11.3.2 5 of 8

ID # 920615298-30

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS

✓ Checked for Completeness

Birds

ID stamped/Input completed
Name
Affiliation
Costs

Category: Monitoring

Lead Agency: USFS

Cooperating Agency(ies): FWS

(Y) N Passed initial screening criteria

type: birds

RANKING H M L Rank Within Categories

H M L Rank Overall

Project Number - if assigned

Critical Factors

Potential projects must meet all of the following to be considered further. Check the blank for "yes", "no", or "unknown".

YES	NO	UNKNOWN	
✓			1. Linkage to resources and/or services injured by the Exxon Valdez oil spill.
✓			2. Technical feasibility.*
✓			3. Consistency with applicable Federal and State laws and policies.*

Comments:

* Restoration Framework, 1992, pp 43-44.

XON VALDEZ OIL SPILL TRUSTEE (CIL

FORMAT FOR IDEAS FOR RESTORATION PROJECTS

Title of Project:

ABUNDANCE, DISTRIBUTION, HABITAT USE AND FOOD HABITS OF STAGING SHOREBIRDS IN INTERTIDAL HABITATS ON THE WESTERN COPPER RIVER DELTA

Justification: (Link to Injured Resource or Service)

Shorebirds staging on intertidal mudflats were injured by the Exxon Valdez oil spill.

Description of Project: (goal(s), objectives, location, rationale, approach)

The extensive 500+km^2 tidalflats on the Copper River Delta are the largest staging area for an estimated 10+million shorebirds migrating on the Pacific Coast of North America. Over 30 species stage on the Copper River Delta during the spring, including nearly 100% of the western sandpiper (Calidris mauri) and dunlin (Calidris alpina pacifica) populations on the Pacific coast, the two largest Pacific coast shorebird populations. Low reproductive rates, high energy requirements for migration, and precise timing create a critical dependence on the environmental conditions on the Delta during spring migration. The recent Exxon Valdez oil spill in Prince William Sound has underscored the vulnerability of the western delta to catastrophic oil spills. Shorebird stopover areas on the the western end of the delta, including Orca Inlet and mudflats adjacent to Hawkins Island Cutoff, overlap with areas that could be impacted by a future oil spill in Prince William Sound.

This study would gather information that would enable efficient and effective deployment of response and containment resources to best protect shorebird habitats in the event of a spill. Numbers, distribution, key concentration areas and species composition of shorebirds can be determined using aerial shoreline surveys combined with ground transects. Prey availability for shorebirds can be sampled using a stratified random sampling design in the intertidal zone weekly during spring migration. Prey availability will be correlated with food habits as determined by examination of esophageal contents. Two years of sampling has refined aerial methodology and provided initial baseline information on numbers and distribution. Long-term monitoring is necessary to determine population trends, key concentration areas, and to assess habitat use patterns in relation to habitat type and prey availability.

Estimated Duration of Project: Five years.

Estimated Cost per Year: $35,000

Other Comments: This project falls within the confines of Restoration Option No. 31 in terms of the development of a comprehensive monitoring program. Data collection and analysis could be coordinated with intertidal ecology studies.

Name, Address, Telephone:
Dr. Mary Anne Bishop, Acting Manager,
Copper River Delta Institute, Pacific Northwest Research Station
USDA Forest Service,
P.O. Box 1460, Cordova, AK 99574, phone (907) 242-7212, fax (907) 424-7214.

920615298-31

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS Birds

V Checked for Completeness

ID stamped/Input completed
Name
Affiliation
Costs

Category ~~Mgmt~~ Monitoring

Lead Agency USFS

Cooperating Agency(ies) FWS

(Y) N Passed initial screening criteria

Type: Birds

RANKING H M L Rank Within Categories

H M L Rank Overall

Project Number - if assigned

920615298-31

Critical Factors

Potential projects must meet all of the following to be considered further. Check the blank for "yes", "no", or "unknown".

YES	NO	UNKNOWN	
✓			1. Linkage to resources and/or services injured by the Exxon Valdez oil spill.
✓			2. Technical feasibility.*
✓			3. Consistency with applicable Federal and State laws and policies.*

Comments:

* Restoration Framework, 1992, pp 43-44.

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
MAT FOR IDEAS FOR RESTORATION JECTS

29831

Title of Project:

SURVEYS TO DETERMINE DISTRIBUTION, ABUNDANCE AND FOOD HABITS OF MIGRATORY WATERFOWL STAGING IN INTERTIDAL HABITATS OF THE WESTERN COPPER RIVER DELTA DURING SPRING AND FALL

Justification: (Link to Injured Resource or Service)

Sea ducks, in particular the 3 species of scoters, were injured by the Exxon Valdez Oil Spill. All three species of scoters (white-winged, surf and black), as well as 6 other diving duck species and 4 dabbling duck species occur as migrants in the intertidal and shallow subtidal zone of western Copper River Delta. Baseline information is needed on food resources available, food habits, and the numbers and distribution of dabbling and sea ducks staging in the intertidal and shallow subtidal habitats on the Copper River Delta.

Description of Project:

Baseline information on sea and dabbling duck relative abundance, spatial and temporal distribution patterns, and key concentration areas in intertidal and shallow subtidal zones can be used to direct and monitor restoration efforts, and enable effective response in the event of a future spill. The numbers, distribution and species composition of staging waterfowl in intertidal habitats will be determined using a combination of aerial and boat surveys along the western Copper River delta shoreline and barrier islands. Aerial shoreline surveys at high tide and aerial fixed-strip transects for shallow subtidal habitats will be used to estimate waterfowl abundance. Extensive exposed intertidal areas will be surveyed in their entirety.

A data base describing spring and fall food habits of sea and dabbling ducks staging in the intertidal and shallow subtidal zone will be compiled. Food habits of dabbling and sea ducks will be determined from collections in the intertidal and shallow subtidal zone of the western Copper River Delta throughout spring and fall migration. Gizzards and stomach contents will be analyzed for frequency of occurrence and percent volume of prey items. Based on waterfowl distribution, a stratified random sampling design will be used to sample prey availability and waterfowl habitat use.

Estimated Duration of Project: Three years.

Estimated Cost per Year: $91,000 Year1. $78,000 Year2. $20,000 Year 3.

Other Comments: This project falls within the confines of Restoration Option No. 31 in terms of the development of a comprehensive monitoring program

Name, Address, Telephone:
Dr. Mary Anne Bishop, Acting Manager,
Copper River Delta Institute, Pacific Northwest Research Station
USDA Forest Service,
P.O. Box 1460, Cordova, AK 99574,
(907) 242-7212, fax (907) 424-7214

ID #920615298-32

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS

Birds

✓ Checked for Completeness

ID stamped/Input completed
Name
Affiliation
Costs

Category
Monitoring

Lead Agency
USFS USDA

Cooperating Agency(ies)
FWS

(Y) N Passed initial screening criteria

type - birds

RANKING H M L Rank Within Categories

H M L Rank Overall

Project Number - if assigned

Critical Factors

Potential projects must meet all of the following to be considered further. Check the blank for "yes", "no", or "unknown".

YES	NO	UNKNOWN	
—	—	—	1. Linkage to resources and/or services injured by the Exxon Valdez oil spill.
—	—	—	2. Technical feasibility.*
✓	—	—	3. Consistency with applicable Federal and State laws and policies.*

Comments:

* Restoration Framework, 1992, pp 43-44.

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

29832

IAT FOR IDEAS FOR RESTORATION ECTS

Title of Project:
MIGRATORY SHOREBIRDS STAGING IN ROCKY INTERTIDAL HABITATS OF PRINCE WILLIAM SOUND

Justification: (Link to Injured Resource or Service)

Up to one half-million shorebirds, representing 5 species, stage each spring in rocky intertidal habitats of Prince William Sound, feeding primarily on small crustaceans, blue mussels, and herring spawn deposition. These species include black turnstone, ruddy turnstone, surfbirds, rock sandpiper and wandering tattler. The rocky intertidal zone at Montague and Green Islands have been particularly important to black turnstones and surfbirds with as many as 75,000 birds representing 20-45% of their respective breeding populations observed staging in this area during spring. Shorebirds and their prey base on rocky intertidal habitats were injured by the Exxon Valdez oil spill.

Description of Project: (e.g. goal(s), objectives, location, rationale, and technical approach)

Baseline information on shorebird relative abundance, spatial and temporal distribution patterns, length of stay and key concentration areas in rocky intertidal habitats can be used to direct and monitor restoration efforts, and enable effective response in the event of a future spill.

The numbers, distribution, key concentration areas, and species composition of staging shorebirds in rocky intertidal habitats can be determined using stratified random aerial and boat transects along rocky shorelines in PWS, along with intensive transect sampling at Montague and Green Islands. In conjunction with herring spawn deposition information, shorebird spatial and temporal distribution in relation to habitat type and intertidal food resources can be monitored. A sample of surfbirds and black turnstones will be collected to assess the relative importance of prey items. Gut contents will be analyzed for frequency of occurrence and percent volume of food items. At northern Montague Island, black turnstones and surfbirds will be captured and marked with dye and colored leg-bands to determine length of stay (turnover rate) and total bird-day-use.

Estimated Duration of Project: Three years.

Estimated Cost per Year: $80,000 first year; $70,000 second and third years.

Other Comments: This project falls within the confines of Restoration Option No. 31 in terms of the development of a comprehensive monitoring program. Data collection and analysis could be coordinated with herring egg deposition surveys conducted by ADF&G.

Name, Address, Telephone:
Dr. Mary Anne Bishop, Acting Manager,
Copper River Delta Institute, Pacific Northwest Research Station
USDA Forest Service,
P.O. Box 1460, Cordova, AK 99574,
(907) 242-7212, fax (907) 424-7214.

II 9206152 98-40

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS

Birds

__/__ Checked for Completeness

ID stamped/Input completed
Name
Affiliation
Costs

_____ Category monitoring

_____ Lead Agency USFS USDA

_____ Cooperating Agency(ies) FWS

(Y) N Passed initial screening criteria

Type: Birds

RANKING H M L Rank Within Categories

H M L Rank Overall

_____ Project Number - if assigned _____

Critical Factors

Potential projects must meet all of the following to be considered further. Check the blank for "yes", "no", or "unknown".

YES	NO	UNKNOWN	
✓			1. Linkage to resources and/or services injured by the Exxon Valdez oil spill.
✓			2. Technical feasibility.*
✓			3. Consistency with applicable Federal and State laws and policies.*

Comments:

* Restoration Framework, 1992, pp 43-44.

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

29840

Title of Project:

Migratory Waterfowl and Shorebird Monitoring

Justification:

Of 36,000 bird carcasses recovered following the spill, 31,000 of the deaths were attributable to oil, with the total number of birds killed by the spill estimated to be between 375,000 and 435,000. Approximately 1,200 miles of coastline were effected by the oil spill. Many of the sheltered bays and inlets of western Prince William Sound contain wetland habitat important as staging and nesting areas for numerous species. Effected species which commonly use these areas as nesting beaches, feeding areas and staging areas include black oystercatcher and harlequin duck. In the event of additional natural or man-caused catastrophes, this baseline information will facilitate damage assessment and response.

Description of Project:

Goal: To assess and monitor use of Prince William Sound wetland habitats by migratory waterfowl and shorebirds.
Objective: Complete initial wetland map based on aerial photo interpretation.
Objective: Ground truth wetland identification and suitability as monitoring site via aerial reconnaissance.
Objective: Conduct land- and boat-based inventories of species composition and use of identified wetlands during migration.
Objective: Conduct land- and boat-based inventories of species composition and use of identified wetlands during breeding season.
Objective: Continue monitoring use of these wetlands.
Objective: Transer ecological information (identified nesting beaches, staging areas, feeding areas) by species and species groups into Geographical Information System database for easy retrieval and maintenance.

Estimated Duration of Project:

Three years.

Estimated Cost per Year:

$150,000

Other Comments:

Name, Address, Telephone:

Charla Sterne
Wildlife Biologist
Glacier Ranger Station
PO Box 129
Girdwood, AK 99587
907-783-3242

ID # 9206/5273-18

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS

Birds

✓ Checked for Completeness

- ✓ ID stamped/Input completed
- ✓ Name
- ✓ Affiliation
- ✓ Costs

— Category

Restoration Monitoring

✓ Lead Agency

DOI - USFW

_____ Cooperating Agency(ies)

_____

(Y) N Passed initial screening criteria

_____

type - birds

RANKING H M L Rank Within Categories

H M L Rank Overall

_____ Project Number - if assigned _____

27318

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

Title of Project: Monitoring the Rate of Recovery of Murres in Breeding Colonies in or Downstream from the Exxon Valdez Oil Spill

Justification: The oil spill killed up to 300,000 murres directly, and the loss of breeding adults resulted in a drastic reduction in reproductive output in subsequent years. It appears some colonies are beginning to resume more normal breeding activities three years after the spill, but it is too early to tell how long the disruption will last. The project is designed to document duration of effects, and results may be used to predict the damage from future spills.

Description of Project: Measures to judge"normality" are nesting phenology, population trends, and reproductive success. These parameters will be estimated at three affected sites (Chiswell Is., Barren Is., Puale Bay) and at one "control" site (Semidi Is.).

Methods: Established plots will be used to collect data on the timing of nesting events, the average number of birds present, and reproductive output. Exact methods of data collection will vary among sites based on accessibility and on comparability with baseline data. Nevertheless, the intent is to replicate so that some measure of variance is provided for point estimates.

Estimated Duration of Project: Until parameters have returned to normal for several years. Probably about 5-10 more years.

Estimated Cost per Year:

Project Leader:	$60 k
Chiswells:	$40 k
Barrens:	$40 k
Puale Bay:	$70 k
Semidis:	$40 k
Boat Charter:	$150 k
Total:	$340 k

Other Comments: This project depends on a boat charter, thus the expense.

Name, Address, Telephone: U.S. Fish and Wildlife Service
1011 East Tudor Road
Anchorage, Alaska 99503

(907) 786-3494

ID # 9206 15279 - 19

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS

Birds

✓ Checked for Completeness

✓ ID stamped/Input completed
Name
✓ Affiliation
— Costs

_____ Category

Restoration Monitoring

✓ Lead Agency

DOI - USFW

_____ Cooperating Agency(ies)

_____

(Y) N Passed initial screening criteria

_____

Type - bird.

RANKING H M L Rank Within Categories

H M L Rank Overall

_____ Project Number - if assigned _____

92061527920 19

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

FORMAT FOR IDEAS FOR RESTORATION PROJECTS

Document Number 92061527920

☐ A-92 EVOS ☒ B-93 EVOS ☐ C-EVOS ☐ D-PAG ☐ E-MISC.

Title of Project:

Monitoring the Rate of Recovery of Murres in Breeding Colonies in or Downstream from the Exxon Valdez Oil Spill

Justification: (Link to Injured Resource or Service)

SEE REVERSE SIDE

Description of Project: (e.g. goal(s), objectives, location, rationale, and technical approach)

Measures to judge "normality" are nesting phenology, population trends, and reproductive success. These parameters will be estimated at three affected sites (Chiswell Is., Barren Is., Puale Bay) and at one "control" site (Semidi Is.).

Methods: Established plots will be used to collect data on the timing of nesting events, the average number of birds present, and reproductive output. Exact methods of data collection will vary among sites based on accessibility and on comparability with baseline data. Nevertheless, the intent is to replicate so that some measure of variance is provided for point estimates.

Estimated Duration of Project: Until parameters have returned to normal for several years. Probably about 5-10 more years.

Estimated Cost per Year: $340 k (SEE REVERSE SIDE FOR ADDITIONAL DETAILS)

Other Comments: This project depends on a boat charter, thus the expense.

Name, Address, Telephone:

U.S. Fish and Wildlife Service
1011 East Tudor Road
Anchorage, Alaska 99503
(907) 786-3494

Oil spill restoration is a public process. Your ideas and suggestions will not be proprietary, and you will not be given any exclusive right or privilege to them.

Justification: The oil spill killed up to 300,000 murres directly, and the loss of breeding adults resulted in a drastic reduction in reproductive output in subsequent years. It appears some colonies are beginning to resume more normal breeding activities three years after the spill, but it is to early to tell how long the disruption will last. The project is designed to document duration of effects, and results may be used to predict the damages from future spills.

Estimated Cost per Year: Continued from front

Project Leader:	$60 k
Chiswells:	$40 k
Barrens:	$40 k
Puale Bay:	$70 k
Semidis:	$40 k
Boat Charter:	$150 k
Total:	$340 k

Comments: This proposal addresses Option 16 in the Exxon Valdez Oil Spill Restoration Framework, Volume I.

ID # 9206152 79-15

Birds

Harlequin Ducks

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS

✓ Checked for Completeness

ID stamped/Input completed
Name
Affiliation
Costs

✓ Category ~~Damage Assessment~~ Recovery Monitoring

✓ Lead Agency
ADF&G

✓ Cooperating Agency(ies)
DOI-USFWS

(Y) N Passed initial screening criteria

Type: Birds

RANKING H M L Rank Within Categories

H M L Rank Overall

_____ Project Number - if assigned _____

9206152794

1993 PROJECT SCORING SHEET

Critical Factors

Potential projects must meet all of the following to be considered further. Check the blank for "yes", "no", or "unknown".

YES	NO	UNKNOWN	
✓			1. Linkage to resources and/or services injured by the Exxon Valdez oil spill.
✓			2. Technical feasibility.*
✓			3. Consistency with applicable Federal and State laws and policies.*

Comments:

* Restoration Framework, 1992, pp 43-44.

EX[illegible] VALDEZ OIL SPILL TRUSTI[illegible] COUNCIL

FORMAT FOR IDEAS FOR RESTORATION PROJECTS

Title of Project:

Breeding Population Status of Harlequin Ducks on Areas of the Kodiak Island Group West and South Sides.

Justification: (Link to Injured Resource or Service)

Nesting surveys are needed to determine the breeding population status for areas of Kodiak Island which was effected by the oil spill.

Description of Project: (e.g. goal(s), objectives, location, rationale, and technical approach)

Goal: Determine nesting activities of harlequin ducks on areas of Kodiak Island group which were effected by the Exxon Valdez oil spill; using pair counts and brood surveys.

Location: Survey areas on the westside of the Kodiak Island Archipelago including Shuyak, Afognak and Kodiak Islands.

Technical: Timing - June pair counts 5 days; July productivity/brood surveys 2 weeks.

Survey methods - pair counts by helicopter or refuge plane low level flights of possible nesting habitats; productivity/brood surveys flying then float and walk areas of highest concentration of pair counts found during JUne flights. Reports will be submitted.

Estimated Duration of Project: 2 years, then reoccurring after every 5 years on going monitoring.

Estimated Cost per Year: $22,000 to $25,000/year

Other Comments: The Refuge's sea bird surveys and waterfowl productivity surveys which are already completed, could be used as baseline data to help investigate new areas, past (pre oil spill) populations of harlequin ducks.

This proposal addresses Options 4 and 8 in the Exxon Valdez Oil Spill Restoration Framework, Volume I.

Name, Address, Telephone:

Kodiak National Wildlife Refuge
1390 Buskin River Road
Kodiak, Alaska 99615
(907) 487-2600

Oil spill restoration is a public process. Your ideas and suggestions will not be proprietary, and you will not be given any exclusive right or privilege to them.

ID # 920615297-31

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS Birds - Harlequin Ducks

✓ Checked for Completeness

✓ ID stamped/Input completed
✓ Name
✓ Affiliation
✓ Costs

✓ Category

~~Damage Assessments~~ Monitoring

/ Lead Agency

ADF&G

✓ Cooperating Agency(ies)

USFS

Φ N Passed initial screening criteria

type - birds

RANKING H M L Rank Within Categories

H M L Rank Overall

_____ Project Number - if assigned _____

920615247-31

93 PROJECT SCORING SHEET

Critical Factors

Potential projects must meet all of the following to be considered further. Check the blank for "yes", "no", or "unknown".

YES	NO	UNKNOWN	
/			1. Linkage to resources and/or services injured by the Exxon Valdez oil spill.
/			2. Technical feasibility.*
/			3. Consistency with applicable Federal and State laws and policies.*

Comments:

* Restoration Framework, 1992, pp 43-44.

EXX VALDEZ OIL SPILL TRUSTEE UNCIL

29731

Document ID Number
92061529?

- [ ] A-92 WPWG
- [x] B-93 WPWG
- [ ] C-RPWG
- [ ] D-PAG
- [ ] E-MISC.

FORMAT FOR PUBLIC IDEAS FOR RESTORATION PROJECTS

Title of Project: **Harlequin Duck Restoration and Monitoring Study**

Justification: (Link to Injured Resource or Service) Harlequin ducks are experiencing the third consecutive year of reproductive failure in the oil spill area of western PWS in 1992. Harlequin ducks have reproduced normally to date in 1992; in northern, eastern, and southern PWS.

Description of Project: (e.g. goal(s), objectives, location, rationale, and technical approach)
This proposal addresses a 1993 Monitoring Study of the continued reproductive failure of Harlequin ducks in western PWS and includes Harlequin Duck restoration work in eastern PWS. The reproductive failure of Harlequin ducks in the oil spill area is a chronic effect of petroleum exposure to these ducks through contaminated intertidal food resources. Blue mussels (Mytilus) are the postulated agent of transmission of petroleum from the environment to seaducks. Approximately 130 blue mussel beds have been identified in USCG FOSC files as retaining oil in western PWS. Surveys will be conducted to establish areas of use and survey numbers of Harlequin ducks using oiled vs non-oiled streams and mussel beds in eastern and western PWS. This project will use established methodology, including mist-netting Harlequin duck females at PWS stream mouths. If breeding is verified, the number of Harlequin duck broods and feeding areas will be determined by following radio-tagged hens and ducklings through the nesting and brood-rearing cycle. Results will be compared to the Harlequin duck restoration aspects of the study in unoiled eastern PWS. Analysis of Harlequin duck blood and fecal samples will test for evidence of petroleum exposure and/or suppressed immune systems (i.e. presence of Heinz-body anemia; haptaglobins). A workshop of peer reviewers and interested scientists is planned to integrate and synthesize Harlequin duck research results and develop a workplan for future studies.

Estimated Duration of Project: This project is not expected to last more than four (4) years

Estimated Cost per Year: $446,000

Other Comments: It is our intention to cooperate fully with the oiled mussel beds study.

Name, Address, Telephone

Dr. Samuel M. Patten Jr
Alaska Dept of Fish & Game, Wildlife Cons
333 Raspberry Road
Anchorage AK 99518
(907) 267-2376

Because the Oil Spill Restoration is a public process, your ideas and suggestions will not be proprietary, and you will not be given any exclusive right or privilege to them.

ID # 92065273-02

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS

Birds
Harlequin Ducks

✓ Checked for Completeness

- ✓ ID stamped/Input completed
- ✓ Name
- ✓ Affiliation
- ✓ Costs

Category
~~Damage Assessment~~ Monitoring

Lead Agency
ADF&G

Cooperating Agency(ies)
DOI (NPS)

(Y) N Passed initial screening criteria

Type: Birds

RANKING H M L Rank Within Categories

H M L Rank Overall

Project Number - if assigned

92061B-273-02

1993 PROJECT SCORING SHEET

Critical Factors

Potential projects must meet all of the following to be considered further. Check the blank for "yes", "no", or "unknown".

YES	NO	UNKNOWN	
✓			1. Linkage to resources and/or services injured by the Exxon Valdez oil spill.
✓			2. Technical feasibility.*
✓			3. Consistency with applicable Federal and State laws and policies.*

Comments:

* Restoration Framework, 1992, pp 43-44.

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

FORMAT FOR PUBLIC IDEAS FOR RESTORATION PROJECTS

Title of Project: Determine the Extent of Oil Spill Injuries to Harlequin Duck Populations in Oiled National Parks.

Justification: Exxon Valdez oil spill injury to harlequin ducks is just beginning to be understood. Apparent failure of harlequin nesting was observed in western Prince William Sound (oiled) in 1990 and 1991 while the eastern Sound (unoiled) enjoyed apparently "normal" harlequin nesting. This fact alone resulted in closure of the harlequin hunting season in the Sound in 1991 by the State of Alaska. The magnitude and extent of this observed effect is just beginning to be studied. Damage assessment studies of harlequin duck injury have been, to date, limited to Prince William Sound.

The extensive oiling of Kenai Fjords National Park and Katmai National Park is well documented. If harlequin ducks in western Prince William Sound were injured by Exxon Valdez oil it is reasonable to project some degree of injury to harlequins occupying suitable habitats in these park units. Harlequins are a high value species to park visitors and a resource important to both parks.

Although hunted elsewhere within the area affected by the spill, harlequins are not hunted in these park units. Thus the parks, to a certain degree serve as refugia for sizeable populations of these and other injured species. It is proposed that this proposal be conducted in cooperation with ongoing harlequin duck efforts by the trustees. Within the spill area, the unhunted (non-harvested) nature of populations of harlequins is unique to these parks and affords the opportunity of comparing rates of recovery of protected and harvested populations.

An expansion of harlequin study of this type also affords the opportunity to extend this important injury investigation to other major spill-affected areas: the Kenai and Alaska Peninsulas.

Description of Project: Determine the habitat use, population status and reproductive activity of harlequin ducks in Kenai Fjords and (coastal) Katmai National Parks. Cooperate or combine with ongoing harlequin efforts to assure compatible census and habitat evaluation techniques and maximum efficiency.

It would be a purpose of this expanded study to provide information necessary to the trustees in order to justify further limiting harlequin hunting seasons or controlling human activities disturbing to harlequins during critical life cycle stages.

Document ID Number
92061527352

- [ ] A-92 WPWG
- [x] B-93 WPWG
- [ ] C-RFWG
- [ ] D-PAG
- [ ] E-MISC.

Estimated Duration of Project: Three years.

Estimated Cost per Year: $200,000 year one; $100,000 per year thereafter.

Other Comments: None.

For Further Information Contact: Dan Hamson, Chief, Coastal Programs Division, National Park Service, 2525 Gambell Street, Anchorage, Alaska 99503, (907) 257-2526.

ID # 9206 15273-23

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS Birds Guillemots

_____ ✓ Checked for Completeness

- ✓ ID stamped/Input completed
- ✓ ~~Name~~
- ✓ ~~Affiliation~~
- ✓ Costs

_____ ✓ Category Restoration Monitoring

_____ Lead Agency DOI - USFWS

_____ Cooperating Agency(ies)

_____

(Y) N Passed initial screening criteria

_____

type - birds

RANKING H M L Rank Within Categories

H M L Rank Overall

_____ Project Number - if assigned _____

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

FORMAT FOR IDEAS FOR RESTORATION PROJECTS

Title of Project: Pigeon Guillemot Recovery Enhancement And Monitoring

Justification: (Link to Injured Resource or Service) Pigeon guillemots in PWS are at a 20 year low and have declined significantly along oiled shorelines compared to unoiled shorelines in both the Sound as a whole and more specifically in the Naked Island area. This study will investigate parameters affecting reproductive success of guillemots in Prince William Sound (PWS), monitor their recovery at specific colonies and suggest means of enhancing recovery in the spill zone. By locating major breeding colonies, lands and marine areas suitable for protection can be identified. This project will expand study sites for guillemot studies in PWS, and the results and refined methodology can be applied to other areas in the spill zone. It will investigate the limiting factors of predation and prey selection on reproductive success. Because the decline in pigeon guillemots was exacerbated in the spill zone, immediate action should be taken to identify the impact of and recovery from the spill. Identification and monitoring of colonies throughout PWS is a necessary part of this process. A complete study of pigeon guillemot reproduction cannot begin until at least one season is devoted to locating colonies and nest sites. Thus, further delay of this step would reduce the study's effectiveness.

Description of Project: (e.g. goal(s), objectives, location, rationale, and technical approach) The pigeon guillemot is highly vulnerable to oil spills and was subject to direct mortality from oiling throughout the EVOS zone. Reproductive studies at Naked Island indicate that pigeon guillemots may experience long-term impact from the oil spill which could impair their natural recovery in the affected area. At Naked Island, predation was a proximate source of nest failure, but there was also evidence of changes in prey species and availability. In addition, there is evidence of continued contamination of eggs from oiling, which can reduce hatching success. Determining the causes and remediating these impacts could assist recovery of the species. To be meaningful, these studies should be expanded beyond Naked Island. Information about breeding concentrations in the spill zone could be added to knowledge of other species using forest edges in order to guide land acquisition and marine habitat protection efforts. Currently, there is insufficient information about the location and size of major guillemot breeding colonies in the spill zone.

a. To locate pigeon guillemot colonies and accessible nests throughout PWS in order to monitor reproductive success, diet and population recovery.
b. To determine reproductive success of pigeon guillemots and identify parameters affecting their success at selected sites.
c. To implement a pilot project on the feasibility of reducing nest predation by nest site alteration.
d. To implement a pilot project on prey selection through otolith identification from chick feces.

e. To provide for complete analysis of pigeon guillemot data including integration with data collected in previous years.

Project Methods:

Objective A: Locate guillemot colonies and select study sites

Observers will census guillemots at periods of peak colony attendance and document nests as accessible or inaccessible throughout the Sound. Two to four observers may travel with a support vessel, or with the U.S. Forest Service as part of a cooperative effort with the plant association surveys in May. The observers will return to colonies later in the summer to locate nests for future studies of reproductive success.

Objective B: Reproductive success

Naked Island studies will be continued following methodology developed and refined in past years. The study will concentrate on identifying predators and types of susceptible nests. Unhatched eggs will be tested for oil contaminants.

Objective C: Nest predation

Tests will be conducted to determine if predators key in on nest markers, or if vulnerable nest sites can be altered to reduce predation. Since guillemots exhibit very high nest site fidelity, decreasing predation at specific nests could prove beneficial. All nest sites will be monitored for reproductive success.

Objective D: Prey selection

In order to develop an efficient means of documenting prey use by guillemots raising chicks, the efficacy of collecting otoliths and bone parts from chick feces will be tested. Selected nests will be observed following past protocol and feces will be collected and analyzed in the lab to determine whether otolith samples are representative of observed prey deliveries.

Objective E: Data analysis

All current data as well as data from past years will be integrated and analyzed. Chick feces and prey samples will be examined in the lab for otolith and bone part identification.

Estimated Duration of Project: This project would continue from three to six years depending upon the population recovery time for pigeon guillemots and the success of nest site enhancement.

Estimated Cost per Year:	Year	1993	1994 through 1997
	Cost	180k	180k per year

Other Comments: None

Name, Address, Telephone: U.S. Fish and Wildlife Service
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Anchorage, Alaska 99503
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ID # 920615273-~~02~~ 03

DB

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS

✓ Checked for Completeness

- ✓ ID stamped/Input completed
- ✓ Name
- ✓ Affiliation
- ✓ Costs

Category Restoration Monitoring

Lead Agency DOI USFWS

Cooperating Agency(ies) ~~DOI USFWS~~

(Y) N Passed initial screening criteria

type - birds

RANKING H M L Rank Within Categories

H M L Rank Overall

Project Number - if assigned

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

FORMAT FOR PUBLIC IDEAS FOR RESTORATION PROJECTS

Title of Project: Determine the Status of Marbled Murrelet Populations in Oiled National Parks.

Justification: The marbled murrelet is a nearshore diving seabird which is highly vulnerable to oil spills and is one of the most abundant birds in the area affected by the Exxon Valdez oil spill. The marbled murrelet population in Prince William Sound has declined from about 300,000 in 1972 to 100,000 in 1989-91. It is estimated that as many as 14,000 murrelets were killed directly by oil in the spill area. Additionally, apparently healthy murrelets collected in oiled areas had internal contamination by petroleum hydrocarbons, whereas murrelets collected in unoiled areas did not. The U. S. Fish and Wildlife Service has recommended that the murrelet population be monitored and impediments to a natural recovery avoided where possible.

The extensive oiling of Kenai Fjords National Park and Katmai National Park is well documented. Nest sites for marbled murrelets have recently been unexpectedly discovered in alpine zone locations within Kenai Fjords National Park. If marbled murrelets in Prince William Sound were injured by the oil it is reasonable to project some degree of injury to those which occupy suitable habitats in these park units. Expansion of murrelet study affords the opportunity to extend this important injury investigation to other major spill-affected areas: the Kenai and Alaska Peninsulas.

Description of Project: Determine the habitat use, population status and reproductive activity of marbled murrelets in Kenai Fjords and (coastal) Katmai National Parks. Cooperate or combine with ongoing murrelet efforts to assure compatible census and habitat evaluation techniques and maximum efficiency.

It would be a purpose of this expanded study to provide information necessary to the Trustee Council and the National Park Service in order to justify limiting or controlling human activities disturbing to marbled murrelets during critical life cycle stages.

Estimated Duration of Project: Three years.

Estimated Cost per Year: $200,000 year one; $100,000 per year thereafter.

Other Comments: None.

For Further Information Contact: Dan Hamson, Chief, Coastal Programs Division, National Park Service, 2525 Gambell Street, Anchorage, Alaska 99503, (907) 257-2526.

ID # 920615273-24

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS Birds Mammals

✓ Checked for Completeness

ID stamped/Input completed
Name
Affiliation
Costs

Category Restoration ~~Management Actions~~ Monitoring

✓ Lead Agency
DOI-USFWS

Cooperating Agency(ies)

(Y) N Passed initial screening criteria

type - birds

RANKING H M L Rank Within Categories

H M L Rank Overall

Project Number - if assigned

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

FORMAT FOR IDEAS FOR RESTORATION PROJECTS

Title of Project: Assessment of Marbled Murrelet Foraging Habitat Requirements During Breeding Season

Justification: (Link to Injured Resource or Service) The marbled murrelet population which suffered direct mortality in the EVOS zone. This project will provide a comprehensive study design for assessing important foraging areas for murrelets breeding in the EVOS zone.

Description of Project: (e.g. goal(s), objectives, location, rationale, and technical approach) A major population center of the marbled murrelet exists within the EVOS zone. This population suffered direct mortality from EVOS. To adequately insure recovery of this population, protection of appropriate foraging areas must be integrated with acquisition of nesting habitat. The specific objectives are: (a) Design a comprehensive study to assess critical foraging areas for marbled murrelets breeding in the EVOS zone, and (b) Implement a pilot study investigating murrelet foraging area requirements during the breeding season in conjunction with a proposed nesting study on Naked Island.

Project Methods:
Objective A: Design of foraging study. A comprehensive study design will be developed for future implementation in the EVOS zone. This design will address techniques for identifying crucial foraging areas for breeding murrelets. Authorities on murrelet distribution, forage fish, censusing techniques and use of hydroacoustics will be asked to collaborate in this effort.

Objective B: Foraging requirements of breeding murrelets. A pilot effort examining the relationship between murrelet distribution during the breeding season and available prey will be conducted in the Naked Island Archipelago. Systematic surveys of murrelets in the nearshore environment will be coupled with hydroacoustic techniques for estimating relative prey abundance. This endeavor will be in conjunction with the proposed study of nesting murrelets at Naked Island.

Estimated Duration of Project: This will be a one year study.

Estimated Cost per Year: 250K per year.

Other Comments: None

relates to forage fish project

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ID # 9206152 73-17

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS Birds

Black Oystercatcher

____ Checked for Completeness

- ID stamped/Input completed
- Name
- Affiliation
- Costs

____ Category Restoration Monitoring

____ Lead Agency DOI-USFWS

____ Cooperating Agency(ies)

____

(Y) N Passed initial screening criteria

____

type - birds

RANKING H M L Rank Within Categories

H M L Rank Overall

____ Project Number - if assigned ____

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

FORMAT FOR IDEAS FOR RESTORATION PROJECTS

Title of Project: Feeding Ecology and Reproductive Success of Black Oystercatchers in PWS

Justification: (Link to Injured Resource or Service) The black oystercatcher is an obligate member of the rocky intertidal community. Thus, deleterious effects of the spill resulted in reduced productivity of the Prince William Sound (PWS) population. Additionally, intertidal prey organisms of the oystercatcher experienced diminished productivity and direct mortality. This project will provide information needed to protect suitable marine habitat for oystercatchers, monitor the natural recovery of the PWS population and explore the role oystercatchers play in the recovery of invertebrate species. This project addresses general and avian-specific needs in several ways. Firstly, elucidation of the predation role that black oystercatchers have on structuring intertidal invertebrate assemblages directly responds to a shift of emphasis from a species-directed approach to a community-directed approach and forges a link between predator-prey consequences of the spill. Coupling the role of predator and prey with the influence of environmental factors will provide some mechanistic answers to the question of exactly how oystercatchers were affected by the spill. If hydrocarbons persist in the oystercatchers' environment, future reproductive percussions may occur. Secondly, monitoring the reproductive success and the pair occupancy of oiled sites will document the natural recovery of an obligate, intertidal predator.

Description of Project: (e.g. goal(s), objectives, location, rationale, and technical approach) Work assessing the reproductive success of PWS black oystercatchers was initiated on Green Island and Montague Island in 1989 and continued at these sites, as well as at Knight Island, in 1991. Information collected in 1991 was used to determine habitat requirements of breeding oystercatchers. Breeding pair density greatly differed between Knight Island and Green/Montague Island. Elevation and shoreline type were largely responsible for these differences. Reproductive variables of oystercatchers were also contrasted between oil-impacted and oil-unimpacted sites (1989 and 1991). Oiling of beaches affected oystercatchers in various ways. Data from 1989 indicated that the relative egg volume of clutches in impacted sites was lower than clutches in unimpacted sites. Although clutch size, hatching success or fledging success did not differ between these same shorelines, growth rates of chicks in 1991 were significantly lower on impacted shorelines than on unimpacted shorelines. Higher mortality of mussels on impacted shorelines than on unimpacted shorelines did not translate to a difference in the quantity of food delivered to chicks. Some segments of the PWS oystercatcher population appear to be recovering. The number of breeding pairs on impacted Green Island increased by 50% between 1989 and 1991 while no change occurred on unimpacted Montague Island. Further information is needed to monitor the oystercatcher recovery, particularly on Knight Island, and to examine the predation pressure oystercatchers exert on invertebrate prey populations. Specifics objectives of this project are:

1. Further develop habitat models and test those produced in 1991;
2. Continue to monitor the population recovery, reproductive success and chick growth rates of PWS oystercatchers at impacted and unimpacted sites and determine the role predators may play in oystercatcher recovery;
3. Determine if the continued persistence of hydrocarbons in mussel beds is being transferred to chicks and may be responsible for depressed growth rates;
4. Compare the foraging ecology of black oystercatchers on impacted and unimpacted shorelines and elucidate the role that oystercatchers play in structuring the intertidal invertebrate community and the effect they may have on population recovery of their prey species.

Project Methods: Study methodology will primarily follow previous plans. From mid May to late August, two field camps will be used to monitor the reproductive success of oystercatchers. Habitat variables of nest sites and foraging territories will be measured. Foraging of adults will be quantified during incubation. Deliveries of prey items to chicks will be recorded at sites not sampled in 1991. Chicks will be banded when $\geq$7 days old and will be reweighed twice before fledging. At $\geq$25 days, blood samples will be collected from chicks. Standard Operating Procedures of the Coastal Habitat Project will be implemented to assess prey density in oystercatcher foraging territories at the beginning of the season and at the end of the field season. Density of invertebrate prey items will also be quantified at impacted and unimpacted sites. Samples of mussels will also be collected for hydrocarbon analysis. Shell collections from territories not sampled in 1991 will be used to determine the size structure of invertebrate species taken by oystercatchers. Predation on oystercatcher nests will be monitored during incubation and chick-rearing phases.

Estimated Duration of Project: This project can be accomplished in 2 years.

Estimated Cost per Year:

Year	1993	1994
Cost	125k	125k

Other Comments: None

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ID #9206041O6-1

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS

Birds

✓ Checked for Completeness

ID stamped/Input completed
Name
Affiliation
Costs

✓ Category

Monitoring

✓ Lead Agency

DOI - US FWS

____ Cooperating Agency(ies)

(Y) N Passed initial screening criteria

type - birds

RANKING H M L Rank Within Categories

H M L Rank Overall

____ Project Number - if assigned _____

920604406
4106-1

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

FORMAT FOR IDEAS FOR RESTORATION PROJECTS

Title of Project:
Monitor, catalog migratory birds passing along Gulf of Alaska

Justification: (Link to Injured Resource or Service)
Observed decrease in migratory birds after spill

Description of Project: (e.g. goal(s), objectives, location, rationale, and technical approach)

"Scout and catalog and propagate"

Estimated Duration of Project: 10 years

Estimated Cost per Year: —

Other Comments:

Name, Address, Telephone:

Neil A. Sargent
303 Wilson Street
Kodiak, AK 99615

Oil spill restoration is a public process. Your ideas and suggestions will not be proprietary, and you will not be given any exclusive right or privilege to them.

recorded to 92 MWL

June 1, 1992

Mr. Dave Gibbons
Acting Administrative Director, Restoration Team
645 G. street
Anchorage, Ak. 99501

Dear Sir:

This letter offers testimony for possible use for the Restoration Framework - Exxon Valdez Oil Spill Restoration Plan.

I am a property owner on Shuyak Island where, oil from the spill did touch my property with minimal damage, if any.

After a lifetime in the Kodiak Island group and activity on Shuyak Island since 1928, it wasn't hard to observe the flight patterns of birds coming of the great arc of the Gulf of Alaska, stopping in Shuyak near my place, then at other times observed at Kiziuyak Bay or other areas on their way to the south end of Kodiak where they cross the Shelikof Straits and find the pass to Becharoff Lake and beyond.

My concern is with the diminishing returns of these flights after the spill resulting in a smaller percentage available along the route for subsistence users and the building of a program to scout and catalog and possibly propagate this chain of life for a ten year period which would involve biologists, ornithologists and the like. The results of such a program should be aimed at recovery of the species affected by the spill along the route and continued good use for all Alaskans from the chain of life.

I consider the acquisition of land secondary unless it directly helps to advance the promotion of the species involved.

Sincerely,

Neil A. Sargent

Neil A. Sargent
303 Wilson Street
Kodiak, Alaska 99615

CC: Alaska Federation of Natives

ID # 92061527-27

Birds

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS

✓ Checked for Completeness

- ✓ ID stamped/Input completed
- ✓ Name
- ✓ Affiliation
- ✓ Costs

✓ Category Restoration Monitoring

✓ Lead Agency DOI-USFWS

✓ Cooperating Agency(ies)

(Y) N Passed initial screening criteria

type - birds

RANKING H M L Rank Within Categories

H M L Rank Overall

_____ Project Number - if assigned _____

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

FORMAT FOR IDEAS FOR RESTORATION PROJECTS

Title of Project: Monitor Population Status of Seabird Nesting Colonies in the Spill Zone

Justification: (Link to Injured Resource or Service) More than 30,000 carcasses representing over 90 species of birds were collected the spill zone in 1989. In addition, both direct and lingering population effects of the spill have been demonstrated in NRDA studies on cormorants, harlequin ducks, black oystercatchers, black-legged kittiwakes, arctic terns, marbled murrelets, common murres and pigeon guillemots. There are about 320 colonial seabird nesting colonies in the spill zone that contain about 1.121 million breeding seabirds.

The Exxon Valdez oil spill killed many seabirds in Prince William Sound (PWS) and northern Gulf of Alaska. This prompted the recensus of selected seabirds at selected seabird colonies in the PWS, Chiswell, Barren, Kodiak, Semedi, and Ugiaushak islands, and the upper southside Alaska Peninsula. Some of the colonies recensused had been censused between two and six times since 1983, and provided a baseline to assess population trends. However, most colonies in the spill zone were not surveyed after the spill, have not been censused for several years, and have a weak baseline of historical data. In addition, past surveys used census methods that are considered inadequate today; e.g., replicate counts were not used.

Description of Project: (e.g. goal(s), objectives, location, rationale, and technical approach) This project would be designed to census breeding colonial seabirds (except murre and PWS pigeon guillemot colonies) in the oil spill zone (Prince William Sound, outside coast of the Kenai Peninsula, Kodiak Island, and upper southside of the Alaska Peninsula) to determine their population status.

Project Methods

The first year all colonies in the PWS except pigeon guillemot colonies area will be censused. The murre colonies in the spill zone and the pigeon guillemot colonies in PWS will be surveyed as a ongoing objectives of the complimentary murre and guillemot studies.

All colonies will be censused using standard Fish and Wildlife Service (FWS) methods for land-based and boat-based censuses of breeding colonial seabirds. Colony catalog forms used by the FWS will also be completed and data entered into the Alaska Seabird Colony Catalog Database. Total populations of all seabirds (except nocturnals) at each colony will be estimated. In addition, established census plots will also be censused where they exist. Photograph and video documentation will be completed to evaluate future changes in colonies and to assist in establishing population estimates.

This study is a component in the continuing FWS statewide seabird colony catalog project. The FWS has just completed a new Alaska Seabird Colony Catalog Database Management System including GIS capabilities. This new system is now available to catalog and analyze new data.

Estimated Duration of Project: Two years.

Estimated Cost per Year: 100K per year.

Other Comments: None

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ID # 920615279-16

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS

Eagles

✓ Checked for Completeness

✓ ID stamped/Input completed
Name
✓ Affiliation
— Costs

_____ Category

Monitoring — Eagles

_____ Lead Agency

DOI USFW

_____ Cooperating Agency(ies)

_____

(Y) N Passed initial screening criteria

Type: Birds

RANKING H M L Rank Within Categories

H M L Rank Overall

_____ Project Number - if assigned _____

92061529 16

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

FORMAT FOR IDEAS FOR RESTORATION PROJECTS

Document ID Number 92061529
☐ A-92 WPWG ☒ B-93 WPWG ☐ C-RFWG ☐ D-PAG ☐ E-MISC.

Title of Project:

Bald Eagle Nesting Surveys - Alaska Peninsula Pacific Coast

Justification: (Link to Injured Resource or Service) Bald Eagle nesting surveys were conducted during 1989 and 1990 along the Pacific Coast of the Alaska Peninsula as part of the Fish and Wildlife Service oil spill damage assessment studies. Follow-up surveys would provide a better understanding of the long term effects of the spill on eagle production/distribution along the impacted portion of Alaska Peninsula coastline.

Description of Project: (e.g. goal(s), objectives, location, rationale, and technical approach)

The goal of these surveys would be to compare resuts with surveys conducted in 1989 and 1990, with objectives to include: a) determine location and distribution of eagle nests along the impacted portion of the Alaska Peninsula Pacific coast; b) monitor reproductive success from egg to fledging; and c) collect abandoned eggs for hydrocarbon analysis. Study location would be the northern border of Becharof Refuge (Cape Kubugakli) south to the northern border of Aniakchak National Monument (Cape Kunmik) including the nearshore islands of the Alaska Peninsula Unit of Alaska Maritime National Wildlife Refuge (Alinchak Islets to Sutwik Island). Methods would involve mapping and monitoring the nests using a Bell 206 or Hughes 500 helicopter on pop-out floats with 1-2 trained observers. Surveys would be flown once during egg incubation (May) and once during the fledgling stage (July), taking approximately three flight days for each survey.

Estimated Duration of Project: 1993-1995

Estimated Cost per Year: 22K

Other Comments: This proposal addresses Options 7, 13, and 29 in the Exxon Valdez Oil Spill Restoration Framework, Volume I.

Name, Address, Telephone:

Ronald E. Hood, Refuge Manager
Donna Dewhurst, Wildlife Biologist
U. S. Fish and Wildlife Service
Alaska Peninsula/Becharof National Refuge Complex
P. O. Box 277
King Salmon, Alaska 99613
(907) 246-3339

Oil spill restoration is a public process. Your ideas and suggestions will not be proprietary, and you will not be given any exclusive right or privilege to them.

ID # 92061579 -13

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS

eagles

V Checked for Completeness

- ✓ ID stamped/Input completed
- ✓ Name
- ✓ Affiliation
- — Costs

_____ Category

Monitoring Eagles

_____ Lead Agency

DOT - USFW

_____ Cooperating Agency(ies)

Y N Passed initial screening criteria

Type Birds

RANKING H M L Rank Within Categories

H M L Rank Overall

_____ Project Number - if assigned _____

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

FORMAT FOR IDEAS FOR RESTORATION PROJECTS

Title of Project:

Bald Eagle Productivity Survey and Catalogue

Justification: (Link to Injured Resource or Service)

Many eagles were lost to the oil spill this project will give baseline data on individual birds.

Description of Project: (e.g. goal(s), objectives, location, rationale, and technical approach)

The goal will be to produce a productivity catalogue for monitoring individual bald eagle pairs on the Kodiak Archipelago. Determining the loss of one or both members of a breeding pair and shifts in nest use are normally not possible. Voice printing will allow for the determination of breeding longevity, nest shifting, and breeding success of individual bald eagle pairs.

The project will include purchase of digital tape recorders and boom microphones; audio tape analysis and computer cataloging; transportation costs of refuge vessel and flight charges of refuge aircraft.

Voice recordings of breeding eagles in attendance of active nest sites will be obtained with follow-up aerial surveys to determine number of young eagles fledged. Computer voice print analysis of the tapes and computer cataloging to identify individual bald eagles will be completed in subsequent years.

Estimated Duration of Project: Three years

Estimated Cost per Year: $10,000/year 1, $22,500/year 2, $22,500/year 3.

Other Comments: This baseline data will make an accurate analysis of our bald eagle population possible.

This proposal addresses Options 7, 13, and 29 in the Exxon Valdez Oil Spill Restoration Framework, Volume I.

Name, Address, Telephone:

Kodiak National Wildlife Refuge
1390 Buskin River Road
Kodiak, Alaska 99615
(907) 487-2600

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ID # 920615273-29

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS

Eagles

✓ Checked for Completeness

ID stamped/Input completed
Name
Affiliation
Costs

✓ Category Monitoring - Eagles

Lead Agency DOI USFW

Cooperating Agency(ies)

Y N Passed initial screening criteria

type: birds

RANKING H M L Rank Within Categories

H M L Rank Overall

Project Number - if assigned

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

Title of Project: Long-term Population Monitoring for Bald Eagles in the Exxon Valdez Oil Spill Area

Justification: (Link to Injured Resource or Service)
To determine the population level effects of the loss of the 1989 nestling production and older eagles caused by the Exxon Valdez oil spill, estimates are needed for the normal annual production, survival of each age class, and the average age when eagles first breed. During damage assessment studies, information was collected on reproductive success for one year that was strongly influenced by the oil spill and for a second year that may be normal. Data is available for survival of adults and for one cohort of young during their first and second years of life. Insufficient time has passed to determine the survival of eagles between 2 years old and the time they become sexually mature. The average age of first breeding is unknown. In unregulated populations in the eastern U.S., adults often breed in their fifth year. However, density dependent factors may play a role in the more densely populated habitats of Alaska, significantly delaying the time when a maturing eagle can successfully compete for a breeding place. All of these factors need to be determined to understand the effect of the loss of both nestlings and sexually mature adults that were killed during the spill.

d Eagles are relatively unique among the species impacted by the oil spill, having a delayed sexual maturity and relatively long life spans under normal conditions. Population level impacts may not be readily apparent due to the slow population turnover rates in Bald Eagles. For example, experiments have been conducted in southeastern Alaska for the last 10 years where the annual nestling production has been removed and released in the eastern United States to augment depleted populations there. The effects of the removal have been monitored and compared with a neighboring area where no young were removed. It was not until the fifth year of the study that differences in reproductive parameters were noted between the experimental and control areas.

A huge investment in time, resources, and money was made to capture and radiotag a large sample of Bald Eagles from 1989 to 1991, as part of the damage assessment process. At least 80 of these eagles are still alive with functional transmitters that will continue to operate for up to three and a half years from now. Research conducted on radiotagged eagles during the past 3 years has provided important data for survival. Some of these individuals have been followed as nestlings since 1989. A delay in initiating this project will result in the loss of these transmitters as their battery life is consumed, and a valuable investment will be wasted.

Project Description: This study would be a continuation of work initiated during the assessment. To further evaluate the impact of EVOS and document recovery of Bald Eagle populations, it is necessary to determine age-specific survival, and age of first breeding for a representative segment of the Bald Eagle population in the spill area. Because the impacts to Bald Eagle reproduction were t apparent in Prince William Sound (PWS), this study will be conducted within PWS. These

ta will be used to prepare an accurate model that will show the extent and duration of the injury sustained by Bald Eagles and document recovery of populations in the spill area.

We propose to conduct a population survey in three areas once every three years beginning in 1993: Kodiak/Afognak, Alaska Peninsula and PWS. This would result in two estimates for each area over a period of six years and provide a good basis for the population model.

Up to 40 subadult and 10 adult Bald Eagles will be radio-tagged during the first 3 years of the study using transmitters designed to last at least 5 years. Transmitters will be equipped with mortality sensors. Tagged birds will be relocated at least monthly from fixed wing aircraft. Eagles at least 5 years old will be monitored during the breeding season to document breeding efforts and success. Survival rates will be calculated using the Kaplan-Meier procedure.

Data collected during the telemetry work would be used to develop a population model for Bald Eagles. Existing stochastic models for Bald Eagle populations use random derived estimators, not estimators from observed parameters and deviations in normal wild populations. Data do not exist for age at first breeding, age specific survival rates for all age classes from hatching to maturity and for the portion of the population that breeds; all critical parameters in the development of a realistic model. The collection of these data over a period of years would allow the development of a model that uses observed variation rather than randomly generated variation.

ration of Project: The study needs to be continued through at least one Bald Eagle generation. d Eagles have been assumed to take at least five years to mature sexually, but the actual value is unknown. Other birds of shorter generations also take several years after their first breeding attempt to achieve nest success rates of established breeders. It seems likely that an extended study is indicated to encompass at least one generation and obtain an adequate sample to estimate survival and age at first breeding. Because of the length of time it takes for eagles to acquire adult plumage characteristics, and the delay expected before physiologically mature eagles breed, we recommend that the study be continued for six years.

					($K)	
Estimated Cost per Year:	1993	1994	1995	1996	1997	1998
	115	117	112	84	84	84

Other Comments: Parts of this study (e.g., radiotelemetry, salaries) could be combined with the "Identification and Protection of Important Eagle Habitats" study. Conducting these studies simultaneously would reduce logistic and personnel costs.

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ID # 920615273-28

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS

Eagles

✓ Checked for Completeness

ID stamped/Input completed
Name
Affiliation
Costs

Eagles

✓ Category Monitoring

____ Lead Agency DOT USFW

____ Cooperating Agency(ies)

Y N Passed initial screening criteria

type: birds

RANKING H M L Rank Within Categories

H M L Rank Overall

____ Project Number - if assigned ____

Title of Project: Monitor productivity of bald eagles in Prince William Sound, Kodiak Archipelago and Alaska Peninsula Pacific Coast

Justification (Link to Injured Resource or Service): Bald Eagle reproductive studies were conducted in the spill area in 1989 and 1990. In 1989, about 85 percent of eagle nests in oiled areas failed to produce young. Reproductive success improved in 1990, and estimates of damages have been based partly on a comparison of reproductive success between 1989 and 1990. However, it is not known if reproductive rates observed in 1990 were normal, or if there were continuing effects of the spill. Results of hydrocarbon analyses of bald eagle eggshells and prey remains in 1990 suggest there was continuing contamination that might have affected reproduction. No nest surveys were conducted in 1991 or 1992. At least one additional year of data on bald eagle reproduction is needed to better evaluate 1) whether 1990 reproductive rates were "normal", 2) document recovery, and 3) provide reproductive estimates necessary to model the extent and duration of injury. Because the impacts to bald eagle reproduction were most apparent in PWS, this study will focus on PWS.

Description of Project: Bald Eagle nests will be surveyed in Prince William Sound, Alaska Peninsula, and Kodiak Archipelago during the nesting season. Dependent upon the geographic area, combinations of the following activities would be undertaken: (1) Activity surveys will be nducted by helicopter in mid-May to determine occupancy, and (2) productivity surveys will be nducted in late July and early August to determine nest success and count chicks. These surveys will provide a standard estimate of the reproductive parameters for this population. The study area in Prince William Sound will incorporate a sample of about 300 eagle nests that were surveyed in 1989 and again in 1990. Study design has yet to be accomplished for the other geographic areas.

Estimated Duration of Project: The study is proposed for one year. However, it should be continued at least one additional year to assess natural, annual variation in reproductive success.

Estimated Cost per Year: 153 K

Other Comments: This study will yield information required for the Population Monitoring..." study, and both studies would benefit if combined. Also, parts of this study (e.g., salaries, fuel caches) could be coordinated with the "Identification and Protection of Important Eagle Habitats.." and "Population Monitoring..." studies. Conducting these studies simultaneously would reduce logistic and personnel costs.

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ID # 920615273-05

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS

Eagles

✓ Checked for Completeness

ID stamped/Input completed
Name
Affiliation
Costs

Eagles

✓ Category

Monitoring

Lead Agency

DOT USFW

Cooperating Agency(ies)

Y N Passed initial screening criteria

type - birds

RANKING H M L Rank Within Categories

H M L Rank Overall

Project Number - if assigned

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

FORMAT FOR PUBLIC IDEAS FOR RESTORATION PROJECTS

Title of Project: Determine the Status of Bald Eagle Populations in Oiled National Parks.

Justification: Preliminary results from damage assessment studies conducted by the U. S. Fish and Wildlife Service have shown that oil contamination of the intertidal habitats used extensively by breeding, wintering and migrating bald eagles have resulted in impacts to these birds. Conservative estimates of total mortality of bald eagles due to the Exxon Valdez oil spill is 553. Bald eagle nesting surveys revealed a significantly low nest success and productivity in Prince William Sound with approximately 69% of occupied nests failing in 1989 and 43% failing in 1990. A conservative estimate of lost production in 1989 was 133 chicks. Hydrocarbon analysis of addled eggs, prey remains, blood and feathers 1989 and 1990 indicated exposure. Two of three eggshell samples collected in 1989 on the Alaska Peninsula and Kodiak area were exposed to hydrocarbons. Concentrations of uric acid in blood serum from adult eagles in oiled areas were higher than those from unoiled areas in 1989. Eggs collected in 1990 in the eastern Sound also indicated exposure to petrogenic hydrocarbons.

The extensive oiling of Kenai Fjords National Park and Katmai National Park is well documented. Many bald eagles are known to forage and nest in these parks. If bald eagles in Prince William Sound were injured by the oil it is reasonable to project some degree of injury to those which occupy suitable habitats in these park units. Expansion of the bald eagle study affords the opportunity to extend this important injury investigation to other major spill-affected areas: the Kenai and Alaska Peninsulas.

Description of Project: Determine the habitat use, population status and reproductive activity of bald eagles in Kenai Fjords and (coastal) Katmai National Parks. Cooperate or combine with ongoing eagle efforts to assure compatible census and habitat evaluation techniques and maximum efficiency.

It would be a purpose of this expanded study to provide information necessary to the Trustee Council and the National Park Service in order to justify limiting or controlling human activities disturbing to bald eagles during critical life cycle stages.

Estimated Duration of Project: Three years.

Estimated Cost per Year: $80,000 per year.

Other Comments: None.

For Further Information Contact: Dan Hamson, Chief, Coastal Programs Division, National Park Service, 2525 Gambell Street, Anchorage, Alaska 99503, (907) 257-2526.

ID # 920601058-07

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS

Eagles

✓ Checked for Completeness

- ✓ ID stamped/Input completed
- NO ~~✓~~ Name
- ✓ Affiliation
- ✓ Costs

✓ Category

Monitoring - Eagles

Lead Agency

DOI USFW

Cooperating Agency(ies)

Y N Passed initial screening criteria

type - birds

RANKING H M L Rank Within Categories

H M L Rank Overall

Project Number - if assigned

USE AND PRODUCTIVITY OF BALD EAGLE NEST SITES OF THE KODIAK ISLAND ARCHIPELAGO

EXXON VALDEZ OIL SPILL SETTLEMENT FUND STUDY PROPOSAL

OBJECTIVES:
Kodiak National Wildlife Refuge proposes the development of a productivity catalogue to be used for monitoring productivity of individual bald eagle pairs nesting on the Kodiak Island Archipelago. Coastal refuge habitats at high risk to exposure to oil spill impacts and enviromentally sensitive areas would receive priority with additional nonrefuge areas receiving coverage on an opportunistic basis.
These data would allow area specific monitoring of bald eagle productivity, and assessment of enviromental and developmental impacts on Kodiak's bald eagle population.

EQUIPMENT REQUIRED:
The principal components in development of the productivity catalogue are:
Portable digital tape recorders and sound equipment to obtain voice recordings of breeding adult bald eagles in attendance of active nest sites. Follow-up aerial surveys to determine number of young eagles fledged. Computer voice print analysis of the tapes and computer cataloguing to identify individual bald eagles in subsequent years. Funding for subsequent annual surveys and voice print collection will be sought from U.S. Fish and Wildlife Service.

EQUIPMENT COST (thousand $):

Digital tape recorders and boom microphones	$ 5
Audio tape analysis and computer cataloguing	$25
Transportation (refuge vessel) and Aircraft cost	$25
TOTAL	$55

JUSTIFICATION:
Nesting bald eagles are susceptable to both enviromental and man-induced impacts. Determining the loss of one or both members of a breeding pair of bald eagles, and shifts in nest use are normally not possible but are essential in assessing changes in bald eagle productivity. Radio telemetry has allowed for short term monitoring of individual pairs of nesting bald eagles. Since bald eagles live up to 50 years in captivity, breeding activity in individual pairs could exceed 25 years. However, identification of breeding pairs of bald eagles throughout their lifespan has not been possible in the past. Voice printing allows for the determination of breeding longevity, nest shifting, and breeding success of individual breeding bald eagle pairs. These data would provide the basis for evaluating the

factors the influence bald eagle nesting success and productivity. The development of a bald eagle voice print catalogue would also serve to identify critical habitat areas (other than nesting habitat) and establish their importance to productivity and population status of Kodiak bald eagles.

ID # 920615297 -18

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS Coastal Habitat

✓ Checked for Completeness

- ✓ ID stamped/Input completed
- ✓ Name
- ✓ Affiliation
- ✓ Costs

✓ Category

Restoration - monitoring

✓ Lead Agency

~~ADF&G~~ USDA

_____ Cooperating Agency(ies)

_____

Ⓝ N Passed initial screening criteria

_____

Type: Coastal Hab

_____

RANKING H M L Rank Within Categories

H M L Rank Overall

_____ Project Number - if assigned _____

1993 PROJECT SCORING SHEET

Critical Factors

Potential projects must meet all of the following to be considered further. Check the blank for "yes", "no", or "unknown".

YES	NO	UNKNOWN	
✓			1. Linkage to resources and/or services injured by the Exxon Valdez oil spill.
✓			2. Technical feasibility.*
✓			3. Consistency with applicable Federal and State laws and policies.*

Comments:

* Restoration Framework, 1992, pp 43-44.

920615297
☐ A-92 WPWG
☑ B-93 WPWG
☐ C-RPWG
☐ D-PAG
☐ E-MISC.

ex. 18

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

FORMAT FOR IDEA FOR RESTORATION PROJECTS

Title of Project: Coastal Habitat Comprehensive Intertidal Monitoring Program

Justification:
The Coastal Habitat study showed damage to the intertidal community in all three oil-spill regions: Prince William Sound, Kenai Peninsula, Kodiak/Alaska Peninsula. The impacts by tidal height and by species were different in the three regions. In 1991, some species showed signs of the recovery process while others continued to decline or showed no sign of recovery.

Description of Project:
Goals and Objectives: The goal of the study is to conduct a comprehensive monitoring program of intertidal communities in the area impacted by the EVOS. To be comprehensive, the study will include oiled and matched control sites (already established), from which we have a valuable historical record of post-spill data, in all three regions impacted by the oil spill, and a variety of habitats (e.g. sheltered rocky, coarse textured). Within these sites, we will focus on the recruitment and population dynamics of key species as determined by their role in the community (indicator species, spatial dominants, annual vs perennial algae, grazers, predators).

Location:
The study would be conducted in all three oil spill regions or could be conducted in one or two regions per year.

Rationale: See Justification and Goals. The Coastal Habitat sites were not visited in 1992. A selected subset of matched oiled and control sites should be monitored to determine the extent to which recovery is occurring, or not occurring, among major intertidal species. The greater the period between visits to quantify recovery or continued impacts, the more difficult it will be to relate the findings to the oil spill and to distinguish between oil spill impacts and natural events.

Approach: A subset of matched sites in sheltered rocky and coarse textured habitats will be studied. We will utilize a repeated measures design for floral and faunal censuses in existing permanent quadrats to track recovery. Key organisms will be identified and counted in the field and the data recorded on-site. To analyze interannual recruitment variability, supplemental quadrats will be cleared each year (sheltered rocky only).

Estimated Duration of Project: 3 years

Estimated Cost per Year: $1,650,000

Other Comments: Dr. Mike Stekoll will participate in this project.

Name, Address, Telephone:

Dr. Ray Highsmith
Institute of Marine Science
University of Alaska Fairbanks
Fairbanks, AK 99775-1080

ID # 1208152580 01

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS 258-01

✓ Checked for Completeness

✓ ID stamped/Input completed
✓ Name
✓ Affiliation
✓ Costs

✓ Category

Restoration - Recovery Monitoring

✓ Lead Agency

NOAA

✓ Cooperating Agency(ies)

DEC

(Y) N Passed initial screening criteria

type: CH

RANKING H M L Rank Within Categories

H M L Rank Overall

_____ Project Number - if assigned _____

PROJECT SCORING SHEET 258-01

Critical Factors

Potential projects must meet all of the following to be considered further. Check the blank for "yes", "no", or "unknown".

YES	NO	UNKNOWN	
✓			1. Linkage to resources and/or services injured by the Exxon Valdez oil spill.
✓			2. Technical feasibility.*
✓			3. Consistency with applicable Federal and State laws and policies.*

Comments:

* Restoration Framework, 1992, pp 43-44.

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
Restoration Projects for 1993

920615258-01

Title of Project: Recovery Monitoring of Intertidal Oiled Mussel Beds in Prince William Sound and the Gulf of Alaska Impacted by the *Exxon Valdez* Oil Spill.

Justification (Link to Injured Resource or Service): High concentrations of oil in mussels (*Mytilus trossulus*) from oiled mussel beds appear to be a linked to continued reproductive failure of harlequin ducks in western Prince William Sound (PWS), damage to oystercatchers, and elevated mortalities in juvenile sea and river otters - all of which feed on mussels. The presence of these contaminated beds is also of concern for human subsistence.

Description of Project (e.g. goals, objectives, location, rationale, and technical approach): 1992 goals of this project are (1) to establish the geographic extent and intensity of oiling of densely packed mussel beds in PWS and the Gulf of Alaska (GOA); (2) to document within site variation of oiling levels; and, (3) to test the feasibility of a minimally intrusive restoration technique, monitor changes in petroleum hydrocarbons (Hcs) in mussels and underlying sediments and to measure physiological recovery in mussels.

Proposed goals and objectives for 1993 are (refer to 1, above) to follow recovery in all densely packed mussel beds that have been previously documented and to sample any newly discovered potential contaminated beds; (refer to 2 and 3, above) monitor recovery in mussel beds manipulated under this project in 1992 and by AK Department of Environmental Conservation; and, (refer to 2 and 3, above) using current data from within site sampling, test different restoration techniques which are directed toward only those areas which show extremely high levels of contamination and document chemical and biological recovery of HC levels in mussels and underlying sediments.

NOAA's Auke Bay Lab has now successfully established a fast screening method (UV Fluorescence) for sediment petroleum hydrocarbons (turn around time for data is ~10 d). Using this technique, we have documented that HC distribution within an heavily contaminated mussel bed appear to be quite patchy and probably related to grain size of the sediment more than tidal height. Rapid receipt of HC data will allow targeting manipulative areas in a timely manner.

Estimated Duration of Project: 3 years

Estimated Cost per Year:
1993: $ 325,000 (salaries, HC analyses, vessel charter, logistics)
1994: $ 225,000
1995: $ 190,000

Other Comments:
This project will necessarily have other components which are specifically oriented toward higher consumers (humans, sea and river otters, oystercatchers, harlequin ducks); this focuses on chemical recovery of habitat and biological recovery of the target prey items - i. e. mussels.

Name, Address, Telephone:
Stanley D. Rice
907-789-6020

NOAA/NMFS Auke Bay Fisheries Lab
11305 Glacier Highway
Juneau, Alaska 99801-8626

ID # 920615273-04

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS Coastal Habitat

✓ Checked for Completeness

- ✓ ID stamped/Input completed
- ✓ Name
- ✓ Affiliation
- ✓ Costs

Category ~~Damage Assessment~~ Monitoring

Lead Agency
NOAA

Cooperating Agency(ies)
DOI - NPS, ADF+G, DEC

(Y) N Passed initial screening criteria

Type: CH

RANKING H M L Rank Within Categories

H M L Rank Overall

Project Number - if assigned

9206S273-04

1993 PROJECT SCORING SHEET

Critical Factors

Potential projects must meet all of the following to be considered further. Check the blank for "yes", "no", or "unknown".

YES	NO	UNKNOWN	
✓			1. Linkage to resources and/or services injured by the Exxon Valdez oil spill.
✓			2. Technical feasibility.*
✓			3. Consistency with applicable Federal and State laws and policies.*

Comments:

* Restoration Framework, 1992, pp 43-44.

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

FORMAT FOR PUBLIC IDEAS FOR RESTORATION PROJECTS

Title of Project: Recovery Monitoring of Intertidal Oiled Mussel Beds Outside of Prince William Sound Impacted by the Exxon Valdez Oil Spill.

Justification: The highest oil concentrations in animals or sediments in 1991 were found in mussels and underlying substrates from oiled mussel beds in Prince William Sound (PWS) (Babcock, 1991 status report on oiled mussel beds). The oiled mussel bed study of 1991 exposed a potentially serious pathway of oil to predators higher in the food chain.

Description of Project: The primary objectives of this study will be to further describe the geographical extent of oiled mussel beds within the spill zone of the Exxon Valdez spill, follow the chemical recovery of untreated mussel beds, and, as indicated by results of the 1992 Oiled Mussel Restoration Study (#103), test recovery of beds following mechanical treatment.

The 1992 Oiled Mussel Restoration Study, whose results are not yet available, is examining the geographical distribution of oiled mussel beds within Prince William Sound and at a selected subsample of sites along the Kenai Peninsula, the Alaska Peninsula and the Kodiak Archipelago. Due to budget cuts, the number of sites to be sampled was reduced. Dependent upon the results of this year, additional candidate sites would be sampled, and possibly other sites outside of PWS would be tested for mechanical treatments and recovery monitoring. The methods used in 1991 and 1992 would be continued unless modifications were deemed appropriate. A combination of ultraviolet (UV) screening and gas chromatograph/mass spectroscopy (GC/MS) will be used to reduce analytical costs. The 1992 project component examining oiled mussels outside of PWS was a cooperative study involving the National Park Service and NOAA (the Auke Bay Lab).

Estimated Duration of Project: One year (dependent upon results of 1992 and 1993 studies).

Estimated Cost per Year: $175,000.

Other Comments: Any study of oiled mussel beds outside of PWS should be coordinated with continued study of PWS oiled mussel beds. The scope and specific plan for this study will be dependent on interpretation of results of the 1992 Oiled Mussel Restoration Study.

For Further Information Contact: Dan Hamson, Chief, Coastal Programs Division, National Park Service, 2525 Gambell Street, Anchorage, Alaska 99503, (907) 257-2526.

ID # 92061023O-01

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS Coastal Habitat

✓ Checked for Completeness

- ✓ ID stamped/Input completed
- ✓ Name
- ✓ Affiliation
- ✓ Costs

✓ Category

Monitoring

✓ Lead Agency

ADFG

✓ Cooperating Agency(ies)

USFS

(Y) N Passed initial screening criteria

Type: ST

RANKING H M L Rank Within Categories

H M L Rank Overall

_____ Project Number - if assigned _____

920610230-01

1993 PROJECT SCORING SHEET

Critical Factors

Potential projects must meet all of the following to be considered further. Check the blank for "yes", "no", or "unknown".

YES	NO	UNKNOWN	
✓			1. Linkage to resources and/or services injured by the Exxon Valdez oil spill.
✓			2. Technical feasibility.*
✓			3. Consistency with applicable Federal and State laws and policies.*

Comments:

* Restoration Framework, 1992, pp 43-44.

920610230-01

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

FORMAT FOR IDEAS FOR RESTORATION PROJECTS Coastal Habitat

Title of Project:
Experimental Evaluation of Oiled/Control Paired Design Used in Assessing Damages and Recovery of Intertidal, Subtidal Communities

Justification: (Link to Injured Resource or Service)

Description of Project: (e.g. goal(s), objectives, location, rationale, and technical approach)

Estimated Duration of Project: 1-3 years

Estimated Cost per Year: $150,000

Other Comments:

Name, Address, Telephone:
Dr. Thomas Dean
Coastal Resources Associates
2270-I Camino Vida Roble
Carlsbad, CA 92009

Oil spill restoration is a public process. Your ideas and suggestions will not be proprietary, and you will not be given any exclusive right or privilege to them.

JUN 1 0 REC'D

Document ID Number
920610230
- [ ] A-92 WPWG
- [x] B-93 WPWG
- [ ] C-RPWG
- [ ] D-PAG
- [ ] E-MISC.

Coastal Resources Associates

2270 Camino Vida Roble, Suite L
Carlsbad, CA 92008
(619) 438-0588

FAX TRANSMITTAL COVER

Deliver To:	To: Dave Gibbons
Contact Name:	
Fax Number:	916-274-0178
Sender:	Tom Dixon
Description:	Coordination letter

Number of pages (not including cover):	3
Date Sent: 6/10/92	Time Sent: 3:00 pm

If there are any problems with this transmission, please call (619)438-0588 immediately

Coastal Resources Associates
2270 Camino Vida Roble, Suite L
Carlsbad, CA 92009
(619) 438-0588

9 June 1992

Dr. Dave Gibbons
Exxon Valdez Oil Spill Restoration Team
645 "G" Street
Anchorage, AK 99501

Dear Dr. Gibbons:

Enclosed are several ideas for restoration projects to be conducted in 1993. Thank you for the opportunity to present these.

Sincerely,

Thomas A. Dean, Ph.D.

cc: Mr. Mark Fraker
Dr. Art Weiner

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

IDEAS FOR RESTORATION PROJECTS

Title of Project: Experimental Evaluation of the Oiled/Control Paired Design Used in Assessing Damages and Recovery of Intertidal and Subtidal Communities.

Justification: (Link to Injured Resource or Service)
Damages to a variety of plants and animals in the intertidal and subtidal communities of Prince William Sound have been observed as the result of the EXXON VALDEZ oil spill. Some of the damaged populations are apparently recovering, while others are not.

Description of Project: (e.g. goal(s), objectives, location, rationale technical approach)
Goals: Evaluate the paired oil/control sampling design used to assess damages and recovery from the EXXON VALDEZ oil spill. Also refine the criteria used for selection of an experimental design and sampling sites to be used in future spill monitoring.
Objective: Test the assumption that oiled and control sites selected for study in coastal habitat damage assessment and resource recovery studies were similar except with respect to oiling. Define criteria that may lead to selection of oiled and control sites in future monitoring.
Location: Studies will be conducted in areas of Prince William Sound not impacted by the EXXON VALDEZ oil spill.
Rationale: The quantitative assessment of impacts of damages to biological resources in coastal habitats, as well as recovery from these damages, relies on comparisons between selected oiled and control sites that were sampled after the EXXON VALDEZ oil spill. The assessment of impacts based on this design rests on the assumption that pairs of oiled and control sites were similar except for the presence of oil. Without independent evidence in support of this assumption, there will always be the suspicion that differences among oiled and control sites may have resulted from some inherent differences among sites rather than from oiling. A "slow recovery" could also be interpreted as a result of inherent differences unrelated to oiling.
Technical Approach: An oil spill simulation model will be used to identify set of hypothetically "oiled" sites within Prince William Sound. A subset of the "oiled" sites will be selected at random, and these sites will be visited. Paired "control" sites will be selected that match the "oiled" sites as closely as possible . The selection of the "control" sites will be based on criteria similar to those used in the selection of control sites in the Coastal Habitat Damage Assessment Studies. We will then sample and determine the population density of a variety of key indicator species at both "oiled" and "control" sites. These will include both intertidal and subtidal species that were assessed as being severely damaged by the EXXON VALDEZ oil spill. In addition, a number of other selected physical variables (eg. temperature, salinity, depth, slope, aspect) will be measured at each site. Possible differences between "oiled" and "control" sites will be determined using statistical methods comparable to those used by the Coastal Habitat damage assessment program. We will attempt to explain possible differences among sites based on physical differences among sites.

Estimated Duration of Project: One to three years

Estimated Cost per Year: $150,000

Other Comments: Logistical costs for this project could be reduced by combining efforts with other Coastal Habitat sampling programs.

Name, Address, Telephone:

Dr. Thomas A. Dean
Coastal Resources Associates
2270-I. Camino Vida Roble
Carlsbad, CA 92009
619/438-0588

II 9206152901-0001

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS

Coastal Habitat

✓ Checked for Completeness

ID stamped/Input completed
Name
Affiliation
Costs

✓ Category Restor. Monitoring

✓ Lead Agency DEC

_____ Cooperating Agency(ies)

(Y) N Passed initial screening criteria

Type: Coastal Hab

RANKING H M L Rank Within Categories

H M L Rank Overall

_____ Project Number - if assigned _____

920613

PROJECT SCORING SHEET

Critical Factors

Potential projects must meet all of the following to be considered further. Check the blank for "yes", "no", or "unknown".

YES	NO	UNKNOWN	
__	__	__	1. Linkage to resources and/or services injured by the Exxon Valdez oil spill.
__	__	__	2. Technical feasibility.*
__	__	__	3. Consistency with applicable Federal and State laws and policies.*

Comments:

* Restoration Framework, 1992, pp 43-44.

JUN 5 RECD

Document ID Number
920615290 01

- [ ] A-92 WPWG
- [x] B-93 WPWG
- [ ] C-RPWG
- [ ] D-PAG
- [ ] E-MISC.

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

FORMAT FOR IDEAS FOR RESTORATION PROJECTS

Title of Project:

Shoreline Assessment

Justification: (Link to Injured Resource or Service)

Determine on an annual basis the condition contaminated beaches

Description of Project: (e.g. goal(s), objectives, location, rationale, and technical approach)

Ongoing monitoring of oiled beaches listed as contaminated sites. The goal being to assure the sites are returning to pre-oil spill conditions. The objective will be to visit each site during the summer season. The only way we will be able to maintain a credible image with the public is to visit each contaminated site on an annual basis and prepare a written report listing the condition of the beach. The best method will be to establish a listing of each beach still containing oil. A physical visit to each of these beaches will be made by a team who will conduct a survey. The survey will consist of surface observations, photographs for the permanent record, and the digging of test pits to determine the depth of any oil. It is estimated the first year some 50 to 80 sites that will be checked during year one.

It is probable that each year the public will express concerns about specific beaches. Should there be sufficient cause to visit one of these sites the team would attempt to include as many of these locations as possible for survey.

Estimated Duration of Project: Four years with a project assessment at the end of ~~year four~~.

Estimated Cost per Year: Year 1: $90,000, year 2: $85,000, year 3: $80,000, year 4: $75,000

Other Comments:

Name, Address, Telephone:

David Bruce
ADEC-EVOS Project
410 Willoughby Ave., Suite 105
Juneau, AK 99801-1795
907 465 5322

Oil spill restoration is a public process. Your ideas and suggestions will not be proprietary, and you will not be given any exclusive right or privilege to them.

ID # 920610229-02

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS

Coastal Habitat

✓ Checked for Completeness

- ✓ ID stamped/Input completed
- ✓ Name
- ✓ Affiliation
- Costs ✓

✓ Category

Monitoring

✓ Lead Agency

USFS

____ Cooperating Agency(ies)

____

(Y) N Passed initial screening criteria

Type: CH

RANKING H M L Rank Within Categories

H M L Rank Overall

____ Project Number - if assigned ____

920610229-02

1993 PROJECT SCORING SHEET

Critical Factors

Potential projects must meet all of the following to be considered further. Check the blank for "yes", "no", or "unknown".

YES	NO	UNKNOWN	
✓			1. Linkage to resources and/or services injured by the Exxon Valdez oil spill.
✓			2. Technical feasibility.*
✓			3. Consistency with applicable Federal and State laws and policies.*

Comments:

* Restoration Framework, 1992, pp 43-44.

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

FORMAT FOR IDEAS FOR RESTORATION PROJECTS

Title of Project: *Fucus* Recovery in the Upper Intertidal Zones

Justification: (Link to Injured Resource or Service)
The dominant algal species, *Fucus*, in the intertidal was severely damaged by the oil spill and subsequent clean-up.

Description of Project: (e.g. goal(s), objectives, location, rationale, technical approach)
Goals: To understand what factors limit the recolonization of the intertidal by *Fucus* and to predict the recovery rate for the *Fucus* population in various habitats.
Objectives:

1. To determine the population structure and population dynamics of *Fucus* in oiled, oiled/cleaned, and control (un-oiled) areas in order to assess the time needed for recovery of these populations, especially in the upper intertidal zone.
2. To determine the ability of *Fucus* plants to recolonize the upper intertidal areas made bare by the oil spill and subsequent clean-up activities.

Location: Experiments will be conducted in Herring Bay, Knight Island, Prince William Sound.
Rationale: Experiments conducted at Herring Bay and throughout the Prince William Sound area over the last two+ years give strong support to the fact that one of the consequences of the Exxon Valdez oil spill and clean-up activities was serious damage to the intertidal algal populations. The perennial brown alga, *Fucus gardneri* which can make up to 90% of the biomass of the algae in the intertidal was adversely affected, especially in the upper intertidal zone. Results from our experiments indicate that it may be several years before the upper edges of the *Fucus* beds are restored by natural means. Many of the experiments conducted at Herring Bay in Prince William Sound were designed to facilitate long-term monitoring of the recovery of the intertidal. We propose to continue to monitor some of these experiments and to extend and refine others from the 1990-92 field seasons.
Technical Approach: Monitor existing population dynamics plots to follow the status of various size classes of *Fucus*. Measure growth rates of tagged *Fucus* plants. Continue studies on *Fucus* recruitment and egg dispersal and survival.

Estimated Duration of Project: Two Years

Estimated Cost per Year: $160,000

Other Comments: This project would be a continuation of the Herring Bay restoration work being done in cooperation with Dr. Ray Highsmith of the University of Alaska Fairbanks and Dr. Larry Deysher of Coastal Resources Associates.

Name, Address, Telephone

Dr. Michael S. Stekoll
University of Alaska
11120 Glacier Highway
Juneau, AK 99801
907-789-4579

Oil spill restoration is a public process. Your ideas and suggestions will not be proprietary, and you will not be given any exclusive right or privilege to them.

ID # 920610228-02

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS

Coastal Habitat

✓ Checked for Completeness

- ✓ ID stamped/Input completed
- ✓ Name
- ✓ Affiliation
- ✓ Costs

✓ Category

~~DAMAGE ASSESSMENT~~ Monitoring

✓ Lead Agency

ADF&G

✓ Cooperating Agency(ies)

USFS

Ⓝ N Passed initial screening criteria

Type: Coastal Hab.

RANKING H M L Rank Within Categories

H M L Rank Overall

_____ Project Number - if assigned _____

Critical Factors

Potential projects must meet all of the following to be considered further. Check the blank for "yes", "no", or "unknown".

YES	NO	UNKNOWN	
✓			1. Linkage to resources and/or services injured by the Exxon Valdez oil spill.
✓			2. Technical feasibility.*
✓			3. Consistency with applicable Federal and State laws and policies.*

Comments:

* Restoration Framework, 1992, pp 43-44.

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

FORMAT FOR IDEA FOR RESTORATION PROJECTS

Title of Project: Coastal Habitat Comprehensive Intertidal Monitoring Program

Justification:
The Coastal Habitat study showed damage to the intertidal community in all three oil-spill regions: Prince William Sound, Kenai Peninsula, Kodiak/Alaska Peninsula. The impacts by tidal height and by species were different in the three regions. In 1991, some species showed signs of the recovery process while others continued to decline or showed no sign of recovery.

Description of Project:
Goals and Objectives: The goal of the study is to conduct a comprehensive monitoring program of intertidal communities in the area impacted by the EVOS. To be comprehensive, the study will include oiled and matched control sites (already established), from which we have a valuable historical record of post-spill data, in all three regions impacted by the oil spill, and a variety of habitats (e.g. sheltered rocky, coarse textured). Within these sites, we will focus on the recruitment and population dynamics of key species as determined by their role in the community (indicator species, spatial dominants, annual vs perennial algae, grazers, predators).

Location:
The study would be conducted in all three oil spill regions or could be conducted in one or two regions per year.

Rationale: See Justification and Goals. The Coastal Habitat sites were not visited in 1992. A selected subset of matched oiled and control sites should be monitored to determine the extent to which recovery is occurring, or not occurring, among major intertidal species. The greater the period between visits to quantify recovery or continued impacts, the more difficult it will be to relate the findings to the oil spill and to distinguish between oil spill impacts and natural events.

Approach: A subset of matched sites in sheltered rocky and coarse textured habitats will be studied. We will utilize a repeated measures design for floral and faunal censuses in existing permanent quadrats to track recovery. Key organisms will be identified and counted in the field and the data recorded on-site. To analyze interannual recruitment variability, supplemental quadrats will be cleared each year (sheltered rocky only).

Estimated Duration of Project: 3 years

Estimated Cost per Year: $500,000 per region

Other Comments: Dr. Mike Stekoll will participate in this project.

Name, Address, Telephone:

Dr. Ray Highsmith
Institute of Marine Science
University of Alaska Fairbanks
Fairbanks, AK 99775-1080

ID # 9206/0229-04

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS

Coastal Habitat

✓ Checked for Completeness

- ID stamped/Input completed
- Name
- Affiliation
- Costs

✓ Category

monitoring

✓ Lead Agency

USFS

____ Cooperating Agency(ies)

____

(Y) N Passed initial screening criteria

Type: CH

RANKING H M L Rank Within Categories

H M L Rank Overall

____ Project Number - if assigned ____

920610229-04

1993 PROJECT SCORING SHEET

Critical Factors

Potential projects must meet all of the following to be considered further. Check the blank for "yes", "no", or "unknown".

YES	NO	UNKNOWN	
✓			1. Linkage to resources and/or services injured by the Exxon Valdez oil spill.
✓			2. Technical feasibility.*
✓			3. Consistency with applicable Federal and State laws and policies.*

Comments:

* Restoration Framework, 1992, pp 43-44.

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

FORMAT FOR IDEAS FOR RESTORATION PROJECTS

Title of Project: Remote Monitoring of Intertidal Recovery at Affected Sites

Justification: (Link to Injured Resource or Service)
The mid to upper intertidal zone in Prince William Sound has been damaged by the EVOS and subsequent clean-up activities.

Description of Project: (e.g. goal(s), objectives, location, rationale, technical approach)
Goals: To quantify the extent of the damage to the mid and upper intertidal zones in Prince William Sound caused by the EVOS.
Objective: To quantify the damage to the intertidal areas in Herring Bay using remote sensing techniques.
Location: Experiments will be conducted in Herring Bay, Prince William Sound.
Rationale: Extrapolating the damage we have documented inside of Herring Bay to similar habitats outside of Herring Bay indicates that a substantial loss of habitat and productivity occurred within Prince William Sound. It will be important to quantify the restoration of Fucus and other algal populations (and mussel beds) over the entire Prince William Sound area. The loss of Fucus from the upper intertidal habitat has created large areas of bare substrate. The CASI (Compact Airborne Spectrographic Imager) studies conducted in Herring Bay during the summer of 1990 showed that Fucus and other algal populations can be easily discerned from bare substrate. The area and location of these barren regions can be mapped by remote sensing instruments sensitive to radiation in the near infrared region of the spectrum. There are now a number of new, low cost video techniques being developed for this type of monitoring. These techniques would be ideal for covering the large amount of shoreline within PWS that was impacted by the EVOS. Images taken on an annual basis would allow accurate monitoring of the recovery of all of the affected beaches.
Technical Approach: The current Herring Bay studies offer an extensive set of data with which to ground-truth video techniques for monitoring Fucus populations. We propose using Herring Bay as a model to test the more extensive use of this type of monitoring technique in the areas affected by the EVOS. Both the correlation with the ground surveys and the ease of inputting this type of data into a GIS format will be tested.

Estimated Duration of Project: One Year

Estimated Cost per Year: $90,000

Other Comments: This project could be combined with the *Fucus* recovery monitoring studies to realize cost savings, especially with respect to logistics. This is a cooperative project with Coastal Resources Associates.

Name, Address, Telephone:

Dr. Michael S. Stekoll
University of Alaska
11120 Glacier Highway
Juneau, AK 99801
907-789-4579

ID 9206152 64-01

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS Coastal Habitat

✓ Checked for Completeness

- ✓ ID stamped/Input completed
- ✓ Name
- ✓ Affiliation
- ✓ Costs

✓ Category

Restoration monitoring

✓ Lead Agency

NOAA

_____ Cooperating Agency(ies)

USDA Cardinals w/other Coastal Hab studies,

Ⓝ N Passed initial screening criteria

Type: CH

RANKING H M L Rank Within Categories

H M L Rank Overall

_____ Project Number - if assigned _____

Critical Factors

Potential projects must meet all of the following to be considered further. Check the blank for "yes", "no", or "unknown".

YES	NO	UNKNOWN	
✓			1. Linkage to resources and/or services injured by the Exxon Valdez oil spill.
✓			2. Technical feasibility.*
✓			3. Consistency with applicable Federal and State laws and policies.*

Comments:

* Restoration Framework, 1992, pp 43-44.

Title of Project: Natural Recovery of Oiled and Treated Shorelines

Justification:
Shoreline plant and animal communities damaged by oiling and treatment.

264-01

Description of Project: Goal: Provide a scientific basis for restoration intervention in recovery of natural shoreline ecosystem; forecast if and when shoreline ecosystems will return to natural or pre-spill conditions.
Objectives: (1) Determine the extent to which past treatment has enhanced or delayed the recovery of abundance, diversity and population structure of intertidal communities and sub-tidal eelgrass beds at representative oiled and treated sites and (2) determine the need for specific additional restoration actions to enhance recovery and to reduce contamination of shellfish.
Location: Twenty-eight shoreline sites in western Prince William Sound.
Rationale: Treatment activities in 1989-1991 clearly cleaned the surface of almost all of the shoreline in the Sound, but it also damaged shoreline communities that otherwise survived moderate oiling, and redistributed fresh and weathered oil into lower intertidal and subtidal sediments, providing a potential source of continued contamination of shellfish (mussels, clams) which are a food source to shoreline predators. Recovery of the most damaged communities may take a decade or more, but may or may not benefit from additional intervention. Continued monitoring in 1992 will provide the first true indication of the actual rate and shape of recovery curves which are essential for forecasting. Additional annual surveys through 1994-95, and possibly beyond, are needed to support preliminary forecasts resulting from planned 1992 surveys.

Technical Approach: We will continue, at least through 1995, a shoreline recovery monitoring program initiated in 1990. The program will use a risk assessment strategy, documenting and comparing changes in the geomorphology and contamination of sediments, and possibly-related changes in the contamination, abundance, growth, recruitment and diversity of shoreline marine life at 28 unoiled, oiled and oiled-and-treated shoreline sites. Sampling wll be conducted at upper- mid- and lower-intertidal elevations on three classes of shoreline: rocky, boulder-cobble and mixed-soft, and at 14 adjacent subtidal eelgrass beds. Methods have already been standardized and verified through an open peer review process in 1991 and 1992, including successful chemical inter-laboratory agreement with one NOAA laboratory. We will continue a "core" monitoring program at least through 1995 using standard ecological, geomorphological chemical methods. A five year contract is now in place, with work dependent on funding level.

Estimated Duration: 2 to 5 more years. Cost per year: Total, $600-$700K; from Restoration, $400 K.
Contact: Dr. Alan J. Mearns, NOAA HMRAD, 7600 Sand Point Way NE, Seattle, 98115. (206) 526-6336; FAX (206) 526-6329

ID # 920615297 -19

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS

Coastal Habitat

✓ Checked for Completeness

- ✓ ID stamped/Input completed
- ✓ Name
- ✓ Affiliation
- ✓ Costs

✓ Category

~~Damage Assessment~~ Recovery Monitoring

✓ Lead Agency

~~USFS~~ ADF&G

✓ Cooperating Agency(ies)

~~ADF&G~~ USFS

(Y) N Passed initial screening criteria

Type: Coastal Hab

RANKING H M L Rank Within Categories

H M L Rank Overall

_____ Project Number - if assigned _____

1993 PROJECT SCORING SHEET

Critical Factors

Potential projects must meet all of the following to be considered further. Check the blank for "yes", "no", or "unknown".

YES	NO	UNKNOWN	
✓			1. Linkage to resources and/or services injured by the Exxon Valdez oil spill.
✓			2. Technical feasibility.*
✓			3. Consistency with applicable Federal and State laws and policies.*

Comments:

* Restoration Framework, 1992, pp 43-44.

EXX VALDEZ OIL SPILL TRUSTEE UNCIL

97 19

FORMAT FOR PUBLIC IDEAS FOR RESTORATION PROJECTS

Title of Project: Herring Bay Experimental and Monitoring Studies

Justification: (Link to Injured Resource or Service) Many intertidal plant and animal species were damaged by the oil spill and/or subsequent clean-up. Previous work has shown that some populations continued to decrease in 1991 (1992 data is not in yet), suggesting continuing expression of the original impact or additional damage due to residual oil.

Description of Project: (e.g. goal(s), objectives, location, rationale, and technical approach)

Goals: The goals of the proposed work are to elucidate the impacts of the oil/clean-up on recruitment dynamics and biological interactions influencing intertidal community structure and recovery rates.

Objectives:

1. To determine recruitment rates of barnacles and other sessile species on oiled, oiled and cleaned, and non-oiled substrates and at ciled and non-oiled sites.
2. To determine the recovery rate of important community members dependent upon other species reduced or eliminated by the spill, i.e. second-order impacts.
3. To determine the recovery rate of species with poor dispersal capabilities.

Location: The experiments will be conducted in Herring Bay, Knight Island, Prince William Sound.

Rationale: Experimental studies on the impact of the oil spill on intertidal community structure and recovery dynamics have been conducted in Herring Bay since 1990 and are continuing in 1992. Some species were found to be less abundant in 1991 than in 1990, suggesting that recovery has not yet begun. At this time, 1992 results are not yet available. Second-order relationships are complex and can only be understood by manipulative experiments and close monitoring of established sites.

Approach: Population dynamics of Fucus, sessile invertebrates, and grazers (limpets) will continue to be quantified in established quadrats at oiled and unoiled sites. Growth rates of tagged Fucus plants will be determined. Studies will be continued on Fucus egg dispersal, survival and recruitment at oiled and unoiled sites. Recruitment of algae and invertebrates on tarred, cleaned, and control substrates will be determined, with and without grazing. The impact of grazing on algal recruitment and the role of algae in providing food or shelter on survival or recruitment of other species will be examined in exclosures and enclosures.

Estimated Duration of Project: Two (2) years

Estimated Cost per Year: $495,000

Other Comments: This project would be a continuation of the Herring Bay restoration studies being done with Dr. Mike Stekoll and includes his portion of the work.

Name, Address, Telephone
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Institute of Marine Science
University of Alaska Fairbanks
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(907) 474-7836

Because the Oil Spill Restoration is a public process, your ideas and suggestions will not be proprietary, and you will not be given any exclusive right or privilege to them.

ID # 9206/5273 -3

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS

Sediments

✓ Checked for Completeness

- ✓ ID stamped/Input completed
- ✓ Name
- ✓ Affiliation
- ✓ Costs

✓ Category Restoration Monitoring Manipulation & Enhancement

✓ Lead Agency ~~NOAA~~ DOI-USGS

✓ Cooperating Agency(ies) ~~DOI-USGS~~ NOAA

(Y) N Passed initial screening criteria

Impe - Pac coastal hab.

RANKING H M L Rank Within Categories

H M L Rank Overall

_____ Project Number - if assigned _____

IDEAS FOR RESTORATION PROJECTS

Title of Project: Fate and transport of subsurface hydrocarbons in beach deposits of Prince William Sound.

Justification: Many of the studies relating to damage assessment and remediation are using anecdotal or statistical descriptions of the distribution and occurrence of hydrocarbons and toxins, but no research group is evaluating the storage, degradation and removal of hydrocarbons from gravel, sand, and fractured rock of the affected beaches. Without this information, the critical links between the biological system and the physical system can not be established. Cause and effect can never be established if the cause is within the physical rather than the biological system.

Description of Project: The U.S. Geological Survey, as part of its Toxic Substances Hydrology Program, has intensively studied a crude oil spill in a glacial outwash aquifer at an internationally recognized research site in Minnesota for nearly 10 years. The studies, which have been conducted by dozens of researchers from academia and government agencies, have described in detail the fate and transport of petroleum derivatives, the effects of those derivatives on other geochemical properties or constituents, and the microbial activity which eventually appears to limit the spread of the contaminants. The studies have resulted in more than 100 publications, most of which are published in refereed journals. Without the information provided by such studies, ecosystems research, particularly in the intertidal zone, is fundamentally unsound because it is inadequately linked to the physical system. The proposed research in Prince William Sound will draw on the same internationally recognized expertise.

Several research sites will be chosen at locations of ecosystems research, such as that occurring at Herring Bay. Multiport sampling wells will be installed in the beaches using a track-mounted drill rig and a barge. These wells will be arrayed in lines perpendicular to the shore and used to evaluate both the geochemistry and hydrodynamics of the subsurface. Multiport sampling wells will allow researchers to identify the movement of water and contaminants in a 2-dimensional plane perpendicular to the beach. Samples of sediments and water will be collected and analyzed for a wide array of analytes. Depending on the analyte, analyses will be performed either on site or in the U.S. Geological Survey Central Lab in Arvada, Colorado. The wells will be installed to last for several years; however, damage from storms is likely and maintenance of facilities will be a major challenge. The hydrodynamics and transport of contaminants will be simulated using a finite-element density-dependent computer model. The geochemistry of the system will be modeled using equilibrium and reaction-path modeling. Reports will be produced describing the quantity of oil in the beaches, the rates of degradation of the oil, the effects of the spill on solubility of minerals, and rates of migration of the constituents to the aquatic environment.

Estimated Duration of Project: Five years

Estimated Cost per Year: $600,000

Other Comments: The project will incur substantial costs for contractual services in the form of costs of laboratory analyses, the drill rig, and the barge to transport the rig. Actual costs will depend on the scope agreed upon in consultation with researchers already working in the Sound.

Name, Address, Telephone:

Philip J. Carpenter, District Chief
U.S. Geological Survey
4230 University Drive, Suite 201
Anchorage, AK 99508-4664
(907) 786-7100

ID # 9206152 98-29

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS Ecosystem

✓ Checked for Completeness

ID stamped/Input completed
Name
Affiliation
Costs

Category Monitoring

Lead Agency USFS

Cooperating Agency(ies)

(Y) N Passed initial screening criteria

Type: Ecosystem

RANKING H M L Rank Within Categories

H M L Rank Overall

Project Number - if assigned

9206152 98-24

Critical Factors

Potential projects must meet all of the following to be considered further. Check the blank for "yes", "no", or "unknown".

YES	NO	UNKNOWN	
✓			1. Linkage to resources and/or services injured by the Exxon Valdez oil spill.
✓			2. Technical feasibility.*
✓			3. Consistency with applicable Federal and State laws and policies.*

Comments:

* Restoration Framework, 1992, pp 43-44.

EXON VALDEZ OIL SPILL TRUSTEE COUNCIL

29829

FORMAT FOR IDEAS FOR RESTORATION PROJECTS

Title of Project:
INVENTORY, MONITOR, AND PROTECT PERMANENT MONITORING SITES

Justification:

Permanent monitoring sites, including non-oiled control sites, can determine the extent and rate of recovery of habitats injured by the Exxon Valdez Oil Spill.

Description of Project: (e.g. goal(s), objectives, location, rationale, and technical approach)

This project would establish permanent study sites, including non-oiled control areas for monitoring of marine, intertidal, and upland habitats as suggested by Restoration Option 27. In addition to habitat, the wildlife, fish, recreation and other cultural values can be inventoried, monitored, and protected. Any restoration-funded study would include the permanent monitoring sites in their sampling schemes. Low-impact field camp facilities will be provided when possible.

Control areas should include areas of high vulnerability to oil spills, including the following locations: a) near the Alyeska terminal; 2) in the PWS Vessel Traffic System; and c) on the western Copper River Delta.

Estimated Duration of Project: Ten years.

Estimated Cost per Year: $500,000

Other Comments: This project falls within the confines of Restoration Option No. 27, and No. 31 in terms of the development of a comprehensive monitoring program. Data collection and analysis could be coordinated between all studies.

Name, Address, Telephone:
Dr. Mary Anne Bishop, Acting Manager,
Copper River Delta Institute, Pacific Northwest Research Station
USDA Forest Service,
P.O. Box 1460, Cordova, AK 99574,
(907) 242-7212, fax (907) 424-7214.

ID 326-08

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS

Ecosystem

_____ Checked for Completeness

- ✓ ID stamped/Input completed
- ✓ Name
- ✓ Affiliation
- ✓ Costs

Restoration Monitoring

✓ Category ~~Technical Support~~ Ecosystem Management

✓ Lead Agency

USDA ~~FACOM~~

✓ Cooperating Agency(ies)

ADF&G, USFWS

(Y) N Passed initial screening criteria

Type: Ecosystem

RANKING H M L Rank Within Categories

H M L Rank Overall

_____ Project Number - if assigned _____

Critical Factors

Potential projects must meet all of the following to be considered further. Check the blank for "yes", "no", or "unknown".

YES	NO	UNKNOWN	
✓			1. Linkage to resources and/or services injured by the Exxon Valdez oil spill.
✓			2. Technical feasibility.*
✓			3. Consistency with applicable Federal and State laws and policies.*

Comments:

* Restoration Framework, 1992, pp 43-44.

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

FORMAT FOR IDEAS FOR RESTORATION PROJECTS

Title of Project: A multi-agency/university ecosystem study of Prince William Sound.

Justification: The need for testable, functional response models of ecosystem processes in Prince William Sound were identified as necessary to determine impacts of the oil spill in the 1990 conference on research in the Prince William Sound, the 1991 workshop on Hatchery and Wild Salmon, and by the oil spill damage assessment program.

Description of the Project:

There is a need for more comprehensive, large scale, high resolution, and synoptic information than is available to truly understand the oil spill impacts on the ecosystem. This view is corroborated by the National Science Foundation GLOBEC reports on determining the impact of climate change on ocean ecosystems (1991).

The development of ecosystem models requires the use of many different measurement tools which have the power to provide large-scale and high-resolution information which is quasi-continuous in space, synoptic in time, rapid, and cost-effective. The accepted measurement technologies for such a task are optical and acoustical data acquisition systems.

We propose the use of satellite, aerial, and underwater acoustic-optical sampling to map habitats, stationary resources, and mobile resource to determine their response to environmental changes. Data will be fused into a GIS using geo-time coding information.

The research team is multi-organizational:

- Dr. G.L. Thomas (Director, acoustics, Science Center),
- Dr. Ted Cooney (Professor, biological oceanographer, University of Alaska Fairbanks),
- Dr. Larry Pank (M. Mammals and Birds, USFWS, Anchorage),
- Dr. Douglas Eggers (population models, ADF&G),
- Auke Bay Laboratory, NMFS, Marine Resources, Juneau,
- U.S. Forest Service, coastal watersheds, Juneau.

Estimated Duration of Project: 9 years

Estimated costs per Year: $6,000,000 ($1,000,000 each organization)

Other comments: The Science Center, as an independent non-profit, will take the lead, but all parties will participate in the modeling.

Name, Address, Telephone:

Dr. G.L. Thomas, Director
Prince William Sound Science Center
P.O. Box 705
Cordova, AK 99574
(907) 424-5800 - FAX 424-5820

Dr. R.T. Cooney, Professor
Institute of Marine Science
University of Alaska Fairbanks
Fairbanks, Alaska
(907) 474-7407

Oil spill restoration is a public process. Your ideas and suggestions will not be proprietary, and you will not be given any exclusive right or privilege to them.

ID # 920615262-01

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS

Ecosystem

✓ Checked for Completeness

✓ ID stamped/Input completed
Name
✓ Affiliation
— Costs

✓ Category

Restoration Monitoring

✓ Lead Agency

NOAA

_____ Cooperating Agency(ies)

_____

(Y) N Passed initial screening criteria

Type: F/S

RANKING H M L Rank Within Categories

H M L Rank Overall

_____ Project Number - if assigned _____

920615262-01

Title of Project: DISTRIBUTION, ABUNDANCE AI AVAILABILITY OF PREY SPECIES FOR APEX PREDATOR SPECIES (COMMON MURRE, PIGEON GUILLEMOT, MARBLED MURRELET, HARBOR SEAL, PINK SALMON, SEA OTTER) INJURED BY THE EXXON VALDEZ OIL SPILL

Justification: There is increasing concern that without better understanding of how prey availability affects growth and reproductive success of apex predators, efforts to restore predator species injured by the oil spill, particularly harbor seal, pigeon guillemot, marbled murrelet, common murre and pink salmon, could be delayed or completely unsuccessful.

Description of Project:

1) Evaluate existing field methods used in determining distribution, abundance and availability of important prey species, both invertebrates and vertebrate forms. Develop or refine new methodologies (e.g., high-frequency quantitative acoustic sampling) as necessary for prey species not generally exploited in the spill area.

2) Evaluate, refine, select or develop numerical models to estimate productivity of important prey species (both invertebrate and vertebrate forms). Include provision to model affects of changing oceanographic regime on prey species productivity.

3) Design sampling program to fulfill requirements of numerical model(s). At minimum, provide for determining densities and species composition of important invertebrate species. For fish species, provide for determining sex, age, growth, recruitment, mortality, etc. Characterize oceanographic regime by measuring currents, salinity, temperature, dissolved gases, dissolved and suspended solids, nutrients, chlorophyll, etc.

4) Determine locations where apex predators forage and conduct field surveys to validate productivity model(s).

Estimated Duration of the Project: 5 years

Estimated Cost Per Year: $500K

Other Comments: This pre-proposal is similar to that drafted by the Restoration Planning Work Group

Name, Address, Telephone:

National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Oil Spill Damage Assessment and Restoration Office
P.O. Box 210029
Auke Bay, AK 99821
(907) 789-6600

ID # 920615262-02

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS

Ecosystem

✓ Checked for Completeness

✓ ID stamped/Input completed
Name
✓ Affiliation
— Costs

✓ Category

Restoration Monitoring

✓ Lead Agency

NOAA

_____ Cooperating Agency(ies)

_____

(Y) N Passed initial screening criteria

_____

Type: Eco

_____

RANKING H M L Rank Within Categories

H M L Rank Overall

_____ Project Number - if assigned _____

Title of Project: Comprehensive Monitoring Pr[illegible]am

Justification: There is a need for a comprehensive and integrated monitoring strategy to assess recovery of injured natural resources and services in the oil spill area. Monitoring is required to determine if and when injured resources and services return to their baseline conditions, to evaluate the effectiveness of restoration activities, to detect latent injuries and to reveal long-term trends in the health of ecosystems affected by the spill.

Description of Project: It is the objective of this option to develop and implement a comprehensive and integrated restoration monitoring program that will follow the progress of natural recovery, evaluate the effectiveness of restoration activities, and to establish a ecological baseline from which future disturbances can be evaluated.

Estimated Duration of the Project: 5-10 years (1st year is for planning and following years are for implementation)

Estimated Cost Per Year: $500K

Other Comments: This pre-proposal is similar to that drafted by the Restoration Planning Work Group

Name, Address, Telephone:

National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Oil Spill Damage Assessment and Restoration Office
P.O. Box 210029
Auke Bay, AK 99821
(907) 789-6600

ID # 920515016

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS

Ecosystem

✓ Checked for Completeness

- ✓ ID stamped/Input completed
- ✓ Name
- ✓ Affiliation
- ✓ Costs

✓ Category

~~Damage Assessment~~ Restoration Monitoring

✓ Lead Agency

~~AOFG~~ NOAA

✓ Cooperating Agency(ies)

AOF&G

(Y) N Passed initial screening criteria

Type: Ecosystem

RANKING H M L Rank Within Categories

H M L Rank Overall

_____ Project Number - if assigned _____

1993 PROJECT SCORING SHEET

Critical Factors

Potential projects must meet all of the following to be considered further. Check the blank for "yes", "no", or "unknown".

YES	NO	UNKNOWN	
✓			1. Linkage to resources and/or services injured by the Exxon Valdez oil spill.
✓			2. Technical feasibility.*
✓			3. Consistency with applicable Federal and State laws and policies.*

Comments:

* Restoration Framework, 1992, pp 43-44.

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

FORMAT FOR IDEAS FOR RESTORATION PROJECTS

Document ID Number
92051501G
- [ ] A-92 WPWG
- [x] B-93 WPWG
- [ ] C-RFWG
- [ ] D-PAG
- [ ] E-MISC.

Title of Project: Toxicological Profile of Prince William Sound.

Justification: (Link to Injured Resource or Service)

Assess damage to food chain caused by oil spill

Description of Project: (e.g. goal(s), objectives, location, rationale, and technical approach)

Injury assessment of Prince William Sound, specifically the long term effects on food chains needs to be addressed. Extensive research to look at the fate pathways and toxicological effects of crude oil metabolites should be done. The location for such studies should include primary spill zones to include representative benthic, pelagic and tidal zone species. The same species in an adjacent non-spill area should be used as a control. An injury assessment of Prince William Sound can not be considered complete without such data and analysis as the toxic effects of crude oil metabolites are much more insidious than early spill contaminants. Certain species identified as "indicators" and food chain data will give a more accurate and in depth assessment of injury to the PWS ecosystem.

A research team comprised of aquatic ecologists, environmental toxicologists, chemists and veterinary pathologists and other relevant disciplines should carry out the studies. It would be up to this interdisciplanary team to design the research methods and protocols. Such a team would provide an in depth, unbiased interpretation of the oil spills affect on this ecosystem.

Estimated Duration of Project: 3-5 years

Estimated Cost per Year: $150,000 minimum

Other Comments:

Name, Address, Telephone:

Paul Jackson
Environmental Specialist
The North Pacific Rim
3300 C Street
Anchorage, Alaska 99503
907- 562-4155

Oil spill restoration is a public process. Your ideas and suggestions will not be proprietary, and you will not be given any exclusive right or privilege to them.

THE NORTH PACIFIC RIM
3300 C STREET
ANCHORAGE, AK 99503

MAY 15 REC'D

EXXON VALDEZ OIL SPILL RESTORATION TEAM
645 "G" STREET
ANCHORAGE ALASKA 99501

Document ID Number
920515016

- ☐ A-92 WPWG
- ☑ B-93 WPWG
- ☐ C-RPWG
- ☐ D-PAG
- ☐ E-MISC.

ID # 9205 26039

COVER WORKSHEET FOR 1993 IDEA SUBMISSIONS

Ecosystem

✓ Checked for Completeness

✓ ID stamped/Input completed
✓ Name
✓ Affiliation
NO Costs

✓ Category

Monitoring

✓ Lead Agency

NOAA

_____ Cooperating Agency(ies)

(Y) N Passed initial screening criteria

Type: Ecosystem

RANKING H M L Rank Within Categories

H M L Rank Overall

_____ Project Number - if assigned _____

9205260 39

1993 PROJECT SCORING SHEET

Critical Factors

Potential projects must meet all of the following to be considered further. Check the blank for "yes", "no", or "unknown".

YES	NO	UNKNOWN	
✓			1. Linkage to resources and/or services injured by the Exxon Valdez oil spill.
✓			2. Technical feasibility.*
✓			3. Consistency with applicable Federal and State laws and policies.*

Comments:

* Restoration Framework, 1992, pp 43-44.

920526039

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

FORMAT FOR IDEAS FOR RESTORATION PROJECTS

Title of Project:
Long term monitoring of marine environment of Resurrection Bay

Justification: (Link to Injured Resource or Service)
Suggests using sites at Resurrection Bay near Seward

Description of Project: (e.g. goal(s), objectives, location, rationale, and technical approach)

Estimated Duration of Project: _____

Estimated Cost per Year: _____

Other Comments:

Name, Address, Telephone:

Dennis C. Roger
Institute for Marine Science
U of A Fairbanks

Oil spill restoration is a public process. Your ideas and suggestions will not be proprietary, and you will not be given any exclusive right or privilege to them.

INSTITUTE OF MARINE SCIENCE

UNIVERSITY OF ALASKA-FAIRBANKS
FAIRBANKS, ALASKA 99775-1080

May 21, 1992

Exxon Valdez Oil Spill Restoration Team
645 "G" Street
Anchorage, Alaska 99501

I have been noticing a lack of studies to address the general topic of long term changes or pollution in Alaska's marine environment. Many other states in the U.S. has established programs to monitor the marine environment to be able to document such changes. To my knowledge there are no such comprehensive sampling programs in Alaska. The closest program to this is the monthly measurement of temperature and salinity versus depth profiles at the mouth of Resurrection Bay that are carried out by the Institute of Marine Science, University of Alaska under the NOAA Climate and Global Change Program. Those data are extending a record that began in December 1970, so the record is slightly more than 21 years in length.

In order to determine other changes in the marine environment we will need to expand these measurements, as soon as possible, to other parameters such as nutrients, primary production, plankton, larval fish, hydrocarbons, and others. We should attempt as complete an inventory as possible. In addition, samples should be archived for future research efforts that would address parameters that we have not presently considered.

Why should these measurements be done at Seward? First, it will be adding to a time series that already exists and one that has shown significant changes over the past twenty years (See attached figure). This location is well connect with other regions along the coast, SE Alaska and British Columbia, since the Alaska Coastal Current flows past the station. This coastal flow begins with the Columbia River and extends beyond Kodiak Island, through Unimak Pass into the Bering Sea. Conditions within this flow have been shown to be characteristic of the whole northern North Pacific and much of the Bering Sea. Finally, the logistics are very simple and inexpensive since the Institute of Marine Science ship facilities and labs are at Seward which is connected by road to Anchorage.

I hope that these data would provide better information to help manage Alaska's marine resources. I will be glad to provide further information.

Sincerely,

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