontinue the assessment of any private losses resulting from the spill.

Com.	Topic	Issue	Sug.	Sort
81	2	0133		2

VIII. THE DRAFT PLAN FAILS TO INCLUDE MEASURES THAT WILL AVOID DOUBLE COUNTING AND DOUBLE RECOVERY OF DAMAGES

82 at bottom +

CERCLA § 107(f)(1) decrees that "[t]here shall be no double recovery under this chapter for natural resource damages" The Regulations forbid both double recovery and double counting. 43 C.F.R. §§ 11.15(d), 11.84(c)(1), and 11.84(c)(2). The Draft Plan is not structured to avoid double counting of damages, despite the Trustees' assurance to the contrary. Rigorous analysis and coordination is required to avoid double counting and double recovery problems, of which there are many different types. Several examples will illustrate the problem:

Com.	Topic	Issue	Sug.	Sort
83	3	0133		2

1. Economic Uses Study No. 4 proposes to study the effects of the oil spill on the "value of public land." Draft Plan at 193. But all of the reduced land value claims in that proposed study double count reduced use values that are already being assessed elsewhere, both within the Draft Plan and privately. Any reduction in the value of land is exactly the reduced value of the (capitalized) use rights of that land (whether the use rights be, e.g., for logging, mining or recreation).

Com.	Topic	Issue	Sug.	Sort
84	2	2240		2

²¹The relevant "public" does not include citizens of foreign countries. See 43 C.F.R. § 11.84(i)(2). Thus, Economic Uses Study No. 5, which studies economic damages to recreational services incurred by "recreationists from throughout the United States and other countries," is overly broad. The Trustees must limit that study and all studies to assessments that are necessary to determine recoverable damages.

Com.	Topic	Issue	Sug.	Sort
82	2	2250		2

Funds spent assessing losses that are not recoverable under CERCLA or the Clean Water Act (including funds spent for studies that commingle private losses and public losses) are not reimbursable.

Because reduced use values are already being claimed (see, e.g., the Economic Uses Study No. 5), to claim them again, under another name, is simply double counting.²²

2. Another form of double counting occurs when the Draft Plan assesses alleged damages that are also the subject of private claims. Virtually every type of damage being assessed by the Draft Plan is also being claimed in one or more lawsuits brought by private litigants or the State of Alaska. See, e.g., Economic Uses Studies discussed in Section VII above.²³

3. The Draft Plan's failure to identify interdependent services will lead to yet another form of double counting. The Regulations specifically require the identification of interdependent services to avoid double counting and provide that only the net reductions in services can be claimed. 43 C.F.R. §§ 11.71(b)(4) and 11.71(1)(1). The Draft Plan provides no procedures for identifying interdependent services.

4. The Draft Plan also fails to ensure that the final damage assessment will quantify only the net effects of the spill on natural resources, taking into account not only interdependent services, but also various increases and reductions in services across the spectrum of those measured in the assessment process. By failing to take net effects into account, the Draft Plan will produce an inaccurate assessment.

5. The proposed Economic Uses Studies fail to consider the effects of response actions (oil cleanup activities) as required by the Regulations. 43 C.F.R. § 11.84(c)(2). This failure will lead to another form of double counting.

In sum, despite the Trustees' assurance that they will take care to avoid double counting, the Draft Plan fails to do so.

²²This study is also improper and wasteful because it proposes a general study of changes in public land values, though the "committed use" requirement of the Regulations would permit consideration (if at all) only of effects on land sales that were specifically planned and "committed" before the spill. 43 C.F.R. §§ 11.84(b)(2) and 11.14(h).

²³Alaska does not concede that such private litigants have stated a cause of action.

#84
85 at bottom ↓

Com.	Topic	Issue	Sug.	Sort
86	3	0133		2

87 at bottom ↓

Com.	Topic	Issue	Sug.	Sort
88	3	0133		2

Com.	Topic	Issue	Sug.	Sort
89	4	0102		2

Com.	Topic	Issue	Sug.	Sort
90	3	0133		2

0102

Com.	Topic	Issue	Sug.	Sort
85	2	0133		2

Com.	Topic	Issue	Sug.	Sort
87	2	0132		2

IX. THE DRAFT PLAN FAILS TO SPECIFY RELIABLE
STATISTICAL METHODS

A. The Draft Plan Is Inadequate to Ensure Valid Statistical Sampling.

Com.	Topic	Issue	Sug.	Sort
91	5	0103		2

Many of the proposed studies in the Draft Plan rely on statistical methods, including statistical sampling, for the determination and quantification of injury and for damage determination. Details of the statistical sampling plans are not included in the Draft Plan, however. The purpose of a statistical sample is to study a portion of a population and then to extrapolate those findings to the entire population. The reliability of this extrapolation depends, in part, on the extent to which the samples are selected to be representative of the population as a whole. Samples that are procured haphazardly or otherwise fail to conform to a statistically valid, probability-based sampling plan will generate biased, erroneous results and cannot be used reliably.

The NRDA Regulations direct the Trustees to disclose their proposed sampling methodologies in detail:

[T]he Assessment Plan shall include the sampling locations within those geographical areas [impacted by the spill], sample and survey design, numbers and types of samples to be collected, analyses to be performed, preliminary determination of the recovery period, and other such information required to perform the selected methodologies.

43 C.F.R. § 11.31(a)(2).

The Draft Plan recognizes that a statistically valid design is necessary if the findings in the sampled areas are to be reliably extended to areas not sampled:

The statistical design, in accordance with the Quality Assurance Program, will permit extrapolation to the entire affected area of the injuries determined through analysis of the study sites.

Draft Plan at 30.

Turning to Appendix A, which discusses the Draft Plan's Quality Assurance Program, one finds no instructions or guidance whatever to ensure a valid statistical design or sampling plan. Rather, the Quality Assurance Program described in Appendix A is limited to "minimum requirements necessary to validate the data generated by analytical chemistry laboratories. Quality assurance

Com.	Topic	Issue	Sug.	Sort
92	5	2410		2

Cont next page.

requirements for other types of measurements are not addressed." Draft Plan at 212 (emphasis added). Nor do the individual plans contain a description of how they intend to achieve a statistically valid sampling plan. For example, Fish/Shellfish Study No. 1 states:

Of the 211 aerially surveyed index streams in the Sound, a statistically significant number (tentatively 100) will be surveyed in this study.

Draft Plan at 51 (emphasis added). The study does not discuss why it thinks 100 streams is the appropriate number to survey. Nor does it mention how the 100 streams are to be chosen.

B. The Draft Plan Lacks Safeguards To Ensure Accurate Surveys and Interviews.

A number of the Draft Plan studies rely on use of surveys and interviews. It is well known and not controversial that surveys and interviews are subject to both "sampling error" and "non-sampling error." Sampling error is unavoidable. It is the consequence of having studied a sample rather than the entire population. The magnitude of sampling error can be determined if a statistically valid, probability based, "random" sample is used. Non-sampling error arises from obtaining and recording observations incorrectly, or from failing to obtain observations. Non-sampling error is an important practical problem in sample surveys and interviews because it is difficult to avoid, difficult to detect and is potentially much larger than sampling error. "Interviewer bias" is one form of non-sampling error. Interviewer bias is the result of intentional or unintentional influence by the survey interviewer on the results of a survey. For example, when an interviewer poses a question, the wording, intonation or facial expression of the interviewer can be predicted to influence the answer to that question.

In violation of the Regulations, the Draft Plan fails to provide the detail necessary to analyze the statistical reliability of the proposed studies, and individual study descriptions do not include safeguards to protect against interviewer bias and other forms of sampling and non-sampling errors or to allow for the detection of such errors if present.

X. THE DRAFT PLAN FAILS TO PROVIDE FOR DOCUMENTATION AND PRESERVATION OF ALL FIELD DATA, DATA ANALYSIS AND DAMAGE CALCULATIONS

An assessment plan must include procedures to document every factual finding on which the damage determination relies, and every cost for which the Trustees intend to seek reimbursement from PRPs.

#91

Com.	Topic	Issue	Sug.	Sort
93	5	0103		2

Com.	Topic	Issue	Sug.	Sort
94	5	0104		2

For instance, Section 11.31(a)(1) of the Regulations requires that an assessment plan shall "identify and document the use of all of the scientific and economic methodologies that are expected to be performed" Section 11.31(a)(4) states that the Plan shall "contain procedures and schedules for sharing data, split samples, and results of analyses, when requested, with any identified potentially responsible parties" Section 11.30(c)(2) states that costs incurred by the Trustees "shall be supported by appropriate records and documentation" #94

The purpose for these requirements is clear: Reviewers must be able to verify the data and replicate all calculations underlying the Trustees' damage claims.

A. Documentation

The Draft Plan falls far short of meeting the documentation requirements outlined above. The documentation for each study should provide a complete audit trail of facts and figures from source documents through final reports and conclusions. Trustees must provide enough detail to allow reviewers to trace and replicate all calculations, and to review all samples gathered, questionnaires filled out, and laboratory tests performed. The records must show what methodologies were chosen and why. The audit trail should include, among other things:

- Original planning documents for all data collection and field and sample surveys, including data collection work plans, sample frame listings and procedures used to select sample and survey locations and subjects.
- Original documents on which facts, figures, notes and comments were recorded, such as questionnaires, interviewers' and field surveyors' notes and records, chain-of-custody records, laboratory measurements and reports, and technicians' observations and conclusions.
- Work papers, quality assurance/quality control records, computer programs and printouts, and intermediate data sets documenting all calculations, editing and other data manipulation.

Full documentation is especially important when statistical methods are to be used, as many of the studies propose. Unless reviewers can trace numerical calculations, it will be impossible to verify that the assumptions of the statistical methods were met and that the calculations were performed correctly.

B. Preservation

The Regulations require the Trustees to preserve all field samples and other data, to state what procedures they intend to follow for data collection and preservation, and to share data with FRPs on request. See 43 C.F.R. §§ 11.22, 11.31 and 11.64.

The Draft Plan is seriously deficient in that it not only omits this information,²⁴ it actually states that certain data will be discarded: The Quality Assurance/Quality Control Plan declares that "[u]nacceptable performance will result in the discarding of the associated data." Draft Plan at 217.

XI. THE DRAFT PLAN FAILS TO SELECT A DISCOUNT RATE

The Draft Plan states that the Trustees have not yet decided whether to use the discount rate called for in the Regulations. Draft Plan at 26. The Trustees should state any discount rates they propose to use, and they should explain any deviation from the ten percent (10%) rate specified in the Regulations, see 43 C.F.R. § 11.84(e)(2).

#94

Com.	Topic	Issue	Sug.	Sort
95	3	0142		2

²⁴Appendix A to the Draft Plan consists of a Quality Assurance/Quality Control Plan for the analytical chemistry portions of the assessment. The Table of Contents to Appendix A states that Section 2.3 discusses "Sample Preservation and Holding Times." Draft Plan at 211. Curiously, the Quality Assurance/Quality Control Plan contains no Section 2.3.

Com.	Topic	Issue	Sug.	Sort
96	5	2410		2

SERVICE COMPANY

04

BY FACSIMILE

Alyeska Pipeline Service Company has received a copy of the draft State/Federal Natural Resource Damage Assessment and Restoration Strategy for the Exxon Valdez Oil spill and plans to submit comments on it. Given the size and significance of the plan and the breadth of the studies identified in it, Alyeska requests a 30-day extension of the comment period from September 30 to October 30, 1989. As discussed briefly below, the circumstances warrant an extension, and a 30-day extension will not delay the assessment process.

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Com.	Topic	Issue	Sug.	Sort
97	4	0250	X	2

The Honorable Donald W. Collinsworth
The Honorable Manuel Lujan, Jr.
The Honorable Clayton Yeutter
The Honorable Robert A. Mosbacher.
September 11, 1989
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In your Notice of Intent to Perform an Assessment, you identify Alyeska as a "potentially responsible party" and invite its participation in the natural resource damage assessment process. The participation of a potentially responsible party in the damage assessment process is consistent with the requirement of 43 C.F.R. § 11.32(a)(2)(iii)(A), which provides that the authorized official "shall invite the participation of the potentially responsible party . . . in the development of the type and scope of the assessment and in the performance of the assessment." The recent court of appeals decision in Ohio v. Department of Interior, and the Department of the Interior's views as expressed in that decision, also expressly contemplate significant opportunities for potentially responsible parties to be involved in the pre-assessment and assessment process.

Com.	Topic	Issue	Sug.	Sort
98	5	0200	X	2

As you know, Alyeska denies that it is potentially responsible or liable in any respect for damages resulting from the M/T Exxon Valdez discharge. Nevertheless, Alyeska accepted your invitation to participate in the assessment process because you have designated it as a potentially responsible party, because Alyeska shares the widespread concern regarding the natural resource impacts caused by the spill, and because Alyeska strongly supports a cost-effective, comprehensive and accurate damage assessment.

Com.	Topic	Issue	Sug.	Sort
99	2	0206	X	2

Thus far, despite the above, Alyeska has been denied any opportunity to participate in the development of the type and scope of the assessment or otherwise to give any input into the assessment process. Alyeska's opportunity to comment on the draft damage assessment plan is its first opportunity to participate in any way. Given the length, complexity and significance of the draft plan and the non-involvement of the "potentially responsible parties" in the development of the plan, it is reasonable to extend the comment period until at least October 30. The regulations expressly contemplate the granting of such an extension. 43 C.F.R. § 11.32(c)(1).

Com.	Topic	Issue	Sug.	Sort
100	3	0206		2

An extension of the comment period will not delay the assessment process. The Department of the Interior has stated that virtually all of the studies outlined in the draft plan are already underway, that field data gathering will cease in mid to

The Honorable Donald W. Collinsworth
The Honorable Manuel Lujan, Jr.
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Page 3

late September, and that data analysis will occur until February 28, 1990. 54 Fed. Reg. 33,618 (Aug. 15, 1989). The requested extension will not impede that process.

We understand that, though the federal and state representatives on the Trustee council approved the draft damage assessment plan on June 23, 1989, its publication was delayed for two months beyond that date to permit further agency review. If the agencies that drafted the plan took two months to review the plan following its completion, the potentially responsible parties--who had no opportunity to participate in drafting the plan--should receive at least that long to comment on the plan.

All parties involved in this process surely share the common goal of a cost-effective and accurate natural resource damage assessment. Alyeska would like the opportunity to comment on the plan with that goal in mind. An extension of the comment period until at least October 30 is reasonable under the circumstances and will not delay the assessment process.

Because time is running short, we would appreciate your responding to this request at your earliest opportunity. For your convenience, my telecopy number is (907) 265-8611.

Sincerely,


Alfred T. Smith
General Counsel

lms

xc: Mr. Michael A. Barton
Mr. Steven Pennoyer
Mr. Walter O. Stieglitz
Trustee Council

Com.	Topic	Issue	Sug.	Sort
101	4	0202	X	2