

Restoration Planning Meeting - Birds
30-31 October 1990
Simpson Building (CACI)
645 "G" Street (4th Floorr)

Agenda

30 October

- 08:30 Introductions, Purpose and Scope of Meeting,
 Products
- 09:00 Review 1990 Results/Planning for 1991 for
 Restoration Feasibility Study No. 4:
 Marbled Murrelet - Kuletz
- 10:30 Break
- 10:45 Continue Discussion of Murrelet Project (as needed)
- 12:00 Lunch
- 13:00 Review 1990 Results/Planning for 1991 for
 Restoration Feasibility Study No. 4:
 Harlequin Duck - Patten
- 14:45 Break
- 15:00 Continue Discussion of Harlequin Project (as needed)
- 16:00¹ Begin Review of 1990 Results/Planning for
 1991 for Restoration Technical Study No. 3:
 Availability of Forage Fish - Irons

¹If time permits, we need to start on the forage fish project.

Day 2 - Bird Meeting

31 October

08:30 Continue Review of 1990 Results/Planning for
1991 for Restoration Technical Study No. 3:
Availability of Forage Fish - Irons

10:30 Break

10:45 Continue Discussion of Forage Fish Project
(as needed)

11:30 Review Additional Candidates for 1991
Feasibility and Restoration Projects (see list)

12:00 Lunch

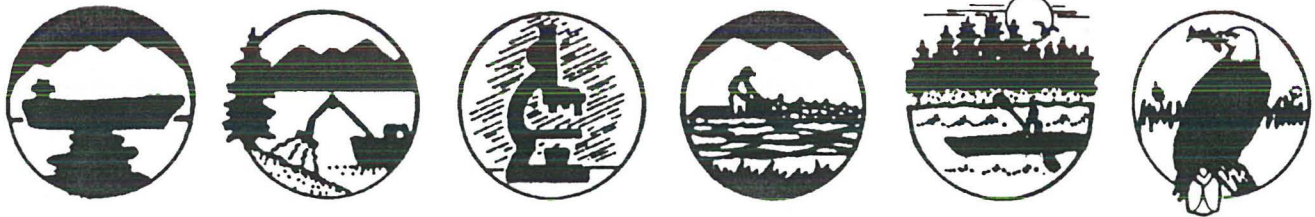
13:00 Continue Review of Candidate Projects and
Identify Others

14:00 Discuss Relative Merits/Priority of all
Candidate Projects

14:45 Break

15:00 Summary and Assignments

Trick or Treat!



OIL SPILL RESTORATION PLANNING OFFICE

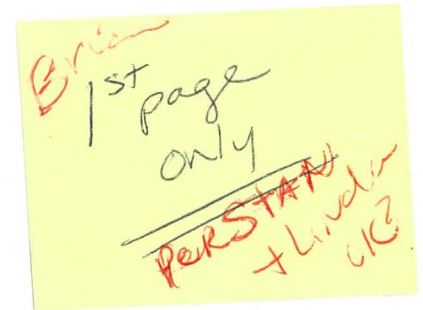
437 E Street, Suite 301 Anchorage, Alaska 99501
(907) 271-2461 FAX: (907) 271-2467
October 19, 1991

MEMORANDUM

SUBJECT: Restoration Work Sessions with PIs, PRs,
and Senior Scientist

FROM: Brian D. Ross *Brian D. Ross*
Restoration Planning Work Group

TO: Management Team, Legal Team



The Restoration Planning Work Group has organized a series of work sessions with the Senior Scientist, selected Peer Reviewers and Principal Investigators to be held October 25 - 31, 1990, at the Simpson Building in Anchorage. The purpose of this series of work sessions is to identify candidate restoration projects that can be considered for implementation in 1991, as well as to identify any need to conduct further feasibility studies on promising restoration technologies or approaches. Following the individual work sessions, RPWG will hold a synthesis meeting on November 1 - 2 with the Senior Scientist and representatives of the Legal Team to determine the overall suite of projects that are most appropriate to include in the December 28 Federal Register document ("draft Restoration Work Plan and 1991 Restoration Program"). A schedule of the meeting dates and the lists of participants invited to the Coastal Habitat, Fish/Shellfish, and Mammals sessions, is attached for your reference. (Participant lists for the Bird and Recreational Resources sessions should be available early next week.) Of course participation by the Management Team or other members of the Legal Team, is welcomed at any of these meetings.

In order to focus the work sessions, RPWG has developed draft lists of factors to be considered by the participants in discussing possible restoration projects and feasibility studies. These lists, intended to help guide discussions only, have been sent to the invitees and are also attached for your information. As you will notice, a primary factor for 1991 projects is a clear tie to injury.

This series of work sessions is critical to our ability to produce a scientifically credible document for publication in the Federal Register on the schedule we have been given. We look forward to frank and productive discussions so that we may proceed with development of the best possible proposals for 1991.

(ATTACHMENTS)



OIL SPILL RESTORATION PLANNING OFFICE

437 E Street, Suite 301 Anchorage, Alaska 99501
(907) 271-2461 FAX: (907) 271-2467

October 19, 1990

MEMORANDUM

SUBJECT: Fish/Shellfish Restoration Work Session

FROM: Restoration Planning Work Group

TO: xxxx xxxxx
xxxx xxxxx

EXAMPLE

This is to formally request your participation in the Fish/Shellfish work session on restoration to be held on Friday, October 26, 1990, beginning at 8:30 A.M. The location will be the Simpson Building at 645 G Street, Anchorage, Alaska. The objectives of the work session are 1) to identify a candidate suite of actual restoration projects addressing known injuries from the oil spill that can be initiated in 1991; and 2) to identify the need for, and propose for the 1991 field season, further feasibility studies of promising restoration technologies or approaches.

Attached you will find two sets of factors to be considered in proposing either restoration projects or feasibility studies. If possible, please prepare a brief description of any proposed projects/studies for consideration at the work session, or submit any such proposals to this office prior to October 26 if you cannot attend. More detailed proposals will be requested by the Restoration Planning Work Group for those projects that best address the factors on the attached sheets.

Should you have any questions do not hesitate to call the Restoration Planning Office at (907)271-2461. Your attendance at this session is appreciated.

RPWG

Proposed Meeting Schedule

<u>Meeting</u>	<u>Date</u>	<u>RPWG Organizer</u>
Coastal Habitat/Intertidal	Oct 25	Dave
Recreation	Oct 26	Sandy, Art
Fish/Shellfish	Oct 26	Brian, John
Birds	Oct 30/31	Stan
Marine Mammals	Oct 31	John, Carol
RPWG Synthesis	Nov 1/2	All members

Invited Participants - Restoration Work Sessions

October 26, 1990 Fish/Shellfish

NAME	AFFILIATION	PHONE	FAX
Jeff Short	NMFS/Juneau	789-6600	789-6608
Pat Rounds	NMFS/Juneau	789-6600	789-6608
— Alex Wertheimer	NMFS/Juneau	789-6040	789-6094
Evan Haynes	NMFS/Juneau	789-6600	789-6608
Charles O'Clair	NMFS/Juneau	789-6016	789-6094
— Usha Varanasi	NMFS/Seattle	442-7737	442-2359
Dave Irons	USFWS/Anch	786-3396	562-2297
Will Barber	UA/FBX	474-7177	474-7204
Phil Mundy	CRIFC/Portland	(503) 238-0667	255-4228
Jeff Hartman	ADFG/FRED/Juneau	465-4160	465-4168
Doug McBride	ADFG/Sport/Anch	267-2227	522-1413
Doug Eggers	ADFG/Comm./Juneau	465-4210	465-2604
James Fall	ADFG/Subst./Anch	267-2359	349-1723
Sam Sharr	ADFG/Comm./Cordova	424-3212	424-3235
Kelly Hepler	ADFG/OSIAR/Anch	267-2218	522-1413
Evelyn Biggs	ADFG/Comm./Cordova	424-3212	424-3235
— Dave Cantillon	NMFS		
Bob Spies	Livermore Lab/Calif	(415) 422-5792	422-1370
Tom Krow			

Invited Participants - Restoration Work Sessions

October 31, 1990 Marine Mammals

<u>NAME</u>	<u>AFFILIATION</u>	<u>PHONE</u>	<u>FAX</u>
Tom Loughlin	NOAA/Seattle	(206) 526-4045	526-6615
Marilyn Dahlheim	NOAA/Seattle	(206) 526-4045	526-6615
Larry Pank	USFWS/Anchorage		
Brenda Bellachey	USFWS/Anchorage	786-3570	869-3417
Jim Bodkin	USFWS/Anchorage		
Kathy Frost	ADFG/FBX	456-5156	456-3091
Lloyd Lowry	ADFG/FBX	456-5156	456-3091

Invited Participants - Restoration Work Sessions

October 25, 1990 Coastal Habitat

NAME	AFFILIATION	PHONE	FAX
Roy Nowlin	ADFG	267-2136	522-3148
Ray Highsmith	UA/FBX	474-7836	474-7204
Andy Hooten	UA/FBX	474-7836	474-7204
John Karinen	NOAA/Juneau	789-6054	789-6094
Josh Schimmel	UA/FBX	474-7682	474-6967
Kim Sundberg	ADFG/Anchorage	267-2334	349-1723
Steve Jewett	UA/FBX	474-7840	474-7204
Don Boesch	UM/Maryland	(301) 228-9250	228-3843
Charles Peterson	UNC/N.Carolina	(919) 726-6841	962-8330
Jeep Rice	NOAA/Juneau	789-6020	789-6094
Mike Foster	USJSU/Calif.	(408) 755-8658	753-2826
Hal Kibby/Rich M.	EPA/ORD/Corvallis	(503) 420-4625	420-4799

RPWG

RESTORATION WORK PLAN SCHEDULE

1 9 9 1

March 24, 1991	Publish final FR notice
March 15	FR notice to Office of FR
March 1	Complete review of and response to public comment
February 13	Close of public comment period

1 9 9 0

December 28, 1990	Publish draft FR notice
December 21	FR notice to Office of FR
December 17-20	Revision of FR notice
December 17	Final comments due from WPG and State of Alaska
December 14	Final draft submitted to WPG
December 13	Trustee Council review and recommendation
December 12	Final draft submitted to Trustee Council through Management Team
December 7	Comments due from the Management Team
November 28	Draft 1991 work plan/1990 status report submitted to Management Team
November 12	Background sections and detailed outline of draft public document submitted to RPWG
October 10-11	RPWG meeting to adjust internal schedule and make assignments
October 5	Teleconference of Trustees and/or Washington Representatives
October 4	Circulate schedule and draft initial FR notice

Restoration Workshop - Birds
30-31 October 1990
Participants

Principal Investigators

Kathy Kuletz, USFWS		murrelet
Dave Irons, USFWS		forage fish
Sam Patten, ADF&G		sea ducks
Bob Hunter		Patten's assistant

Agency Personnel

Kent Wohl, USFWS		migratory birds
John Piatt, USFWS		alcids/forage fish
Steve Klosiewski, USFWS		statistics/study design
Dirk Derksen, USFWS	?	waterfowl
Tom Rothe, ADF&G		waterfowl
John Wright, ADF&G		nongame/conserv. biology
Roy Nowlin, ADF&G		NRDA-wildlife
Mark Willette, ADF&G		forage fish
Ken Krieger, NOAA/NMFS	?	forage fish

Outside Personnel

Kim Nelson, OSU		murrelets
Dan Roby, SIU		seabirds/physiol. ecol.
David Bowden, CSU	?	sample design

Restoration Group

Stan Senner, ADF&G		
Sandy Rabinowitch, USDOJ		
Linda Comerci, EPA		

1991 Feasibility Studies -
Factors to be considered in proposing studies

DRAFT

Proposed projects should reflect the need to determine technical feasibility or environmental benefit of candidate restoration approaches or techniques (i.e., those potential restoration projects specifically related to a damaged resource which, if technically feasible, have the likelihood of being realistically considered/implemented as a restoration measure). Besides technical feasibility, projects may also address information necessary to confirm the benefits or enable the implementation of a potential technique otherwise feasible. For example, one of the 1990 studies provided necessary information to confirm the use of upland forested areas as habitat for marbled murrelets and harlequin ducks. Factors to be considered include:

- 1) must be restoration of damage resulting from the spill; injury documentation; link to NRDA (including intrinsic values).
- 2) likelihood of project ultimately being proposed as a full-scale restoration measure.
- 3) probability of successful study.
- 4) ecological importance of target resource.
- 5) ability to evaluate success and document ecological value of project.
- 6) cost of feasibility study.

DRAFT

1991 Restoration Projects -
Factors to be considered in proposing projects

Agencies have decided to consider appropriate restoration projects for implementation in 1991. This is not contingent on whether any restoration funds become available in the immediate future from the responsible party. Proposed projects will be those that are technically feasible and can be implemented in the 1991 field season. Recovery of an injured resource being the primary goal, projects should also provide, either directly or indirectly, a net environmental benefit. Potential projects will include those that will mitigate known or documented damages and also any actions which will mitigate other sources of environmental disturbance (immediate threats) interfering with the natural recovery of injured resources. Finally, neither the timing nor the magnitude of any potential settlement for damages should be considered when proposing candidate projects. Factors to be considered include:

- 1) addresses known NRDA damage (including intrinsic values); must be restoration of damage resulting from the spill.
- 2) known technical feasibility.
- 3) reasonable to implement considering the expectations for natural recovery.
- 4) importance of implementing in 1991; examples include:
 - ability to implement project in 1991
 - addresses an existing damage which would likely continue to cause impacts;
 - addresses the threat of additional (cumulative) impacts which, if eliminated, would allow a quicker recovery of an injured resource;
 - should be implemented immediately by the agencies even if funds from the responsible party are not yet available.
- 5) net environmental benefit expected.
- 6) benefits ecosystem/multiple species.

7) reasonable duration of project (multi-year o.k.); results you expect from the project and ability to evaluate and submit results in a reasonable period of time.

8) geographic scope (should not be restricted to PWS, unless that is the only area that damage may be effectively addressed at this time).

9) cost of implementation.

10) extent to which something will be done anyway through routine agency management activities (e.g. restoration funds should not go towards maintenance of USCG navigation lights or ADFG normal fisheries management, etc.).

11) any project should not interfere with cleanup activities or NRDA studies/projects.

DRAFT

by no means agreed upon by all Alaskans that it is desirable for sea otters to expand further.

Para 2, sea otters - Delete this statement. This was not the consensus of the group. There is no factual information to support a recommendation that harvest be restricted.

IV-28 - I am assuming that this entire section on a sea lion disturbance study has been deleted. It is inappropriate and NMFS/ADF&G currently have ongoing studies at Marmot Island.

I have a suggestion for a marine mammal demonstration project on habitat use by harbor seals. Currently, we know nothing about site tenacity within or between years in PWS. We know nothing about seasonal movements, or about the relationship between harbor seals in PWS and the Copper River delta. These questions are all essential to assessing the impact of the 1989 oil spill, or of any other future action. Unless one has an indication of how readily animals switch haulout locations, how dependent they are on PWS on an annual basis, etc. it is impossible to assess the effects of damage to habitat or of disturbance and displacement. Harbor seals are currently declining, but not yet on the endangered list, so should be (but are not) receiving additional attention. Because we think they are relatively sedentary, they may be a good way to monitor the health of the sound. PWS is an ideal place to conduct such a study because of the spill focus, simple logistics, some historic data on numbers and diet. Without understanding dependence on particular places or habitat, it isn't possible to address restoration goals.

Estimated cost (if conducted by ADF&G, NMFS, and Texas A&M along with ongoing studies) would be \$40-50,000 for year 1 and approximately \$100,000 for year 2. Satellite transmitters would be attached to seals and monitored. Funding would include transportation, field logistics, purchase of satellite transmitters, satellite time, some salary, and analysis of data.

I hope these comments are helpful. I am sorry they were so long in coming, but the last few weeks have been hectic and I've spent less than a full week in the office since mid-May.

Sincerely,

Kathy Frost

Kathy Frost
Marine Mammals Biologist
Wildlife Conservation

cc: Stan Senner
Don Calkins

DRAFT

SEP 20 1990

RESTORATION PROJECT: DEVELOPMENT OF A CONCEPTUAL ECOSYSTEM MODEL FOR PRINCE WILLIAM SOUND.

INTRODUCTION

The Prince William Sound ecosystem is regulated by a complex set of interactions, and as such, can best be managed by taking a holistic approach rather than by managing it as separate unrelated parts. Certainly, this concept is not new to the resource managers (see e.g., Flint 1984, Truett 1984, Zeitlin Hale and Wright 1979). However, the vehicle to take such an approach does not exist. Support for defining the interactions among species comes from the discussions of the need for synthesizing results from the Exxon Valdez oil spill assessment studies. But, this synthesis will be limited by the scope of the oil spill studies themselves. Effects of the fishing industry, fisheries enhancement, timber harvesting, and oil spills will, as a whole, still be poorly understood because of the lack of a conceptual ecosystem model. In this regard, a conceptual model can be used to better understand the total impact of the Exxon Valdez oil spill, identify the need for other restoration studies, identify significant information gaps and rank them based on need, and direct future research and monitoring plans.

OBJECTIVES

- o To catalog and gather information from the literature (including grey literature) pertaining to species and processes occurring in Prince William Sound though not limited in scope to work conducted in the Sound itself.
- o To incorporate information gathered from the literature into a knowledge database.
- o To develop a black-box conceptual model using a knowledge based, i.e. artificial intelligence, approach to identify the links and to determine strength of links among species and processes (including anthropogenic ones).

SCOPE OF WORK

This study will require an extensive search of the literature, much of which can be done electronically. Pertinent literature will be incorporated into a bibliographic database. The literature will be reviewed and information will be incorporated in a knowledge database. Black-box models will be developed from the knowledge database.

PERIOD OF PERFORMANCE

The period of performance of this project will be March 1, 1991, to February 29, 1992.

PRODUCTS

The Fish and Wildlife Service will complete a draft report by December 31, 1991, and final report by February 29, 1992.

RESPONSIBLE AGENCY

U.S. Fish and Wildlife Service

LITERATURE CITED

Flint, R.W. 1984. Ecosystem Integration and environmental decision-making. Coastal Ocean Pollution Assessment News 3:17-18.

Truett, J.C. 1984. Ecological process studies of a barrier island-lagoon system, Beaufort Sea, Alaska. U.S. Department of Commerce, NOAA, OCSEAP Final Report 24:113-127.

Zeitlin Hale, L., and R.G. Wright. 1979. The Glacier Bay marine ecosystem. A conceptual model. National Park Service. Anchorage, Alaska.

TO: Paul Gertler
Oil Spill Coordinator

FROM: Lee A. Hotchkiss
Project Leader, Bird Study 2A

DATE: September 17, 1990

SUBJECT: Oil Spill Year 1991 Restoration Monitoring Proposal and Budget

Aerial surveys of the Prince William Sound and Kenai Peninsula have been flown during March of 1989 and 1990, April of 1989 and 1990, May of 1989 and 1990, July 1989 and October 1989. The October 1990 survey will begin late this week or early next week. These aerial surveys provide a relative index to the waterfowl and waterbird populations and is an excellent method of detecting population and distribution changes in those populations impacted by the Exxon Valdez oil spill. Injuries to waterfowl and waterbirds from exposure to the oil spill included, but were not limited to, death, changes in behavior, and decreased productivity. This aerial survey proposal is offered to continue monitoring waterfowl and other waterbirds recovery response to the oil spill by observing and reporting changes to the distribution and abundance of waterfowl and waterbirds in Prince William Sound and the northern Gulf of Alaska.

Re-oiling of beaches by oil released from the beach substrate will continue to affect waterfowl and other waterbirds. Other bird studies such as the sea duck study No. 11 are indicating a possible relationship between some sea duck species and the contaminated food chain they are dependent upon.

Aerial surveys will also provide a reliable index to the marine mammal populations found in the study area. The resulting survey data showing distribution and population of sea otters, sea lions and other marine mammals could prove to be valuable to other ongoing investigations.

These surveys will provide a valuable index in the measure of recovery of the oil spill zone as it will measure changes in wildlife use of those habitats impacted by oil in comparison with those that were not impacted.

This proposal is expected to cost:

Salaries	\$67,000
Travel/PerDiem	7,000
Supplies/Equipment	5,000
Aircraft	<u>45,000</u>
Total	\$124,000

Fish Availability Pilot Project
Preliminary results and gut level feelings
David B. Irons and Mary Beth Decker
1 Sept 1990

The main objective of this pilot project was to determine the distribution, relative abundance and spatial and temporal variability of fish, foraging birds and mammals. It also tested methods that could be used in a full scale study of prey availability in Prince William Sound.

Because there are no data on fish and foraging bird distributions from before the Exxon Valdez oil spill, we are unable to compare our results to pre-oil spill prey distribution and abundance. However, preliminary results from this pilot project may be relevant to oil spill litigation and restoration.

Most foraging flocks of Black-legged Kittiwakes and Marbled Murrelets in our study area were found in shallow water habitats 5 to 1000 m from shore. Preliminary examination of the transects indicate that more schools of fish were also found in near shore than in offshore areas. Oiling and human disturbance presumably has a greater impact in this near shore zone and could adversely affect the distribution and abundance of marine birds and their prey.

Throughout the season, foraging flocks were consistently found in a few specific bays and passes. This may indicate that there is a limiting number of foraging areas essential to marine birds. Because there appears to be small number of important foraging sites, the loss of these areas to oiling and disturbance would be detrimental to the maintenance of stable marine bird populations.

It is important to consider that these are preliminary results and additional analyses need to be completed. Analyses will include comparisons of prey fish and marine bird and mammal abundance and distribution on transects completed in 1989 and 1990 in oiled and non-oiled locations, determination of spatial and temporal variation in distribution and abundance of marine birds and mammals and prey fish from randomly selected transects in Valdez Arm, Tatitlek Narrows and Glacier Island, and identification of stomach samples collected from foraging Kittiwakes.

DRAFT

SEP 19 1990

FEASIBILITY STUDY PROPOSAL: POPULATION MONITORING OF MARINE BIRDS AND MAMMALS IN THE EXXON VALDEZ OIL SPILL AREA

INTRODUCTION

The Exxon Valdez oil spill caused direct mortality to thousands of marine birds and mammals in Prince William Sound and the Gulf of Alaska. In addition, habitats and food resources were damaged, providing the potential for additional bird and mammal mortality or loss of productivity in the years following the spill. Preliminary results from Damage Assessment studies suggest that sea otters and some bird species are continuing to decline since the spill. Restoration of injured populations will require population estimates to determine whether declines continue after the spill, and to monitor recovery. The goal of this feasibility study is to devise a more cost-effective and logistically efficient method of estimating bird and mammal populations in the area affected by oil, making future population recovery monitoring possible.

OBJECTIVES

- A. To establish a cost-effective, logistically efficient and statistically rigorous method to determine distribution and estimate abundance of marine birds and mammals in Prince William Sound, the Kenai Peninsula and Kodiak Island waters.
- B. To evaluate restoration efforts by monitoring recovery of marine bird and mammal populations in the spill area, and by documenting continuing population declines due to the spill.

METHODS

Surveys will be conducted from 25-foot motor vessels manned by an operator and two observers. Scientifically sound, statistically rigorous sampling methods will be designed using information available from previous surveys, including Damage Assessment studies carried out by the principal investigators (Bird Study 2, Marine Mammal Study 6) and information recently made available by the Service's new Pelagic Seabird Database.

In 1991, Prince William Sound, the Kenai Fjords National Park area of the Kenai Peninsula, and Kodiak Island waters would each be sampled once in late winter, (between February and April) and once during the summer. Prince William Sound is the highest priority for surveying, as future oil accidents are most likely to occur there, and historical population information exists for that area. Kodiak Island waters and a portion of the southern coast of the Kenai Peninsula are next in priority for surveying. Kenai Fjords National Park and the adjacent islands of the Alaska Maritime National Wildlife Refuge are within potential spill zones and have recreational value. Both areas have large seabird and mammal populations in winter and summer and have been significantly affected by oil spills in the past.

Information gathered from these surveys would be used to determine the minimum number of sampling units needed to detect population change of a given size. Reducing the number of sampling units compared to previous surveys will decrease the length of time each survey takes, simplify logistics, and reduce the cost of determining population indices.

11.23 11.23 11.23 11.23

The goal would be to make such surveys more cost-effective, making future population recovery monitoring feasible.

PERIOD OF PERFORMANCE

The period of performance of this study will be March 1, 1991 to February 29, 1992.

PRODUCTS

The U.S. Fish and Wildlife Service will complete a draft report by December 31, 1991, and a final report by February 29, 1992.

RESPONSIBLE AGENCY

U.S. Fish and Wildlife Service

Principal Investigators: Karen Laing, Migratory Bird Management
Douglas Burn, Marine Mammal Management

TITLES OF ADDITIONAL RESTORATION FEASIBILITY STUDIES 10/8/90

SUBMITTED BY DAVID IRONS AND KAREN LAING

Temporal and Spatial Differences in Food Habits of Black-legged Kittiwakes, Pigeon Guillemots and Marbled Murrelets in Prince William Sound.

Justification: Damage Assessment Studies have shown damage to kittiwakes and guillemots. Diets of these species have been sampled in only one or two locations in the Sound. It has been, perhaps incorrectly, assumed that these samples are representative for all birds in the entire Sound. We must know what species of fish are being eaten by birds throughout the Sound and throughout the summer while the data for the Food Availability project are being collected. This project could be combined with the Food Availability project or could stand alone.

Population Status and Reproductive Success of Pigeon Guillemots in Prince William Sound.

Justification: Damage Assessment Studies have shown damage to guillemots. The population in the Sound, which was at a 20 year low, was further damaged by the oil spill. Their numbers may be at a critical level and need to be restored, through insuring reproductive success and survival of adults.

Submitted by
Sandy Katinowski - DOT

RESTORATION STUDY NUMBER 4

Study Title: Identification of Upland Habitats Used by Wildlife Affected by the EVOS
Principal Investigator: Kathy Kuletz, MBM/U.S. Fish & Wildlife Service

INTRODUCTION

The area effected by EVOS is one of the principal population centers of the Brachyramphus species, in particular, the marbled murrelet (B. marmoratus). These alcids suffered direct mortality from EVOS. Recovery could be enhanced by identifying and protecting important nesting habitat. In 1990, a Restoration Pilot Study was done to investigate methods of studying upland use by marbled murrelets. This proposal outlines a Restoration project to define murrelet and upland habitat associations for use by appropriate management agencies to identify critical murrelet nesting habitats.

There is no clear definition of marbled murrelet nesting habitat in Alaska, where the species has been known to nest on the ground and in the canopy of old-growth trees. First, we will perfect methods of identifying upland use by marbled murrelets. This will include distinguishing the inland activity and habitat use of the marbled from that of the Kittlitz's murrelet, a closely related species also at risk by EVOS. Second, a database integrating habitat data with murrelet nesting use will be developed. Finally, predictions of murrelet habitat use will be tested in the field and specific sites with high murrelet nesting activity identified.

OBJECTIVES

- A. Develop methods and define parameters used to locate and monitor murrelet nesting activity.
- B. Integrate habitat data with murrelet upland activity to define murrelet nesting habitat requirements.
- C. Test the predictions of murrelet nesting habitat requirements.
- D. Identify potential murrelet nesting sites in the EVOS zone and check specific sites of interest for level of murrelet activity.

SCOPE OF WORK

In 1990, the pilot study at Naked Island was successful at using the "dawn watch" method to monitor inland activity by marbled murrelets. In some cases, potential nest sites were narrowed down to a few trees. At sites with frequent watches, we were able to track variability in detections, seasonal patterns and behavioral changes over time. These efforts will be continued to refine protocols for censusing murrelet upland activity. In 1990, sites with single watches scattered throughout the island were added to include a greater variety of habitats. This effort will also be expanded to increase sample size and habitat types.

With the baseline of data established at Naked Island, it would be advantageous to continue the study at that site. A cooperative agreement would be pursued to have the U.S. Forest Service implement the habitat component of Objective B. Their habitat data will be used in conjunction with the murrelet observations to map and define habitat preferences via ARC/INFO.

Naked Island does not have the full range of habitat types, and a complete data set requires a second study site, preferably with both Brachyramphus species and a mosaic of alpine and forested upland habitats. The most cost-effective site for fulfilling Objectives A and B is Kachemak Bay, which was also within the oil spill zone. As with the Naked Island site, Kachemak Bay benefits from the availability of historic data and a large murrelet population. Additionally, a variety of upland areas can be accessed via boat, road and trail systems with fewer logistic problems than more remote sites. Aerial photos exist for habitat classification.

Objective C will utilize results from Objectives A and B to test the predictions of murrelet presence among habitat types throughout the EVOS zone. In the final phase, areas of interest to management agencies will be identified with respect to potential murrelet nesting habitat and specific sites will be censused for upland murrelet activity.

PERIOD OF PERFORMANCE

The period of performance of this study will be three years beginning April 1, 1991.

PRODUCTS

The U.S. Fish and Wildlife Service will complete draft reports by December 31 and final reports by February 29 throughout the three-year period of performance.

RESPONSIBLE AGENCY

U.S. Fish and Wildlife Service
Principal Investigator:

Kathy Kuletz, Marine and Coastal Bird Project

U.S. Forest Service:

Bill Ostrand, Glacier Ranger District

BUDGET

Year one: \$
Year Two: \$
Year Three: \$

**TITLE: Preliminary Restoration Project Proposal
Removal of Introduced Animals on Selected
Colonial Seabird Nesting Islands**

INTRODUCTION

Arctic foxes, red foxes, and rodents were introduced by fur farmers to many islands between the western Aleutians and southeastern Alaska. These exotic animals have preyed heavily on seabirds and destroyed nesting habitat. Some burrow- and ground-nesting seabird populations such as storm-petrels, tufted puffins, some auklets, terns and gulls were extirpated from some islands while other species were reduced to remnant populations. The Fish and Wildlife Service has removed foxes from 17 islands to date. The removal program has resulted in significant increases in some seabird populations. For example, on Alaid and Nizki Islands, several species of seabirds increased five to 15-fold following fox removal. There has also been a large increase in auklets following fox removal on Big Koniugi Island in 1985-86. The Exxon Valdez oil spill caused direct mortality to thousands of marine birds and reduced productivity in others in Prince William Sound and the Gulf of Alaska. Fox removal is a cost effective method for acquiring equivalent resources to replace birds lost in Prince William Sound and Western Gulf of Alaska due to the 1989 oil spill.

OBJECTIVES

- o To eliminate foxes and rodents on selected colonial seabird nesting islands to reestablish populations of burrow- and ground-nesting seabirds or enhance remnant populations.
- o To monitor the recovery of selected burrow- and ground-nesting seabird species.

SCOPE OF WORK

Six islands (Ulak, Amatignak, Segula, Herbert, Ugamik, and Gareloi Islands) will be selected that have or had burrow- and ground-nesting colonial seabird populations and on which foxes occur. Removal of foxes will be completed on Ulak and Amatignak in year 1 and on the other 4 in year 2. The Service will use trapping and shooting as removal methods on the first five islands. Gareloi Island, the sixth location will be included only if the Service receives the approval from the Environmental Protection Agency to use toxicants (M-44 cyanide projectile and 1080 compound).

Colony size, reproductive success phenology, and recruitment of young birds will be measured on the selected islands for five-years following fox removal to ensure the success of the removal effort and to monitor bird recovery. Pre-eradication bird surveys will be

completed. Permanent population and productivity plots will be established and monitored annually following the removal of foxes.

PERIOD OF PERFORMANCE

The period of performance of this project will be five years beginning March 1, 1991.

PRODUCTS

The Fish and Wildlife Service will complete draft reports by December 31 and final reports by February 29 throughout the five-year period of performance.

RESPONSIBLE AGENCY

U.S. Fish and Wildlife Service in cooperation with Department of Agriculture (Animal Damage Control) and Environmental Protection Agency.

BUDGET

Year One:	\$	(Remove foxes on two islands)
Year Two:	\$	(Monitor recovery on two islands and remove foxes on four islands)
Year Three:	\$	(Monitor recovery on six islands)
Year Four:	\$	(Monitor recovery on six islands)
Year Five:	\$	(Monitor recovery on six islands)

DRAFT

RESTORATION FEASIBILITY STUDY

STUDY TITLE: EFFECTS OF INTERTIDAL RESTORATION ON BLACK OYSTERCATCHERS

SEP 17 1990

INTRODUCTION

Black oystercatchers (Haematopus bachmani) have been impacted by the EVOS and may have been impacted by the subsequent clean up efforts. With more clean up and restoration activities planned, they may face further disruption. Study is needed to evaluate the effects of human activity on breeding black oystercatchers. In 1991 we can determine if black oystercatchers have differential reproduction in shoreline areas treated differently. To determine the feasibility of studying the effects on black oystercatchers of clean up or restoration versus natural recovery, we will also need to determine if it is possible to follow a sufficient sample size in each treatment type to warrant monitoring the recovery of black oystercatchers.

OBJECTIVES

- A. Determine if a sufficient number of black oystercatcher nests can be found and monitored at shorelines where different restoration processes will be implemented.
- B. Determine if feeding territories, prey choice and chick feeding rates vary among differently treated shorelines.
- C. Determine whether black oystercatcher breeding success is differentially affected in areas with different treatment regimes.

METHODS

Study methods will replicate those used in Bird Study 12 in 1989. Black oystercatcher feeding territories, feeding rates, prey choice and breeding success will be monitored in conjunction with levels and types of onshore human activity. Transects similar to those established in 1989 will be surveyed in the intertidal zone. Study sites will include areas that were unoiled or cleaned mechanically or bioremediated. In 1991, areas undergoing restoration activities will be added.

The primary study sites will be those used in 1989 on Green and Montague where a total of 37 nests were monitored. Other sites may be established on Channel, Naked, Smith, and Knight Islands, or where restoration activities dictate. Site location and analysis would be coordinated with Coastal Habitat Studies.

FEASIBILITY STUDY: LONG-TERM POPULATION MONITORING FOR BALD EAGLES IN THE EXXON VALDEZ OIL SPILL AREA

Bald 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.

In order to determine the population level effects of the loss of the 1989 season nestling production and a yet to be estimated number of older bald eagles, estimates are needed for the normal annual production, survival of each age class and the average age when eagles first breed. Assessment studies have addressed these questions, but it is uncertain how long funding will be available from assessment sources.

Information has been collected on reproductive success for one year that was strongly influenced by the oil spill and for a second year that may be normal. One season's worth of data is available on survival for adults and for one cohort of young during their first year of life. Insufficient time has passed to determine the survival of known age eagles for the age classes between the nestlings of 1989 and sexually mature adults. The average date of first breeding is unknown. In unregulated populations that have been studied in the eastern U.S., adults are thought to achieve sexual maturity in their fifth year. 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 value of nestlings to the population and how long it will take to replace sexually mature adults that were lost during the spill.

OBJECTIVE

Monitor reproductive parameters and survival of a representative segment of the bald eagle population in the oil spill area to determine age specific survival rates, normal reproductive parameters and the average age of first breeding. Use these data to prepare an accurate model that will show the extent and duration of the injury sustained by bald eagles within the spill area.

SCOPE OF WORK

This study would be a continuation of work initiated during the assessment. Breeding success would be monitored in a sample of nests in the spill area. Approximately 40 adult eagles would be kept radio tagged throughout the duration of the study to provide survival

data for this segment of the population. A group of 40 or more nestlings would be tagged annually and monitored throughout the maturation process until they become established as breeding adults. Only a small percentage of each year's nestlings would survive to adulthood, but the data for each age class could be pooled to give statistical significance. Radio tagged eagles would be relocated on a routine basis to determine their status. Because of the length of time it takes for bald eagles to become sexually mature (speculatively, 6-8 years in Alaska), the tagging study would need to be conducted for at least 10 years to collect the necessary data.

PERIOD OF PERFORMANCE

Due to the nature of the bald eagle's biology, this must be a long-term study to collect the data described above. During the next year, March 1, 1991 through February 29, 1992, data on a second normal year of reproduction, survival of adults and of eagles during the first year of life and the first year of data on survival for eagles during their second year of life will be collected.

PRODUCTS

A draft report on the next year's data would be completed by December 31, 1991, and a final progress report would be completed by February 29, 1992. A draft of the population model framework would be completed by February 29, 1992.

RESPONSIBLE AGENCY

U.S. Fish and Wildlife Service
Raptor Management
P.O. Box 21287
Juneau, AK 99802

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FEASIBILITY STUDY: REDUCTION OF POTENTIAL SOURCES OF DIS FOR BALD EAGLES IN THE EXXON VALDEZ OIL SPILL AREA

Disturbance has been cited as an alternate cause of the reduction in breeding success for bald eagles observed following the EXXON Valdez oil spill. Intense air traffic and frequent disturbance by cleanup workers may have had adverse consequences for nesting success. As a result of these concerns activity near bald eagle nests was controlled during the 1990 nesting season. The management guidelines developed to control activities near nest sites were based primarily on the best judgement of experienced biologists rather than on empirical data. These guidelines could undoubtedly be improved through a review of existing data collected during response and assessment activities and carefully designed experiments. Guidelines based on fact instead of intuition would provide better future protection to bald eagles and be more acceptable to people influenced by those guidelines.

OBJECTIVE

Determine the influence of disturbances on bald eagle reproductive success by activities associated with spill response or other human actions and develop sound guidelines that will provide protection for nesting eagles while not unduly restricting human activity.

SCOPE OF WORK

The project would be conducted in two phases. The initial phase would review information collected in 1989 on the reproductive success of bald eagles and attempt to correlate the observed success rates with the level of cleanup activity. The review would need to consider the timing of the human activities in relationship to the nesting chronology and the confounding influence of the oil. It is likely that the most heavily oiled beaches were also the beaches most disturbed by cleanup activities.

The second phase would be experimental simulation of response type disturbances to collect the empirical data necessary for the development of sound guidelines. Insights gained during the review of the 1989 data will be used to design meaningful simulations and disturbance models.

PERIOD OF PERFORMANCE

The initial phase of the project would be conducted from March 1, 1991, through February 29, 1992. The experimental phase would be conducted in subsequent field seasons.

PRODUCTS

A report on the review on 1989 data and a study plan for the second phase would be completed by February 29, 1992. Revised guidelines and project reports would be completed on a schedule defined in the study plan for the second phase.

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RESPONSIBLE AGENCY

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FEASIBILITY STUDY: DELINEATION AND PROTECTION OF PREY RESOURCES FOR BALD EAGLES IN THE EXXON VALDEZ OIL SPILL AREA

Adequate prey resources, well distributed spatially and temporally, are essentially to the health of bald eagle populations. Eagles feed extensively in the intertidal habitats, which were heavily impacted by the EXXON Valdez oil spill. They use a combination of prey items that varies throughout the year as different items become abundant or scarce. Food resources are least abundant during the late winter and early spring and most abundant during the summer spawning season of the various pacific salmon species. The actual prey items used by bald eagles within the spill area has not been adequately documented. Prey remains have been collected during the spill assessment, but these were collected for hydrocarbon testing and not for food habit analyses.

OBJECTIVE

Determine the prey items important to breeding and non-breeding bald eagles throughout the year, assess the impacts to these resources identified by ongoing assessment projects, and recommend actions to preserve or enhance the abundance of these items.

SCOPE OF WORK

Field work will need to be conducted throughout at least one full year to determine the seasonally important prey resources used by bald eagles in the spill area. Direct observation of feeding eagles will determine soft tissue foods that they use. Collection of prey remains and regurgitated pellets at nest sites, perch trees and night roosts will provide supplemental information on prey with more durable parts. Data on the impacts of the oil spill on important prey will be obtained from other principal investigators. Recommendations on potential restoration or enhancement procedures will be developed in conjunction with the other principal investigators.

PERIOD OF PERFORMANCE

Field work will be conducted from March 1, 1991 through February 29, 1992. A preliminary report will be completed by February 29, 1992 with a final report incorporating data collected from the winter period (Dec. to Feb.) will be completed by July 1, 1992.

PRODUCTS

A report detailing the prey resources of importance to bald eagles in the spill area and an action plan for the restoration or enhancement of these resources will be completed by July 1, 1992.

RESPONSIBLE AGENCY

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DRAFT

INTRODUCTION TO PROPOSED RESTORATION FEASIBILITY STUDIES FOR BALD EAGLE PROTECTION AND MONITORING IN THE EXXON VALDEZ OIL SPILL AREA

Bald eagles are a frequently seen resident of the area affected by the Exxon Valdez oil spill with approximately 2,500 adults and near adults in Prince William Sound, 500 along the Kenai Peninsula, 1,500 on Kodiak and the surrounding islands and another 1,000 along the south coast of the Alaska Peninsula. Roughly half that number of immatures also occur in these areas. Response teams collected more than 150 dead eagles after the spill and it is likely that many more were not recovered. Surveys conducted by the Fish and Wildlife Service found that reproduction during the 1989 breeding season was essentially eradicated in areas of significant contamination and substantially reduced in areas up to 50 miles from the actual path of the spill.

Potential restoration work can be classified into four areas of activity:

1. Identification and protection of important habitats,
2. Delineation and protection of prey resources,
3. Reduction of potential sources of disturbance, and
4. Population monitoring.

Study proposals are attached addressing each of these four areas. The proposals are interrelated; activities conducted to accomplish one will facilitate the accomplishment of others. Some of the topics have also been partially addressed by the assessment studies. The proposals are written as "stand-alone" projects, but they would more reasonably be conducted as tasks under a single project in a sequenced multi-year approach. It is likely that some of the tasks cannot be accomplished in a single year, but these concerns will be identified in the individual proposals. Work on bald eagles will be more involved than on some other species because:

1. Eagles are present in the spill area for the entire year so more facets of their life history are potentially impacted,
2. Sexual maturity is delayed in eagles until at least their fifth year of life, delaying the observable impacts from lost production and the recovery from lost adults, and
3. Longevity is great so the loss of breeding adults is "felt" by the population for many years.

These proposals were hurriedly prepared and are preliminary in nature. Please call Phil Schempf at 586-7244 in Juneau to clarify any points.

FEASIBILITY STUDY: IDENTIFICATION AND PROTECTION OF IMPORTANT BALD EAGLE HABITATS IN THE EXXON VALDEZ OIL SPILL AREA

It has become almost dogmatic in wildlife management that if a species habitat is secure the population will do well. This requires a rather loose definition of habitat to be true, but it emphasizes the importance of adequate habitat protection. Assessment studies have identified important habitats for breeding and non-breeding bald eagles throughout the oil spill area. Other areas remain to be adequately surveyed. These areas have, for the most part, not been recognized as important to bald eagles by the respective land owners and managers. This is mostly due to the lack of knowledge about bald eagle habitats, though in some cases it is due to conflicting resource development issues.

OBJECTIVE

Identify and protect habitats important to bald eagles to maintain populations at current levels of abundance and to maintain productivity within normal parameters.

SCOPE OF WORK

The project area will be from Prince William Sound to the western boundary of the spill area on the Alaska Peninsula. Survey work for nesting habitat has been accomplished throughout much of the spill area. The areas that have been surveyed will be summarized on a project area map and unsurveyed areas identified. Land ownership for the project area will be determined. Priority for additional survey work will be given to lands with the highest likelihood of development that would adversely impact the quality of quantity of bald eagle habitat. The nests in remaining areas will be surveyed by helicopter.

Telemetry studies conducted during the assessment have identified several important habitat areas for non-breeding eagles, either for immatures or other non-breeders during the summer or for all eagles during the winter. These studies have only addressed lands within Prince William Sound. Additional telemetry work in other parts of the spill area would no doubt identify additional important habitats. These studies would be particularly valuable in areas of significant human activity such as Cook Inlet or in the vicinity of spill area communities.

Important habitats on public lands will be brought to the attention of the appropriate land manager with recommendations for the long term protection of these areas, such as described in the existing interagency agreement between the U.S. Fish and Wildlife Service and the U.S. Forest Service. Private lands will be evaluated and listed in priority order for protective measures such as cooperative agreements, conservation easements or acquisition of critical parcels.

Collation of the existing survey data collected during the assessment and during previous studies conducted for other purposes, determination of land status, distribution of survey

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information to affected land managers and the preparation of action plans for protective action will be a full time task for at least one person. New survey work will require a team of two qualified observers and a helicopter most of the upcoming field season. It is unlikely that a telemetry study could be implemented on short notice, but it should be considered for a longer term approach.

PERIOD OF PERFORMANCE

Evaluation of existing data and the preparation of an action plan for habitat protection would occur from the period of March 1, 1991 through February 29, 1992. Surveys of previously unsurveyed areas would be conducted from May 1 through August 31, 1991, and incorporated into the action planning process. Telemetry studies would be initiated in April 1, 1991 with marking adults. Nestlings would be marked beginning August 1, 1991. Tagged eagles would be tracked from the time of marking through August 31, 1992. Final reports would be prepared by February 28, 1993.

PRODUCTS

Habitat status reports will be made available to each major land management agency (U.S. Fish and Wildlife Service, National Park Service, Forest Service, State of Alaska, native corporations, etc.) by February 29, 1992. An action plan for habitat protection will be completed by February 29, 1992. A supplement to the action plan adding the findings of the telemetry work would be prepared by February 28, 1993.

RESPONSIBLE AGENCY

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