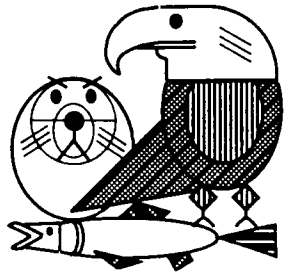
Exxon Valdez Oil Spill Trustee Council

Restoration Office
645 G Street, Suite 401, Anchorage, Alaska 99501-3451
Phone: (907) 278-8012 Fax: (907) 276-7178



MEMORANDUM

TO: Trustee Council Members

FROM: James R. Ayers
Executive Director

DATE: April 1, 1994

RE: Request for signature on Revised Court Request

Attached you will find a revision of the March 16, 1994 court request for your signature. I urge you to sign this revised request as soon as possible, so the projects funded by this request can go forward.

The only revision to this court request is the deletion of the $12 million for the Restoration Reserve. This item and corresponding amount are being held for a future court request because the Office of Legal Counsel (OLC) in the Department of Justice has not completed its review as to whether the reserve can be maintained outside the U.S. Treasury or the Court Registry.

A long-term investment strategy would provide the Trustees a higher interest return that the current short-term strategy does not allow. This would be most easily accomplished via Alaska State Department of Revenue investment through a Memorandum of Understanding. This approach would probably provide as much as 4-6% higher rate of return annually than that currently received.

If the OLC determines that the reserve cannot be established outside the U.S. Treasury or the Court Registry Investment System (CRIS), we will petition the CRIS to provide a long-term investment strategy for the reserve fund. This strategy would provide a rate of return higher than that now received, although less than what could be obtained by an investment through the state of Alaska.

In any event, the various scenarios for a long-term investment strategy will be brought before the Trustee Council for discussion once the reserve is established.

If you have any questions regarding this, please don't hesitate to contact me.

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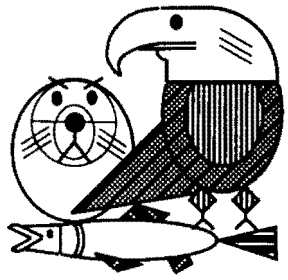

RESOLUTION OF THE EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL

We, the undersigned, duly authorized members of the *Exxon Valdez* Oil Spill Trustee Council do hereby certify that, in accordance with the Memorandum of Agreement and Consent Decree entered as settlement of United States of America v. State of Alaska, No. A91-081 Civil, U.S. District Court for the District of Alaska, and after public meetings, and the opportunity for, and consideration of, any written comments from the public, unanimous agreement has been reached to expend funds received in settlement of United States of America v. Exxon Corporation, et al., No. A91-082 Civil, U.S. District Court for the District of Alaska, and State of Alaska v. Exxon Corporation, et al., No. A91-083 Civil, U.S. District Court for the District of Alaska, for necessary natural resource damage assessment and restoration activities for federal fiscal year 1994 from October 1, 1993 to September 31, 1994. The total approved budget, appended hereto, is $16,745,800.00.

The moneys are to be distributed according to the following schedule:

Alaska Department of Fish & Game	$10,000,000.00
Alaska Department of Natural Resources	765,900.00
Alaska Department of Environmental Conservation	1,625,800.00
SUBTOTAL TO STATE OF ALASKA	$12,391,700.00
U.S. Department of Agriculture, Forest Service	$1,558,200.00
U.S. Department of the Interior	1,495,400.00
National Oceanic & Atmospheric Administration	1,300,500.00
SUBTOTAL TO UNITED STATES OF AMERICA	$4,354,100.00
TOTAL APPROVED BUDGET	$16,745,800.00

In accordance with the Financial Operating Procedures adopted by the Trustee Council, the amount of funds requested from the Joint Trust Fund is to be reduced by the amount of interest previously earned from settlement funds held by the Federal and State governments and any unobligated fund balances from previously approved budgets. Since the last disbursement from the Joint Trust Fund, the amount of interest earned is $22,427.00 for the United States and $180,535.59 for the State of Alaska. Accordingly, the amount to be withdrawn from the fund will be reduced by $202,962.59 because of interest earned. The unobligated balance for the fiscal period from March 1, 1992 to September 30, 1993, is $3,106,555.00 for the United States. The unobligated balance for March 1, 1992 to February 28, 1993 for the State of Alaska was subtracted from a prior court request. The unobligated balance for March 1, 1993 to September 30, 1993 for the State of Alaska will be determined at a later date and subtracted from a subsequent court request. The amount to be withdrawn from the fund with this request will be reduced by $3,106,555.00 because of the unobligated balance.

By unanimous consent, we hereby request the Attorney General of the State of Alaska and the Assistant Attorney General of the Environmental and Natural Resources Division of the United States Department of Justice to petition the United States District Court for the District of Alaska for withdrawal of the sum of $13,463,282.41 from the Court Registry account established as a result of the governments' settlement with the Exxon companies. Of this amount $1,255,118.00 shall go to the United States of America and $12,211,164.41 shall go to the State of Alaska.

_____ Dated _____
MICHAEL A. BARTON
Regional Forester
Alaska Region
USDA Forest Service

_____ Dated _____
BRUCE M. BOTELHO
Attorney General
State of Alaska

for Dated 4/1/94
GEORGE T. FRAMPTON, JR.
Assistant Secretary for Fish,
Wildlife & Parks
U.S. Department of the Interior

_____ Dated _____
STEVEN PENNOYER
Director, Alaska Region
National Marine Fisheries Service

_____ Dated _____
CARL L. ROSIER
Commissioner
Alaska Department of Fish &
Game

_____ Dated _____
JOHN A. SANDOR
Commissioner
Alaska Department of
Environmental Conservation

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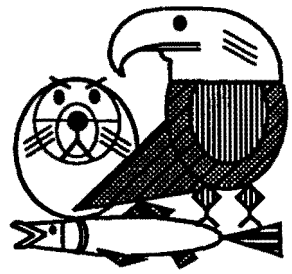

MEMORANDUM

TO: Jim Ayers, Executive Director
Restoration Work Force

FROM: Molly McCammon
Director of Operations

DATE: April 1, 1994

RE: Update on activities and assignments

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1. Next Trustee Meeting

The teleconferenced continuation of the January 31 Trustee Council meeting was tentatively scheduled for April 6, and has now been rescheduled to **1 pm, April 11.** The date of this meeting is contingent upon receiving all of the DPDs and detailed budgets for Project 94320 in order to make a comprehensive review and recommendation. All of the DPDs with the exception of the Science Center's Program Management Project are in and have been peer-reviewed. Spies has drafted a recommendation for internal review. The Science Center budgets are still not available, and if they do not arrive by Monday afternoon, it is likely the April 11 meeting will have to be postponed for an additional week. **Agency review of Project 94320 will commence at 2 pm Monday, April 4 with as much material as we have available. Please let Rebecca know is you want to be teleconferenced to Anchorage for this. Our two main objectives will be to review project budgets and to develop more detailed recommendations for implementing Spies' recommendations.**

2. Increments and additions to FY94 Work Plan

As a general rule, any proposed increments to annual work projects or additional projects outside the regular work plan schedule should come with a cover memo from the proposing agency, a project description, and a budget. These will then be distributed to the Restoration Work Force for review in order to prepare an Executive Director recommendation.

There will be a package of such increments for the April 11 meeting. However, we are still developing cover memos and putting them into a package for your review. You should receive those on Monday.

3. Small parcel process

An agency liaison meeting with the Habitat Work Group is scheduled for Monday, April 4, at 10 am in Anchorage. Substantial issues are still outstanding concerning this process.

4. Retroactive contracts and payments

There has been some confusion about Trustee Council policies governing authorization for expenditures. A memo is being drafted to clarify these, and you will be getting a copy next week.

5. Clarification on tasks

Just to clarify a few items, Dave Gibbons and Carol Fries have the lead on the negotiation coordination process, which includes development of a standardized appraisal process. Dave Gibbons has the lead on the EIS, but Jim would also like Veronica Gilbert to act as co-lead on behalf of the state. NOAA & ADF&G have the lead on developing a monitoring and research approach. Veronica Gilbert, Sandy Rabinowitch, Rita Miraglia of ADF&G, L.J. Evans and Cherri Womack are putting together a series of public meetings for the spring.

5. PWSAC EA

The FONSI was signed March 28. Congratulations to Ken Chalk at ADF&G and to the folks at NOAA for a job well done.

6. Forum/Status Report

My thanks to everyone for their help with the March 22 Forum and the 1994 Status Report, especially to the Coordinating Committee of L.J. Evans, Bruce Wright, and Sandy Rabinowitch. Both have been very well received. We are transcribing the presentations, and will be putting them into a report form. Videotapes of the Forum will also soon be available, as well as a 1/2 hour edited version. L.J. Evans and OSPIC are putting together a collection of press clippings relating to the 5th anniversary. You should be receiving that next week.

7. April 13 - 15 Workshop

You should be receiving on Monday a packet of information for the April 13-15 research and monitoring workshop. Keep your calendar open for them.

8. Seward IMS

The EIS for the Seward IMS project has begun, with scoping meetings in Seward and Anchorage last week. The Seward meeting generated a lot of interest, with about 50-60 persons attending. The Anchorage meeting had about 5 public members in attendance. The architects will be working with the Science Advisory Committee in Seward on April 11-12.

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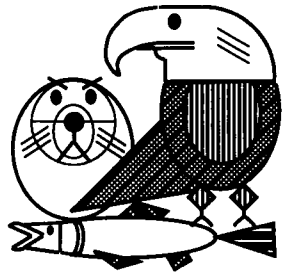


MEMORANDUM

To: Jerome Montague, ADF&G
Byron Morris, NMFS/NOAA

From: Molly McCammon
Director of Operations

Date: April 20, 1994

Subj: Information From the Navy

Please review the enclosed information. The U.S. Navy, responding to its dual responsibilities of "Defense and Commercial" have offered their assistance in our monitoring efforts. Could you please advise us as to the utility of this effort? Please respond back to me by April 29.

NAVAL AIR WARFARE CENTER
AIRCRAFT DIVISION
6000 E. 21st Street
Indianapolis, IN 46219

NAWC Aircraft Division NAVAL AIR WARFARE CENTER

FAX TRANSMITTAL SHEET

TO: MR. Jim AyRES
FROM:
DATE: 4/6/94
NUMBER OF PAGES: 13 (Including cover sheet)

HANDLING INSTRUCTIONS:
HIGH PRIORITY (DELIVER IMMEDIATELY): ____
CALL ADDRESSEE WHEN COMPLETED: ✓

MESSAGE:

Jim:
Some FYI. I put together after we talked yesterday. I'm also putting together a mailer and I'll include this in it. Mailer will leave this week.

THANKS FOR THE TIME YES

Molly — P/S. ask NOAA's Fish and Game to review this — Navy has "Dual purpose" Defense/Commerce responsibility and wants to know if they can help?! A

M - you don't want this cover pg to go to J&B do you? NO
took this pg out before faxing to BJ. RMW

... ELLIS
Federal Aviation Administration Liaison

Program Manager (FAA)
Plans/Programs Dept.
Code 078M

(317) 351-4709
(fax) (317) 351-4295
(messages) (317) 353-~~7078~~ 7103

Why Navy in Indy

The Naval Avionics Center
Past and Present

NAC was originally founded to meet the Navy's need for a safe inland naval ordnance plant to produce bombsights and related fire-control equipment. The planning process began in the late 1930s, and ground was broken in Indianapolis in May of 1941. Carl L. Norden, Incorporated, on behalf of the United States Navy, designed, built, organized, and operated the facility under its subsidiary, the Lukas-Harold Corporation.

Workers began producing Norden bombsights in February 1942, while the plant was less than 25% complete. Three years later, the Navy took over management of the plant, employees were converted to Civil Service, and the primary emphasis moved into the field of airborne and shipboard fire control devices.

Above: NAC workers began producing the Norden Bombsight in 1942.

NAC is now one of several field activities which operate within the authority of the Naval Air Systems Command, or NAVAIR. We receive direct project funding from all major Navy appropriations and function as a Naval Industrial Fund activity, which gives us the ability to operate in a direct buyer-seller relationship.

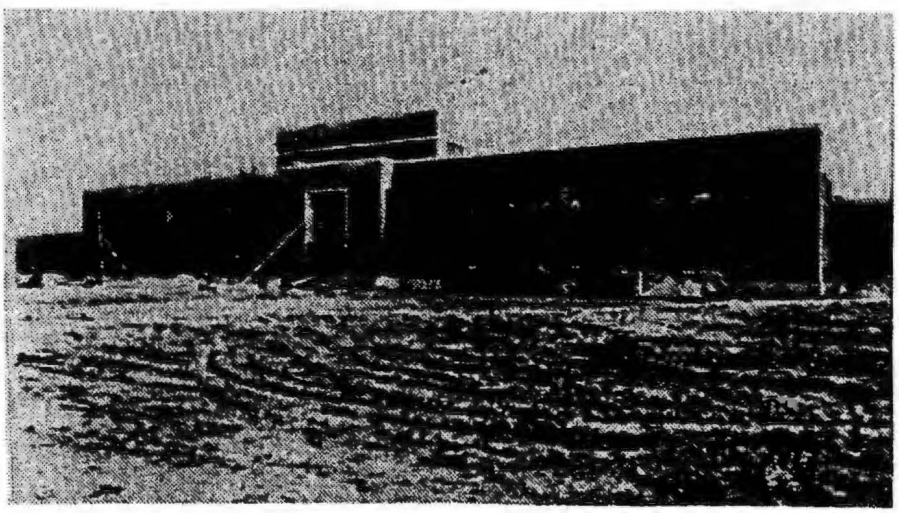
On a corporate level, NAC is committed to pursuing innovative philosophies as well as strengthening day-to-day effectiveness. That corporate commitment reflects the Department of Defense's Total Quality Management philosophy, and this same philosophy defines ideals for NAC's Continuous Improvement effort.

Through direct and indirect liaison with the fleet, the Center ensures that its products and services meet the requirements of airborne and shipboard forces. To meet those needs, our engineers are involved in the design, development, technical direction, and support of sophisticated avionic systems. We manufacture new systems in our state-of-the-art facilities, and support pilot production and emergency fabrication as well as overhaul and repair. NAC also anticipates future needs, and is committed to supporting next generation platforms and avionics.

NAC serves the fleet, and the DOD community, by providing the most timely, high-quality, cost-effective products and services possible, continually striving toward our goal of avionics and manufacturing excellence.

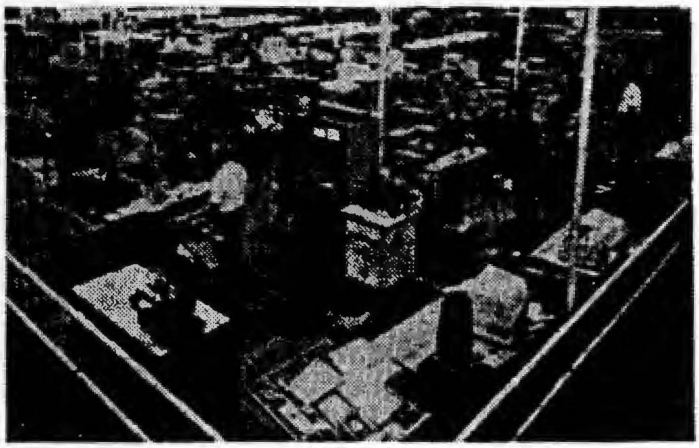
Past . . .

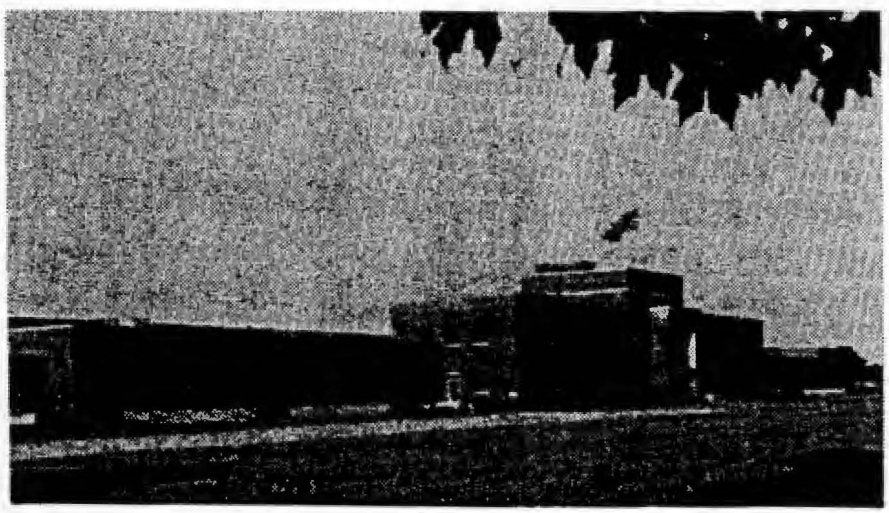
The Naval Air Warfare Center, Aircraft Division, Indianapolis (NAWC AD Indianapolis) was established in 1942 to meet the Navy's need for a safe, inland naval ordnance plant. On behalf of the United States Navy, the Lukas-Harold Corporation, a subsidiary of Carl L. Norden, Incorporated, designed, built, organized, and operated the facility. Three years later, the Navy took over management of the plant and employees were converted to Civil Service. Initially, the main product of the facility was the Norden Bombsight, which was highly effective during World War II.



Present. . .

Today, NAWC AD Indianapolis is a leader in the development, production, and acquisition of advanced aviation electronics (avionics) for many of the finest systems in the Navy. Our full-spectrum, state-of-the-art facility provides the capability to pursue advanced avionic and electronic concepts for the Navy, as well as the Army, Air Force, Marine Corps, and other government agencies. Our mission is to provide the most timely, high-quality, cost-effective products and services possible to support the Fleet. We have the technology, the programs, and, most importantly, the highly dedicated and professional workforce required to provide that support.





Indianapolis

WE ARE Cool
MAYBE ADAPTABLE
to MONITOR WARM
blooded ANIMALS. . . ?
(SEALS. OTTERS. . .)
ABOVE GROUND ONLY

Projects . . .

Pilot/Emergency Production:

The Tactical Remote Sensor System (TRSS) is an intelligence project that includes various unattended ground sensors capable of transmitting movement detection data to a sensor-monitoring station or portable field monitor. NAWC AD Indianapolis was able to provide for the project capabilities which were unavailable in private industry and which enhanced system producibility. We also performed pilot production, and prepared a reprocurement data package sufficient to permit transition of the project to industry.

Sonobuoy Instructional Manual

Sonobuoy Organizational/Intermediate Characteristics Instructional Manual

ed by Direction of Commander, Naval Air Systems Command
AIR TASK #A5495490/1594/1P04000000
Naval Weapons Support Center
Crane, Indiana 47522
1 Ju 96

- Supporting the F-18 replacement aircraft for the existing EA-7L and EA-6A aircraft
- Providing study/analysis support on aircraft options to replace the obsolete ERA-3B
- Providing support on other FEWSG mission avionics, including the AN/ALE-43, AN/ALR-75, OE-320, FAEWS Interface Equipment, AN/USQ-113, and AN/ARC-153

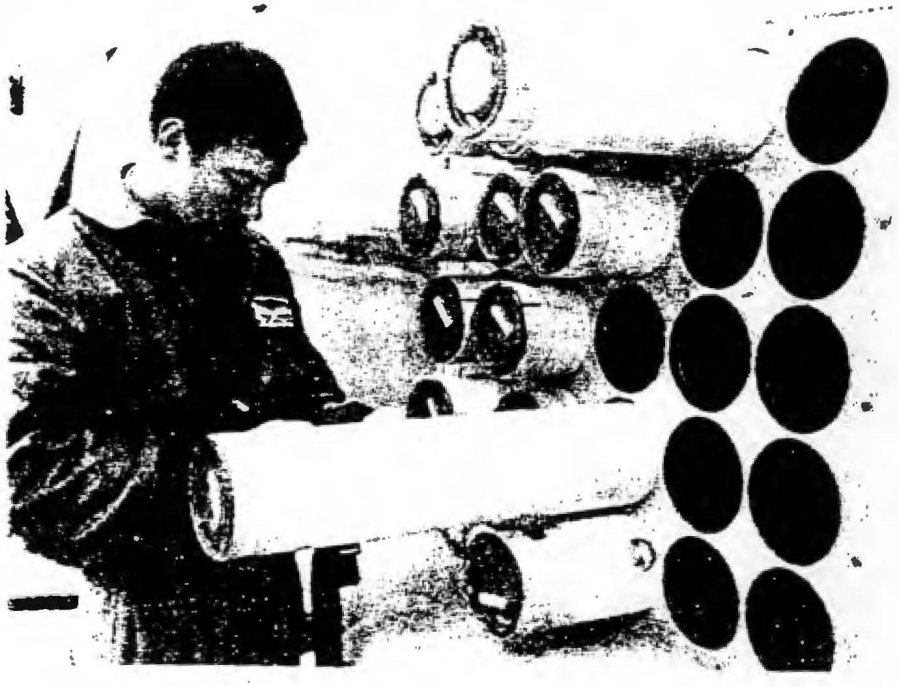
Sonobuoys

NAC was established as the Cognizant Field Activity (CFA) for production Sonobuoys in 1976. As CFA, NAC is responsible for sonobuoy procurement, basic design engineering, and product assurance. NAC has competitively procured well over $100 million worth of sonobuoys annually. NAC also works closely with the Naval Air Development Center (NADC) to ensure the smooth transition of research and development buoys into production.

The Center also manages the acceptance test operation at St. Croix, Virgin Islands. In September 1989, the island of St. Croix was devastated by Hurricane Hugo. In conjunction with the test contractor and other field activities, NAC was able to resume testing within three weeks and reestablished the land base operation within the year.

NAC works closely with sonobuoy manufacturers in developing sonobuoy performance improvements to counter known and projected threats. Improvements to the Q-36, Q-53, and Q-62 buoys are planned for FY-91. NAC has also completed self-noise evaluation testing in Alaska, and plans to conduct all mechanical noise testing there in the future.

NAC is using Statistical Process Control (SPC) as a tool to complement Total Quality Management (TQM) initiatives on the Sonobuoy program. SPC training has been provided to over 400 sonobuoy manufacturing personnel, enabling them to better control their processes. This effort should allow the Navy to significantly reduce the acceptance testing by controlling critical in-house processes.



Right: NAC procures over $100 million worth of sonobuoys annually.

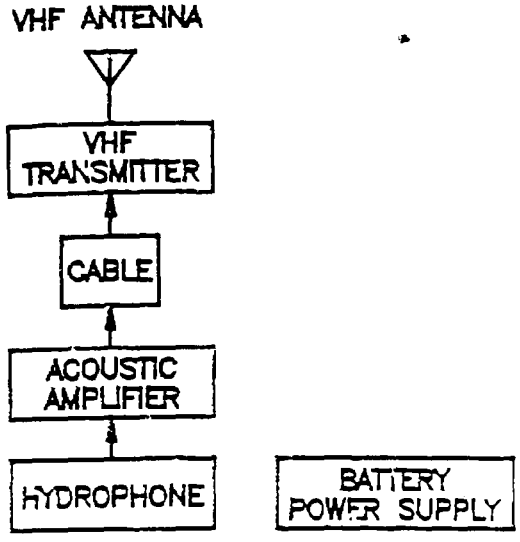


Figure 2-2. Passive Omnidirectional Sonobuoy Block Diagram.

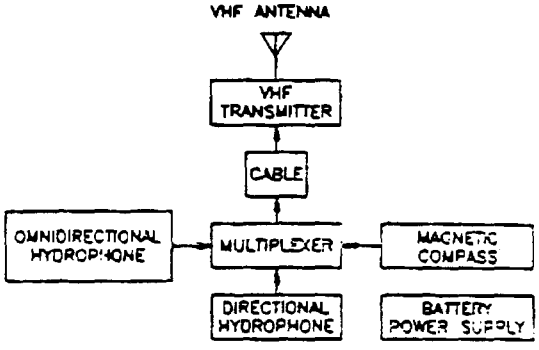


Figure 2-3. Passive Directional Sonobuoy Block Diagram.

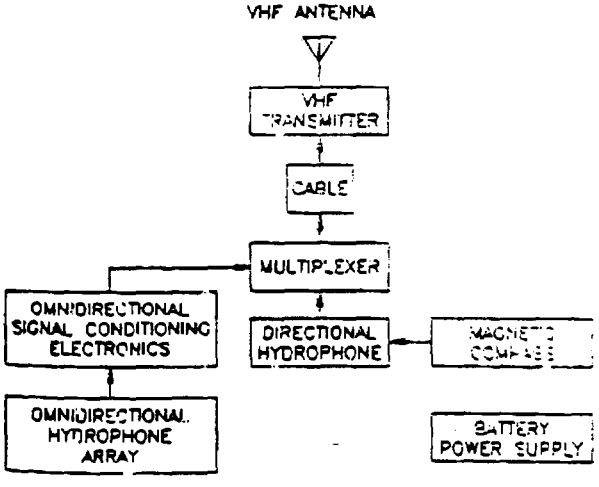


Figure 2-4. Vertical Line Array Sonobuoy Block Diagram.

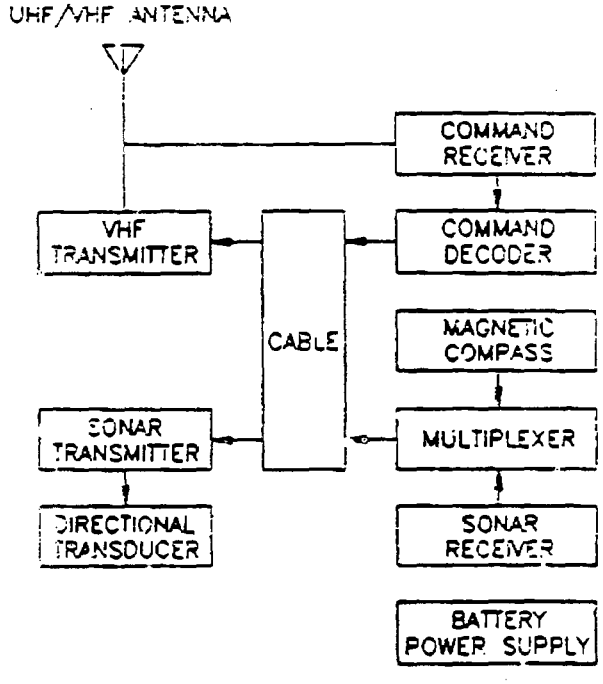


Figure 2-5. Directional Commandable Sonobuoy Block Diagram

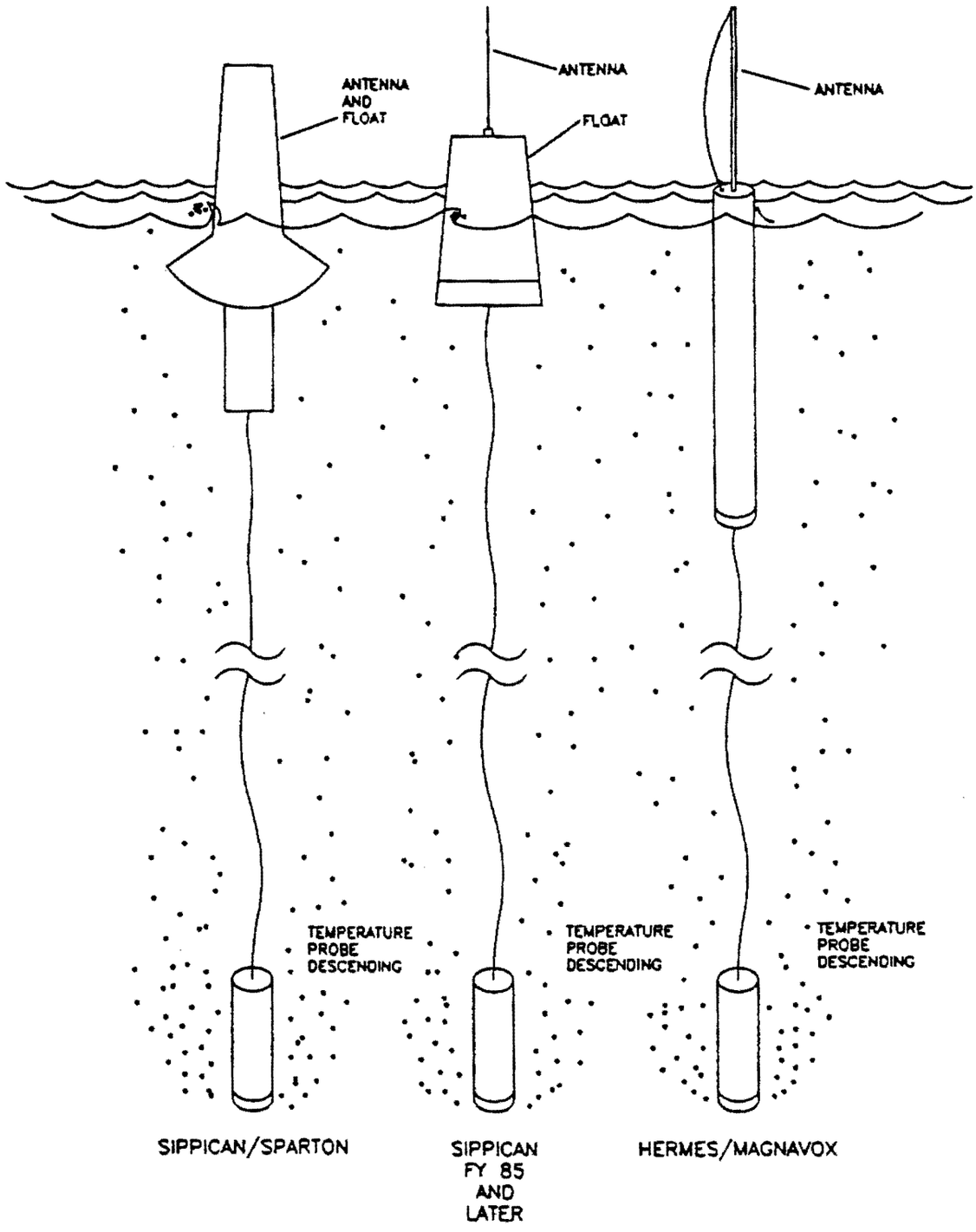


Figure 2-14. Sonobuoy AN/SSQ-36 Deployment.

Figure 2-66. Sonobuoy AN/SSQ-77A Deployment.

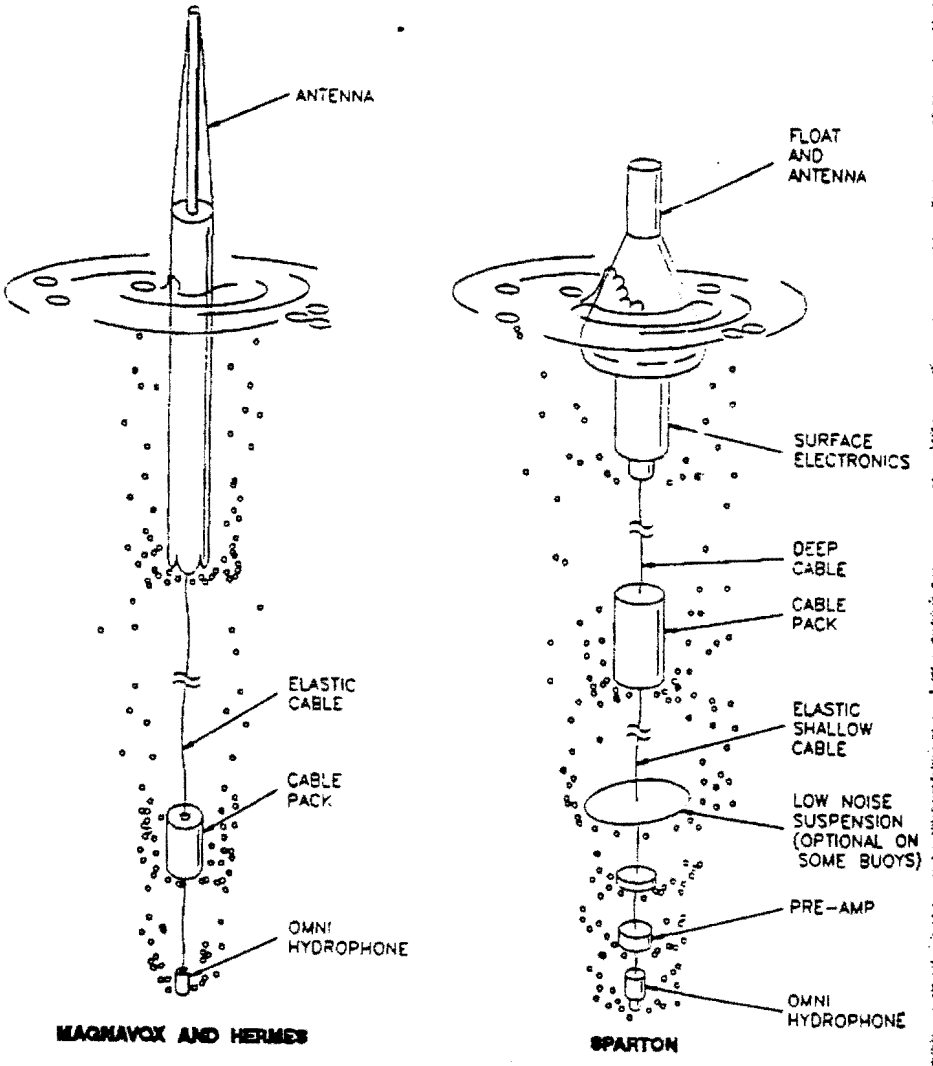
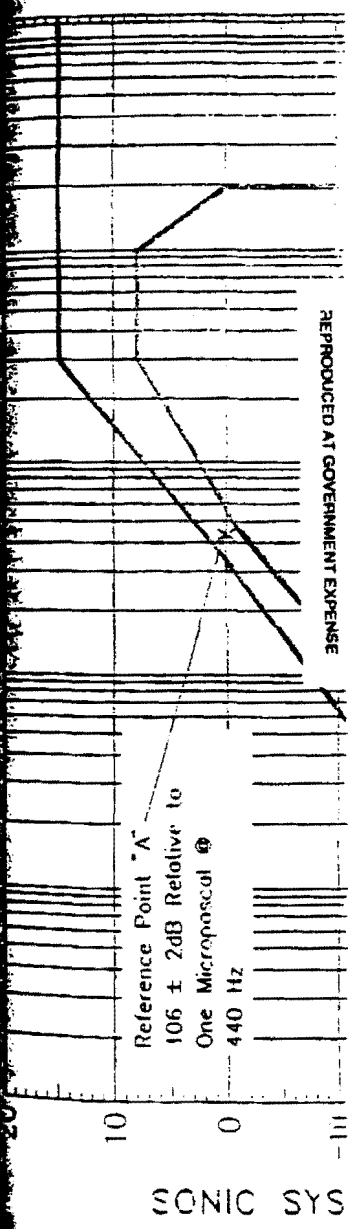


Figure 2-53. AN/SSQ-57A and -57A(XN-5) Sonobuoy Deployment.



SONIC SYS

Figure 2-54 Frequenc

Exxon Valdez Oil Spill Trustee Council
Restoration Office
645 G Street, Suite 401, Anchorage, AK 99501-3451
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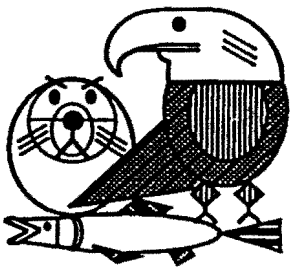

FAX COVER SHEET

To: Jerome Montague Byron Morris Number:

From: Molly McCammon Date: 4-21-94

Comments: Total Pages: 12

Pls deliver to Jerome & Byron.

****
*** ACTIVITY REPORT ***
****

TRANSMISSION OK

TX/RX NO.	8854
CONNECTION TEL	7896608
CONNECTION ID	MORRIS-WRIGHT
START TIME	04/21 13:19
USAGE TIME	08'37
PAGES	13
RESULT	OK

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*** ACTIVITY REPORT ***
****

TRANSMISSION OK

TX/RX NO.	8853
CONNECTION TEL	4654759
CONNECTION ID	J.MONTAGUE
START TIME	04/21 13:09
USAGE TIME	09'39
PAGES	13
RESULT	OK

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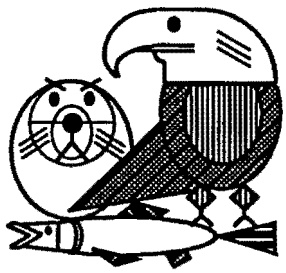

MEMORANDUM

TO: Byron Morris/NOAA

FROM: Molly McCammon, Director of Operations

DATE: April 21, 1994

SUBJ: Project #94166-B/Pacific Herring Reproductive Impairment — Authorization

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The purpose of this memorandum is to formally approve work under Project #94166-B/Herring Reproductive Impairment, consistent with the recommendations of the Chief Scientist in the enclosed review that call for the elimination of the mixed oxidase experiments with associated budget alterations to reflect this change.

enclosure

cc: Jim Ayers
Eric Myers

APPLIED
marine
SCIENCES

March 30, 1994

TO: James Ayers
Executive Director

FROM: Robert B. Spies
Chief Scientist

CC: Molly McCammon
Byron Morris
Jeep Rice

RE: Review of Project 94166-B, Herring Reproductive Impairment

Purpose of Study

This study is investigating the theory that exposure to hydrocarbons results in reproductive impairment in pacific herring. Specifically, this investigation is to "determine whether genetic injury to early life stages of herring can be caused by exposure of pre-spawning adult, egg, and larval stages to oil and relate this injury to larval survival potential."

Relation to Restoration Management Objectives

This laboratory study will provide the Trustee Council with evidence regarding whether such exposure to crude oil could adversely affect herring reproduction, thereby providing additional evidence that the EVOS was responsible for the poor herring recruitment currently being observed. There will still be viable alternate explanations for the poor herring returns in 1992 and 1993, although if this study provides no evidence of reproductive impairment it will strengthen the argument that other natural factors were responsible for the recent poor returns.

Analysis

The project has been reviewed by two scientists, and I have given this project description careful review as I have particular expertise in this area

2155 Las Positas Court, Suite S Livermore, CA 94550 510.373.7142 FAX 510.373.7834

myself. Both of the reviewers and I have concluded that the mixed function oxidase experiments proposed will not provide information that can be used to determine if the poor herring returns are the result of oil toxicity.

In addition, in my research experience with starry flounder and kelp bass, I have found that successfully spawning fish in the laboratory is a challenging undertaking. Even in the herring not exposed to crude oil, there can be great variation in survival of eggs and larvae, making it difficult to discern the effects of the toxicant of interest. The independent scientific reviewer, who also has extensive experience exposing fish to toxicants in the laboratory, did not express similar questions about the success of the spawning experiments. The investigators should keep these issues in mind as the study progresses.

Recommendation

Project 94166-B should go forward without the mixed function oxidase experiments (#1 and #2). The DPD and associated budget should be amended to reflect this alteration.

Exxon Valdez Oil Spill Trustee Council

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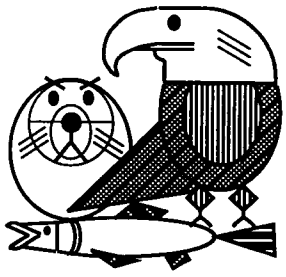
Phone: (907) 278-8012 Fax: (907) 276-7178



MEMORANDUM

TO: Jim Ayers, Executive Director

FROM: Eric Myers, Project Coordinator

DATE: 4/21/94

SUBJ: Further Information Regarding Hydroacoustics, Project #94320 and Project #94163/Forage Fish

---

The purpose of this memo is to follow-up on your questions regarding

1) the hydroacoustics work being pursued as part of Project #94163/Forage Fish Influence on Recovery of Injured Species in relation to the hydroacoustics work being done as part of Project #94320/PWS System Investigation; and

2) the extent to which research questions concerning pollock will be addressed by Project #94163/Forage Fish Influence on Recovery of Injured Species.

Hydroacoustics Work

As described in the DPD, Project #94163/Forage Fish has several interrelated components that collectively address questions related to obtaining a better understanding of forage fish as a prey resource for certain apex predators that were injured by the Exxon Valdez (e.g., marbled murrelets, pigeon guillemots, harbor seals). This will be the first attempt to make measurements of forage fish abundance, species composition and diet in PWS.

Part of the work proposed for Project #94163/Forage Fish calls for the use of hydroacoustic surveys, in combination with bird/mammal surveys and forage fish net sampling, to locate, sample and estimate the distribution and abundance of forage fish resources in PWS in relation to apex predators. Project #94163/Forage Fish is conceived of as a multi-year project, with the first year work in FY 94 to serve as an "exploration effort" to locate forage fish

schools and develop appropriate survey and sampling techniques. The results of the first year effort will be used to develop a longer term, more comprehensive research effort for subsequent years. In FY 94, Project #94163/Forage Fish calls for the hiring of a contractor with a budget of up to 350.0 through an RFP process that is now under way. The RFP specifically contemplates contracting for hydroacoustic equipment use and services. Responses to the RFP are due at the end of May.

As for Project #94320, there are 3 separate sub-projects that call for significant hydroacoustics work: 1) #94320-E/Salmon Predation; 2) #94320-N/Nearshore Fish; and 3) #94320-H/Zooplankton in Ecosystem. These sub-projects involve highly coordinated groups of vessels using state-of-the-art hydroacoustic equipment to track juvenile salmon and their predators as the hatchery fish progress from their release at the Esther Island Hatchery towards the Southeast passages from PWS to the Gulf of Alaska and also to identify macrozooplankton prey resources in the area. This is the effort for which the Trustee Council authorized expenditures for hydroacoustics equipment (270.0 was budgeted as part of the #94320-N/Nearshore Fish sub-project budget for hydroacoustics related equipment). See Attachment A. [1]

I spoke with Bruce Wright, NOAA project leader for Project #94163/Forage Fish, and Ted Cooney/Lead Scientist for Project #94320, regarding the relationship of the hydroacoustics work in the respective projects. Both see the two project efforts involving hydroacoustics as complimentary. The extent to which the hydroacoustics equipment and vessels being used for Project #94320 could also be used for Project #94163/Forage Fish remains unclear, largely due to the uncertainty regarding the timing of field work scheduled for the respective efforts. Bruce Wright is, however, continuing to explore the possibility of using the hydroacoustics equipment/crews from Project #94320 on behalf of the Forage Fish project.

As far as the *technology* is concerned, it appears that hydroacoustics equipment being purchased with Trustee Council funding for the #94320/PWS System Investigation could, as a technical matter, be used for the Forage Fish project, i.e., in terms of the ability of the hydroacoustics equipment to project the needed beams and frequencies needed for the forage fish research. (It should be noted that this question needs further examination. It was Bruce Wright's perception that some of the hydroacoustics equipment being used for Project #94320 was too "high-frequency" for use on forage fish. Ted Cooney indicated, however, that the frequency of the equipment being used could be adjusted and that it might well serve the forage fish research needs.)

The more significant difficulty may simply involve a *conflict in terms of the amount and timing of work* to be done under #94320/PWS System Investigation project in that it might preclude use of the Project #94320

hydroacoustics equipment for work on the forage fish project. That is, all the available field time may be taken up working on the Salmon Predation, Nearshore Fish and Macrozooplankton in Environment sub-projects. This, however, also remains a question.

As noted above, a major objective for the Forage Fish project work during the initial FY 94 field season will be to locate appropriate study areas where forage fish are sufficiently concentrated to allow for meaningful sampling and to develop and refine sampling techniques. Given the late start in FY 94, Bruce Wright anticipates that whatever Forage Fish project field work is possible this first year, it will likely occur in the late summer (August). According to Ted Cooney, the field work for the PWS System Investigation should be concluded by the end of July. Thus, in FY 94, it is conceivable that the hydroacoustics equipment would be available for use to serve both project efforts. Ted Cooney stressed, however, the need to ensure that proficient crews to successfully operate the hydroacoustics equipment (hydroacousticians) also be carefully addressed.

Looking to the future, the potential for the Project #94320/PWS System Investigation and Project #94163/Forage Fish projects to use a shared "research platform" (that is, to share common hydroacoustics vessels and crews) is somewhat uncertain due largely to the timing and magnitude of work for the respective efforts. The hydroacoustics work for Project #94320 largely revolves around biological phenomenon that start in the late spring/early summer (i.e., the plankton bloom and the associated release of hatchery fish). With regard to the Forage Fish project, the future work effort will be more concentrated in the early to mid-summer timeframe, coincident with breeding bird foraging. The extent to which the respective project efforts can be coordinated remains to be determined.

In short, in FY 94, it may work out that some of the hydroacoustics work for the Forage Fish project could be undertaken with the equipment/crews from Project #94320. A significant part of the uncertainty regarding the availability of the "Project #94320 equipment" this first year for purposes beyond the Salmon Predation/Nearshore Fish/Macrozooplankton projects is attributable to the unique problems associated with an extremely ambitious "start up" year (i.e., purchasing the equipment, getting it deployed into the field and calibrated, coordinating vessel crews and cruise plans, etc.). Additionally, Bruce Wright is waiting to see what kind of proposals he gets as a result of the RFP process. After those responses become available, he will be in a better position to assess the best options. He is aware of the potential opportunity to utilize the "Project #94320 hydroacoustics equipment" but also wants to make sure that the respective project data collection objectives are met. In the future (FY 95 and beyond), the availability of the "Project 320 hydroacoustics equipment" for use on the Forage Fish effort will depend on the intensity and

timing of effort of the respective projects. Again, this is a matter of on-going discussion among Bruce Wright, Ted Cooney and Gary Thomas.

Pollock

With specific regard to pollock and Project #94163/Forage Fish, the DPD indicates that a fundamental purpose of this project will be to obtain a better understanding of the adult and juvenile fish that compose the prey resources (forage fish) used by apex predators (marine birds and mammals) and that these forage fish species may include, among others, walleye pollock. Bruce Wright indicated that one of the goals of the initial FY 94 effort was to do some test fishing on fish school that are identified as pollock by way of the hydroacoustics to verify their identification. He indicated that some of the "reports" regarding pollock moving into PWS were based on readings from fish finders, rather than actual samples. This is, in any case, a relatively small portion of the overall project effort.

cc: Bruce Wright
Ted Cooney

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1 A listing of the hydroacoustics equipment being purchased with Trustee Council funds as part of the Project #94320-N/Nearshore Fish budget is provided as part of the Detailed Budget forms. A description of the hydroacoustics work proposed for FY94 as part of Project #94320-N/Nearshore Fish is provided in the Methods Section starting on page 10 of the DPD.

Attachment A

EXXON VALDEZ TRUSTEE COUNCIL
1994 Federal Fiscal Year Project Budget
October 1, 1993 - September 30, 1994

Commodities:				Reprt/Intrm	Remaining
Analytical software					$1.0
Statistical software					$1.2
Communications software					$0.9
4 UPS (power supplies) @ $250/each					$1.0
4 Mustang suits @ $250/suit					$1.0
4 survival suits @ $750/suit					$3.0
4 sets raingear @ $150/each					$0.6
Electronics/Mechanical tools					$1.0
Marine hardware					$1.1
Office supplies					$0.9
Video tapes, disks, film					$1.0
Calibration and maintenance					$2.0
			Commodities Total	$0.0	$14.7
Equipment:					
4 Biosonics DT 38,120/420, 200/420, 720/1000 kHz portable, digital, dual and split beam, scientific sounder systems @ $25,915/sounder	103.7	Tektronix color printer	13.9		$13.9
		Seagate barracuda disk drive (2 gigab	2.2		$2.2
		Sun 1.7 gigabyte CDROM, 8mm,& .25" tape drive, w/ optical disk drive storage systems	4.8		$103.7
4 Pentiem color ntbk computer w/2PCMCIA slots @ $4,799	19.2				$19.2
4 HP560 Color inkjet printers @ $902/each	3.6				$8.4
4 Optical data storage systems @4,989/sys	20.0	Infocus screen projection system	4.8		$24.8
2 - 8' Biofin towed body @ $4970/ea	9.9	Nikon 35mm camera w/wide angle and telescopic lens	2.3		$9.9
2 - 4' Biofin towed Body @ $2735/ea.	5.5				$7.8
6 Standard targets (38-1000kHz) @ $600/ea.	3.6	Sony, 8mm, 3 chip video camera	6.9		$10.5
4 - 50' tow cables @ $3,300/ea	13.2	Frame grabber	3.4		$16.6
Acoustic survey boat, 27'-32', dry hull, large cabin, twin OB's	37.5				$37.5
Polaroid color pallet	6.5				$6.5
Sun Sparc 2 work stations	9.9				$9.9
			Equipment Total	$0.0	$270.9

07/14/93

1994

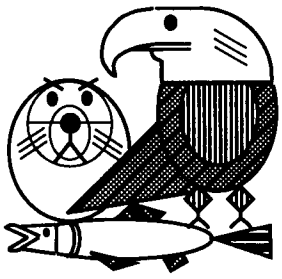
Printed: 4/7/94 4:08 PM

Project Number: 94320 - N
Project Title: Prince William Sound System Investigation
Sub-Project: Nearshore Fish
Agency: Prince William Sound Science Center

FORM 4B
SUB-PROJECT
CONTRACTUAL
DETAIL

Exxon Valdez Oil Spill Trustee Council

Restoration Office
645 G Street, Suite 401, Anchorage, Alaska 99501-3451
Phone: (907) 278-8012 Fax: (907) 276-7178



To: Restoration Work Force

From: Molly McCammon

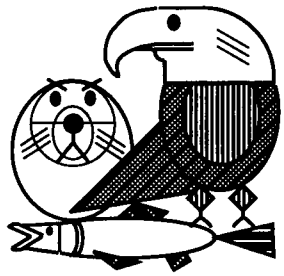
Date: April 19, 1994

Subj: Wednesday Staff Meeting

Tomorrow's meeting will be held at **10:00 am** instead of the usual 9:00 am. The Anchorage location will be the 4th floor conference room at the Simpson Building. The Juneau location will be at NMFS in room 413.

Exxon Valdez Oil Spill Trustee Council

Restoration Office
645 G Street, Suite 401, Anchorage, Alaska 99501-3451
Phone: (907) 278-8012 Fax: (907) 276-7178



April 18, 1994

Donna Nadell, President
Eyak Corporation
P.O. Box 340
Cordova, Alaska 99574

Luke Borer, President
Sherstone, Inc.
P.O. Box 340
Cordova, Alaska 99574

Dear Ms. Nadell and Mr. Borer:

Thank you for your letter of April 11, 1994. Your letter states that Sherstone anticipates resumption of timber harvest operations this summer on some of Eyak Corporations's lands. We assume that Sherstone's harvesting activities will be conducted with the protection of fisheries, wildlife, and scenic values in mind. The timber which was harvested in the Cordova area early this century has regenerated and supports outstanding fisheries and wildlife values. Thus, the more modern forest practices including those covered in the Forest Practices Act should enable Sherstone, Inc. to provide significant protection for these values under normal circumstances.

However, because of the *Exxon Valdez* oil spill and the resultant stress placed on resources and services injured by the spill, the Trustees continue to be interested in providing additional protection to the injured resources and services by purchasing the so-called core lands around Power Creek, Eyak Lake and Eyak River. The Trustees also want to discuss additional protection measures for Sheep Bay, Windy Bay/Deep Bay, and Port Gravina, areas of special biological importance, and for Orca Narrows, an area of importance for recreation and tourism. We are interested in discussing with you any additional measures that you believe may be necessary for lands which have historical or cultural significance.

The Trustees share your belief that these or any other proposals must be subject to approval by the shareholders and understand that the lands and timber under consideration are wholly owned by Eyak Corporation and its shareholders. Any lands or interests in lands, including commercial timber interests, not owned by Eyak Corporation need to be identified at the outset of any negotiations.

We believe your Board is aware of the public negotiations which surrounded the purchase of the Seal Bay lands on Afognak Island by the Trustee Council, and the Trustees are hopeful Eyak Corporation and Sherstone, Inc. will follow a similar public process in negotiating with the Trustee Council. The Trustees look forward to working with you and are willing to consider whatever counter or additional proposals you want to discuss.

Sincerely,

James R. Ayers
Executive Director

jra/raw

****
*** ACTIVITY REPORT ***
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Exxon Valdez Oil Spill Trustee Council
Restoration Office
645 G Street, Suite 401, Anchorage, AK 99501-3451
Phone: (907) 278-8012 Fax: (907) 276-7178

MEMORANDUM

TO: Sandy Rabinowitch/DOI
Tony DeGange/USFWS
Leslie Holland-Bartles/NBS

FROM: James R. Ayers, Executive Director

DATE: April 18, 1994

SUBJ: Proj #94039/Murre Population Monitoring — Authorization

---

The purpose of this memorandum is to formally approve work to proceed on Project #94039/Common Murre Population Monitoring consistent with the specific conditions identified by the Chief Scientist in his memorandum dated April 11 (see attached).

attachment
— R. Spies to J. Ayers, memorandum dated April 11, 1994

cc: Robert Spies
Karen Oakley/USFWS
Eric Myers

A P P L I E D
marine
S C I E N C E S

April 11, 1994

TO: James Ayers
Executive Director

FROM: Robert B. Spies
Chief Scientist

THRU: Eric Myers

RE: Project 94039 ("Common Murre Population Monitoring")

Project 94039 ("Common Murre Population Monitoring") was delivered to my office with a request to expedite the peer-review process. The DPD for these projects arrived in our office on March 24, and the review of this project has been received. As we have agreed, I plan to provide a formal recommendation for each project that summarizes the purpose of each study and its relationship to restoration management objectives. Given the extensive work required for Project 94320, I have not yet completed the formal recommendations for Project 94039. I do plan to recommend that the murre monitoring go forward, however, and given their time sensitive nature I thought this informal recommendation might allow this projects to proceed.

Common and thick-billed murres were severely injured by the spill, with their breeding colonies at the Barren Islands being particularly hard hit. This project continues the recovery monitoring of the murre populations in the Barren Islands. In addition, this project will investigate the disparity between the results obtained by Trustee Council investigations and those sponsored by Exxon/MMS. As you may remember, much attention was given to the results of Exxon-sponsored study of murres on the Barren Islands that concluded recovery was well-underway, while government studies suggest recovery will take decades.

The reviewer of this project expressed two concerns that I share. First, comparing the results to the two different studies is predicated upon receipt of data from Exxon's investigators at the University of Washington. The data in question are for 1992, in which UW worked at the same sites, but for MMS rather than Exxon (the Exxon data for 1990-91 are unavailable until the private party litigation is complete). While Trustee Council investigators have provided their data to UW, the reverse has not occurred (as of March 10, 1994). Unless this exchange is completed, the principal investigators will be unable to achieve their objective of explaining the differing results from the two studies. Andy spoke with the principal investigator, who indicated that he believes the data will be released once a paper containing the data is published in the next two months. The second question raised by the reviewer related to the specific statistical analyses to be conducted in the project.

I recommend that Project 94039 be approved, with the following provisions:

1. The principal investigator should advise the chief scientist by July 15, 1994, regarding the status of data transfer from UW. If data transfer has not been achieved by July 15, this part of the project should be postponed until FY 1995.

2. The principal investigator should carefully consider the suggestions for statistical methods made by the reviewer. The final report must address these critiques by providing justification for the statistical techniques utilized in the analysis.

As you are aware, the analysis that the peer reviewers and I have provided these Detailed Project Descriptions is focused upon their technical merit. I recommend that each project be given a budgetary review in addition to the technical review provided by my office.

Exxon Valdez Oil Spill Trustee Council
Restoration Office
645 G Street, Suite 401, Anchorage, AK 99501-3451
Phone: (907) 278-8012 Fax: (907) 276-7178

MEMORANDUM

TO: Byron Morris/NOAA

FROM: James R. Ayers, Executive Director

DATE: April 18, 1994

SUBJ: Proj #94163/Forage Fish Influence on Recovery of Injured Species — Authorization

---

The purpose of this memorandum is to formally approve that the RFP portion of work on Project #94163/Forage Fish Influence on Recovery of Injured Species proceed immediately subject to the specific conditions identified by the Chief Scientist in his memorandum dated April 12 (see attached).

As indicated in the Chief Scientist's memo, the remaining portion of the work on Project #94163/Forage Fish Influence on Recovery of Injured Species will be subjected to further peer review.

attachment
— R. Spies to J. Ayers, memorandum dated April 12, 1994

cc: Robert Spies
Bruce Wright/NOAA
Eric Myers

APPLIED
marine
SCIENCES

April 12, 1994

TO: James Ayers
Executive Director

FROM: Robert B. Spies
Chief Scientist

THRU: Eric Myers

CC: Bruce Wright
National Marine Fisherics Service

RE: Project 94163 ("Forage Fish Influence on Recovery of Injured Species")

Project 94163 ("Forage Fish Influence on Recovery of Injured Species") was delivered to my office on March 25, 1994, with a request to expedite the peer-review process. As we have agreed, I plan to provide a formal recommendation for each project that summarizes the purpose of each study and its relationship to restoration management objectives. Project 94163 as formulated requires that NOAA release a Request for Proposals (RFP) for the major portion of the work. Given that procurement regulations require a 30-day period of advertisement in Commerce Business Daily, I have prepared this memo to recommend that you approve issuance of the RFP while the remaining portion of Project 94163 is subjected to further peer review.

This project is designed to investigate whether food is limiting recovery of injured resources in Prince William Sound, including marbled murrelets, harbor seals, pigeon guillemots, and black-legged kittiwakes. If food is limiting recovery of these populations, all restoration efforts not addressing food availability will probably fail. Forage fish, including pacific herring, capelin, sandlance, pollack, cod, and juvenile salmon, are considered important food resources for the above injured species. This project proposes to hire a contractor to determine forage fish abundance and species composition using hydroacoustic techniques, and relate these data to concurrent measurements of foraging and reproductive success of injured marine birds. This study will be the first attempt to make measurements of forage fish abundance, species composition, and diet in Prince William Sound. A major objective of the first sampling season is to refine the sampling techniques and utilize statistical procedures to improve sampling design.

I recommend that the RFP for Project 94163 be approved for issuance, with the following provisions:

1. This approval is for issuance of the RFP only. The proposals in response to the RFP will be reviewed by an Evaluation Board that includes Dr. James Traynor of NOAA, a specialist in hydroacoustics who will be able to give the proposals adequate peer review (I am also officially included as an advisor to the Evaluation Board).

2. The following modifications to the RFP are made:

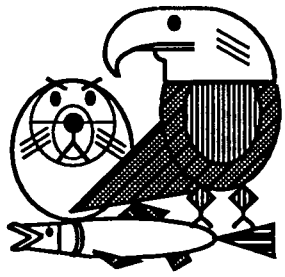
a) Copies of final cruise plans and progress reports are sent to the Chief Scientist.
b) The data sharing requirement in Task 7 is expanded to require the contractor to provide raw and summarized fish distribution and abundance data to Dr. Vince Patrick at the

University of Maryland (principal investigator for Project 94320-J: Information Management and Modeling) in addition to sharing the data with Projects 94102 (Marbled Murrelets) and 94173 (Pigeon Guillemots).

c) Contractor is required to submit the draft annual report and the detailed plan for future sampling to the Chief Scientist for peer review. The detailed plan need not be reviewed if this plan will become part of a future year Detailed Project Description.

As you are aware, the analysis that the peer reviewers and I provide Detailed Project Descriptions is focused upon their technical merit. I recommend that each project be given a budgetary review in addition to the technical review provided by my office.

Exxon Valdez Oil Spill Trustee Council
Restoration Office
645 G Street, Suite 401, Anchorage, AK 99501-3451
Phone: (907) 278-8012 Fax: (907) 276-7178



MEMORANDUM

TO: Jim Ayers
Molly McCammon
Barbara Wilson

FROM: Eric Myers

DATE: 4/18/94

SUBJ: Project #94320-S/Disease Impacts on PWS Herring Populations

---

In order to avoid future confusion regarding reference to FY 94 projects, it would be helpful if the recently proposed research project concerning disease impacts on PWS herring populations can be referenced from this point forward as "Project #94320-S/Disease Impacts on PWS Herring Populations".

(As a result of consultation between ADF&G and Applied Marine Sciences, it has become apparent that the DPD tracking system used by Applied Marine Sciences already has assigned project numbers for Projects #94320-A through #94320-R, making #94320-S the first available project number.)

cc: Dean Hughes
Bob Spies

Exxon Valdez Oil Spill Trustee Council
Restoration Office
645 G Street, Suite 402, Anchorage, Alaska 99501
Phone: (907) 278-8012 Fax: (907) 276-7178

PUBLIC SERVICE ANNOUNCEMENT

Date: April 18, 1994
Subject: Public Meeting In Valdez April 19, 1994
Contact: Molly McCammon at 278-8012

Please announce or post!

Exxon Valdez Oil Spill Status Report

The *Exxon Valdez* Oil Spill Trustee Council is sponsoring a series of public meetings to update the public on recovery of natural resources injured by the March 1989 Exxon Valdez oil spill. A meeting will take place in Valdez on Tuesday, April 19, 1994, at 7:00 P.M. in the City Council Chambers.

Several other public events are scheduled in Valdez on April 19 to facilitate public access to this information:

- **Coffee Break:** Jim Ayers, Executive Director for the Trustee Council; Craig Tillery of the Alaska Attorney General's Office; Molly McCammon, Director of Operations for the Trustee Council; and Dr. Robert Spies, Chief Scientist for the Trustee Council, will be on public radio station KCHU in a live call-in program from ~~10:00—11:00~~ 9:00 – 10:00 A.M.
- **Rotary Club:** The Valdez Rotary Club will host Jim Ayers with the other representatives from the Trustee Council at their regular Tuesday luncheon, 12:00 - 1:00 P.M. at the Sourdough Restaurant in the Village Inn.
- **Public Meeting:** Dr. Robert Spies will present an overview on the current status of birds, fish, marine mammals, subsistence resources, archaeological sites, and the nearshore ecosystem. This meeting is scheduled at 7:00 P.M. at the Valdez City Council Chambers.

Persons who may need a special modification in order to participate should contact Carrie Holba at 278-8008 to make any necessary arrangements. For more information contact the Oil Spill Public Information Center, 645 G St, Anchorage, AK 99501, or call 278-8008, toll-free within Alaska at 1-800-478-7745.

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*** ACTIVITY REPORT ***
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All Documents Faxed to the Trustee Council
Must Be Followed Up With Phone Calls
To Ensure Arrival and Delivery

This Confirmation Sheet MUST be Attached to the Faxed Document

___ Mr. Barton (Renee)
586-8863 Date & Time:_____

___ Mr. Frampton (Cathy)
202-208-4416 Date & Time:_____

___ Mr. Pennoyer (Linda)
586-7221 Date & Time:_____

___ Mr. Rosier (Carla)
465-4100 Date & Time:_____

___ Mr. Sandor (Martha)
465-5050 Date & Time:_____

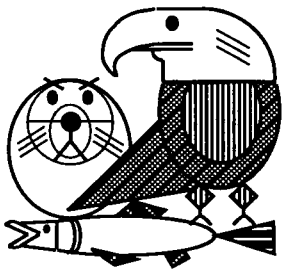
___ Mr. Tillery (Vicki)
269-5274 Date & Time: 4/18 1:57

Description of Document:

Comments:

Your Initials: blw

Exxon Valdez Oil Spill Trustee Council
Restoration Office
645 G Street, Suite 402, Anchorage, Alaska 99501
Phone: (907) 278-8012 Fax: (907) 276-7178



MEMORANDUM

TO: Bob Spies, Chief Scientist
Attn: Andy Gunther

FROM: Eric Myers, Project Coordinator

DATE: 4/18/94

SUBJ: Revised DPD for Project #94320-C/Otolith Marking of Wild Pink Salmon in PWS

As you know, shortly prior to the Trustee Council meeting on April 11, 1994, the Alaska Department of Fish and Game substantially revised the scope of work proposed as part of the DPD for Project #94320-C/Otolith Marking of Wild Pink Salmon in PWS by eliminating the thermal mass marking portion of the project. This left the portion of the project that calls for testing of chemical (tetracycline) marking of fish as an alternative to coded wire tags.

Enclosed for your reference is a copy of the revised DPD (dated 4/7/94) as approved by the Trustee Council at the April 11, 1994 meeting. As we discussed while you were in Anchorage on April 18th, the peer review process for Project #94320 already included consideration of the chemical (tetracycline) marking work proposed in this revised DPD in that the chemical (tetracycline) marking work was part of the earlier, more comprehensive project proposal that also included thermal mass marking.

enclosure

Exxon Valdez Oil Spill Trustee Council

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

MEMORANDUM

TO: Dave Gibbons
USFS Liaison

FROM: Jim Ayers
Executive Director

DATE: April 15, 1994

RE: Financial Operating Procedures

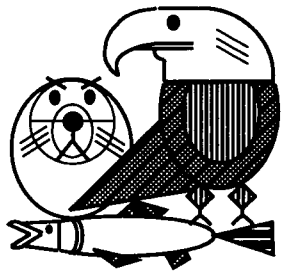
It came to my attention, at the April 11 teleconference ,that my office does not have the most current approved Trustee Council Financial Operating Procedures. Please provide us with one.

It is also not clear whether all Trustee Council financial operating procedures and processes have been documented. I would like to take you up on your offer to work on a revised document. Please get together with June Arkoulis-Sinclair so the two of you can begin this project.

gibbons.jas

Exxon Valdez Oil Spill Trustee Council

Restoration Office
645 G Street, Suite 401, Anchorage, Alaska 99501-3451
Phone: (907) 278-8012 Fax: (907) 276-7178



Fax Cover Sheet

To: Trustee Council

Number:

From: Jim Ayers
Executive Director

Date: April 14, 1994

Total Pages: 2

We have recently received a letter from Eyak Corporation expressing a desire to open fresh discussions regarding habitat acquisition of their lands. I have had the opportunity to discuss our interests with most of you and have received input accordingly. (A proposed response to Eyak drafted by John Sandor is attached indicating his views.) Several of you expressed the desire of moving forward quickly. We will be meeting with them in the near future to clarify their intentions and express ours. If you have any additional comments, I will be in Anchorage through Thursday and in Juneau Friday.

DRAFT

Donna Nadell
President
EYAK Corporation

Thank you for your letter of April 11, 1994, which was jointly signed by Luke Borer, President of Sherstone, Inc. Your letter states that Sherstone anticipates resumption of timber harvest operations this summer on some of Eyak Corporation's lands. Timber harvesting can be conducted in a manner which protects fisheries, wildlife and scenic values, and we would anticipate that Sherstone's harvesting activities would be conducted with the protection of such values in mind. Even the timber harvesting which occurred in the Cordova area early this century, has regenerated and supports outstanding fisheries and wildlife values. Thus, the more modern forest practices including those covered in the Forest Practices Act should enable Sherstone, Inc. to provide significant protection for these values under normal circumstances.

Because of the *Exxon Valdez* oil spill and the resultant stress placed on resources and services injured by the spill, the Trustees propose to purchase the so-called core lands of approximately 13,700 acres, including a subset of three parcels; the Power Creek parcel consisting of approximately 4,800 acres; the Eyak Lake parcel consisting of approximately 5,100 acres and the Eyak River parcel consisting of approximately 3,800 acres. The Trustees propose to purchase these lands in fee at fair market value, and would propose these lands be identified with a specific designation chosen by the Eyak Corporation and shareholders so that the area may be so signed and identified as such in perpetuity.

The Trustees also propose to purchase approximately 19,600 acres of land which have been identified as areas of special biological importance. These three areas consist of Sheep Bay (9,100 acres), Windy Bay/Deep Bay (7,100 acres), and Port Gravina (3,400 acres). The Trustees also propose to purchase these lands at fair market value. We are interested in discussing with you any additional measures that may be necessary for lands which have historical or cultural significance.

We believe your Board is aware of the public negotiations which surrounded the purchase of the Seal Bay lands on Afognak Island by the Trustee Council, and the Trustees are hopeful Sherstone and Eyak Corporations will follow a similar process in preparing various counteroffers which the Trustees can consider.

The Trustees urge Sherstone, Inc. and Eyak Corporation to give serious consideration to this proposal, and are willing to consider whatever counter or additional proposals your organizations may want to propose.

The Trustees believe these or any other proposals must be subject to approval by the shareholders and understand that the lands and timber under consideration are wholly owned by Eyak Corporation and its shareholders. Any lands or interests in lands, including commercial timber interests, not owned by Eyak Corporation need to be identified at the outset of any negotiations.

****
*** ACTIVITY REPORT ***
****

TRANSMISSION OK

TX/RX NO.	9070
CONNECTION TEL	2026245857
CONNECTION ID	
START TIME	04/27 09:34
USAGE TIME	01'53
PAGES	3
RESULT	OK

Katz's WDC ofc

All Documents Faxed to the Trustee Council
Must Be Followed Up With Phone Calls
To Ensure Arrival and Delivery

This Confirmation Sheet MUST be Attached to the Faxed Document

___ Mr. Barton (Renee)
586-8863 Date & Time:_____

___ Mr. Frampton (Cathy)
202-208-4416 Date & Time:_____

___ Mr. Pennoyer (Linda)
586-7221 Date & Time:_____

___ Mr. Rosier (Carla)
465-4100 Date & Time:_____

Gov ofc WDC 202-624-5858

✓ Mr. Sandor (Martha) melissa 9:43
465-5050 Date & Time: 4/27 9:50
Martha

___ Mr. Tillery (Vicki)
269-5274 Date & Time:_____

Description of Document: 3pg memo from Ayers Eyak & draft Eyak ltr.

Comments: 3Rd time sent

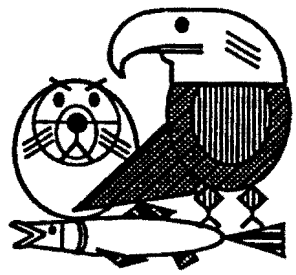
Your Initials: RAW

****
*** ACTIVITY REPORT ***
****

TRANSMISSION OK

TX/RX NO.	9071
CONNECTION TEL	4655070
CONNECTION ID	J.SANDOR
START TIME	04/27 09:37
USAGE TIME	01'44
PAGES	3
RESULT	OK

Exxon Valdez Oil Spill Trustee Council
Restoration Office
645 G Street, Suite 401, Anchorage, AK 99501-3451
Phone: (907) 278-8012 Fax: (907) 276-7178



FAX COVER SHEET

FAX COMPLETE

465-5070

To: John Sander Number: 202-624-5857

From: Mark Brodersen Date: 4-2794

Comments: Total Pages: 3

PLS deliver to J. Sander ASAP.

Rebecca
FYI
Weathered out of Chenega

DRAFT as of 4/14/94, 3:00 p.m.

CHENEGA BAY

April 18, 1994 - 1:30 p.m. at Community Center

Jim Ayers, Craig Tillery, Bob Spies, and Rita Miraglia

Jim's travel schedule:
(Mary will make Jim's travel arrangements from Juneau to Anchorage. If the weather is marginal Jim may want to fly up the evening of 4/17, otherwise . . ..)
Depart Juneau 4/18 6:30 a.m. - Arrive Anchorage 8:07 a.m.

All participants should meet at 11:15 a.m. at Ketchum Air Service on Lake Hood. Fly to Chenega Bay in a Cessna 206. (Cherri has reserved the round trip Charter for Chenega Bay.)

Ketchum Charter departs Anchorage at noon - Arrives Chenega Bay at 1:15 p.m.

The 1:30 p.m. public meeting will be held in the Community Center.

Following the meeting, Chuck Totemoff has offered to give Jim, Craig, Bob and Rita at 30 to 45 minute tour of the Village.

Departure from Chenega Bay will be following tour - Arrive Anchorage approximately 1.25 hours later.

Gary Kompkoff and Roy Totemoff are flying over from Tatitlek to attend the meeting. They will fly a Ketchum charter out of Valdez.

Contacts: Chuck Totemoff, Chenega Corp (Anchorage) 277-5706
Gail Evanoff, Chenega Corp. 573-5118

DRAFT as of 4/14/94, 3:00 p.m.

VALDEZ

April 19, 1994

Jim Ayers, Molly McCammon, Bob Spies and Craig Tillery
(Jim and Craig will be in Valdez part of the day only, they will depart that evening at 6:05.)

Radio - KCHU arrive at 8:45 a.m. Meet host Dick Reichman at the studio located at 128 Pioneer Street. The live call-in talk show, Coffee Break, runs from 9:00 to 10:00.

Coffee at 10:15 with Luke Borer, Eyak Corp., at the cafe in the Westmark.

Rotary Club luncheon 12:00 to l:00 pm in the Sugarloaf Restaurant at the Village Inn Hotel. The Rotary's program person is Bert Cottel, (also the Valdez Chief of Police). The luncheon is very casual and laid back with about 25 to 30 attendees. The Rotary starts promptly at noon and ends at 1:00. Thirty minutes has been allotted for Jim's presentation.

Meet with Doug Griffin and members of the City Council at City Council Chambers from 2:00 to 3:00 p.m.

Public meeting at City Council Chambers at 7:00 p.m. The City Council Chambers are located nexted to the Police Station. The building will be open when they arrive. Video player, monitors, and a screen are available. They do not have a slide projector.

Jim's travel schedule:
(Mary will make Jim's travel arrangements from Juneau to Anchorage and return to Juneau. Mary will also arrange car rental in Valdez.)

Depart Anchorage 4/19 7:30 am - Arrive Valdez 8:10 am

Jim and Craig will depart Valdez on 4/19 at 6:05 back to Anchorage.

Molly and Bob will overnite at the Westmark following the 7 pm meeting. (The latest evening flight from Valdez to Anchorage is at 6:05 pm.)

Depart Valdez 4/20 8:35 am - Arrive Anchorage 9:15 am

Contacts: Dick Reichman, KCHU 835-4665
Bert Cottel, Rotary Club 835-4560
Gina, City Clerk 835-4313

WORLD EXPRESS TRAVEL

Attention CHERRT 04/14/94 01:55pm Page 1

MCCAMMON/MOLLY

The airline booking locator is STUUNB. The fare is $190.00.

AIR Alaska Airlines Flight#4800 Class:Y Seat:N/A
From: Anchorage AK, USA Date: 04/19 Tuesday 07:30am
To: Valdez AK, USA Date: 04/19 Tuesday 08:10am
Meal:None Equip:CONVAIR (ALL SE Status:Confirmed

HOTEL Westmark Valdez Phone:907-835-4391
BOX 468, VALDEZ AK 99686
In: 04/19 Tuesday Room Type: Sup. 2 Dbl Bedo Rm Not Guaranteed
Out: 04/20 Wednesday (1 Night) Conf#:N/A Rate:82.00USD

AIR Alaska Airlines Flight#4801 Class:Y Seat:N/A
From: Valdez AK, USA Date: 04/20 Wednesday 08:35am
To: Anchorage AK, USA Date: 04/20 Wednesday 09:15am
Meal:None Equip:CONVAIR (ALL SE Status:Confirmed

THANK YOU FOR CHOOSING WORLD EXPRESS TRAVEL.
YOUR TRAVEL CONSULTANT IS CHERYL.
.
DUE TO LAST MINUTE SCHEDULE CHANGES, PLEASE RECONFIRM
ALL FLIGHTS DIRECTLY WITH THE AIRLINE 24-48 HOURS
PRIOR TO DEPARTURE.
.

WORLD EXPRESS TRAVEL

Attention CHERRI WOMAC 04/13/94 08:41am Page 1

SPIES/BOB

The airline booking locator is SIDZAX. The fare is $190.00.

AIR Alaska Airlines Flight#4800 Class:Y Seat:N/A
From: Anchorage AK, USA Date: 04/19 Tuesday 07:30am
To: Valdez AK, USA Date: 04/19 Tuesday 08:10am
Meal:None Equip:CONVAIR (ALL SE Status:Confirmed

HOTEL Westmark Valdez Phone:907-835-4391
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AIR Alaska Airlines Flight#4801 Class:Y Seat:N/A
From: Valdez AK, USA Date: 04/20 Wednesday 08:35am
To: Anchorage AK, USA Date: 04/20 Wednesday 09:15am
Meal:None Equip:CONVAIR (ALL SE Status:Confirmed

THANK YOU FOR CHOOSING WORLD EXPRESS TRAVEL.
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ALL FLIGHTS DIRECTLY WITH THE AIRLINE 24-48 HOURS
PRIOR TO DEPARTURE.
.

→ Eyak – ↕ Billy Miles

Jeff Short / Bruce Wright ÷ bullets
subsistence project –

Luke Borer – Eyak / Valdez –
835-5200

more copies status Report

Tues the 19th

left message – and set up mtg w/ him for an hour.

also a FAX #.
same as home –
835-5200

between 4-7

81
7.5
88.5
4.50
2.75
7.25
4.5
3.5
8.0
73.5
7.5
81.0
8.5
+ .25
8.75

92812

Coffee a.m. (10-1) chat Is he going to be Valdez
no negotiations

Time: 5:00
8.5
+ .45
8.95
Place: Jim's Hotel Room ?
Hotel Location Coffee Shop
9.15
Jim
chat not negotiate

9-10 talkshow
10:15 Luke Borer
12-1 lunch
7 mtg (public)

meeting will have to be in Seattle – (all people involved)
would like to meet ASAP

20th He's was
Jim
Donna
Mike Barton
Luke
Craig
wednesday

Rebecca – ask me about this part.

Westmark
10:15

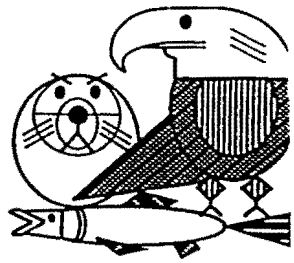
receptionist
5'6
wearing
Carheart Jacket
glasses
looks 27 even tho
38

clerk
Ckc

1.25
.25
1.50
2.50
4
6.00
6.75
.75
6.75
7.50

Exxon Valdez Oil Spill Trustee Council

Restoration Office
645 G Street, Suite 401, Anchorage, Alaska 99501-3451
Phone: (907) 278-8012 Fax: (907) 276-7178



MEMORANDUM

TO: Trustee Council Members

FROM: James R. Ayers
Executive Director

DATE: April 7, 1994

RE: Small parcel protection process

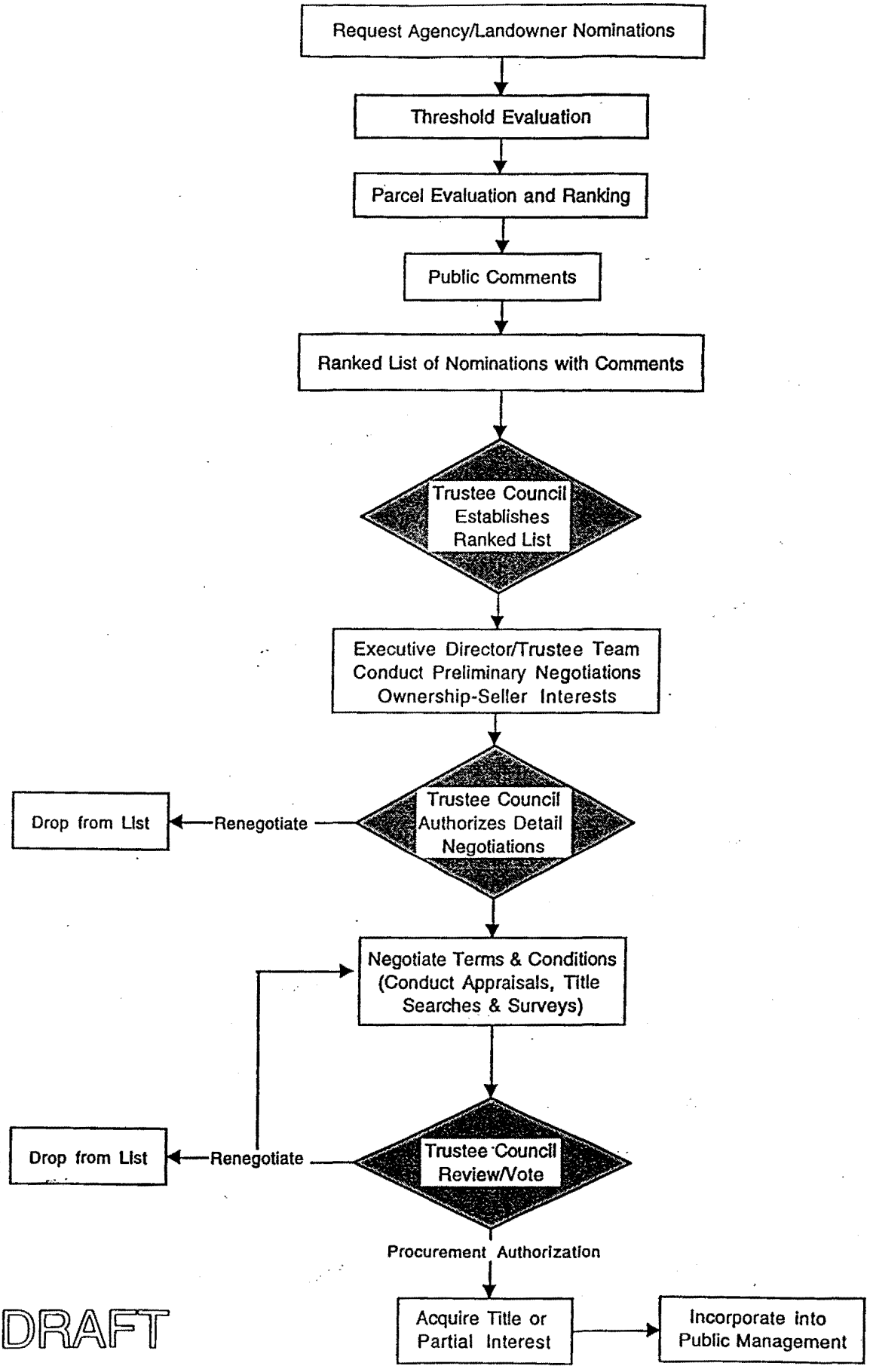
On January 31, 1994 the Trustee Council adopted a resolution in conjunction with Projects 94110 and 94126 for Habitat Protection and Acquisition. Number 7 of that resolution says that

> Small parcel negotiations will proceed once an evaluation and ranking of small parcels has been completed and approved by the Trustee Council.

Staff have been working on development of a small parcel protection process, as well as a timeline for the activities involved in that process. Attached you will find a graphic description of the process that has been recommended by agency staff. The process will begin with a joint, simultaneous agency/landowner request for nominations. This request will include information to assist the public in developing its nominations and will be coordinated with the Trustee Council public solicitation for FY95 Work Plan projects. Once the nomination process is closed, agency and Trustee staff will review, evaluate, and rank parcels according to established criteria. A ranked list of parcels would be distributed for public comment, with a final list to be submitted to the Trustee Council.

The threshold and evaluation criteria are close to completion, although there still remain some minor revisions. The expected budget and timeline for completion of the small parcel process depend in large part upon the number of parcels that are eventually nominated, the scope of the evaluation process, and the number of other work duties assigned to the staff. It is estimated that this process could be completed in early 1995, and possibly before.

SMALL PARCEL PROTECTION PROCESS



DRAFT

Kachemak Heritage Land Trust
P.O. Box 2400 Homer, Alaska 99603
(907) 235-5263

April 6, 1994

Members of the Trustee Council
Jim Ayres, Executive Director
Exxon Valdez Oil Spill Trustee Council
645 G Street
Suite 402
Anchorage, AK 99501

Dear Mr. Ayres and Members of the Council:

Kachemak Heritage Land Trust, a non-profit land conservancy located in Homer, strongly supports the Trustee Council's efforts on behalf of habitat acquisition. We are pleased with the Council's work to date acquiring key habitats throughout the spill-affected area.

Of particular interest to KHLT is the small parcel acquisition program. This program is a key component of the habitat acquisition process. Small parcels with high habitat values are often the most accessible, therefore also the most threatened with adverse development. We are gratified to see the Council has approved a process for evaluating small parcel acquisitions. We urge the Council to move quickly to establish a program for completing evaluations during the 1994 field season.

We understand that the process for evaluating small parcels could potentially take a long time. Therefore, we suggest that parcels which are sponsored by a state or federal agency be considered now, while leaving open the opportunity for individuals to also recommend parcels for acquisition.

We are concerned about guaranteeing adequate funding for agencies to manage new acquisitions. Kachemak Heritage Land Trust supports full funding for land management responsibilities by public agencies. In those instances, however, where agency funding is insufficient, we urge the Trustee Council to consider partnerships with non-profit 501(c)(3) land trusts to manage some of these acquisitions. For example, KHLT is actively

promoting acquisition of several small parcels in our service area. At the appropriate time, we are willing to discuss the possiblity of KHLT assuming management responsibility for these lands.

Thank you for considering our comments on small parcel acquisition.

Sincerely,

Barbara Seaman

Barbara Seaman
President

Exxon Valdez Oil Spill Trustee Council

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

MEMORANDUM

TO: Jerome Montague, ADF&G

FROM: James R. Ayers
Executive Director

DATE: April 12, 1994

RE: Project #94258/Sockeye Salmon Overescapement - Authorization

---

The purpose of this memorandum is to formally approve work to proceed on Project #94258/Sockeye Salmon Overescapement, as described in the DPD, as recommended by the Chief Scientist in his memorandum dated April 5 (attached).

As indicated in the Chief Scientist's memo, Project #94258/Sockeye Salmon Overescapement is a continuation of a project started during the NRDA process and was favorably reviewed by an international panel in March of 1993.

JRA/mir

Attachment: R. Spies to J. Ayers memo dated April 5, 1994

cc: Joe Sullivan, ADF&G
Eric Myers, Anchorage

APPLIED
marine
SCIENCES

April 5, 1994

TO: James Ayers
Executive Director

FROM: Robert B. Spies
Chief Scientist

THRU: Eric Myers

RE: Projects 94041 and 94258

Project 94041 ("Introduced Predator Removal from Islands") and Project 94258 ("Sockeye Salmon Overescapement") were delivered to my office with a request to expedite the peer-review process. The DPD for Project 94041 arrived in our office on March 24, and the DPD for Project 94258 arrived on March 10. The reviewd for both of these projects has been received.

As we have agreed, I plan to provide a formal recommendation for each project that summarizes the purpose of each study and its relationship to restoration management objectives. Given the extensive work currently underway with regards to Project 94320, I have not yet completed the formal recommendations. I do plan to recommend that both projects go forward, however, and given their time sensitive nature I thought this informal recommendation might allow the projects to proceed.

Project 94041 ("Introduced Predator Removal from Islands"): The key issue raised by the reviewer was to verify that neither cattle or rats are present on the two islands slated for fox trapping. Cattle destroy bird nesting habitat and crush burrows, and rats are predators on seabirds, so if they are present removing the foxes will not provide a "predator" free habitat for seabirds. The principal investigator has assured Andy Gunther that Simeonof and Chernabura Islands (in the Shumagin Islands) do not contain either cattle or rats. Consequently, I recommend the project go forward as described.

Project 94258 ("Sockeye Salmon Overescapement"): This project is a continuation of a project started during the NRDA process. The project was favorably reviewed by an international panel convened in Vancouver on March 15, 1993. The panel made some recommendations for improvements, which have been incorporated by the principal investigators. Consequently, I recommend the project go forward as described.

As you are aware, the analysis that the peer reviewers and I have provided these Detailed Project Descriptions is focused upon their technical merit. I recommend that each project be given a budgetary review in addition to the technical review provided by my office.

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

MEMORANDUM

TO: Rod Kuhn
E.I.S. Project Manager

FROM: James R. Ayers
Executive Director

DATE: April 12, 1994

RE: Budget Assumptions for Analysis
E.I.S. Project

It is my understanding from your March 25 memo that in order to compose the Environmental Impact Statement (E.I.S.) you need a general response for the budget assumptions regarding the remaining Exxon Valdez Joint Trust funds including receivables. This response is to provide you with that basis for the E.I.S. preferred alternative assumptions.

The Trustees have not yet formally established specific directives in this matter. However, given the general body of knowledge that we have today, it is my perspective from conversations with the Trustees that we are developing a comprehensive balanced approach within the following parameters.

The fund balance at this time including receivables subject to the Trustees Authority is approximately $650,259,710.

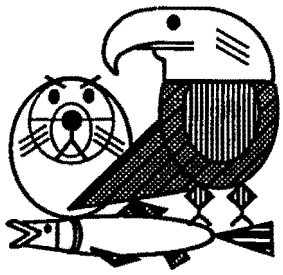
% of dollars projected for respective category:

Administration and Public Involvement	3 - 5%
Monitoring and Research	20 - 25%
General Restoration	10 - 15%
Habitat Protection/Acquisition	45 - 50%
Restoration Reserve	15 - 20%
Reimbursements	3 - 5%

These are ranges that I believe reflect the collective current assumptions and judgements of the Trustees.

JRA/mir
cc: Trustee Council Members

Exxon Valdez Oil Spill Trustee Council
Restoration Office
645 G Street, Suite 402, Anchorage, Alaska 99501
Phone: (907) 278-8012 Fax: (907) 276-7178



FAX COVER SHEET

To: Trustee Council Number:

From: James Ayers Date: 4-14-94

Comments: Total Pages: 2

The following is a memo forwarded to Rod Kuhn, E.I.S. Project Manager, on April 13.

Pls. deliver to the TC member in your office. Thank You.

FAX COMPLETE

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

MEMORANDUM

TO: Sandy Rabinowitch, DOI
Tony DeGange, USFWS
Leslie Holland-Bartles, NBS

FROM: James R. Ayers
Executive Director

DATE: April 11, 1994

RE: Project #94102/Marbled Murrelet Prey and Foraging Habitat in PWS - Authorization

---

The purpose of this memorandum is to formally approve work to proceed on Project #94102/Marbled Murrelet Prey and Foraging Habitat in PWS, as described in the DPD, with the understanding that the work effort will be modified as recommended by the Chief Scientist in his memorandum dated April 7 (attached). In particular, these study modifications include that:

1. the proposed lipid analysis will be eliminated; and

2. the Principle Investigator will examine substituting non-lethal dietary analysis techniques (live capture and regurgitation).

With respect to the second issue, it is my understanding that the project DPD, as presented for peer review, called for the collection (i.e., killing) of 30 murrelets. As a general matter, the Trustee Council has not looked favorably upon methods that involve the sacrifice of already damaged resources. While I recognize that there may well be valid and important justifications for "taking" 30 murrelets, this element of the project should not proceed prior to my being personally briefed on this aspect of the study and persuaded that the alternative technique of capture and regurgitation will not reasonably accomplish the research objectives.

JRA/mir
Attachment: Spies to Ayers, memo dated April 7

cc: David Irons, Project Manager, DOI-USFWS
Karen Oakley, DOI-USFWS
Eric Myers, Anchorage

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

MEMORANDUM

TO: Sandy Rabinowitch, DOI
Tony DeGange, USFWS
Leslie Holland-Bartles, NBS

FROM: James R. Ayers
Executive Director

DATE: April 11, 1994

RE: Project #94102/Marbled Murrelet Prey and Foraging Habitat in PWS - Authorization

---

The purpose of this memorandum is to formally approve work to proceed on Project #94102/Marbled Murrelet Prey and Foraging Habitat in PWS, as described in the DPD, with the understanding that the work effort will be modified as recommended by the Chief Scientist in his memorandum dated April 7 (attached). In particular, these study modifications include that:

1. the proposed lipid analysis will be eliminated; and

2. the Principle Investigator will examine substituting non-lethal dietary analysis techniques (live capture and regurgitation).

With respect to the second issue, it is my understanding that the project DPD, as presented for peer review, called for the collection (i.e., killing) of 30 murrelets. As a general matter, the Trustee Council has not looked favorably upon methods that involve the sacrifice of already damaged resources. While I recognize that there may well be valid and important justifications for "taking" 30 murrelets, this element of the project should not proceed prior to my being personally briefed on this aspect of the study and persuaded that the alternative technique of capture and regurgitation will not reasonably accomplish the research objectives.

JRA/mir
Attachment: Spies to Ayers, memo dated April 7

cc: David Irons, Project Manager, DOI-USFWS
Karen Oakley, DOI-USFWS
Eric Myers, Anchorage

APPLIED
marine
SCIENCES

April 7, 1994

TO: James Ayers
Executive Director

FROM: Robert B. Spies
Chief Scientist

THRU: Eric Myers

RE: Projects 94102 and 94173

Project 94102 ("Marbled Murrelet Prey and Foraging Habitat in Prince William Sound, Alaska, in Summer") and Project 94173 ("Pigeon Guillemot Recovery Monitoring") were delivered to my office with a request to expedite the peer-review process. The DPDs for these projects arrived in our office on March 24, and the reviews for both of these projects have been received.

As we have agreed, I plan to provide a formal recommendation for each project that summarizes the purpose of each study and its relationship to restoration management objectives. Given the extensive work currently underway with regards to Project 94320, I have not yet completed the formal recommendations. I do plan to recommend that both projects go forward, however, and given their time sensitive nature I thought this informal recommendation might allow the projects to proceed.

Project 94102 ("Marbled Murrelet Prey and Foraging Habitat in Prince William Sound, Alaska, in Summer"): Murrelets are the most abundant seabird in PWS the summer, although as with many seabirds their numbers have declined significantly since the early 1970s. Murrelets were injured by the spill, and the goal of this project is to determine if food is limiting the recovery of marbled murrelets in PWS. The peer reviewer has pointed out correctly that there are unavoidable confounding factors that will cast doubt on the conclusions of this study. For example, 75% of the murrelets leave PWS in the winter for sites unknown, and mortality there could be limiting observed recovery in PWS. In addition, marbled murrelets make solitary nests high in trees and it is not feasible to directly measure their reproductive success. This study will attempt to develop indices of reproductive success (such as counts of fledged juveniles at sea).

Without studies such as this, we will have little knowledge to track recovery or effect restoration of marbled murrelets. I have discussed the peer reviewer's concerns and my own with Dr. David Irons (Project Manager), and I believe he will integrate these thoughts into the Project. The study will also be carefully integrated with the forage fish project (94163), which should provide the ability to correlate forage fish availability with murrelet foraging locations, foraging behavior, and possibly reproductive success indices. This project proposes to take 30 marbled murrelets (out of a summer population of 100,000). The USF&WS is considering alternate techniques for diet analysis (capture and regurgitation). The proposed lipid analysis is very experimental, and I believe such experimentation is better suited to birds with more varied diets such as pigeon guillemots.

Consequently, I recommend the project go forward as described except that the lipid analysis be eliminated, and the principal investigator consider substituting non-lethal dietary

analysis techniques. I also recommend that the principal investigator share GIS data with the SEA investigators, and obtain relevant data from that study for use in his own GIS analyses.

Project 94173 ("Pigeon Guillemot Recovery Monitoring"): Pigeon guillemots were injured by the spill, and are also among the group of seabirds with declining populations since the 1970s. This project will examine the important factors limiting guillemot recovery, including food availability and predation. The reviewer's key concern here was that guillemots eat a variety of prey, making it difficult to determine if a change in one prey resource (e.g., forage fish) is related to observed changes in reproductive success. I agree that it is unlikely that we will obtain unambiguous information regarding the linkages between pigeon guillemot populations and forage fish distributions, and I plan to consider this issue carefully in review of the forage fish study. The reviewer also pointed out that previous data suggest that predation may be a very important factor affecting guillemot recovery, and that experiments to study predation may yield less ambiguous information.

As with the marbled murrelets, however, pigeon guillemots are an injured resource about which we have very little information for purposes of restoration. If through this study we develop an understanding of factors limiting pigeon guillemot recovery, we could design restoration strategies to bolster recovery of this injured resource. Consequently, I recommend that this project go forward as described with the condition that the principal investigator consider all ways that might strengthen the data obtained from the study regarding predation as a factor limiting guillemot recovery.

As you are aware, the analysis that the peer reviewers and I have provided these Detailed Project Descriptions is focused upon their technical merit. I recommend that each project be given a budgetary review in addition to the technical review provided by my office.

Exxon Valdez Oil Spill Trustee Council

Restoration Office
645 G Street, Suite 401, Anchorage, Alaska 99501-3451
Phone: (907) 278-8012 Fax: (907) 276-7178

MEMORANDUM

TO: Public Advisory Group Members

FROM: Molly McCammon
Director of Operations

DATE: April 8, 1994

RE: Trustee Council meeting on April 11

Attached you will find an agenda for an April 11 teleconferenced meeting of the Trustee Council. As you can see, this is a continuation of the Trustee's January 31 meeting, and will be chaired by the USFS in Juneau. The agenda includes a number of briefings on specific issues, a comprehensive review of Project 94320 - the Prince William Sound System Investigation, requests for supplemental funding for two already approved projects, and consideration of two new projects (one for subsistence planning and one for harlequin duck surveys).

The April 11 meeting is being teleconferenced in Juneau at the federal building, in Anchorage at the 645 G site, and in Cordova. You may also request any other state LIO site to be hooked up to the teleconference.

Based on discussions with Doug Mutter, it appears it may be useful to have a PAG meeting sometime in late June or early July. There are a number of items the PAG needs to be briefed on. They include: the Draft EIS for the Draft Restoration Plan, the status of Habitat Protection and Acquisition activities, the Implementation Management Structure and Research and Monitoring Priorities now under development, as well as proposals for the Draft FY95 Work Plan that will have been submitted. In the meantime, if you have any questions about any of these items, don't hesitate to give me a call.

cc: Jim Ayers
Doug Mutter

Exxon Valdez Oil Spill Trustee Council

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

MEMORANDUM

TO: Dr. Bob Spies, Chief Scientist

FROM: James R. Ayers
Executive Director

DATE: April 11, 1994

RE: Trustee Council Research Projects - Collecting of Animals

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The purpose of this memorandum is to formalize my request that you please bring to my attention any Trustee Council sponsored study plan that calls for the collection (i.e., killing) of birds or mammals as part of the proposed Detailed Project Description (DPD) study design.

As a general rule, the Trustee Council has not looked favorably upon methods that involve the sacrifice of already damaged resources without substantial documentation from the Chief Scientist and peer reviewers that this taking is scientifically sound and is critical to the recovery of the injured species. I will want to be personally informed of those projects that propose such methods and will want to know that there are not alternative methods available to accomplish the research objectives prior to final approval of the DPD.

JRA/mir

cc: Restoration Work Force
[ ] Byron Morris, NOAA
[ ] Jerome Montague, ADF&G
[ ] Dave Gibbons, USFS
[ ] Sandy Rabinowitch, DOI
[ ] Mark Brodersen, ADEC
[ ] Veronica Gilbert, ADNR

Exxon Valdez Oil Spill Trustee Council

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

MEMORANDUM

TO: Dr. Bob Spies, Chief Scientist

FROM: James R. Ayers
Executive Director

DATE: April 11, 1994

RE: Trustee Council Research Projects - Collecting of Animals

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MEMORANDUM

TO: Sandy Rabinowitch, DOI
Tony DeGange, USFWS
Leslie Holland-Bartles, NBS

FROM: James R. Ayers
Executive Director

DATE: April 11, 1994

RE: Project #94173/Pigeon Guillemot Monitoring - Authorization

---

The purpose of this memorandum is to formally approve work to proceed on Project #94173/Pigeon Guillemot Recovery Monitoring, as described in the DPD, with the understanding that the principal investigator will be making a specific effort to strengthen the data obtained regarding predation as a factor limiting recovery as recommended by the Chief Scientist in his memorandum date April 7 (attached).

JRA/mir

Attachment: Spies to Ayers, memo dated April 7

cc: David Irons, Project Manager, DOI-USFWS
Karen Oakley, DOI-USFWS
Eric Myers, Anchorage

Exxon Valdez Oil Spill Trustee Council
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MEMORANDUM

TO: Sandy Rabinowitch, DOI
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JRA/mir

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cc: David Irons, Project Manager, DOI-USFWS
Karen Oakley, DOI-USFWS
Eric Myers, Anchorage

APPLIED
marine
SCIENCES

April 7, 1994

TO: James Ayers
Executive Director

FROM: Robert B. Spies
Chief Scientist

THRU: Eric Myers

RE: Projects 94102 and 94173

Project 94102 ("Marbled Murrelet Prey and Foraging Habitat in Prince William Sound, Alaska, in Summer") and Project 94173 ("Pigeon Guillemot Recovery Monitoring") were delivered to my office with a request to expedite the peer-review process. The DPDs for these projects arrived in our office on March 24, and the reviews for both of these projects have been received.

As we have agreed, I plan to provide a formal recommendation for each project that summarizes the purpose of each study and its relationship to restoration management objectives. Given the extensive work currently underway with regards to Project 94320, I have not yet completed the formal recommendations. I do plan to recommend that both projects go forward, however, and given their time sensitive nature I thought this informal recommendation might allow the projects to proceed.

Project 94102 ("Marbled Murrelet Prey and Foraging Habitat in Prince William Sound, Alaska, in Summer"): Murrelets are the most abundant seabird in PWS the summer, although as with many seabirds their numbers have declined significantly since the early 1970s. Murrelets were injured by the spill, and the goal of this project is to determine if food is limiting the recovery of marbled murrelets in PWS. The peer reviewer has pointed out correctly that there are unavoidable confounding factors that will cast doubt on the conclusions of this study. For example, 75% of the murrelets leave PWS in the winter for sites unknown, and mortality there could be limiting observed recovery in PWS. In addition, marbled murrelets make solitary nests high in trees and it is not feasible to directly measure their reproductive success. This study will attempt to develop indices of reproductive success (such as counts of fledged juveniles at sea).

Without studies such as this, we will have little knowledge to track recovery or effect restoration of marbled murrelets. I have discussed the peer reviewer's concerns and my own with Dr. David Irons (Project Manager), and I believe he will integrate these thoughts into the Project. The study will also be carefully integrated with the forage fish project (94163), which should provide the ability to correlate forage fish availability with murrelet foraging locations, foraging behavior, and possibly reproductive success indices. This project proposes to take 30 marbled murrelets (out of a summer population of 100,000). The USF&WS is considering alternate techniques for diet analysis (capture and regurgitation). The proposed lipid analysis is very experimental, and I believe such experimentation is better suited to birds with more varied diets such as pigeon guillemots.

Consequently, I recommend the project go forward as described except that the lipid analysis be eliminated, and the principal investigator consider substituting non-lethal dietary

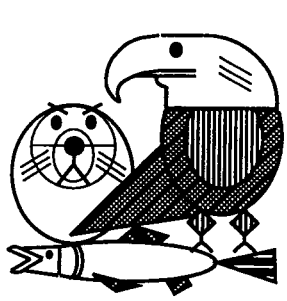
analysis techniques. I also recommend that the principal investigator share GIS data with the SEA investigators, and obtain relevant data from that study for use in his own GIS analyses.

Project 94173 ("Pigeon Guillemot Recovery Monitoring"): Pigeon guillemots were injured by the spill, and are also among the group of seabirds with declining populations since the 1970s. This project will examine the important factors limiting guillemot recovery, including food availability and predation. The reviewer's key concern here was that guillemots eat a variety of prey, making it difficult to determine if a change in one prey resource (e.g., forage fish) is related to observed changes in reproductive success. I agree that it is unlikely that we will obtain unambiguous information regarding the linkages between pigeon guillemot populations and forage fish distributions, and I plan to consider this issue carefully in review of the forage fish study. The reviewer also pointed out that previous data suggest that predation may be a very important factor affecting guillemot recovery, and that experiments to study predation may yield less ambiguous information.

As with the marbled murrelets, however, pigeon guillemots are an injured resource about which we have very little information for purposes of restoration. If through this study we develop an understanding of factors limiting pigeon guillemot recovery, we could design restoration strategies to bolster recovery of this injured resource. Consequently, I recommend that this project go forward as described with the condition that the principal investigator consider all ways that might strengthen the data obtained from the study regarding predation as a factor limiting guillemot recovery.

As you are aware, the analysis that the peer reviewers and I have provided these Detailed Project Descriptions is focused upon their technical merit. I recommend that each project be given a budgetary review in addition to the technical review provided by my office.

Exxon Valdez Oil Spill Trustee Council
Restoration Office
645 G Street, Suite 402, Anchorage, Alaska 99501
Phone: (907) 278-8012 Fax: (907) 276-7178



Date: April 11, 1994
Subject: Trustee Council Meeting Actions on 4/11/94
Contact: L.J. Evans or Molly McCammon at 278-8012

Interdisciplinary Ecosystem Research and Restoration Effort Moves Forward

Anchorage – The Trustee Council today gave their final go ahead on one element of an ambitious approach to implementing ecosystem-based restoration in the oil spill-affected region.

With their approval of the Project 94320: Prince William Sound System Investigation, which consists of 16 integrated and interrelated sub-projects, the Trustees will address a number of important research questions. The findings will be used to:

- Guide further restoration activities
- Improve management of common property fishery resources as a means of effecting restoration
- Identify important marine resources and processes for long-term recovery monitoring.

"Taking an ecosystem approach means that we examine several key indicator species and use that information to tell us more about the whole ecosystem which was injured by the spill," said Jim Ayers, Executive Director for the Trustee Council. "In this case, we're looking at a number of species, with the focus particularly tuned in to try to understand what has caused the serious problems with pink salmon populations in Prince William Sound."

The Trustee Council decided last year upon an ecosystem approach to restoration of resources injured by the 1989 *Exxon Valdez* oil spill after extensive scientific review and public comment. The Prince William Sound System

More...

Investigation program is one of the steps the Trustees are taking in that direction, Ayers said.

"This project represents a valid, defensible, sophisticated ecosystem approach to understanding the factors controlling pink salmon production in Prince William Sound to help guide the Trustee Council's Restoration activities," said Chief Scientist Dr. Robert Spies. "It can also provide valuable information about the biological oceanography of the northern Gulf of Alaska, and in this way will contribute to resource management throughout the oil spill area."

At their January 31 meeting the Trustee Council conditionally approved the System Investigation, with a budget of $6.25 million, subject to integration and coordination of the sub-projects and a favorable scientific review of the Detailed Project Descriptions. After thorough scientific and budget review, the sub-projects as conceived in January were further refined and came to the Trustee Council today as a complete package.

Ayers said that the Chief Scientist has worked with the lead researchers for each of the projects to identify the specific work products and "milestones" that can be used to asses the success of the project's first year of implementation. A scientific review of these milestones is planned in mid-September 1994 and in January 1995 to evaluate the success of the program and to determine which aspects should be modified in the coming year.

The Trustees affirmed Dr. Ted Cooney to serve as the lead scientist for implementation of the Prince William Sound System Investigation for this year. Dr. Cooney is Associate Professor of Marine Sciences at the University of Alaska Institute of Marine Science. His area of specialty is salmon oceanography and zooplankton ecology.

In other actions taken, the Trustees today:

- Approved funding of $97.7 thousand for Project 94191/Oil Related Egg & Alevin Mortality, to replicate the results of studies in 1993 which found heritable genetic damage in pink salmon.
- Approved funding of $83.0 thousand for completion of an Environmental Impact Statement for Project 94199/Institute of Marine Science Improvements at Seward.
- Approved funding of $99.2 thousand for Project 94428/Subsistence Restoration Planning to design and implement a one-time planning

More...

process to identify subsistence restoration project proposals and to ensure the participation of subsistence users in planning efforts.

- Approved funding of $20.4 thousand for Project 94427/Harlequin Duck Boat Surveys & Methodology Testing to devise and test field methodologies for determining impacts of the oil spill on harlequin ducks.

The next meeting of the Trustee Council is expected to take place in June . The *Exxon Valdez* Oil Spill Trustee Council consists of six representatives, three from the State of Alaska and three from the U.S. Government. The Trustees manage funds obtained in the 1991 civil settlement with Exxon Corporation.

For more information, contact the Oil Spill Public Information Center at 645 G St., Suite 100, Anchorage, Alaska 99501, or call 278-8008, toll-free within Alaska at 1-800-478-7745.

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Exxon Valdez Oil Spill Trustee Council

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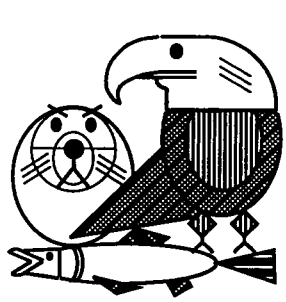

Date: April 11, 1994
Contact: L.J. Evans or Molly McCammon at 278-8012

Project 94320: Prince William Sound System Investigation
FACT SHEET

Background

The Trustee Council sponsored a workshop in Cordova in December 1993 to begin developing an ecosystem approach to restoration. The major objectives of the workshop were to consult national experts and experienced local scientists in designing a multi-disciplinary study of the Prince William Sound marine ecosystem, and to review and critique an ecological study plan – the SEA Plan – already prepared by the Prince William Sound Fisheries Ecosystem Planning Research Group.

The outcome of that workshop was recommendations from the scientists endorsing the SEA plan as a good starting point. Specifically the workshop Steering Committee said that (1) the SEA plan contained an innovative, reasonable, and scientifically-testable hypothesis to explain how certain ecological processes may control fluctuations of key fisheries resources in Prince William Sound, and (2) the ecological approach described in the SEA plan could form the basis of a program that would make an important scientific contribution to the Trustee's mission of restoring a healthy, productive, and biologically diverse ecosystem within the spill area.

The relevance of the SEA Plan to the Trustee's restoration mission led to the development of specific project proposals as the Prince William Sound System Investigation (Project 94320) for the 1994 Work Plan. At their January 31, 1994 meeting, the Trustees approved interim funding for several time-sensitive aspects of the proposal, such as vessel charters which needed to be negotiated in order to conduct field work this spring. After extensive review by the Executive Director, the Chief Scientist, and peer reviewers, the detailed project descriptions and budgets were modified as needed and incorporated in the project for review and today's decision by the Trustee Council.

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Specific Analyses of Each Component of Project 94320
From the Chief Scientist's Recommendations

94320-A: Salmon Growth & Mortality

The purpose of this project is to: (1) estimate the growth of juvenile pink salmon in 1994 and compare the rates to past years, (2) describe their migration through PWS, (3) estimate their diet and compare it to past years, (4) determine the role of food abundance in limiting growth, (5) evaluate past relationships between juvenile growth rates and fry-to-adult survival, and (6) develop techniques to estimate mortality of juveniles in PWS and the Gulf of Alaska. There may be a predictable relationship between food availability to juveniles, juvenile growth rates and survival from juvenile to adult. This project will continue to explore these relationships and in the context of the other studies, particularly those on salmon predation and zooplankton abundance, help improve our understanding of the main factors that determine adult returns.

94320-B: Coded Wire Tag Recoveries from Pink Salmon in Prince William Sound

The purpose of this study is to recover coded wire tags from pink salmon caught by commercial fishermen, researchers, and others. The recovery of the tags and subsequent analyses will provide, among other objectives, data regarding (1) the contribution of tagged hatchery stocks to the commercial harvest, and (2) the growth and marine survival rates of tagged hatchery stocks. These data are quite valuable to fisheries managers, and used for both planning and in-season regulation. The data on salmon growth and survival will also be used in conjunction with data from salmon predation, oceanographic, and zooplankton studies to test the basic hypothesis regarding factors controlling pink salmon production in Prince William Sound.

94320-C: Otolith Marking: In–Season Stock Separation

This study uses oxytetracyline for marking the otoliths (ear bones) of juvenile pink salmon as a technique to help to determine the degree of staying of wild and hatchery fish.

More...

94320-D: Genetic Structure of Pink Salmon Stock

The objective of this project is to define the genetic structure of pink salmon stocks in PWS. Potential sources of variation include stream-to-stream differences, even and odd-year stocks, upstream and intertidal spawners, and early and late-season spawners. The program proposes to evaluate a series of analyses of allozyme frequencies in fish from a wide geographic range and from two hatcheries and apply a series of statistical measures to determine if different allele frequencies exist, the extent of the difference, and, if there are systematic differences, to construct measures of genetic distances between substocks. In addition a pilot study using DNA techniques will be carried out using mitochondrial DNA.

94320-E: Salmon Predation

The purpose of this project is to: (1) determine the role that variable predation plays in overall survival of pink salmon, and (2) identify and describe the predators and mechanisms of predation under various conditions. This is an ambitious program that will track cohorts of juvenile pink salmon after they are released into PWS, attempt to identify their predators, and examine the mode of interaction of predators with the juvenile fish. This involves a highly coordinated group of vessels using state-of-the-art hydroacoustic equipment to track the juvenile fish and their predators as the fish progress from the Esther Island hatchery towards the southeast passages from PWS to the Gulf of Alaska. At the same time there will be real-time sampling of oceanographic conditions, plankton abundance, predators and the juveniles themselves.

94320-F: Trophic Interactions of Harbor Seals

This project is a small but potentially important part of the overall investigation. The objective of this portion of the project is to determine if links between various food sources and the harbor seal population in PWS can be established either by use of lipid-specific analysis or analysis of stable isotope ratios. The technique being proposed is a relatively new application using lipid markers to indicate food sources in marine food webs.

94320-G: Plankton Dynamics: Phytoplankton and Nutrients

The objective of this part of the program will be to: (1) describe the spatial and temporal extent of the spring-summer phytoplankton bloom in PWS, (2)

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measure phytoplankton primary productivity, (3) identify the major species comprising the bloom, and (4) describe the distribution and abundance of the dissolved inorganic nutrients important to phytoplankton growth. Besides the obvious importance of this program for describing the primary production that eventually supports larval fish growth and production, this program will be making a major contribution in itself to basic understanding of the PWS system. There has simply been very little work done in this area and this study will be a pioneering one in phytoplankton dynamics of PWS.

94320-H: The Role of Zooplankton in the Prince William Sound Ecosystem

The purpose of this project is to: (1) determine the timing, duration and magnitude of the bloom of mixed layer zooplankton stocks in western and northern PWS in the spring and summer, (2) determine how changes in vertical distribution of zooplankton affect their predators, (3) provide estimates of zooplankton abundance to calibrate the acoustic instrumentation used to locate and track swarms and patches of zooplankton in PWS, (4) determine the coupling of the phytoplankton and zooplankton blooms, and (5) provide taxonomic assistance with identification of zooplankton. The main goal of the project is to test the "River-lake" hypothesis which postulates that in years when PWS is swept continuously by buoyancy-driven coastal currents during the spring plankton bloom, food for juvenile fish is poor, and in years when PWS is not so swept — a "lake" year — there are better feeding conditions for juvenile pink salmon. A second and related hypothesis, "prey switching," is that certain fish that feed on zooplankton in "lake" years, when they are abundant, become predators of juvenile pink salmon instead in "river" years when zooplankton are less abundant.

94320-I: Confirming Food Web Dependencies in the Prince William Sound Ecosystem using Stable Isotope Tracers

The objective of this project is to use the predictable shifts in stable isotope ratios of carbon and nitrogen that occur with increasing trophic level to determine if the river-lake and prey switching hypotheses described above can be confirmed. As both of these elements are cycled further up the food chain the heavier natural isotopes (^{13}C and ^{15}N) become relatively less abundant. Such shifts are easily measured and shifts of these isotopes in predatory fish during various types of years — "river' or "lake" — provide a

More...

novel way to test these hypotheses. This represents a new application of stable isotope ratios.

94320-J: Information Systems and Model Development

This study component is the data and information management element for all the major portions of 94320. The major objectives of this component are (1) to process the data developed by all parts of the project (including available satellite imagery), (2) integrate these data using geographic coordinates and date of collection, (3) adapt an existing computer interface for use by principal investigators for data analysis and interpretation, and (4) plan for the development of a numerical model of the Prince William Sound ecosystem in future years. This program component also includes purchase and modification of the aquashuttle sampling device for biological oceanography, and establishment of a high-speed Internet connection to Cordova for data transmission and analysis.

94320-K: Experimental Fry Release
94320-L: Experimental Manipulation

Standard approaches to aquaculture used previously will again be employed to raise pink salmon fry from eggs. The juveniles will be released from the hatchery after attaining specified sizes, at certain times in relation to plankton abundance and at certain places. By releasing tagged lots and having a juvenile sampling and tag recovery component in other parts of this program it will be possible to do "natural experiments" whose outcome will point to conditions that are optimal for survival of juveniles.

94320-M: Observational Physical Oceanography in PWS & the Gulf of Alaska

The purpose of this project is to: (1) determine the structure and variability of the climatic patterns and oceanographic features in PWS and the Gulf of Alaska, (2) determine the relationship between the atmospheric forcing and the wind and buoyancy-driven ocean currents, (3) determine how currents act to disperse or retain food resources, (4) and determine the relationship between climatic and oceanographic cycles, physical features and changes in abundance of important species. The basic oceanographic processes that influence the abundance of fish food resources will be studied through charting currents and physical structure of the water in relation to biological

More...

phenomenon. This provides the physical evidence for testing the "River-Lake" hypothesis. The basic measurements will be conducted with conductivity/temperature/depth measurements, acoustic doppler current profilers and chemical analyses of water samples. In addition, towed vehicles with attached instruments will provide the "sections" needed to further characterize water structure. In the future the use of permanent buoys will be considered to supplement these other data gathering modes. The investigator has requested and received assurances that continuing advice from other oceanographers regarding fruitful approaches to measuring physical processes on a scale appropriate to biological resources will be made available.

94320-N: An Ecosystem Research plan for PWS Nearshore Fish

The purpose of this project is to: (1) evaluate the distribution of macrozooplankton in PWS in real time in order to describe the prey field for juvenile pink salmon, and (2) describe the distribution of predators of juvenile fish in real time. This will be an integral part of the complex field studies centered around fry releases in northwestern PWS and provides an important part of the biological picture for the purposes of coordinating net sampling of predators and zooplankton. The investigator faces the challenge of ground truthing the measurements of zooplankton by hydroacoustical methods against the more conventional methods. There is considerable controversy on the ability of single-frequency hydroacoustic equipment to quantitatively measure zooplankton and this is, therefore, a challenging area on the cutting edge of biological oceanography for the investigators. To be convincing, data interpretation will need to rely whenever possible on simultaneous net and hydroacoustic data for zooplankton abundance.

94320-P: Program Management

This program element provides funding for program management in order to ensure that appropriate planning and communication, among and between agencies and researchers, as well as community involvement takes place.

94320-Q: Avian Predation on Herring Spawn

The purpose of this study is to assess the impact of avian predation on herring spawn, with the goal of integrating this information into a model to

More...

predicts herring embryo survival. Better information regarding factors influencing the mortality of herring eggs should improve our ability to predict the spawning biomass of herring in Prince William Sound. The investigators will use avian census techniques to compare bird densities at sites of low and high density of egg deposition in different habitat types. Predator exclusion techniques will attempt to quantify predation from different sources. In this first year, the project will be limited to herring spawning sites along the northeastern shore of Montague Island.

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Exxon Valdez Oil Spill Trustee Council

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

MEMORANDUM

TO: Jerome Montague, ADF&G
Byron Morris, NOAA

FROM: James R. Ayers
Executive Director

DATE: April 7, 1994

RE: Project #94191/Egg and Alevin Mortality - Authorization

The purpose of this memorandum is to authorize work to proceed on Project #94191 (Egg/Alevin Mortality) consistent with the changes recommended by the Chief Scientist in the attached memorandum dated April 1, 1994.

Please note especially the specific changes on page 3. I would appreciate your written response to each of these study design changes to indicate how you plan to proceed together with appropriate revisions to the project budget as a result of the change in project scope.

As you appreciate, the work being done under this project is some of the most important research being supported by the Trustee Council. In particular, I refer to the work that resulted in last years findings indicating inheritable genetic damage to pink salmon. These are startling findings that were not anticipated at the time of the Settlement. Work on this project deserves strong support in order to determine the full extent of spill related damages.

JRA/mir

Attachment: Spies to Ayers Memo Dated April 1, 1994

cc: Molly McCammon, Director of Operations, Anchorage
Eric Myers, Anchorage
Jeep Rice
Sam Scharr
Jim Seeb
Bob Spies, Chief Scientist, Applied Marine Sciences
Joe Sullivan
Craig Tillery, Department of Law

APPLIED
marine
SCIENCES

April 1, 1994

TO: James Ayers
Executive Director

FROM: Robert B. Spies
Chief Scientist

CC: Molly McCammon
Byron Morris
Jeep Rice
Jerome Montague
Jim Seeb
Sam Scharr

RE: Review of Project 94191, Oiled Related Egg and Alevin Mortalities

Purpose of Study

Past investigations of damage to pink salmon as a result of the oil spill have indicated that (1) eggs and larvae in oiled streams had lower survival than those from unoiled streams, (2) that this difference has persisted despite a vast reduction in the concentrations of hydrocarbons in the oiled streams, and (3) this difference is apparently the result of an inherited genetic difference between fish returning to oiled and unoiled streams. This study will continue to monitor recovery of pink salmon embryos and fry in the field, verify the inheritable differences documented last year and use cytogenetic techniques to look for the presence of genetic aberrations, and conduct a controlled laboratory experiment to determine if genetic damage can be induced by exposing fertilized pink salmon eggs to crude oil.

Relation to Restoration Management Objectives

This project will document the recovery of pink salmon populations injured by the spill, which is an important trend to be monitoring to assess the progress of restoration. The project will also verify a surprising discovery that the inferior survival of populations in oiled streams is inheritable, and conduct laboratory experiments to determine if this damage is due to oil exposure. Verifying genetic damage from oil exposure would imply a continuing impact on the wild pink salmon of Prince William Sound. This has important implications for restoration, as historic escapements may not be sufficient to maintain genetically damaged populations.

Analysis

Component A of the project, field monitoring of egg and fry survival, is the continuation of past recovery monitoring. This component received strong support from reviewers, and is important for maintaining our up-to-date knowledge of the recovery of damaged salmon populations.

In component B of the study pink salmon gametes will be collected from fish in oiled and unoiled streams. Fertilization and rearing will take place in a controlled laboratory environment to verify last year's startling finding that decreased egg survival in oiled streams exists even when the eggs are not exposed to the contaminated stream environment. This finding underlies the claims of inheritable genetic damage to the pink salmon populations in oiled streams, and it is important that this study be conducted.

Component C is the continuing laboratory study to verify injury to pink salmon eggs and pre-emergent fry exposed to crude oil during incubation. This component includes several experimental endpoints, and review of the proposal raised important questions about some of these measurements. The rationale for this study component is sound, as verifying that exposure to crude oil can produce the effects documented last year (and, it is assumed, in component B) will provide robust proof of the genetic difference between the fish from oiled and unoiled streams. Randomly obtained fertilized eggs will be exposed to different doses of crude oil, and samples taken during development for genetic, mixed-function oxidase (MFO), histopathological, and hydrocarbon analyses. Fry from these incubations will be reared to maturity, and their gametes incubated without exposure to oil. Consequently, decreased survival will be due to inherited characteristics from oil exposure only, not a function of environmental factors

There are questions about the measurements that are proposed to quantify injury in this experiment. First, the measurement of MFO does not seem warranted. This will only document exposure to crude oil, which seems unnecessary in a dosing study, especially given the fact that hydrocarbon concentration in the various stages of development will also be measured. The principal investigators should also provide justification for the histopathological measurements.

Second, the measurement of genetic damage, flow cytometry, does not seem appropriate for the experiment. Flow cytometry measures large changes in DNA, and is not well-suited to determining the subtle changes expected from exposure to crude oil. Our expert reviewer suggests that if genetic damage of the level that can be measured by flow cytometry occurred in 1989 in fish in oiled streams, it is unlikely that these fish would survive to reproductive age in order to pass this damage on to the next generation.

The reviewer has suggested three polymerase chain reaction (PCR) based techniques to measure genetic damage, which should provide orders-of-magnitude more sensitivity than flow cytometry. These techniques, although not commonly used in aquatic toxicology, are well-established in biomedical research, and can be used on archived tissue as well as fresh samples. These techniques include analyses of mitochondrial DNA, use of gene probes, and single stranded conformational polymorphism analysis. Discussion with the principal investigators indicates that they are investigating the use of PCR-based techniques, and recognize the value of these techniques for this study. They will begin to phase these techniques into the project, and have requested a meeting for peer review of the study occur in mid-October.

Finally, there remains a question regarding the whether the differences in survival that have been measured in the field, which are the basis of the injury, existed prior to the oil spill. There may be some geographic bias in the location of oiled and unoiled streams that may introduce differences in these two groups besides oiling in 1989. Or, there is a possibility of straying of hatchery fish unequally into the oiled and unoiled wild populations. These questions introduce potential confounding factors into the interpretation of research results.

Recommendation

I recommend that Project 94191 be approved with the following changes:

1. MFO analyses should be eliminated, as they do not contribute information that will be valuable for restoration. Histopathology measurements should also be eliminated unless the principal investigators can justify their inclusion.

2. The one person-year of effort for flow cytometry should be scaled back to 2-3 person-months, with the remaining resources being put into PCR-based analyses of genetic damage. The PCR-based analyses of mitochondrial DNA, a technique already on-line in fisheries genotoxicology, should be considered as the first priority for PCR analyses.

3. A program review involving the principal investigators, key peer reviewers, and myself should occur in early October. The results of the review should be considered in decisions regarding relevant portions of the 1995 workplan.

I would request a written response from the principal investigators regarding their implementation of the above recommendations. In addition, the principal investigators should consider the existence of factors that confound the interpretation of the observed changes oil-related, and suggest experiments that might eliminate these questions. I am happy to assist them in obtaining additional advice from key peer reviewers as appropriate.

Finally, I would like to note that this is one of the better scientific studies supported by the Trustees. The investigators are quite competent, have found something of potentially great importance and are doing a very good job of following up on their findings.

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

MEMORANDUM

TO: Jerome Montague, ADF&G

FROM: James R. Ayers
Executive Director

DATE: April 6, 1994

RE: Project #94320 - PWSAC Hatchery Manipulation

The purpose of this memorandum is to formally authorize you to proceed with funding for the PWSAC Experimental Manipulation (94320-L) and Experimental Release (94320-K) portions of Project #94320/PWS System Investigation as time critical.

As you know, NEPA compliance has been addressed through a Finding of No Significant Impact (FONSI) by the National Marine Fisheries Service on March 28, 1994. In view of the time critical role of the hatchery component of the overall research effort, please proceed as quickly as possible with the funding of this portion of the project effective March 28, 1994.

cc: Mark Brodersen, ADEC
Dave Gibbons, USFS
Veronica Gilbert, ADNR
Molly McCammon, Director of Operations, Anchorage
Byron Morris, NOAA
Eric Myers, Anchorage
Sandy Rabinowitch, DOI

Exxon Valdez Oil Spill Trustee Council

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Phone: (907) 278-8012 Fax: (907) 276-7178

MEMORANDUM

TO: Sandy Rabinowitch, DOI

FROM: James R. Ayers
Executive Director

DATE: April 6, 1994

RE: Project #94041/Introduced Predator Removal - Authorization

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The purpose of this memorandum is to formally approve work to proceed on Project #94041/Introduced Predator Removal as described in the DPD.

As indicated by Karen Oakley/USFWS, expenditure authority for this project is needed immediately in order to meet the R/V Tiglax sailing date of May 13 from Homer. The Chief Scientist has reviewed the DPD and recommends that the project go forward as indicated in the attached memorandum dated April 5. (A more formal recommendation from the Chief Scientist will follow.)

JRA/mir

Attachment

cc: Eric Myers, Anchorage
Bob Spies, Chief Scientist, Applied Marine Sciences

APPLIED
marine
SCIENCES

April 5, 1994

TO: James Ayers
Executive Director

FROM: Robert B. Spies
Chief Scientist

THRU: Eric Myers

RE: Projects 94041 and 94258

Project 94041 ("Introduced Predator Removal from Islands") and Project 94258 ("Sockeye Salmon Overescapement") were delivered to my office with a request to expedite the peer-review process. The DPD for Project 94041 arrived in our office on March 24, and the DPD for Project 94258 arrived on March 10. The reviewd for both of these projects has been received.

As we have agreed, I plan to provide a formal recommendation for each project that summarizes the purpose of each study and its relationship to restoration management objectives. Given the extensive work currently underway with regards to Project 94320, I have not yet completed the formal recommendations. I do plan to recommend that both projects go forward, however, and given their time sensitive nature I thought this informal recommendation might allow the projects to proceed.

Project 94041 ("Introduced Predator Removal from Islands"): The key issue raised by the reviewer was to verify that neither cattle or rats are present on the two islands slated for fox trapping. Cattle destroy bird nesting habitat and crush burrows, and rats are predators on seabirds, so if they are present removing the foxes will not provide a "predator" free habitat for seabirds. The principal investigator has assured Andy Gunther that Simeonof and Chernabura Islands (in the Shumagin Islands) do not contain either cattle or rats. Consequently, I recommend the project go forward as described.

Project 94258 ("Sockeye Salmon Overescapement"): This project is a continuation of a project started during the NRDA process. The project was favorably reviewed by an international panel convened in Vancouver on March 15, 1993. The panel made some recommendations for improvements, which have been incorporated by the principal investigators. Consequently, I recommend the project go forward as described.

As you are aware, the analysis that the peer reviewers and I have provided these Detailed Project Descriptions is focused upon their technical merit. I recommend that each project be given a budgetary review in addition to the technical review provided by my office.

Exxon Valdez Oil Spill Trustee Council

Restoration Office
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MEMORANDUM

TO: Agency Liaisons

FROM: Molly McCammon
Director of Operations

DATE: April 6, 1994

RE: Final review of Project 94320

The teleconferenced review of the final draft recommendation for Project 94320, will be at 11 a.m. Juneau location is NMFS conference room unless you hear otherwise.

Exxon Valdez Oil Spill Trustee Council

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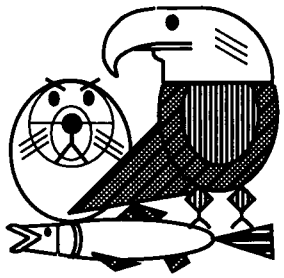
Phone: (907) 278-8012 Fax: (907) 276-7178



MEMORANDUM

To: Simpson Building EVOS Staff

From: Molly McCammon
Director of Operations

Date: April 6, 1994

Subj: Staff Meetings and Other

This is to notify you that staff meetings for all Simpson Building Staff will be held every Monday morning at 9:00 a.m. in the large conference room. These meetings will be short - hopefully about half an hour maximum, and will provide an opportunity for everyone to be informed of all the Trustee Council activities. Since a Trustee Council meeting is already scheduled for Monday April 11, next week's staff meeting will be held on Tuesday, April 12.

In addition, Fish and Game's Personnel Officer, Larae Jones, will be available Tuesday, April 12, from 1:30 - 4:30 p.m. to meet with staff. We will be setting up meetings to discuss such mundane items as filling out time sheets, employee benefits, and other items of general staff assistance. Larae is extremely knowledgeable about these issues, and if you would like to speak with her on an individual basis in addition to the group meetings, this would be a good opportunity to do so.

Exxon Valdez Oil Spill Trustee Council

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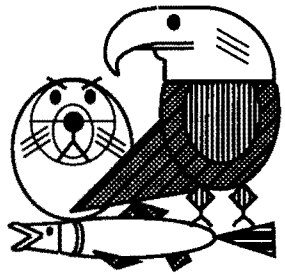

MEMORANDUM

To: Jerome Montague

From: Molly McCammon
Director of Operations

Date: April 6, 1994

Subj: Information About Kodiak Fisheries

Last Friday I received a very irate call from Bruce Schactler, who represents the Kodiak Area K Seiners. Bruce was complaining about the content of our 1994 Status Report, and strongly felt that the concerns and impacts of the oil spill on the fishermen of Kodiak had been completely ignored. He felt that too much emphasis had been placed on the Prince William Sound (PWS) problems, and that the Cook Inlet sockeye problems had been largely caused by Cook Inlet fishermen, rather than the spill.

Bruce believes the Trustees are perpetuating a myth that Kodiak fisheries were unscathed by the oil spill, and that only PWS and Cook Inlet incurred any damages.

I would like by Tuesday, April 12, if possible, the following: 1) a report from you on the status of the Kodiak area fisheries, 2) the impact they received from EVOS, 3) an analysis of their recovery and, 4) any other pertinent information regarding this issue so that I may respond to Bruce's complaint.

If you have any questions about this request, please call me.

cc: Jim Ayers

Exxon Valdez Oil Spill Trustee Council
Restoration Office
645 G Street, Suite 401, Anchorage, AK 99501-3451
Phone: (907) 278-8012 Fax: (907) 276-7178

Note to File
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MEMORANDUM

TO: Jim Ayers, Executive Director
Byron Morris/NOAA
Jerome Montague/ADF&G
Dave Gibbons/USFS
Sandy Rabinowitch/DOI
Mark Brodersen/ADEC
Veronica Gilbert/ADNR

FROM: Molly McCammon, Director of Operations MM

DATE: 4/5/94

SUBJ: Proposed Additional Projects for the FY 94 Work Plan

As of this writing, I am aware of the following five projects that are proposed by agencies for approval as incremental additions to the FY 94 Work Plan by the Trustee Council at the next meeting:

1. Harlequin Duck Boat Survey (ADF&G) Cost: $18.0
Recommended by: ADF&G

This is a new proposal that is an outgrowth of discussions over the past several weeks and calls for limited boat surveys, would test several methods of classifying age and sex composition, and design a sampling program for future efforts. (See Attachment A)

2. Proj #94191/Oil Related Egg & Alevin Mortality (ADF&G) Cost: $97.7
Recommended by: ADF&G and the Chief Scientist

Supplemental funding for project #94191 is needed to replicate the results of studies from last year that found inheritable (genetic) damage in pink salmon. This project is strongly recommended by the Chief Scientist. (See Attachment B)

3. Subsistence Restoration Planning (ADF&G) Cost: $81.9
Recommended by: ADF&G (developed at request of Craig Tillery in conjunction with the Director of Operations)

This is a new project to design and implement a coordinated planning process to identify subsistence restoration project proposals for the FY 95 Work Plan and to ensure the participation of subsistence users in other FY 95 planning efforts. Project ideas that do not become part of the FY 95 Work Plan may be eligible for funding through grants from a $5 million appropriation of Exxon Valdez criminal settlement funds by the Alaska Legislature. (See Attachment C)

4. Proj #94199/IMS at Seward - EIS Process (ADF&G, DOI) Cost: $97.0
Recommended by: ADF&G and DOI

An additional 97.0 is needed to secure NEPA compliance, continue needed consultation among affected agencies, develop an integrated funding approach and prepare a recommendation for formal Trustee Council action on the appropriate level of funding for the project. An incremental $64.0 is needed by the Department of the Interior for EIS coordination and an additional $33.0 is needed by ADF&G. (See Attachment D)

5. Proj #94320-C/Otolith Thermal Mass Marking (ADF&G) Cost: $289.6
Recommended by: ADF&G

As reflected in the attached materials, additional funds are requested to cover the cost of equipment needed to apply otolith thermal marks at four pink salmon hatcheries in PWS. The original budget turned out to be considerably low because: 1) it was mistakenly assumed that boilers and other equipment would be installed inside existing buildings which is not possible due to fire code and lack of space; and 2) larger boilers are needed to ensure that sufficient water can be heated to produce the number of banding "rings" for the thermal banding codes. (See Attachment E)

* * * * *

I am distributing the information I have available at this point in order for the Restoration Work Force to be able to discuss these materials on Wednesday. In order to be sure that these proposals reflect the support of the respective Trustee from the sponsoring agency, a memorandum from that agency will be needed for inclusion in the Trustee Council packet.

Attachment A

Harlequin Duck Boat Survey (ADF&G) Cost: $18.0
Recommended by: ADF&G

MEMORANDUM

State of Alaska
Department of Fish and Game

TO: Jim Ayers
Executive Director
EVOS Restoration Office
Anchorage

DATE: April 4, 1994

FILE:

TELEPHONE NO: 267-2206

THRU: Wayne Regelin
Deputy Director
Division of Wildlife Conservation
Juneau

SUBJECT: Pursuit of 1994 EVOS Harlequin Duck Surveys

FROM: Thomas C. Rothe
Waterfowl Coordinator
Division of Wildlife Conservation
Anchorage

We appreciate your understanding in evaluating the need for more work on harlequin ducks in Prince William Sound (PWS) and for your participation in our meeting on March 22. Based on further discussions, the Department of Fish and Game intends to seek Trustee Council support for a very modest experimental survey effort for harlequin ducks in May and June 1994. We believe this work is essential to ascertain the status of harlequins and design sound monitoring efforts. We also are providing some considerations for work in FY 95 and beyond.

We have been examining two main hypotheses to explain these findings: (1) ingested oil is continuing to cause either mortality and/or sublethal impairment of reproduction; and/or (2) initial mortality caused significant losses to the local western PWS breeding component and subsequent low production. To date, oil has been found in a few harlequins collected during 1989-90 and 1993, and they continue to feed in oiled areas year around. However, we have found no conclusive evidence of histological or physiological effects from oil. As we discussed with Dr. Fry, harlequin ducks may be ingesting oil, but the prospects of detecting any spill related physiological effects are now very remote and probably not worth pursuing.

Regardless of the ultimate cause, collective results of EVOS studies indicate serious population-level concerns for harlequin ducks in western PWS. Up to 1,000 harlequin ducks were killed in the oil spill; breeding season densities of birds have been persistently low; there was almost no breeding effort in western Prince William Sound streams in 1991 and 1992; production of broods has been negligible in the region since 1990; and post-breeding birds aggregating in the PWS spill region may be declining. Prompt focus on specific population parameters is necessary to determine the status and recovery potential of harlequins.

Proposed 1994 Experimental Breeding Bird Survey

In February 1992, an EVOS Harlequin Workshop attempted to develop a hypothetical population model for PWS, but there were no measured population parameters available for application. Harlequin ducks and sea duck populations, in general, are composed of long-lived birds that have delayed sexual maturity, low annual production rates, and "boom and bust" years. Consequently, sea duck population dynamics are quite sensitive to adult survival rates, size of the breeding component, and variable breeding propensity (% of adults breeding annually). Data on sex and age composition are very useful in examining these aspects of a population. To date, EVOS projects have gathered abundance and distribution data only on total harlequin ducks, with little information on sex and age composition, or proportions of paired birds. The focus of these projects has been extensive survey coverage and a diverse array of other time-consuming objectives. Also, efficient techniques for the kind of intensive survey required have not been developed for sea ducks.

More specific information on harlequin duck population structure in PWS is absolutely vital to: (1) estimate post-spill harlequin breeding birds remaining in western PWS, (2) assess potential rates of long-term recovery/increase for the spill region, (3) establish definitive, realistic restoration goals, and (4) monitor a meaningful population parameter for progress toward goals. We believe that pursuit of these data will provide a more reliable basis for restoration planning and be consistent with an adaptive management approach that allows more efficient allocation of efforts and enrichment of knowledge over time. Consequently, we propose to develop survey methods to address these critical needs in 1994 and to recommend appropriate applications as part of the FY 95 monitoring program.

Objectives: (1) conduct limited intensive boat surveys of harlequin ducks in selected shoreline segments (previously surveyed) of western PWS during May and June; (2) test several methods of classifying age and sex composition of harlequin ducks in the region; (3) compare reliability of classification methods and select a viable option; and (4) design a sampling regime to reliably estimate number of adults and/or pairs in the survey region and recommend it for EVOS monitoring plans.

Methods: Shoreline survey segments will be selected in western PWS from areas surveyed during 1991-93 and where sufficient numbers of harlequin ducks are likely to occur. Seasonal sex and age classification criteria will be developed from literature accounts, examination of study skins, and experience of previous investigators in Canada and the U.S. Surveys will be conducted over 1-2 weeks during late May and early June by 2-3 observers from a slow-moving boat within 100 m of shore, ideally during periods and tide stages when harlequins will be most visible. Field classification methods will include visual assessments by multiple observers, photography, videography, and other prospective means of

capturing sex and age data. After field studies are complete, analysis will include quantification of class data from visual observations and other media, comparison and corroboration of data among methods, and statistical description of results.

Operational Resource Needs: This project would be conducted by biologists currently on staff in the ADF&G Waterfowl Program. All primary equipment necessary to conduct the work is in inventory or available on loan; only camera lens or video accessory purchases may be required. Cooperation with other EVOS projects is desireable, but not essential to accomplish project objectives. Funding requirements are estimated on the attached budget sheet.

Rationale for Immediate Work in 1994: We believe that there is substantial support from the Trustees and the public for continued evaluation of harlequin ducks in PWS, based on study results to date and broad publicity about spill damage to the species. Although a full monitoring effort would be ideal in 1994, development of a reliable breeding bird survey is a critical prerequisite to implementing a sound monitoring approach for FY 95. An experimental survey would be a short but intensive effort at low cost this year. Delay until FY 95 would mean experimenting with unproven methods during the short pre-nesting period and preclusion of reliable monitoring data for yet another year.

Considerations for Priority Needs in FY 95 and Beyond

Although assessment of the breeding harlequin population in western PWS is a high priority need, the lack of brood production and apparent decline in post-breeding birds in the region are very important subjects for future monitoring. We are not requesting funds to conduct a July-August survey in 1994, but we believe this should be an important monitoring task in 1995. We will provide input on harlequin ducks for the monitoring plan currently being developed.

During this hiatus in monitoring, it is important that all those involved with EVOS programs realize that there will be no comparative 1994 data for western PWS on: (1) the number of molting/post-breeding harlequins, (2) distribution of molting birds in relation to persistently oiled sites, and (3) annual production of young, indicating recovery or deterioration. Also, Exxon will likely have contractors surveying harlequin ducks in PWS this year and may publicize data on their status and production. During the next few months, we will do our best to present the Trustees with a clear picture of harlequin duck concerns by producing final reports on all previous harlequin studies, working with your staff on evaluating needs for future work, and participating in ecosystem-level planning processes.

cc: Jerome Montague
Joe Sullivan
Dr. Robert Spies

1994 Experimental Harlequin Duck Survey
Proposed Budget

100	Personnel Costs			11,400
	Wildlife Biologist III	0.5 months @ 6.0	3,000	
	Wildlife Biologist II	1.5 months @ 5.6	8,400	
200	Travel and Per Diem			1,800
	Alaska Railroad fares		700	
	Per Diem in Whittier, 10 person-days @ $110		1,100	
300	Contractual Costs			1,500
	Air charter			
400	Supplies and Materials			2,300
	Field food and camp supplies		600	
	Boat fuel		1,200	
	Film, video supplies		500	
500	Equipment			1,000
	Photo/video accessories		1,000	
	TOTAL			18,000

Attachment B

Proj #94191/Oil Related Egg & Alevin Mortality (ADF&G) Cost: $97.7

Recommended by: ADF&G and the Chief Scientist

EXXON VALDEZ TRUSTEE COUNCIL
FY 94 DETAILED PROJECT DESCRIPTION

Project title:	Oil Related Egg and Alevin Mortalities
Project ID number:	94191 - Supplemental
Project type:	Monitoring and Research
Name of project leaders:	Samuel Sharr, Alaska Dept. Fish and Game Jim Seeb, Alaska Dept. Fish and Game
Lead agency:	Alaska Department of Fish and Game
Cooperating agencies: **Other Cooperating Parties:**	National Marine Fisheries Service Washington State University
Cost of project/FY 94: **Cost of project/FY 95:** **Cost of Project/FY 96 and beyond:**	$ 97.7 $128.4 $130.4
Project Start-up/Completion Dates:	October 1, 1994 to September 30, 1996
Geographic area of project:	Prince William Sound

Project leaders:

Sam Sharr (ADF&G) By Brian Bue — 3/18/94 Date

Jim Seeb (ADF&G) By Brian Bue — 3/18/94 Date

Agency project managers:

Joe Sullivan (ADF&G) — 3/18/94 Date

B. INTRODUCTION

This project was included in the 1993 Work Plan under project 93003. At the time proposals were submitted for the 1994 work plan, we elected to discontinue the work proposed here. This decision was based on our perception that oil damages had diminished to an undetectable level; consequently, we believed this work had very little probability of providing additional information on damages. When preliminary results of the 1993 field season were obtained in December of 1993, we found that this project provided strong evidence for the existence of genetic damage. This project will incorporate this work back into the 1994 work plan.

Summary

Elevated embryo mortalities were detected in populations of pink salmon *Oncorhyncus gorbuscha* inhabiting oiled streams following the March 1989 *Exxon Valdez* oil spill (EVOS). These increased rates of mortality have persisted annually through the 1993 field season, three generations after the oil spill, suggesting that genetic damage may have occurred as a result of exposure to oil during early developmental life-stages (Sharr et al. 1994a, 1994b, and in prep; and Bue et al. in press). The consequences of this putative genetic damage include physiological dysfunction and functional sterilization of affected individuals, reducing the reproductive capacity of wild pink salmon populations.

These effects would likely persist in populations of pink salmon for a longer duration than would be observed in other vertebrates because of the tetraploid nature of the salmonid genome. Salmonids evolved through a gene duplication event 25 million years ago (Allendorf and Thorgaard 1984). Pink salmon basically possess a duplicate set of chromosomes (tetraploid instead of diploid); although, some of the duplicates have been lost through subsequent evolutionary processes. However, the extra genes found for many loci would mask deleterious recessive alleles. The effects of these deleterious mutations would be uncovered in the homozygotes formed through the mating of heterozygotes in subsequent generations.

This study will continue to monitor the recovery of pink salmon embryos and provide an assessment of the role that physical stream characteristics played in the damages observed by Sharr et al. (1994a and 1994b) and Bue et al. (in press) in the field. This will be accomplished by collecting pink salmon gametes from oil contaminated and uncontaminated streams in southwestern Prince William Sound (PWS) and incubating them under identical controlled conditions.

History

Pink salmon eggs and fry incubating in the oiled intertidal spawning areas in PrinceWilliam Sound in 1989, 1990, 1991, and 1992 appear to have been adversely affected by EVOS. Oil was deposited in layers of varying thickness in the intertidal portions of streams utilized by spawning pink salmon during the spring of 1989. Pink salmon eggs deposited in 1988 (1988 brood year) emerged as fry through the oiled spawning gravels during the spring of 1989

and began feeding on oiled plankton. These fish showed decreased growth due to oiling (Willette and Carpenter 1993). Although gross oil levels decreased during the summer of 1989, contamination in the intertidal zone was still evident. The pink salmon eggs deposited during the late summer of 1989 (the 1989 brood year) were exposed to intra-gravel contamination from late August 1989 through mid-May 1990. Sharr et al. (1994a) and Bue et al. (in press) detected elevated pink salmon egg mortalities in the intertidal zones of oiled streams while no difference between oiled and non-oiled streams was detected above mean high tide. Elevated egg mortalities in oiled streams were again detected in the 1990 brood year, but only in the highest intertidal spawning zone (Sharr et al. 1994a, and Bue et al. in press). Visual observations indicated that the majority of the remaining oil was deposited in this zone. Spawning areas lower in the intertidal zone seemed to be recovering as egg mortalities in these areas were not statistically different from non-oil impacted streams.

Surprisingly, Sharr et al. (1994a) and Bue et al. (in press), found increased egg mortalities in oiled streams during the fall of 1991 survey. Furthermore, significant differences in egg mortality occurred at all tidal zones, including the area above mean high tide. Clearly, the elevated egg mortalities in the oiled streams were not the direct effect from recent oiling. The 1991 adult returns were the progeny of the 1989 brood year, the group with the highest exposure to intra-gravel oil (the 1989-90 incubation period). We hypothesize that the elevated egg mortalities in 1991 may be the result of genetic damage acquired during development after fertilization in 1989. Elevated egg mortalities at all tidal zones in oiled streams were again detected during the fall of 1992 survey (Sharr et al. 1994b and Bue et al in press). Hatchery incubation experiments using gametes from fish returning to oiled and control streams in 1993 indicate that mortality differences observed during past studies cannot be attributed to sampling design (Sharr et al. in prep).

The hypothesis of genetic damage is consistent with previous laboratory experiments on the effects of crude oil on early life stages of fish and with other NRDA field observations. Long term intra-gravel oil exposures (7-8 months) to freshly fertilized eggs provide embryos sufficient time to accumulate polynuclear aromatic hydrocarbons (PAH's) from very low aqueous concentrations of crude oil. PAH's are abundant in crude oil and are potent clastogens (i.e. capable of breaking chromosomes). Mironov (1969) observed reduced survival of fish eggs and larvae exposed to very low aqueous doses (1 ul oil/l seawater) of oil. Moles et al. (1987) confirmed that pink salmon eggs take up PAH's and demonstrated that the uptake was much greater in an intertidal environment than in strictly freshwater conditions. Biggs et al. (1991) found greater numbers of chromosome aberrations in larval herring which incubated in oiled areas than in non-oiled areas. It is logical that the same type of damage may have occurred in pink salmon, and this damage could have affected the reproductive fitness of a significant proportion of exposed individuals.

Information gained from this study will provide resource managers insight to the magnitude and persistence of damages sustained by wild pink salmon due to EVOS. Efforts to restore damaged pink salmon populations depend upon the fishery manager's abilities to identify sources of reduced survival and to monitor their persistence. Information on the potential of long term oil exposures to cause genetic damage is needed so spawning escapement goals can be reevaluated and adjusted if necessary. In addition, verification of the genetic

hypothesis would provide the first evidence that reproductive capacity of fish exposed to chronic or acute sources of oil pollution would be compromised.

C. PROJECT DESCRIPTION

This project is an addition to project 94191 - *Oil Related Egg and Alevin Mortalities*. In this study we will collect pink salmon gametes from adult pink salmon returning to oil contaminated and unimpacted streams in western Prince William Sound (PWS). Intra-stream crosses will be made and the resulting embryos incubated under identical controlled conditions to evaluate the effect of physical stream characteristics.

This project will also administer a contract (15k) for a pilot study to examine the usefulness of androgenesis for evaluating genetic damage in pink salmon. Androgenetic individuals are obtained by enucleating eggs with gamma radiation before fertilization. These eggs are then fertilized with normal sperm. If no other treatments are applied, the resulting progeny will be haploid, containing only a single set of chromosomes from the male parent and none from the female. Mortality rates for these haploids are directly related to the presence and number of deleterious mutations (Armstrong and Fletcher, 1983). Advantages of this technique over most classical techniques include rapid early detection, ability to detect the effects of point mutations, and the ability to detect the presence of deleterious recessive alleles. The androgenesis technique is not widely used because of the requirement of a gamma radiation treatment. Ultimately, haploid androgens will be used to test for the presence of deleterious mutations in the chromosomes of oil impacted and control populations in Prince William Sound as well as oil treated and control populations from the Little Port Walter experiment (component B of Project 94191).

1. Resources and/or Associated Services:

This study will investigate pink salmon in Prince William Sound, Alaska. Pink salmon are a major predator and prey species in the PWS ecosystem and provide transport of nutrients from the marine to terrestrial ecosystem. Pink salmon also support large commercial, sport, and subsistence fisheries which are vital to the economy of the area.

2. Relation to Other Damage Assessment/Restoration Work:

The foundations for this project date back to the original NRDA F/S Study 2 (Injury to Salmon Eggs and Preemergent Fry). NRDA F/S Study 2 was equivalent to the field monitoring portion of Project 94191 (Component A of 94191) and was conducted in 1989, 1990, and 1991. The same project was continued as Restoration Study R60C in 1992. Two additional elements, a controlled oiling experiment (Component B of 94191) and the study addressed in this proposal were added to Restoration Study R60C during the summer of 1992. These additions were designed to assess the genetic damage hypotheses raised through NRDA F/S Study 2. All three components were present in the 1993 project, Restoration Study 93003.

At the time proposals were submitted for the 1994 work plan, we elected to discontinue the work being proposed here. This decision was based on our perception that oil damages had diminished to an undetectable level; consequently, we believed this work had very little probability of providing additional information on damages. When preliminary results of the 1993 field season were obtained in December of 1993, we found that this project provided strong evidence for the existence of genetic damage. It was at that time that we began to work towards putting this study back into the 1994 work plan.

Several past NRDA and present Restoration projects have been and continue to be intimately related to this project. The 1989 and 1990 NRDA F/S Study 4 demonstrated reduced growth and survival for salmon which reared in oiled areas. NRDA F/S Study 1 in 1989, 1990, and 1991 and subsequent Restoration Study R60B in 1992, investigated oil damage to adult pink salmon spawning populations and provided valuable improvements in escapement estimation procedures used by fisheries managers to monitor and protect injured wild pink salmon populations. NRDA F/S Study 3 in 1989, 1990, and 1991 and subsequent Restoration studies R60A in 1992 and 93185 in 1993 provided hatchery and wild catch contribution estimates. This information was used by fisheries managers to reduce fisheries exploitation rates on injured wild pink salmon and also provided survival estimates for groups of fish examined by NRDA Study 4. The 1989, 1990, and 1991 NRDA F/S Study 28 and a subsequent Restoration study in 1992, incorporated data from all the previous studies into life history and run reconstruction models. These models were used to extrapolate losses in adult pink salmon production from injuries observed in earlier life history stages.

3. Objectives:

1. Determine whether the increased pink salmon egg mortalities observed in oiled streams can be attributed to the physical characteristics of the study streams.

4. Methods:

1. Experimental Design

The experiment will assess the effects of the physical characteristics of the study streams upon the observed results. This will be accomplished by collecting pink salmon gametes from oiled and non-oiled streams and rearing the resulting embryos in a controlled laboratory environment.

This experiment will provide information to help determine whether the results observed in NRDA Study FS2 can be attributed solely to the physical characteristics of the study streams. In this experiment we will collect gametes from 8 oiled and 8 non-oiled streams from southwestern PWS, make intra-stream crosses, and incubate the resulting embryos in a controlled laboratory environment. Egg mortality will be compared between the oiled and uncontaminated streams. If no difference is observed in this experiment and a significant difference in egg mortality is detected between oiled and non-oiled streams during the recovery monitoring portion of this study during the fall of 1993 egg sampling, it can be stated that the physical characteristics of the study streams played a role in the results of the previous egg mortality studies.

Gamete collection and fertilization procedures will occur over a four day period to obtain data from 8 oiled and 8 non-oiled streams. Gametes from 30 male and 30 female pink salmon will be collected from 2 oiled and 2 control streams during each sampling day. The gametes will be flown to the Armin F. Koernig (AFK) hatchery where a random gamete pool will be assembled for each stream in a timely manner.

The random gamete pool will be constructed by placing approximately 30 eggs from each female (one teaspoon) into each of 30 cups. Each cup will then be fertilized by a different male. The 30 cups will be recombined into a large pail where the fertilized eggs will be mixed as they are rinsed. This method of creating a randomized gamete pool should insure that all possible crosses (30 x 30 = 900) will be present.

A minimum of nine randomly selected aliquots of approximately 500 embryos each will be collected from each intra-stream pool, placed into separate incubating vessels, and randomly placed into a common incubator (Heath Incubator).

Incubating embryos will be periodically screened for dead eggs and hatching success. Samples of sperm from each male used to build the embryo pools will be cryopreserved for future analysis if required. The experiment will be terminated prior to swimup at which time all larvae will be killed.

2. Data Analysis

The data will be analyzed as a fixed-effects generalized randomized block design:

$$Y_{ijk} = \mu + B_i + O_j + \epsilon_{ijk} \qquad (1)$$

where Y_{ijk} is egg mortality for sample day i, oil contamination level j, and stream k; μ is the model mean; B_i is sampling day a blocking variable; O_j is the level of oil contamination (oiled or not oiled); and ϵ_{ijk} is random error. The relative power of the test was estimated. The sample size was considered sufficient to detect a difference of less than 1.5 standard deviations at $\alpha = 0.05$ and 95% power (Neter et al. 1990). A test with high power is needed to protect against arriving at the conclusion that all observed damages could be attributed to the physical characteristics of the streams when in actuality significant damages due to oil were present.

The assumption of constant error terms will be tested using the F_{max}-test (Sokal and Rohlf 1969) while normality will be visually assessed using scatter plots, box plots, and normal probability plots (Chambers et al. 1983). Appropriate transformations will be used to alleviate variance and normality concerns if they are detected. All suitable comparisons will be made using Bonferroni family confidence intervals. The SAS (SAS Institute Inc. 1988) General Linear Models Procedure will be used to analyze the data.

5. Location:

This study will collect gametes from streams in southwestern Prince William Sound and incubate the resulting embryos at the Armin F. Koernig hatchery (Figure 1).

6. Technical Support:

A biometrician will ensure the study design will provide a reasonable chance of reaching a defendable conclusion.

7. Contracts:

We propose to have a $15,000 project *Detection of Deleterious Mutations in Pink Salmon Through Haploid Androgenesis* conducted by Dr. Gary Throgaard, Washington State University (WSU), as a sole-source contractor. WSU is uniquely suited to conduct such a project. The WSU Nuclear Radiation Center has Cobalt-60 gamma radiation source that Dr. Thorgaard is currently using to conduct deleterious-mutation studies on rainbow trout. Dr. Thorgaard's laboratory is widely recognized as one of the leading laboratories in the world in the field of androgenesis in salmonids; to our knowledge it is the only laboratory in North America capable of such study. Dr. Throgaard's proposal is attached.

D. SCHEDULES

Dates	Activity
30 Oct 1993 - 30 Jan 1994	Analysis of 1993 data and completion of first draft of 93003 report for laboratory evaluation
April 1994	Initiate Androgensis Contract
1 Aug - 15 Aug 1994	Preparation for 1994 AFK Incubation Experiment
15 Aug - 30 Aug 1994	Collect Gametes and make crosses from 16 PWS streams; begin incubation of gametes at AFK.
30 Aug - 15 Nov 1994	Monitor incubators and collect data
15 December 1994	Androgensis Contract Report Due to ADF&G
15 Nov 1994 - 30 Jan 1995	Analyze data and prepare first draft of 94191 report

E. EXISTING AGENCY PROGRAM

This project will benefit from both ADF&G's commercial fisheries management and genetics programs. Both groups provide supporting information for the successful completion of the project.

F. ENVIRONMENTAL COMPLIANCE/PERMIT/COORDINATION STATUS

Transport of wild gametes to the Prince William Sound Aquaculture Corporation (PWSAC) hatchery on Evans Island, PWS will require an Alaska Department of Fish and Game (ADF&G) Fish Transport Permit for each stock and a permit Alteration may be required to rear and incubate the wild eggs at the hatchery.

G. PERFORMANCE MONITORING

Principal investigator Sharr (Fisheries Biologist III) will help design the experiment, supervise incubator setup, and coordinate and supervise field logistics. Principal investigator Seeb (Principal Geneticist) will help design and provide genetics oversight as well as administer the proposed androgensis contract. Seeb's assistant, Gary Miller (Fisheries Biologist II) will provide fish culture oversite and will supervise the technicians responsible for collecting the data. Consulting biometrician Bue (Biometrician II) will conduct the experimental design and provide statistical oversight for the project. Sharr, Seeb, and Bue will cooperate in the data analysis and writing of the project report.

The methodologies for this project have been approved by the Chief Scientist and his staff in past proposals. Past work has shown the methods to be appropriate and efficient. The principal geneticist and his staff have extensive laboratory fish culture experience and will be present at all times during the rearing experiment at AFK Hatchery.

H. COORDINATION OF INTEGRATED RESEARCH EFFORT

Data collection for this project occurs over a very compressed period of time and is very stream specific; hence, this study does not blend well logistically with most of the other pink salmon projects. However, all of the streams used for brood stock in this study are also of interest to the Pink Salmon Genetics Project (94189) and carcasses from the egg takes can be used for genetic samples from these streams. The study is housed at the Prince William Sound Aquaculture Corporation (PWSAC) Armin F. Koerning (AFK) hatchery and will take advantage of the same incubation facilities as the PWSAC experimental release project included in the SEA project.

Final edited data will be stored electronically as computer databases and final versions will be provided annually to the Information Modeling portion of SEA for incorporation into a centralized ecosystem database.

I. PUBLIC PROCESS

Many of the field procedures used in the field monitoring portion (Component A of 94191) of this project have been employed as part of the data collection activities for preemergent fry indices used in PWS pink salmon forecasts for more than 30 years. The procedures have been presented and reviewed at a multitude of workshops and scientific meetings, are widely understood by the fishing industry, and have undergone peer review through the NRDA process. Field monitoring methodologies were presented at the 1991 Pink and Chum Workshop in Parksville, British Columbia, Canada. Field monitoring results from 1989, 1990, 1991, and 1992 were presented at the 1993 meeting of the Alaska Chapter of The American Fisheries Society in Valdez, Alaska, the 1993 Oil Spill Symposium in Anchorage, Alaska, and the 1993 Pink and Chum Workshop in Juneau, Alaska. Abbreviated operational plans for 1989 through 1994 egg and alevin mortality studies have been published annually in EVOS Trustee Council work plans which incorporate public comment.

J. PERSONNEL QUALIFICATIONS

Fisheries Biologist III - Samuel Sharr

Mr. Sharr received a Bachelor of Science degree in biology from the University of Washington in 1968. He has been a research biologist for ADF&G since 1979 and has worked on PWS salmon and herring since 1981. He assumed his present position as the ADF&G, Division of Commercial Fisheries, Biologist III, PWS Area Finfish Research Project Leader in 1986. In this capacity, Mr. Sharr oversees all the salmon and herring research conducted by the Division of Commercial Fisheries in PWS. His involvement with the PWS salmon escapement aerial survey program dates from the early 1980's. Mr.Sharr has supervised a total re-edit of the historic aerial and ground survey data and designed a new RBASE data base for inseason escapement analyses. Mr. Sharr wrote the original operational plans for NRDA F/S Studies 1,2 and, 3 and has been the Principal Investigator for those projects since their inception.

Principal Geneticist - James E. Seeb

Jim Seeb earned a B.S. in Biology (1974) from the University of Puget Sound, an M.S. in Fisheries (1982) and a Ph.D. in Fisheries (1987) from the University of Washington. Jim has worked as a Fish Biologist for the Washington Department of Fisheries (1978-1980) and Pacific Fisheries Research (1980-1982), as a Graduate Research Assistant at the University of Washington (1982-1986), a Research Assistant Professor at the University of Idaho (1987-1988), and as an Assistant Professor at Southern Illinois University (1988-1990). Presently, Jim is the Principal Geneticist for FRED Division of the Alaska Department of Fish and Game and has overall responsibility for fisheries genetic issues throughout Alaska. Dr. Seeb has published extensively in the Fisheries and Genetics Literature. He has worked with many fish species on numerous genetic topics including but not limited to genetic marking and its use to assess stock dynamics and management programs, genetic variation and postglacial dispersal of populations, the use of genetic structure in the enforcement of fishing regulations, and the measurement of DNA content using flow cytometry.

Biometrician II - Brian G. Bue

Brian Bue has a Bachelor of Science in Biology and a Bachelor of Science in Fisheries from the University of Alaska, Fairbanks. He also possesses a Masters degree in Fisheries with an emphasis on quantitative studies from the University of Alaska, Fairbanks. Brian has worked with the ADF&G from 1974 through present in many capacities. He has worked as a consulting biometrician on oil spill damage assessment projects since the first days of the *Exxon Valdez* spill.

Fisheries Biologist II - Gary Miller

Gary Miller is the flow cytometry specialist for the Alaska Department of Fish and Game Genetics Laboratory in Anchorage. Gary has a Bachelor of Science in Fisheries Biology from the University of Washington, a M.S. in Zoology from Southern Illinois University - Carbondale, and is currently pursuing his Ph.D. from the University of Washington. He has worked periodically for the Alaska Department of Fish and Game since 1981. He has a strong background in genetics and developmental biology and has conducted research and co-authored projects in hybridization, polyploid induction, allozyme expression, and growth performance of triploid salmonids and other fishes. He has extensive laboratory experience with techniques including flow cytometry, protein starch gel electrophoresis, protein and molecular marker analysis, and fluorescent antibody testing of pathogens.

K. BUDGET

(see attached)

L. LITERATURE CITED

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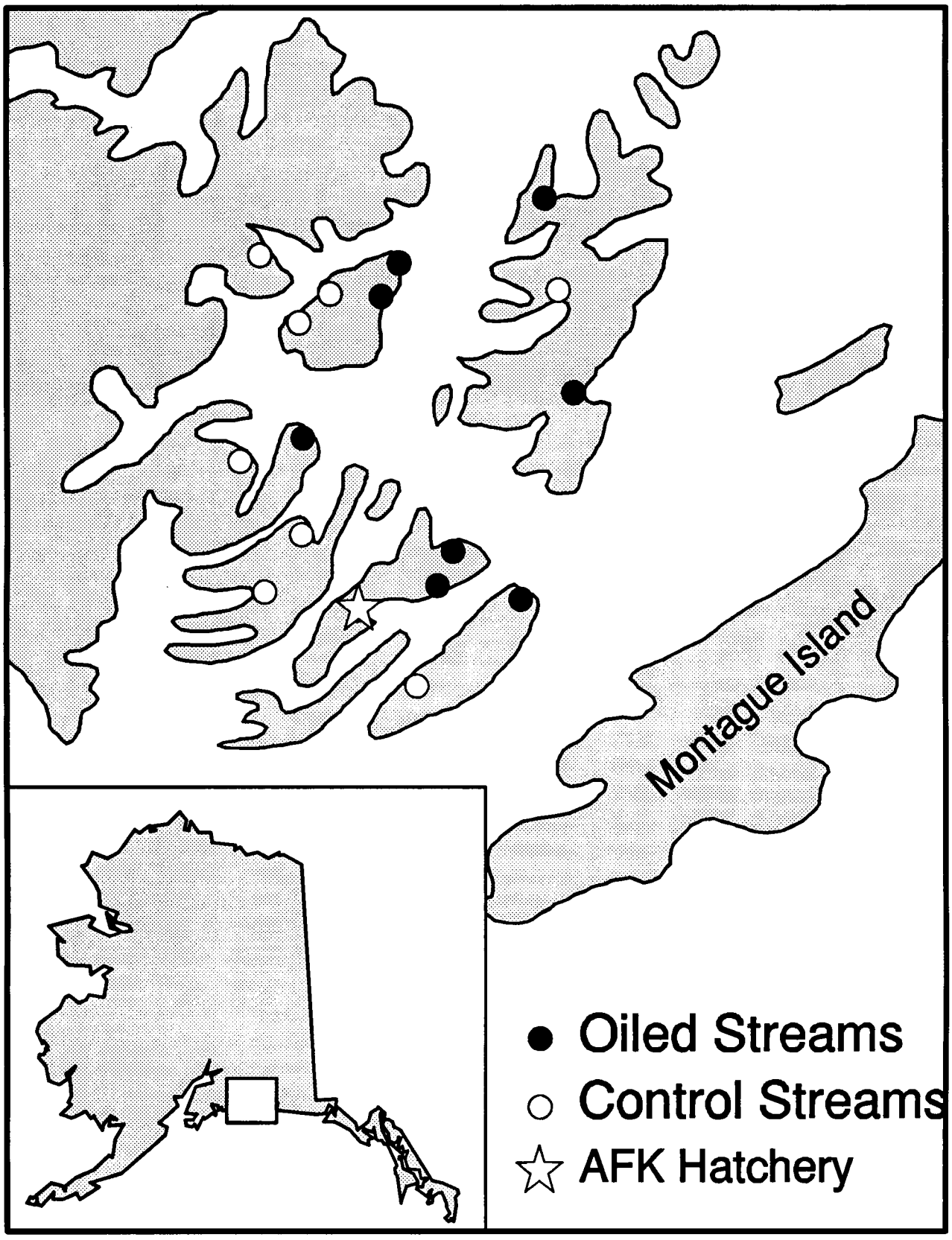

Figure 1. Stream and Hatchery locations for controled incubation experiment.

EXXON VALDEZ TRUSTEE COUNCIL
1994 Federal Fiscal Year Project Budget
October 1, 1993 - September 30, 1994

Project Description: Oil Related Egg & Alevin Mortalities (Supplemental) - This project will evaluate whether the differences in pink salmon embryo mortality observed in the field under Component A of Project 94191 can be attributed to differences in physical stream makeup or to genetic differences. This experiment will examine the possibility of genetic injury as an explanation for chronic injury and assess the likely time frame for natural recovery.

Budget Category:	1993 Project No. 93003 Authorized FFY 93	'93 Report/ '94 Interim* FFY 94	Remaining Cost** FFY 94	Total FFY 94	FFY 95	Comment
Personnel		$0.0	$44.7	$44.7	$65.0	
Travel		$0.0	$2.0	$2.0	$3.5	
Contractual		$0.0	$37.7	$37.7	$42.7	
Commodities		$0.0	$4.0	$4.0	$4.5	
Equipment		$0.0	$0.0	$0.0	$0.0	
Capital Outlay		$0.0	$0.0	$0.0	$0.0	
Subtotal		$0.0	$88.4	$88.4	$115.7	
General Administration		$0.0	$9.3	$9.3	$12.7	
Project Total		$0.0	$97.7	$97.7	$128.4	
Full-time Equivalents (FTE)		0.0	0.7	0.7	1.1	
	Dollar amounts are shown in thousands of dollars.					

Budget Year Proposed Personnel: Position Description	Reprt/Intrm Months	Reprt/Intrm Cost	Remaining Months	Remaining Cost
Fisheries Biologist III			1.5	$9.9
Fisheries Biologist II			2.7	$14.6
Fish and Wildlife Technician III			2.0	$6.7
Fish and Wildlife Technician II			0.6	$4.3
Biometrician II			1.5	$9.2
Personnel Total	0.0	$0.0	8.3	$44.7

NEPA Cost: $0.0

*Oct 1, 1993 - Jan 31, 1994

**Feb 1, 1994 - Sep 30, 1994

07/14/93

1994

Project Number: 94191 - Supplemental
Project Title: Oil Related Egg & Alevin Mortalities
Sub-Project:
Agency: AK Dept. of Fish & Game

FORM 3A SUB-PROJECT DETAIL

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EXXON VALDEZ TRUSTEE COUNCIL
1994 Federal Fiscal Year Project Budget
October 1, 1993 - September 30, 1994

	Reprt/Intrm	Remaining
Travel:		
4Trips Cordova/Anchorage @ $500/trip Per diem included		$2.0
Travel Total	$0.0	$2.0
Contractual:		
Facility Lease		$1.2
Air Charter		$21.5
Genetic Analysis Contract		$15.0
Contractual Total	$0.0	$37.7

07/14/93

1994

Project Number: 94191 - Supplemental
Project Title: Oil Related Egg & Alevin Mortalities
Sub-Project:
Agency: AK Dept. of Fish & Game

FORM 3B
SUB-
PROJECT
DETAIL

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EXXON VALDEZ TRUSTEE COUNCIL
1994 Federal Fiscal Year Project Budget
October 1, 1993 - September 30, 1994

Commodities:	Reprt/Intrm	Remaining
Fish Culture Supplies		$4.0
Commodities Total	$0.0	$4.0
Equipment:		
Equipment Total	$0.0	$0.0

07/14/93

1994

Project Number: 94191 - Supplemental
Project Title: Oil Related Egg & Alevin Mortalities
Sub-Project:
Agency: AK Dept. of Fish & Game

FORM 3B
SUB-
PROJECT
DETAIL

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APPLIED
Marine
SCIENCES

April 1, 1994

TO: James Ayers
Executive Director

FROM: Robert B. Spies
Chief Scientist

CC: Molly McCammon
Byron Morris
Jeep Rice
Jerome Montague
Jim Seeb
Sam Scharr

RE: Review of Project 94191, Oiled Related Egg and Alevin Mortalities

Purpose of Study

Past investigations of damage to pink salmon as a result of the oil spill have indicated that (1) eggs and larvae in oiled streams had lower survival than those from unoiled streams, (2) that this difference has persisted despite a vast reduction in the concentrations of hydrocarbons in the oiled streams, and (3) this difference is apparently the result of an inherited genetic difference between fish returning to oiled and unoiled streams. This study will continue to monitor recovery of pink salmon embryos and fry in the field, verify the inheritable differences documented last year and use cytogenetic techniques to look for the presence of genetic aberrations, and conduct a controlled laboratory experiment to determine if genetic damage can be induced by exposing fertilized pink salmon eggs to crude oil.

Relation to Restoration Management Objectives

This project will document the recovery of pink salmon populations injured by the spill, which is an important trend to be monitoring to assess the progress of restoration. The project will also verify a surprising discovery that the inferior survival of populations in oiled streams is inheritable, and conduct laboratory experiments to determine if this damage is due to oil exposure. Verifying genetic damage from oil exposure would imply a continuing impact on the wild pink salmon of Prince William Sound. This has important implications for restoration, as historic escapements may not be sufficient to maintain genetically damaged populations.

Analysis

Component A of the project, field monitoring of egg and fry survival, is the continuation of past recovery monitoring. This component received strong support from reviewers, and is important for maintaining our up-to-date knowledge of the recovery of damaged salmon populations.

In component B of the study pink salmon gametes will be collected from fish in oiled and unoiled streams. Fertilization and rearing will take place in a controlled laboratory environment to verify last year's startling finding that decreased egg survival in oiled streams exists even when the eggs are not exposed to the contaminated stream environment. This finding underlies the claims of inheritable genetic damage to the pink salmon populations in oiled streams, and it is important that this study be conducted.

Component C is the continuing laboratory study to verify injury to pink salmon eggs and pre-emergent fry exposed to crude oil during incubation. This component includes several experimental endpoints, and review of the proposal raised important questions about some of these measurements. The rationale for this study component is sound, as verifying that exposure to crude oil can produce the effects documented last year (and, it is assumed, in component B) will provide robust proof of the genetic difference between the fish from oiled and unoiled streams. Randomly obtained fertilized eggs will be exposed to different doses of crude oil, and samples taken during development for genetic, mixed-function oxidase (MFO), histopathological, and hydrocarbon analyses. Fry from these incubations will be reared to maturity, and their gametes incubated without exposure to oil. Consequently, decreased survival will be due to inherited characteristics from oil exposure only, not a function of environmental factors

There are questions about the measurements that are proposed to quantify injury in this experiment. First, the measurement of MFO does not seem warranted. This will only document exposure to crude oil, which seems unnecessary in a dosing study, especially given the fact that hydrocarbon concentration in the various stages of development will also be measured. The principal investigators should also provide justification for the histopathological measurements.

Second, the measurement of genetic damage, flow cytometry, does not seem appropriate for the experiment. Flow cytometry measures large changes in DNA, and is not well-suited to determining the subtle changes expected from exposure to crude oil. Our expert reviewer suggests that if genetic damage of the level that can be measured by flow cytometry occurred in 1989 in fish in oiled streams, it is unlikely that these fish would survive to reproductive age in order to pass this damage on to the next generation.

The reviewer has suggested three polymerase chain reaction (PCR) based techniques to measure genetic damage, which should provide orders-of-magnitude more sensitivity than flow cytometry. These techniques, although not commonly used in aquatic toxicology, are well-established in biomedical research, and can be used on archived tissue as well as fresh samples. These techniques include analyses of mitochondrial DNA, use of gene probes, and single stranded conformational polymorphism analysis. Discussion with the principal investigators indicates that they are investigating the use of PCR-based techniques, and recognize the value of these techniques for this study. They will begin to phase these techniques into the project, and have requested a meeting for peer review of the study occur in mid-October.

Finally, there remains a question regarding the whether the differences in survival that have been measured in the field, which are the basis of the injury, existed prior to the oil spill. There may be some geographic bias in the location of oiled and unoiled streams that may introduce differences in these two groups besides oiling in 1989. Or, there is a possibility of straying of hatchery fish unequally into the oiled and unoiled wild populations. These questions introduce potential confounding factors into the interpretation of research results.

Recommendation

I recommend that Project 94191 be approved with the following changes:

1. MFO analyses should be eliminated, as they do not contribute information that will be valuable for restoration. Histopathology measurements should also be eliminated unless the principal investigators can justify their inclusion.

2. The one person-year of effort for flow cytometry should be scaled back to 2-3 person-months, with the remaining resources being put into PCR-based analyses of genetic damage. The PCR-based analyses of mitochondrial DNA, a technique already on-line in fisheries genotoxicology, should be considered as the first priority for PCR analyses.

3. A program review involving the principal investigators, key peer reviewers, and myself should occur in early October. The results of the review should be considered in decisions regarding relevant portions of the 1995 workplan.

I would request a written response from the principal investigators regarding their implementation of the above recommendations. In addition, the principal investigators should consider the existence of factors that confound the interpretation of the observed changes oil-related, and suggest experiments that might eliminate these questions. I am happy to assist them in obtaining additional advice from key peer reviewers as appropriate.

Finally, I would like to note that this is one of the better scientific studies supported by the Trustees. The investigators are quite competent, have found something of potentially great importance and are doing a very good job of following up on their findings.

Attachment C

Subsistence Restoration Planning (ADF&G) Cost: $81.9

Recommended by: ADF&G (developed at request of Craig Tillery in conjunction with the Director of Operations)

EXXON VALDEZ TRUSTEE COUNCIL
FY 94 PROJECT DESCRIPTION

A. COVER PAGE

Title: Subsistence Restoration Planning and Implementation
Project Identification Number: 94510
Lead Agency: Department of Fish and Game
Cooperating Agencies: Department of Community and Regional Affairs; Department of Law
Cost of Project: $81,950
Project Startup Date: April 15, 1994
Duration: April 15, 1994 - April 1995
Geographic Area: Prince William Sound, lower Kenai Peninsula, Kodiak Island, and Alaska Peninsula

B. INTRODUCTION

Subsistence uses of fish and wildlife are a vital natural resource service that was injured by the Exxon Valdez oil spill. After the spill, harvest levels declined, sharing of resources was reduced, and the transmission of skills and knowledge about natural resources was disrupted. While harvest levels and participation in subsistence activities have rebounded somewhat since the first two post-spill years, effects of the spill remain. These include concerns about the long term health effects of using resources from the spill area, a loss of confidence in people's own abilities to judge if resources are safe to eat, scarcity of certain injured subsistence resources (such as harbor seals, marine invertebrates, and waterfowl) in traditional harvest areas, increased costs associated with subsistence harvests, and reduced opportunities for young people to learn the subsistence way of life.

The purpose of this project is to design and implement a coordinated planning process to develop subsistence restoration project proposals for the Trustee Council Restoration Plan for FY 95 and to insure the participation of subsistence users in other FY 95 planning efforts. Such projects could propose to directly restore resources used for subsistence, provide alternative natural resources, or restore access or people's use of the resource. Guidelines for project content will be developed, project ideas will be solicited and prioritized through a public process, project proposals will be evaluated, and a set of project proposals will be presented to the Trustee Council for consideration for funding.

Project ideas developed through this planning process which do not become part of the FY 95 Restoration Plan may be eligible for funding through grants from a $5 million appropriation of Exxon Valdez criminal settlement funds by the Alaska Legislature. The legislature authorized the Department of Community and Regional Affairs to award grants to unincorporated rural communities in the oil spill area in order to restore, replace, or enhance subsistence resources or services damaged or lost as a result of the spill (Section 11, Chapter 79, SLA 1993). The legislation requires that selection of grant recipients shall be made after consultation with the state members of the Trustee Council.

In addressing an injured service which represents an aspect of the human component of the injured natural environment in a comprehensive manner, the development of this planning program is consistent with an ecosystem approach towards restoration endorsed by the Trustee Council.

C. PROJECT DESCRIPTION

1. Resources and/or Associated Services. The purpose of the project is to collaboratively develop and evaluate proposals to restore or enhance subsistence uses, an injured natural resource service.

2. Relation to Other Damage Assessment/Restoration work. The FY 94 Restoration Plan includes two subsistence restoration projects: 94244 (Harbor Seal and Sea Otter Co-op Subsistence Harvest Assistance) and 94279 (Subsistence Food Safety Testing). Aspects of these projects may be continued as part of projects developed during the cooperative planning effort. Projects more appropriately

supported through grants from the $5 million appropriation from the criminal settlement money may also be identified.

3. Objectives. The project has three primary objectives. The first objective is to develop a set of guidelines for soliciting and evaluating proposals to restore reduced or lost subsistence uses. The second objective is to conduct a public outreach program to assist in identifying community needs and priorities related to injured subsistence uses which can be developed as subsistence restoration project proposals, either for the Trustee Council FY 95 work plan, or for possible funding through grants from the criminal settlement appropriation. The third objective is to identify subsistence resources that could be used as substitutes for those subsistence resources injured by the spill. The fourth objective is to enable subsistence users to participate in current planning efforts of Trustee Council staff, specifically the development of the implementation management structure and general research priorities.

4. Methods. Guidelines for appropriate topics for projects will be developed by the Alaska Department of Fish and Game, Division of Subsistence, and the Department of Community and Regional Affairs (DCRA), Division of Municipal and Regional Assistance, with assistance from the Department of Law, Trustee Council staff, and representatives of spill-area communities. A community outreach program will occur to solicit ideas about priorities for subsistence restoration projects. A local community facilitator will be hired as a nonpermanent employee within the Division of Subsistence to assist with the planning and implementation of the community meetings. Following the meetings, interested parties may then develop their projects as proposals for funding; project staff will provide assistance. After evaluation of the proposals, recommendations will be passed on to the Trustee Council for review.

5. Location. Prince William Sound, Cook Inlet, Kodiak Island Borough, and the Alaska Peninsula within the spill area

6. Technical Support. This project will not need technical support as described in the proposal guidelines.

7. Contracts. Development of the program itself will not require contracts.

D. SCHEDULES

April 15 - 30, 1994: Develop draft guidelines
May and June 1994: Community meetings to develop project priorities and proposals.
July - early August 1994: Proposal evaluation
August 15: Publication of project proposals in Draft FY 95 Work plan
October 1994: Trustee Council Meeting.
November 1994 - March 1995: Monitor and evaluate proposals; continue development of proposals for future work plans.

E. EXISTING AGENCY PROGRAM

The ADF&G Division of Subsistence maintains an ongoing program of data collection and report preparation about the role of subsistence activities in Alaska, including the spill area communities. The division is currently involved in a joint project with the U.S. Minerals Management Service, which, among other things, is investigating social effects of the spill. The division is also actively engaged in research on subsistence harbor seal and sea lion harvests in coastal communities of southcentral and southwest Alaska, supported by the National Marine Fisheries Service. In addition, the division is the lead agency on two FY 94 oil spill restoration projects: Project 94279, Subsistence Foods Safety Testing; and Project 94244, Harbor Seal and Sea Otter Co-op Subsistence Harvest Assistance. The Division of Community and Regional Assistance (DCRA) provides technical assistance services, including grants administration, to communities and has administered an emergency oil spill impact program in the spill area.

F. ENVIRONMENTAL COMPLIANCE/PERMIT/COORDINATION STATUS.

This project is categorically excluded under NEPA guidelines.

G. PERFORMANCE MONITORING

Performance monitoring will be conducted jointly by staff of the Division of Subsistence and Division of Municipal and Regional Assistance (MARAD). Generally, staff of the Division of Subsistence will monitor the technical adequacy of projects while MARAD staff will monitor the administrative and management adequacy of projects. The two divisions will develop a general agreement based on the preceding and, for particularly complex projects, may develop specific agreements relating to the performance monitoring of that particular project.

H. COORDINATION OF INTEGRATED RESEARCH EFFORT

As a planning project, a goal of this project will be to coordinate the subsistence restoration program with other research efforts.

I. PUBLIC PROCESS

Community meetings will be held to solicit project ideas and priorities. Information about the projects will be communicated in the Subsistence Restoration Newsletter produced by the Division of Subsistence.

J. PERSONNEL QUALIFICATIONS

James Fall. Dr. Fall is the regional program manager for the Division of Subsistence, ADF&G, for southcentral and southwest Alaska. Since 1989, he has supervised the division's oil spill response and research program.

Rita Miraglia. Ms Miraglia has served as the oil spill coordinator for the Division of Subsistence since 1990. As such, she has organized and participated in the subsistence resource collection and testing program of 1990, 1991, and 1993. She has also been the lead communicator of study findings to communities through organizing community meetings and writing newsletters.

Jody Seitz. Ms Seitz has worked as a subsistence resource specialist with the Division of Subsistence since 1989, with responsibility for Prince William Sound communities since 1991.

Craig Mishler. Since 1989, Dr. Mishler has been the subsistence resource specialist with the Division of Subsistence with responsibility for the Kodiak Island Borough and the division's multi-regional harbor seal and sea lion project.

Lisa Scarbrough. Ms Scarbrough is the subsistence resource specialist with the Division of Subsistence with responsibility for the Alaska Peninsula communities (among others), a position she has held since 1989.

Pat Poland. Mr. Poland is Deputy Director, Division of Community and Regional Assistance, DCRA. He has been responsible for day-to-day management of the division's Technical Assistance and Program Delivery services for a number of years. This experience includes oversight of an emergency oil spill impact grant program following the Exxon Valdez spill.

John Gilva. Mr. Gilva is a Planner IV with the MARAD division and has worked extensively at providing technical assistance services to Prince William Sound communities. Additionally, he developed regulations for administration of the Emergency Oil Spill Impact Program and generally administered the application and award process.

K. BUDGET

Personnel:		$55,950
Subsistence Resource Specialist II. Project Coordinator. 6 months Subsistence Resource Specialist II. Prince William Sound, 2 months. Subsistence Resource Specialist II. Alaska Peninsula/Kodiak, 1.5 months Regional Program Manager, 1 month Fish and Wildlife Technician III, 2 months (local community facilitator)		
Travel		$24,000
Village Meetings	14,000	
Coordinator Travel	10,000	
Printing, etc.		$ 1,000
Supplies		$ 1,000
TOTAL		$81,950

Attachment D

Proj #94199/IMS at Seward - EIS Process (ADF&G, DOI) Cost: $97.0
Recommended by: ADF&G and DOI

DRAFT

Supplemental Budget Request for Seward IMS Project (#94199)

Draft

Background

On January 31, 1994 the Trustee Council passed a resolution approving financial support for expansion of the University of Alaska, Institute of Marine Science (IMS) at Seward. The resolution directed the Executive Director to:

1. Take necessary steps to secure NEPA compliance;

2. Consult appropriate entities, including the University of Alaska, the City of Seward, the Seward Association for the Advancement of Marine Science, and appropriate Trustee agencies to review the assumptions relating to the proposed improvements and capital and operating budgets;

3. Develop an integrated funding approach which assures that the use of trust funds are appropriate and legally permissible under the terms of the Memorandum of Agreement and Consent Decree; and

4. Prepare a recommendation of the appropriate level of funding for consideration by the Trustee Council that would be legally permissible under terms of the Memorandum of Agreement and Consent Decree.

At the January 31 meeting the Trustee Council authorized $50,000 to begin work on the above tasks.

Project Status

Since January 31, substantial progress has been made on addressing the first three tasks. With respect to the first task, a 33-week Environmental Impact Statement process was initiated on March 9. Public Scoping Meetings have been completed in Seward and Anchorage and a pre-application meeting has been held with state and federal regulatory agencies to determine permitting requirements. A Scoping Report is currently being prepared. The Draft EIS is scheduled to be published in late June followed by a 45-60 day public review period. The Record of Decision is scheduled to be published by the end of October 1994.

With respect to the second task, consultation has been initiated with all of the appropriate entities. A Scientific Work Group (SWG) has been formed with representatives of the Institute of Marine Science, National Marine Fisheries Service, National Biological Survey, Alaska Department of Fish and Game and others to advise the project architects and planners on the conceptual and schematic design of the proposed improvements. An Education Work Group (EWG) has been formed to provide

DRAFT Draft

equivalent information for the public education component of the project. Work by the SWG and the EWG will be used by the design team, the EIS team, and other project consultants to validate the assumptions relative to the scope of the improvements and associated capital and operating budgets.

With respect to the third task, a four-part integrated funding plan is being formulated with state and federal restitution funds, joint funds, and private funds. A professionally-run private fund raising program is scheduled to be initiated by SAAMS in May.

Results from the above three tasks will be used to develop the Executive Director's recommendation concerning the appropriate level of funding for consideration by the Trustee Council. Staff will continue to work with state and federal legal council to identify the project components that would be legally permissible for joint funds under the terms of the Memorandum of Agreement and Consent Decree.

Budget Request

An additional FY94 authorization of $97,000 for the Department of Interior and the Department of Fish and Game is requested to complete the above tasks. This authorization would be allocated as follows:

DOI (EIS Coordination)

• Salary & Benefits	$ 64,000
• Travel	9,000
• Administrative Support	10,000
• DOI Solicitor and OEPC Review	6,000
	$ 89,000
• Less $25,000 from January 31 authorization	**$ 64,000**

ADF&G (Project Coordination)

• Salary & Benefits	$ 48,300
• Travel	5,000
• Contractual	4,000
• Supplies	700
	$ 58,000
• Less $25,000 from January 31 authorization	**$ 33,000**

Draft

SAAMS has budgeted approximately $ 1.2 million to support the design team, EIS and other technical consultants, project management, and project administration for the Alaska Sea Life Center / Institute of Marine Science project through the remainder of FY 94. This project support is being funded through a $ 4 million grant from the State of Alaska to the City of Seward from the $ 12.5 million authorized for the Alaska Sea Life Center from state restitution funds.

DRAFT

MEMORANDUM

State of Alaska
DEPARTMENT OF FISH AND GAME

TO: Jerome Montague
Chief, Restoration Unit
Habitat and Restoration Division
Juneau

DATE: March 29, 1994
FILE:

PHONE: 267-2334
FAX: 349-1723
SYSM: FH2CKAS

FROM: Kimbal A. Sundberg
Habitat Biologist
Habitat and Restoration Division
Anchorage

SUBJECT: Seward Institute of Marine Science Budget

Per your request, the following is my recommended budget for accomplishing remaining tasks associated with the Seward Institute of Marine Science (Project #94199) in FY94. This budget anticipates my full time involvement in refining the project description to address the four items in the Trustee Council's January 31 resolution including the EIS, review of assumptions relating to the proposed improvements and capital and operating budgets, and the integrated funding approach. I will continue to document my actual hours spent on this project on bi-monthly time sheets.

Line 100	7.0 months HB IV (3/1/94 - 9/30/94)	$ 48.3
Line 200	Juneau, Fairbanks, Seward	5.0
Line 300	Phone, fax, xerox, email	4.0
Line 400	Software, supplies	0.7
Line 500		0.0
TOTAL		$ 58.0

cc: Carol Roten
Lance Trasky
Joe Sullivan

DRAFT

Environmental Impact Statement for the IMS Improvements

Tasks and Funding Needs for Ms Nancy Swanton:

Tasks

- Works closely with project team to ensure the environmental impact statement meets (EIS) Department of the Interior (DOI) standards and follows DOI procedures.

- Ensures close and frequent coordination with the DOI Solicitor, the Office of Environmental Policy and Compliance, and the Special Assistant to the Secretary, keeping them apprised of EIS planning and schedule, and issues requiring their advice and attention. Prepares briefing materials for these individuals as needed. Coordinates necessary DOI reviews of the draft EIS and final EIS prior to publication ("internal reviews").

- As needed, prepares briefing materials for the Trustee Council to keep them informed of EIS progress and possible problems. Ensures continuing verbal and written status reports for DOI Trustee Council staff.

- Ensures comprehensive coordination with parties interested in the EIS, particularly Federal and State agencies.

- Ensures adequate public involvement in the EIS process. Actively participates in the scoping process for the EIS, and ensures appropriate evaluation of issues and alternatives to be included in the EIS as a result of this process.

- Reviews various written materials relating to the EIS (e.g., scoping materials, newsletters about the EIS process and project, EIS sections).

Funding Needs

Swanton*

o Salary (including benefits)	$64,000
o Travel Costs (assumes travel to Washington, D.C., Seward, Alaska)	9,000
o Administrative Support (includes secretarial support and administrative overhead)	10,000

DOI

o Travel (for DOI Solicitor and staff from the Office of Environmental Policy and Compliance to review the draft and final EIS prior to publication ("internal review")	$ 6,000
TOTAL	$89,000

Attachment E

Proj #94320-C/Otolith Thermal Mass Marking (ADF&G) Cost: $289.6

Recommended by: ADF&G

EXXON VALDEZ TRUSTEE COUNCIL
FY 94 DETAILED PROJECT DESCRIPTION

Project title:	Otolith Thermal Mass Marking of Hatchery Reared Pink Salmon in Prince William Sound
Project ID number:	94320C
Project type:	Research/Monitoring
Name of project leader(s):	Mark Willette Samuel Sharr
Lead agency:	Alaska Department of Fish and Game
Cooperating agencies:	Prince William Sound Aquaculture Corporation Valdez Fisheries Development Association
Cost of project/FY 94:	$649,000
Cost of project/FY 95:	$292,700
Cost of Project/FY 96 and beyond:	$494,500
Project Start-up/Completion Dates:	March 1, 1994 - September 30, 1994
Geographic area of project:	Prince William Sound

Project Leader(s):

_____ _____
Mark Willette Date

_____ _____
Sam Sharr Date

Agency Project manager:

_____ _____
Joe Sullivan Date

BUDGET AMENDMENT TO PROJECT 94320C

A. JUSTIFICATION FOR BUDGET AMENDMENT

Additional funds are requested for Project 94320C to cover the cost of equipment needed to apply otolith thermal marks at four pink salmon hatcheries in Prince William Sound. The original budget for this component of 94320C was estimated from a concept design for the Cannery Creek Hatchery (CCH). The Prince William Sound Aquaculture Corporation could not justify expending the $40,000-$50,000 needed to develop detailed engineering designs and cost estimates for the thermal marking equipment without some commitment of funding for the project. The original concept design for CCH was low because (1) it assumed that boilers and other equipment would be installed in existing buildings at the hatcheries, and (2) the number of rings in each banding code was lower than is now envisioned. It is now known that boilers and other equipment cannot be installed in the hatcheries, because insufficient space is available in existing buildings to satisfy fire codes. The number of rings composing the thermal banding code for each hatchery has also been increased to insure that otolith reader's will correctly identify marked fish (Geiger et al. 1994). A high level of accuracy in code detection is expected to reduce the cost of catch sampling and otolith decoding when the fish return as adults in 1996 and beyond. The number of thermal rings in the banding code affects the size of boilers needed, because more water must be heated at a time to apply more rings within a limited 'marking window' (approximately 35 days).

References:

Geiger, H.J., K. Munk, G.B. Bue, M. Willette. 1994. Technical issues and costs of otolith marking Prince William Sound hatchery pink salmon for fisheries management. Alaska Department of Fish and Game, Division of Commercial Fisheries Management and Development, Regional Informational Report No. 5J94-07, Juneau.

B. BUDGET

Table 1: Original budget summary for the Otolith Mass Marking project in FY94, FY95, and FY96 and beyond. Budgets for FY95 and beyond may change as information from the first year of the project is applied to refine cost estimates.

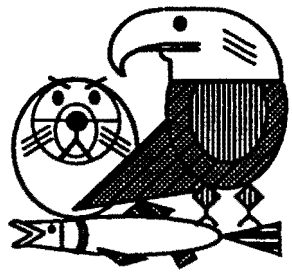
Line Item	FY94	FY95	FY96 and beyond
Personnel	19.7	74.5	337.5
Travel	0.0	1.5	31.3
Contractual	297.3	135.8	48.8
Supplies	10.4	3.2	22.9
Equipment	8.2	57.0	0.0
Total	335.6	272.0	440.5
Indirect Costs	23.8	20.7	54.0
Grand Total	359.4	292.7	494.5

Table 2: Amended budget summary for the Otolith Mass Marking project in FY94, FY95, and FY96 and beyond. Budgets for FY95 and beyond may change as information from the first year of the project is applied to refine cost estimates.

Line Item	FY94	FY95	FY96 and beyond
Personnel	19.7	74.5	337.5
Travel	0.0	1.5	31.3
Contractual	568.0	135.8	48.8
Supplies	10.4	3.2	22.9
Equipment	8.2	57.0	0.0
Total	606.3	272.0	440.5
Indirect Costs	42.7	20.7	54.0
Grand Total	649.0	292.7	494.5

Exxon Valdez Oil Spill Trustee Council

Restoration Office
645 G Street, Suite 401, Anchorage, AK 99501-3451
Phone: (907) 278-8012 Fax: (907) 276-7178



MEMORANDUM

TO: Restoration Work Force

FROM: Molly McCammon
Director of Operations

DATE: April 5, 1994

RE: April 6 Workforce Meeting Agenda

Thus far, the agenda for the April 6 meeting at 9 a.m. (Juneau location is NMFS conference room) includes discussion of the April 11 Trustee Council meeting agenda. This includes proposed increments to the FY94 plan and Project 94320. Copies of **all** the proposed increments will be available at the Juneau and Anchorage locations.

We will also discuss a time and date (Thurs or Fri) for a Work Force meeting to discuss the Draft Recovery Monitoring Plan being coordinated by Byron Morris.

DRAFT

AGENDA
EXXON VALDEZ OIL SPILL SETTLEMENT
TRUSTEE COUNCIL CONTINUATION MEETING

TELECONFERENCE

4/5/94 - 3:25pm **DRAFT**

APRIL 11, 1994
1:00 p.m.

Trustee Council Members:

MICHAEL A. BARTON
Regional Forester, Alaska Region
U.S. Department of Agriculture-Forest Service

BRUCE M. BOTELHO/CRAIG TILLERY
Attorney General/Trustee
State of Alaska/Representative

GEORGE T. FRAMPTON, JR.
Assistant Secretary for Fish, Wildlife & Parks
U.S. Department of the Interior

STEVEN PENNOYER
Director, Alaska Region
National Marine Fisheries Service

CARL L. ROSIER
Commissioner
Alaska Department of Fish & Game

JOHN A. SANDOR
Commissioner
Alaska Department of Environmental Conservation

1:00 p.m. **April 11, 1994**

1. Approval of Agenda
   Order of the Day

2. Reports
   - Executive Director's Report
     - Update on Recreation & Subsistence Planning
     - Report on Forum and Public Participation Efforts
     - EIS Report
     - Implementation Strategy
       - Organizational Structure
       - Science Review Board
     - Habitat Acquisition & Protection
       - Appraisal Process
       - Small Parcel Process
       - Follow-up to Motion on Habitat Protection Options
     - Restoration Reserve
   - Financial Report

3. Old Business
    - 1994 Work Plan
        - * A. Review scope and detailed budgets of Project 94320
        - * B. Increment for Project 94191
        - * C. Increment for NEPA for Project 94199
        - D. Report on status of NEPA Compliance for 1994 Projects

4. New Business

    - * • Planning project for subsistence (still in draft stages and will be circulated to agencies)

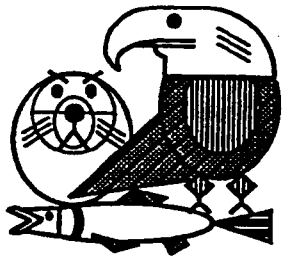
Adjourn

* Indicate action items.

DRAFT

Exxon Valdez Oil Spill Trustee Council

Restoration Office
645 "G" Street, Suite 401, Anchorage, AK 99501-3451
Phone: (907) 278-8012 Fax: (907) 276-7178



April 1, 1994

Jim Ayers
Exxon Valdez Restoration Office
645 G Street, Suite 401
Anchorage, AK 99501-3451

Dear Mr. Ayers:

The purpose of this letter is to:

- invite you to a two-part work shop to be held April 13-15 that will:
  - first (April 13-14), address a series of questions for the restoration process that can be used to guide development of the FY 95 Work Plan: that is, are the injured resources recovering? ... if not, why not? ... how can recovery be achieved or reasonably accelerated;
  - second (April 15), review draft recovery monitoring strategies for specific injured resources and services and other restoration strategies included in the *Draft Restoration Plan* (published in November 1993).
- provide you with an update regarding on-going efforts to develop a management structure to implement an ecosystem approach to restoration activities.

Implementation Management Structure — Update

In mid-January, and then again in mid-March, approximately forty individuals including state and federal resource specialists, peer review scientists, representatives of the Trustee Council's Public Advisory Group (PAG) and other public members, met to discuss the management and organization structure needed to implement an ecosystem approach to restoration activities.

The proposed structure establishes interdisciplinary work groups organized by the major classes of injured resources (birds, fish, nearshore resources, marine mammals and archeological resources). These work groups — which will include not only resource specialists but scientists from other disciplines as well as public user group representatives — will work individually and collectively to identify strategies, research approaches and testable hypotheses for monitoring, research and general restoration. A fundamental responsibility of these work groups will be to move beyond the "single species" approach that has characterized much of the damage assessment work to date and to also focus attention on questions of concern to multiple injured resources and ecosystem processes that may be limiting recovery of injured resources. The work group efforts will help guide development of the annual work plans, starting in FY 95.

A draft organizational chart and more information concerning the work group responsibilities and role of the proposed Science Review Board (SRB) that would provide overall guidance and counsel regarding science planning and management is enclosed (Attachment A).

April 13-15 Workshop — Science Planning for the Restoration Process

On April 13 - 15, a workshop to continue the science planning effort will be held in Anchorage. [NOTE: The workshop location has not yet been determined. Please contact Rebecca Williams in the Anchorage Restoration Office for details regarding the location.] A broad cross-section of scientists, biologists, and agency resource specialists have been invited to attend along with members of the Public Advisory Group, representatives from spill affected communities and resource user groups. A draft agenda is enclosed (Attachment B). The workshop will consist of two parts:

Part 1 — Guidance for the FY 95 Work Plan and Beyond: This part of the workshop (April 13-14) will establish the injured resource working groups (birds, fish, nearshore resources, marine mammals and archeological resources) and move forward with the work of **identifying and prioritizing key research questions, concerns and testable hypotheses as guidance for the FY 95 work plan and beyond.** This "working group" effort will be the start of an on-going, iterative process that can be used to synthesize information acquired over time in order to update, revise and adapt monitoring and/or research priorities funded in any one annual budget cycle. To provide a common basis of understanding, this part of the workshop will start with short presentations and discussion of some sample hypotheses for consideration (Attachment C).

Recognizing that many research questions can only be addressed over the long-term and that budgets will be limited in any one fiscal year, it will be essential to set priorities to guide development of the scientific work effort in FY 95 and beyond. In particular, an effort will be made to identify research questions of common interest to multiple injured resources while recognizing that there will be work unique to certain injured resources that should be supported. Fundamentally,

the working groups will be asked to identify research priorities that address why certain injured resources are not recovering (i.e., whether there are ecotoxicological effects and/or ecosystem processes limiting recovery) and what, if any, active restoration actions should be undertaken.

As you consider research questions, you should keep in mind that expenditure of *Exxon Valdez* Settlement funds must benefit injured resources or services. Also, the Trustee Council has indicated that restoration will emphasize injured resources and services that are not recovering (see Table B-1 from the *Draft Restoration Plan*, attached). As a legal matter, the purpose of the Settlement is restoration of injured resources and services, not study of the spill-area ecosystem for its own sake. Basic research, without a benefit to restoration of injured resources, is not eligible for funding from the Settlement.

Part 2 — Implementation of the *Draft Restoration Plan*: The purpose of the second part of the workshop will be to further develop the management-by-objective implementation structure that can be used in an on-going manner to implement the mission of the Trustee Council.

The second part of the workshop (April 15) will include:

— review of draft Recovery Monitoring Strategies for the injured resources and services as identified in the *Draft Restoration Plan* (November 1993); and

— review of the restoration strategies that have previously been endorsed by the Trustee Council and published in the *Draft Restoration Plan* (November 1993).

A draft set of Recovery Monitoring Strategies will be available for review at the meeting. A set of restoration strategies (excerpted from the *Draft Restoration Plan*) is enclosed, along with draft materials previously developed for inclusion in the Implementation Management Structure document (Attachment D).

Timeline for Development of the FY 95 Work Plan

Finally, I recognize that this is a very short notice for the workshop. It is important to put this work shop into the context of the timeline for development of the FY 95 Work Plan; the results of this work session will be used to help guide development of the Trustee Council work plan.

In mid-May, a general solicitation for a description of FY 95 restoration project proposals will be made by the Trustee Council. This solicitation will include research question identified through this work session process and other means. The response to this solicitation will be used as the basis for formulating a Draft FY 95 Work Plan that will be published for formal public review and comment in mid-August and September. Trustee Council action on the FY 95 Work Plan is scheduled for the end of October.

*****

Please contact Rebecca Williams in the Anchorage Restoration Office to indicate whether you will be able to attend so that we can provide details on the location and final agenda (local phone: 278-8012; Long Distance - Inside Alaska: 1-800-478-7745 or Outside Alaska: 1-800-283-7745). If you cannot attend, please feel free to send me written concepts or hypotheses that you wish to have considered at the workshop (fax: 907-276-7172). The workshop is open to the public, so please let others know about it if you believe their participation would be helpful. While limited, some funding for public (non-agency) travel is available; please contact Rebecca Williams in the Anchorage Restoration Office if you are in need of assistance.

I look forward to your participation in the work session.

Sincerely,

Molly McCammon
Director of Operations

attachments

ATTACHMENTS

Attachment A	Organization and Structure — Science Planning and Management
Attachment B	Draft Agenda — Research Priorities for Restoration (April 13-15)
Attachment C	Directing the Research: Examples of Hypotheses
Attachment D	— Implementation Management Structure (working document) — Strategies for Restoration (excerpted from the *Draft Restoration Plan*)
Attachment E	Mailing List

Attachment A: Organization Structure Draft - 3/30/94

Organization Structure
Science Planning and Management

The Trustee Council has identified the need for an explicit organizational structure for science planning and management. Science needs to address a series of questions for the restoration process: Are the injured resources recovering? (Monitoring). If not, why? (research on toxicological linkages, ecosystem processes, other anthropogenic impacts). How can recovery be achieved or accelerated? (general restoration). This organizational structure must address the public and scientists' concerns that the Council is directing its efforts at the priority restoration issues; that the work is technically appropriate and feasible; and that the programs are efficient and effective, with appropriate coordination and integration. The Council has also recognized the need to take an adaptive management approach to the process, with on-going review and revision utilizing the results of monitoring and research efforts to guide restoration activities.

The attached draft organization diagram was developed at the Implementation Management Structure work sessions held by the Executive Director on January 13 & 14 and March 21 & 23 to address these needs and concerns. This management structure works from the base of injured resources to develop an integrated, ecosystem approach to accomplishing the goals of healthy ecosystem components, and thus the Mission "to restore the environment injured by the *Exxon Valdez* oil spill to a healthy, productive, world-renowned ecosystem..." The court settlement requires that restoration funds must be used "... for the purpose of restoring, replacing, enhancing, or acquiring the equivalent of *natural resources* injured as a result of the Oil Spill and the reduced or lost *services* provided by such resources..." Thus, general restoration and monitoring/research activities must be linked to the injured resources. However, we have recognized that a single-species approach to restoration is not adequate. The first policy stated in the Draft Restoration Plan is that the restoration program will take an **ecosystem approach**. Restoration of the injured resources will require attention to ecosystem processes that may be limiting recovery, as well as monitoring/ research and active restoration that addresses the specific needs of particular injured resources.

The structure proposed to address these concerns and provide a process to pose and answer the appropriate questions includes Interdisciplinary Work Groups, a Coordinating Committee for the Work Groups, and a Science Review Board (SRB). Their responsibilities and composition are outlined below. An Annual Workshop and an annual cycle of review and revision provide the feedback loop for adaptive management. The Annual Workshop provides the opportunity for informing the scientific community, the public, and the Trustee Council about the results from restoration activities. This information can then be used to refine on-going projects and revise strategies and research approaches for future work. A schematic of the annual cycle is attached.

I. Interdisciplinary Work Groups: Structured around groups of injured resources, including fish, birds, mammals, nearshore organisms and sediments, and archeology. This is not a restatement of the single-species paradigm, but a basis to build an ecosystem approach from the need to restore injured resources.

1.) Responsibilities

A. Identify strategies, research approaches, and testable hypotheses for monitoring, research, and general restoration.

a. Emphasis on integrated, interdisciplinary approaches. SEA plan as an example.

b. Needed for guidance of FY-95 proposals and beyond.

B. Annual review of resource status and strategies for achieving restoration objectives.

C. Recommend priorities for research and restoration activities needed to achieve restoration objectives.

D. Ensure communication, cooperation, and integration

a. Within Work Group.

b. Determine representative for Coordinating Committee for communication with other Work Groups.

2.) Composition

A. Scientists from resource disciplines, including PI's with projects for monitoring and restoration of the injured resources.

B. Scientists from other disciplines (e.g., oceanography, toxicology, ecosystem modeling).

C. Public participation. Meetings are open to the public and interested public are a part of the planning and review process. Administrative funds will be available to ensure appropriate representation.

II. Coordinating Committee

1.) Responsibilities

A. Communication, coordination, and cooperation among Work Groups to ensure an integrated effort directed at restoration of injured resources and services and a healthy ecosystem.

B. Coordination of information from Work Groups on strategies, testable hypothesis, priorities, and progress towards restoration for review by the SRB and the Executive Director.

C. Coordination of activities with Restoration Work Force to facilitate agency administration and cooperation.

D. Organizes the agenda for the Annual Workshop, in conjunction with the SRB.

2.) Composition

A. Representatives from Work Groups.
   a. One representative from each Work Group.

B. Two at-large members
   a. Chosen by Work Group representatives.
   b. Executive Director must confirm selection.

C. Trustee Council Chief Scientist.

D. All meetings are open to the public.

III. Science Review Board

1.) Responsibilities

A. Recommend scientific priorities based on technical merit;
   a. Identify meritorious ideas and projects
   b. Recommend a prioritized list of ideas and projects
   c. Recommend resolution of conflicts between competing proposals
   d. Recommend the best proposal or combination of proposals for a given objective and/or project.
   e. Provide guidance to the Interdisciplinary Work Groups for the development of strategies, research approaches, and testable hypotheses for monitoring/research and general restoration.

B. Assist in the development of an adaptive management process;
   a. Help integrate research and monitoring efforts
   b. Help the process run more efficiently and effectively
   c. Help synthesize study results and information from other sources
   d. Following review of results, recommend appropriate changes to ongoing and proposed work and identify new projects.

C. Review proposed, ongoing, and completed work;
   a. Review proposals
   b. Review project design
   c. Review project conclusions and reports.

D. Assist the Executive Director explain what has been done, what has been learned, and what needs to be done;
   a. Explain the effects of completed projects
   b. Explain how proposed projects aid restoration
   c. Explain how proposed projects affect the ecosystem.
   d. Organize the agenda for the Annual Workshop in conjunction with the Coordination Team for the Interdisciplinary Work Groups.
   e. Participate in the development of the annual report to the public.

2.) Composition

A. Members must be recognized as leading experts in their field of expertise, must have a multi-disciplinary approach to problem solving, and must have demonstrated professional integrity.

B. Since continuity is important, prior knowledge of this oil spill is desirable.

C. The Board will consist of six to eight members including the Chief Scientist and needs to cover the following disciplines:

a. Archaeology
b. Birds
c. Ecotoxicology/chemistry
d. Fish
e. Intertidal/Subtidal
f. Marine Mammals
g. Oceanography

Additional expertise on specific topics will be covered as necessary from appropriate sources.

D. The Chief Scientist will chair the Board (including calling meetings, setting agendas, and conveying results).

E. Members will be appointed by the Executive Director following consultation with the Chief Scientist, the agencies, and interested public and confirmed by the Trustee Council.

F. The Executive Director will conduct an annual performance review of the Science Review Board and submit a report with recommendations to the Trustee Council. Members will serve at the pleasure of the Executive Director and concurrence of the Trustee Council.

G. Members may not be contractually involved in the implementation of projects. Even the appearance of a conflict of interest must be avoided.

Assumptions:

1. The Trustee Council makes decisions, the Science Review Board makes recommendations and presentations to the Executive Director and the Trustee Council as appropriate.

2. The Science Review Board primarily focuses on technical merit. Social issues and policy considerations should be incorporated by the Executive Director and Trustee Council.

3. Social objectives and policy are set by the Trustee Council. When appropriate, the Science Review Board will be requested to make recommendations on how to most efficiently and effectively implement those objectives and policies.

4. The Science Review Board will operate on a consensus basis with majority and minority reports on an issue when necessary.

5. Science Review Board members only work part time and are compensated appropriately.

6. Both compensated and uncompensated peer reviewers will be available to the Science Review Board as necessary to review proposals, project descriptions, and reports.

7. The Science Review Board will review Work Group product and make recommendations to the Executive Director and Trustee Council. Work Groups under the direction of the Executive Director and a Coordinating Committee will be set up for injured resources and services and/or appropriate categories (e.g., terrestrial, nearshore, pelagic) to develop information on progress to date, testable hypotheses, research projects, and restoration implementation projects.

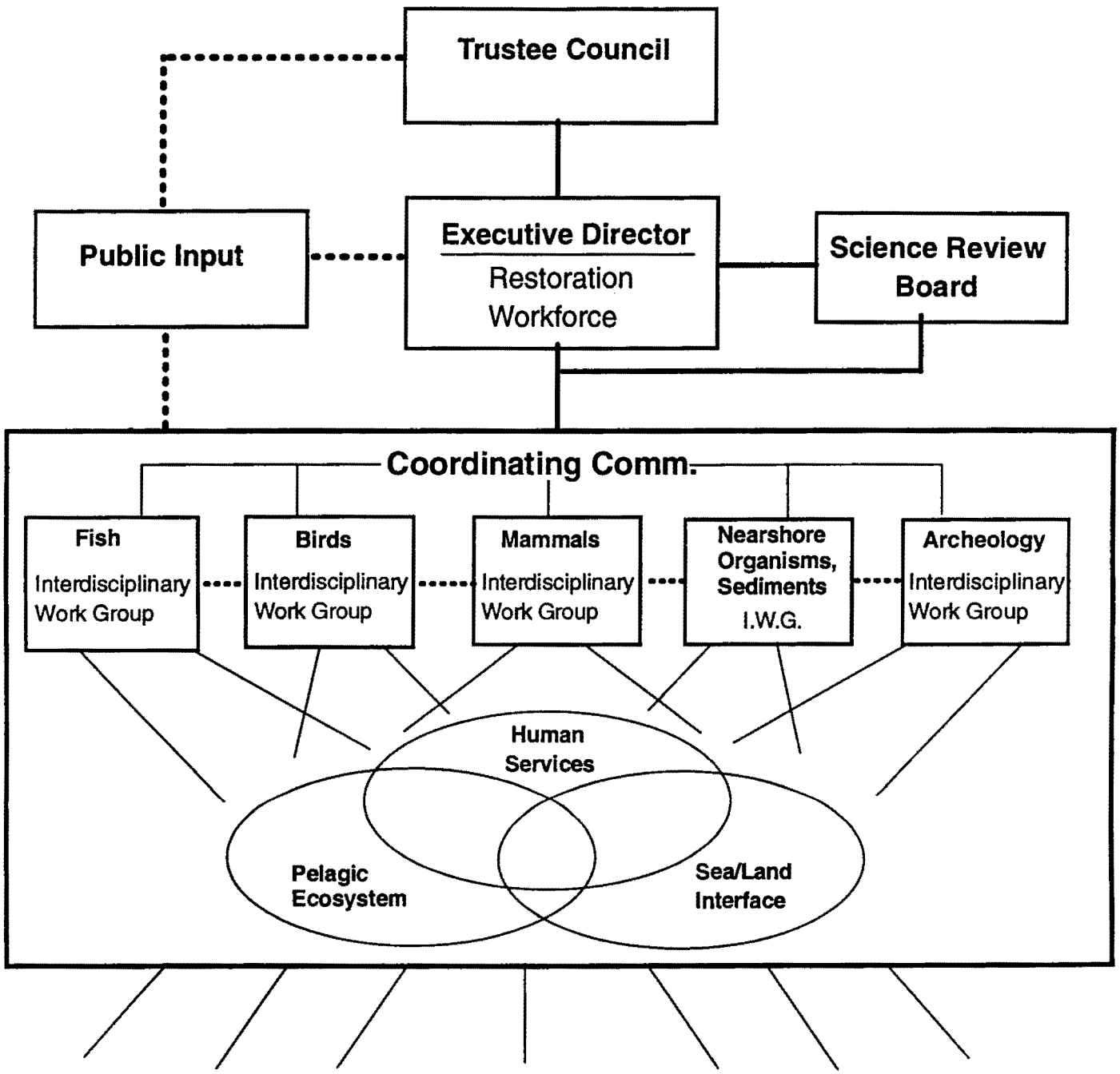
8. Science Review Board meetings will be open to the public.

9. Staff support will be provided by the Executive Director.

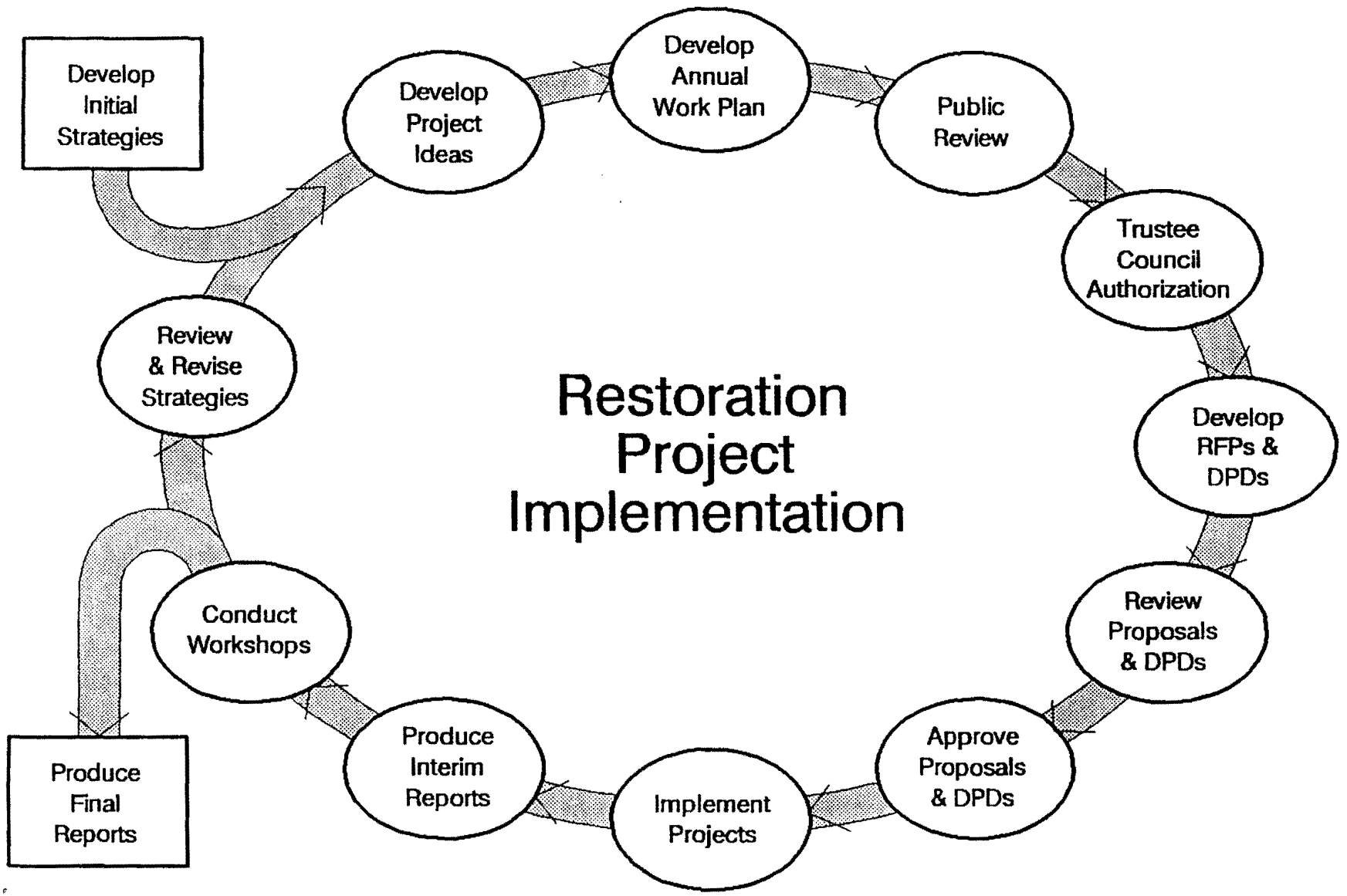
10. The Science Review Board will hold work sessions to synthesize research and monitoring information.

Organizational Diagram Science Planning and Management

(DRAFT 3/30/94)



Monitoring; Ecosystem Research; General Restoration; Habitat Protection


Develop Initial Strategies
Develop Project Ideas
Develop Annual Work Plan
Public Review
Trustee Council Authorization
Develop RFPs & DPDs
Review Proposals & DPDs
Approve Proposals & DPDs
Implement Projects
Produce Interim Reports
Conduct Workshops
Review & Revise Strategies
Produce Final Reports
Restoration Project Implementation

Appendix B. Draft Agenda 3/31/94

Research Priorities For Restoration
Anchorage, April 13-15, 1994

April 13 Part 1. Guidance for the 1995 Work Plan and Beyond

0830 Science Planning and Management for the Restoration Process
Jim Ayers, Executive Director for the Trustee Council

0900 Ecosystem Approach to Restoration
Dr. George Rose, OPEN Scientific Program Leader (if available)

0945 Game Plan for the Work Shop: Part 1
Molly McCammon, Operations Director for the Trustee Council

0955 Break

1015 Directing the Research: Examples of Hypotheses
Presentations by members of the Interdisciplinary Work Groups

1200 Lunch

1300 Interdisciplinary Work Groups Meet
- Selection of Coordinating Committee Representative
- Development of hypotheses list

1700 Break

1900 Interdisciplinary Work Groups Meet
- Continued development of hypotheses list

April 14

0830 Meeting of the Whole
- Coordinating Committee Representatives present hypotheses from Work Groups
- Discussion of classification of hypotheses by ecosystem component (nearshore, pelagic) and/or type of hypotheses (e.g. ecosystem processes, ecotoxicology)

1000 Break

1020 Interdisciplinary Work Groups Meet
·Classify, prioritize hypotheses

1200 Working Lunch

1400 Break

1430 Meeting of the Whole
·Coordinators present draft final lists for review by participants
·Revised lists are compiled as draft for mail-out review

1630 How We Get There From Here
Jim Ayers, Executive Director

April 15 Part 2. Revision of Draft Restoration Plan

0830 Management By Objective: Strategies for Restoration
Jim Ayers, Executive Director

0900 Game Plan for the Work Shop: Part 2
Molly McCammon, Operations Director

0910 Monitoring Strategies for the Restoration Plan
Byron Morris, NOAA

0935 Research/Restoration Strategies for the Restoration Plan
Veronica Gilbert, Alaska Department of Natural Resources

1000 Break

1020 Interdisciplinary Work Group Meetings
·Review Monitoring, Research, and Restoration Strategies
·Provide comments and revisions for inclusion in DEIS review document

1200 Working Lunch

1430 Revising the Injured Resource Listing
Bob Spies, Chief Scientist for the Trustee Council

1700 Closing Comments
Jim Ayers, Executive Director

Table B-1 from the *Draft Restoration Plan* (November 1993)

INJURED RESOURCES			Lost or Reduced SERVICES
Biological Resources		**Other**	
Recovering Bald eagle Black oystercatcher Intertidal organisms (some) Killer whale Sockeye salmon (Red Lake) Subtidal organisms (some)	**Not Recovering** Common murre Harbor seal Harlequin duck Intertidal org. (some) Marbled murrelet Pacific herring Pigeon guillemot Pink salmon Sea otter Sockeye salmon (Kenai River) Subtidal organisms (some)	Archaeological resources Designated wilderness areas	Commercial fishing Passive Uses Recreation and Tourism including sport fishing, sport hunting, and other recreation uses Subsistence
Recovery Unknown Clams Cutthroat trout Dolly Varden River otter Rockfish			

Directing the Research: Examples of Hypotheses
DRAFT 3/31/94

The following seven hypotheses were contributed by participants at the Implementation Management Structure work sessions. The scope of the hypotheses range from broad-based ecosystem research to toxicological and biological mechanisms impacting particular injured resources. No priority weighting is given to these particular hypotheses; they are meant to be examples of research approaches that could give guidance for research proposals for the 1995 Work Plan.

Example 1. The principal factor limiting the restoration of several injured resources (marbled murrelet, pigeon guillemot, and harbor seal) is food availability. Food limitation, in turn, may be caused by a recent ecosystem shift in the Gulf of Alaska and Prince William Sound which favors increased production of demersal fishes such as walleye pollack, cod, and flatfish at the expense of the forage species such as capelin, sandlance, and herring on which these injured resources feed.

Example 2. The decline in pinnipeds and several species of seabirds in Prince William Sound and the Gulf of Alaska during the last decade has occurred due to predation by killer whales (pinnipeds) or avian and mammalian predation at breeding colonies (seabirds); predation constrains recovery of these injured resources from the additional damage inflicted by the oil spill.

Example 3. Hydrocarbons present in nearshore sediments and organisms (e.g., mussels) are being consumed by injured resources such as harlequin ducks and sea otters that forage in the nearshore zone, and impair the recovery of these injured resources.

Example 4. The oil spill has modified the nearshore ecosystem. Variation and potential mechanisms responsible for variation in the recruitment, growth, condition, and survival of injured nearshore organisms must be determined to assess the magnitude of oil-related change, to measure and affect recovery of injured resources, and to evaluate the relative health and productivity of the nearshore ecosystem.

Example 5. Mortality and growth of pink salmon and herring in Prince William Sound are controlled by the standing biomass of zooplankton, as influenced by atmospheric and oceanic processes. The average residence time of the Sound's waters and the strength of advective transport of deeper waters from the Gulf of Alaska into the Sound, control the standing biomass of zooplankton. When zooplankton are abundant, predation pressure on juvenile salmon and herring is relatively low, and survival of the juveniles is higher. If zooplankton abundance is low, predatory fish and birds switch from a zooplankton diet to juvenile salmon and herring, thus reducing survival of the juveniles. Reduced survival of young fish results in lower adult population sizes available to apex predators such as birds, marine mammals, and humans.

Example 6. Pink salmon populations have incurred heritable damage due to exposure to oil during embryonic development resulting in a reduction in survival and increased straying from these populations, which limits the recovery of the exposed populations and may impact the health of adjacent populations.

Example 7. The overescapement of sockeye salmon into the Kenai River and Kodiak Island lakes have produced ecosystem-level effects on the lake rearing habitat associated with the freshwater component of their life history. Top-down predation from rearing juvenile sockeye salmon has resulted in sustained decreases in sockeye salmon production by one of the following mechanisms: alteration of the composition of the zooplankton community to a predation resistant form; reduction in zooplankton biomass through overcropping of the reproductive component of key zooplankton species; or increased mortality of juvenile sockeye salmon by increasing foraging time in high predation risk behavior.

Exxon Valdez Oil Spill Trustee Council

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March 31, 1994

Attachment D

Materials for the
Implementation Management Structure
as drafted in the January 13-14, and March 21, 23 work sessions

The material in this attachment provides part of a structure that allows a restoration activities to be traced from the proposed activity through a strategy, to an approved restoration objective, to a restoration goal, to the mission of restoration. In this way, it will help ensure that all actions are consistent with the mission of the settlement, and that the Trustee Council's activities form a comprehensive, ecosystem-based program of addressing restoration created by the 1989 *Exxon Valdez* Oil Spill.

The material in this attachment was discussed at a work session in Anchorage on January 13 and 14, 1994. Changes were made during review of the work session notes after the meeting. There was little group discussion at the March 21–23 meeting, but a few people made additional comments. The work sessions involved agency representatives, peer review scientists, and members of the public.

Mission Statement

The mission of the Trustee Council and all participants in Council efforts is to efficiently restore the environment injured by the *Exxon Valdez* oil spill to a healthy, productive, world renown ecosystem, while taking into account the importance of the quality of life and the need for viable opportunities to establish and sustain a reasonable standard of living.

The restoration will be accomplished through the development and implementation of a comprehensive, interdisciplinary recovery and rehabilitation program that includes:

- Natural Recovery
- Monitoring and Research
- Resource and Service Restoration
- Habitat Acquisition and Protection
- Resource and Service Enhancement
- Replacement
- Meaningful Public Participation
- Project Evaluation
- Fiscal Accountability
- Efficient Administration

— adopted by the *Exxon Valdez* Oil Spill Trustee Council on November 30, 1993.

Guiding Principles

General Principles

1. Restoration should contribute to a healthy, productive and biologically diverse ecosystem within the spill area that supports the services necessary for the people who live in the area.

2. Restoration will take an ecosystem approach to better understand what factors control the populations of injured resources.

Principles that Focus or Direct Restoration Activities

3. Restoration will focus upon injured resources and services and will emphasize resources and services that have not recovered. Resources and services will be enhanced, as appropriate, to promote restoration. Restoration actions may address resources for which there was no documented injury if these activities will benefit an injured resource or service.

4. Resources and services not previously identified as injured may be considered for restoration if reasonable scientific or local knowledge obtained since the spill indicates a spill-related injury.

5. Projects designed to restore or enhance an injured service:
   - must have a sufficient relationship to an injured resource,
   - must benefit the same user group that was injured, and
   - should be compatible with the character and public uses of the area.

6. Restoration activities will occur primarily within the spill area. Limited restoration activities outside the spill area, but within Alaska, may be considered under the following conditions:
   - when the most effective restoration actions for an injured population are in a part of its range outside the spill area, or
   - when the information acquired from research and monitoring activities outside the spill area will be significant for restoration or understanding injuries within the spill area.

Principles Concerning Integration of Restoration Activities

7. Restoration will include a synthesis of findings and results, and will also provide an indication of important remaining issues or gaps in knowledge.

8. Restoration shall take advantage of cost sharing opportunities where effective.

9. Restoration should be guided and reevaluated as information is obtained from damage assessment studies and restoration actions.

Public Participation Principles

10. Restoration must include a meaningful public participation process at all levels — planning, project design, implementation and review.

11. Restoration must reflect public ownership of the process by timely release and reasonable access to information and data.

Principles concerning the Design of Restoration Projects

12. Proposed restoration strategies should state a clear, measurable and achievable end point.

13. Restoration must be conducted as efficiently as possible, reflecting a reasonable balance between costs and benefits.

Principles to Help Establish Priorities for Restoration Activities

14. Priority will be given to restoring injured resources and services which have economic, cultural and subsistence value to people living in the oil spill area, as long as this is consistent with other principles.

15. Possible negative effects on resources or services must be assessed in considering restoration projects.

16. Priority shall be given to strategies that involve multi-disciplinary, interagency or collaborative partnerships.

17. Restoration projects will be subject to open, independent scientific review before Trustee Council approval.

18. Past performance of the project team should be taken into consideration when making funding decisions on future restoration projects.

19. Competitive proposals for restoration projects will be encouraged.

20. Government agencies will be funded only for restoration projects that they would not have conducted had the spill not occurred.

These Guiding Principles reflect and elaborate on the Policies identified in Chapter 2 of the Draft *Exxon Valdez* Oil Spill Restoration Plan (November 1993). Further guidance regarding the categories of restoration action — General Restoration, Habitat Protection and Acquisition, Monitoring and Research, and Public Information and Administration — are provided in Chapter 3 of the Draft *Exxon Valdez* Oil Spill Restoration Plan (November 1993).

Definitions

Goal: A mental concept of what you want.

Objective: Pertaining to a material or measurable specific object (as distinguished from a mental concept)

Strategy: Activity or expenditure that is directed toward accomplishment of an objective (i.e., who, what, where, when, how).

Categories of Restoration Strategies:

- Monitoring and Research
- Habitat Protection
- General Restoration

Ecosystem Definitions. The two ecosystem types described below are not intended to have hard-and-fast, legally definable boundaries. Rather, they are intended to describe areas that generally contain similar biological and physical features that influence the relationships of the resources that exist there and the services they support. *[Note to participants in previous work sessions: At the March work session, the group combined the upland and near-shore ecosystems in the organization chart. Thus, they are combined here.]*

Pelagic Ecosystem. The deeper, open water region offshore that is not directly affected by wave action, terrestrial runoff, or other near-shore processes. Examples are the center of Prince William Sound and a few hundred yards beyond the steep cliffs and fiord mouths of the outer Kenai coast.

Sea-land Interface. Terrestrial and aquatic areas dominated by near-shore processes such as tidal movement, salt spray, intertidal and shoreline vegetation, wave action, and terrestrial runoff. Near-shore areas include the intertidal zone, salt marshes, and beach areas where salt and shoreline processes dominate, as well as shallower offshore waters that are greatly influenced by near-shore processes. It also includes narrow fjords and channels that occur in the spill area. The sea-land interface also includes extensions of injured resources' and services' habitat into the uplands.

INJURED RESOURCE — ECOSYSTEM MATRIX

	ECOSYSTEM	
	Pelagic (Off-shore)	Sea-land Interface
Harbor seal	X	X
Sea otter		X
Killer whale	X	
Sockeye salmon	X	X
Cutthroat trout		X
Dolly Varden		X
Rockfish	X	X
Pacific herring	X	X
Pink salmon	X	X
Common murre	X	X
Harlequin duck		X
Marbled murrelet	X	X
Pigeon guillemot		X
Bald eagle		X
Black oystercatcher		X
River otter		X
Clams		X
Mussels		X
Intertidal organisms		X
Subtidal organisms	X	X
Sediments	X	X
Other Resources		
Archeological Resources	X	
Designated Wilderness		X

List of Injured Resources by Ecosystem

Pelagic (Off-shore) Ecosystem

Sockeye salmon
Pink salmon
Pacific herring
Rockfish
Killer whale
Harbor seal
Common murre
Marbled murrelet

Subtidal organisms
Sediments

Sea-land Interface

Sockeye salmon
Pink salmon
Cutthroat trout
Dolly Varden
Pacific herring
Harbor seal
Sea otter
Clams
Mussels
Pigeon guillemot
Rockfish

Archaeologic resources

Bald eagle
Harlequin duck
Black oystercatcher
River otter
Intertidal organisms

Subtidal organisms

Marbled murrelet
Sediments
Common murre

Designated wilderness areas

GOALS

Pelagic (Off-shore) Ecosystem: A heathy, productive, pelagic (off-shore) ecosystem that supports resources and services injured by the oil spill, and that maintains naturally occurring biodiversity.

Sea-land Interface: Heathy, productive, near-shore and upland ecosystem that supports resources and services injured by the oil spill, and that maintains naturally occurring biodiversity.

OBJECTIVES

(In the table below, the first column shows the ecosystem to which the objective applies: P=pelagic (off-shore) ecosystem, S=Sea-land interface.)

The overall goal of restoration is recovery of all injured resources and services. Ecosystem goals are described above. This section defines objectives as measures of recovery to meet the overall restoration goal and ecosystem goals. For some resources, little is known about the extent of injury and recovery, so it is difficult to define recovery or develop restoration strategies.

In general, resources and services will have recovered when they return to conditions that would have existed had the spill not occurred. Because it is difficult to predict conditions that would have existed in the absence of the spill, recovery is often defined as a return to prespill conditions. For resources that were in decline before the spill, like marbled murrelets, recovery may consist of stabilizing the population at a lower level than before the spill.

Where little prespill data exists, injury is inferred from comparison of oiled and unoiled areas, and recovery is usually defined as a return to conditions comparable to those of unoiled areas. Because the differences between oiled and unoiled areas may have existed before the spill, statements of injury and objectives for recovery based on these differences are often less certain than in those cases where prespill data exist. However, there can also be some uncertainty associated with interpreting the significance of prespill population data since populations undergo natural fluctuations. Indicators of recovery can include increased numbers of individuals, reproductive success, improved growth and survival rates, and normal age and sex composition of the injured population.

Natural Resources

S **Bald Eagle:** Bald eagle population and productivity comparable to prespill levels.

S **Black Oystercatchers:** Populations that attain pre-spill levels, and reproduction and growth rates in oiled areas that are comparable to those in unoiled areas.

S **Clam:** Clam populations and productivity that are at prespill levels.

P, S **Common Murre:** Prespill populations and fledgling productivity of common murres at all injured colonies.

S **Cutthroat Trout and Dolly Varden Trout:** Growth rates and survival for cutthroat trout and Dolly Varden trout within oiled areas that are comparable to those for unoiled areas.

S **Harbor Seal:** Population trends in harbor seals that are stable or increasing.

S **Harlequin Ducks:** For harlequin ducks, prespill populations or when differences between oiled and unoiled areas are eliminated.

S **Intertidal Organisms:** For each intertidal elevation (lower, middle, and upper), community composition, age class distribution, population abundance of component species, and ecosystem functions and services at levels that would have prevailed in the absence of the oil spill.

P **Killer Whale:** Recovery of the injured AB killer whale pod to the 1988 level (of 36 individuals).

P, S **Marbled Murrelet:** Population trends in marbled murrelets that are stable or increasing.

S **Mussel:** Mussel populations and productivity which are at prespill levels, and that do not contain oil that contaminates higher trophic levels.

P, S **Pacific Herring:** Populations of pacific herring that are healthy and productive and exist at prespill abundances.

P, S **Pigeon Guillemot:** Population trends in pigeon guillemots that are stable or increasing.

P, S **Pink Salmon:** Populations of pink salmon that are healthy and productive and exist at prespill abundances. (An indication of recovery is when egg mortalities in oiled areas match prespill levels or levels in unoiled areas.)

S **River Otters:** For river otters, population levels are unknown but indications of recovery are when use and physiological indices have returned to prespill conditions.

P **Rockfish:** Populations of rockfish levels are unknown, but indications of recovery are when habitat use and physiological indices have returned to prespill conditions.

S **Sea Otter:** A population abundance and distribution of sea otters comparable to prespill abundance and distribution, and when all ages appear healthy.

P, S **Sediments:** Sediments whose contamination, if any, causes no negative effects to the spill-affected ecosystem.

P, S **Sockeye Salmon (Kenai River):** Population of sockeye salmon (Kenai River) that is healthy, and productive and exists at prespill levels. (One indication of recovery is when Kenai and Skilak Lakes support sockeye smolt outmigrations comparable to prespill levels.)

P, S **Sockeye Salmon (Red Lake):** Population of sockeye salmon (Red Lake) that is healthy, productive, and exists at prespill levels in Red Lake.

P, S **Subtidal Organisms:** For subtidal organisms, community composition, population abundance and age distribution of component species, and ecosystem functions and services in each injured subtidal habitat that have returned to levels that would have prevailed in the absence of the oil spill.

Other Resources

S **Archaeological Resources:** For archaeological resources, an end to spill-related injury including looting and vandalism rates that are at or below prespill levels.

S **Designated Wilderness Areas:** Designated wilderness areas where oil is no longer encountered, and when the public perceives them to be recovered from the spill.

Services

Subsistence: Subsistence resources that are healthy and productive and exist at prespill levels, and people that are confident that the resources are safe to eat. (One indication that recovery has occurred is when the cultural values provided by gathering, preparing, and sharing food are reintegrated into community life.)

Commercial Fishing: Population levels and distribution of injured or replacement fish used by the commercial fishing industry match conditions that would have

existed had the spill not occurred. Because of the difficulty of separating spill-related effects from other changes in fish runs, the Trustee Council may use prespill conditions as a substitute measure for conditions that would have existed had the spill not occurred.

Recreation and Tourism: Recreation and tourism, fish and wildlife resources that are recovered; recreation use of oiled beaches that is no longer impaired, and management capabilities and facilities that can accommodate spill-related changes in human use.

Passive Use: A public that perceives that aesthetic and intrinsic values associated with the spill area are no longer diminished by the oil spill.

Management Processes Goals and Objectives

This attachment lists a goal and four objectives for management processes.

GOAL

A long-term, comprehensive and cost-effective restoration program comprised of integrated strategies that are a balanced combination of Monitoring and Research, Habitat Protection and General Restoration.

OBJECTIVES

Administration: Administrative costs that average no more than five percent of overall restoration expenditures over the remainder of the settlement period.

Integrated Research and Monitoring : A research and monitoring program that coordinates project development and design with goals and objectives; appropriately reflects and addresses ecosystem relationships; and ensures that collected data will be readily available and accessible to resource managers, policy makers and the general public.

Information Management: Information that is available in a timely manner and useable format to scientists, managers and the public.

Communication: A public involvement program that provides information and an opportunity for meaningful involvement in all levels of restoration — planning, project design, implementation, and review.

Restoration Strategies

Restoration strategies are presented under three headings: Natural Resources, Other Resources, and Services. The combination of individual restoration objectives and strategies into a unified restoration program will result in an ecosystem approach that recognizes the interconnections between species, and between species and their physical environment. The definitions of recovery and the restoration strategies also reflect consideration of ecosystem relationships. For example, recovery of intertidal and subtidal communities are defined, in part, as a return to ecosystem functions and services that would have existed in the absence of the spill; and the restoration strategy for some injured resources includes research into why they are not recovering, such as declining or contaminated food sources or disruption of ecosystem relationships.

Natural Resources

Because restoration strategies for natural resources differ according to the degree of recovery, they are subdivided into strategies for recovering resources, resources that are not recovering, and resources whose recovery is unknown. The table below lists injured species by status of recovery and indicates the pages on which the restoration strategy for that group of resources can be found.

Recovering (p. 14)	Not Recovering (p. 15)	Recovery Unknown (p. 16)
Bald eagles	Common murres	Clams
Black oystercatchers	Harbor seals	Cutthroat trout
Killer whales	Harlequin ducks	Dolly Varden
Sockeye salmon (Red Lake)	Intertidal organisms	River otter
	Marbled murrelets	Rockfish
	Pacific herring	
	Pigeon guillemots	
	Pink salmon	
	Sea otters	
	Sockeye salmon (Kenai	
	Subtidal organisms	

(Archaeology and Designated Wilderness Areas begin on p. 17; Services begin on p. 18.)

Recovering Resources

The following resources are believed to be recovering. This list is expected to change as the condition of injured resources changes and knowledge about them improves.

Bald eagles	Killer whales
Black oystercatchers	Sockeye salmon (Red Lake)

Restoration Strategy. Restoration of recovering resources will rely primarily on natural recovery because, for most recovering resources:

- They are expected to fully recover over time;
- People can do little to accelerate their recovery; and
- Waiting for natural recovery is not likely to significantly harm a community or industry in the long term. (Subsistence, commercial fishing, and recreation are addressed under "Services.")

However, if a resource is not expected to recover fully on its own or if waiting for natural recovery will cause long-term harm to a community or service, appropriate alternate means of restoration would be undertaken.

The restoration strategy for recovering resources has three parts:

Rely on natural recovery. Natural processes aided by protective measures will be the main agents of restoration.

Monitor recovery. For resources believed to be recovering, the monitoring program will track the progress of recovery and detect major reversals. If results of the monitoring program suggest that a resource may not recover as expected, alternate means of restoration will be considered.

Protect injured resources and their habitats. Recovering resources need protection from other sources of potential injury. Protection and acquisition of important habitat, protective management practices, and the reduction of marine pollution are principal ways of providing protection.

Resources Not Recovering

The following resources show little or no sign of recovery nearly five years after the spill. This list is expected to change as the condition of injured resources changes and knowledge about them improves.

Common murres
Harbor seals
Harlequin ducks
Intertidal Ecosystem
Marbled murrelets
Pacific herring
Pigeon guillemots
Pink salmon
Sea otters
Sockeye salmon (Kenai River)
Subtidal Ecosystem

Restoration Strategy. Except for certain protective measures, attempts to restore these resources without knowing why they are not recovering may be ineffectual or even detrimental. For this reason, the restoration strategy for these resources emphasizes determining why they are not recovering and eliminating threats to the remaining populations. Where sufficient knowledge about the nature of injury exists, the restoration strategy also encourages actions to promote recovery because:

- The populations of some of these resources are in a steep decline and may not recover without help; and
- Some of these resources have subsistence or economic importance and their recovery is linked to the recovery of these services. (Restoration strategies under "Services" also apply to these resources.)

The restoration strategy for resources that are not recovering has four parts:

Conduct research to find out why these resources are not recovering. Effective restoration requires an understanding of why resources are not recovering. For some resources the reason is known; however, for most the reason is unknown. Suspected causes include declining or contaminated food sources and disruption of ecosystem relationships.

Initiate, sustain, or accelerate recovery. The primary objective is to initiate recovery if possible. Once a resource is recovering, decisions about continuing restoration to sustain or accelerate the rate of recovery would depend on such factors as the cost and benefits of additional restoration activities and the importance of the resource for recovery of a service. However, if a resource is expected to recover fully through natural recovery alone and waiting for natural recovery to occur will not cause long-term harm to a community or industry, the restoration strategy would rely primarily on natural recovery.

Monitor recovery. The monitoring program will track changes in the condition of these resources. The condition of these resources may change due to natural causes or restoration actions.

Protect injured resources and their habitats. While protective measures alone may not ensure the recovery of these resources, they may prevent additional impacts due to loss of habitat and other disturbances. Protection and acquisition of important habitat, protective management practices, or the reduction of marine pollution are principal ways of providing protection.

Recovery Unknown

It is not known whether the following resources are recovering because insufficient data are available. This list may be modified as knowledge about these resources improves.

- Clams
- Cutthroat trout
- Dolly Varden
- River otter
- Rockfish

Restoration Strategy. Until more is known about the nature and extent of injuries and the degree of recovery for these resources, restoration will rely primarily on natural recovery, aided by monitoring and protective measures.

The restoration strategy for resources whose recovery is unknown has three parts:

Rely on natural recovery. Natural processes aided by protective measures will be the main agents of restoration.

Monitor recovery. For resources whose recovery is unknown, the monitoring program will track the progress of recovery and detect major reversals. If results of the monitoring program suggest that a resource is not recovering, alternate means of restoration will be considered.

Protect injured resources and their habitats. All injured resources need protection from other sources of potential injury. Protection and acquisition of important habitat, protective management practices, and the reduction of marine pollution are principal ways of providing protection.

Other Resources

Archaeological Resources

Injury to archaeological resources stems from increased looting and vandalism of sites and artifacts, and erosion within and around the sites resulting from cleanup activities. In addition, archaeological artifacts may have been oiled. Injuries attributed to looting and vandalism still occur. These injuries diminish the availability or quality of scientific data and opportunities to learn about the cultural heritage of people in the spill area.

Archaeological resources cannot recover in the same sense as biological resources. Restoration cannot regenerate what has been destroyed, but it can prevent further degradation of both sites and the scientific information that would otherwise be lost.

Restoration Strategy. The restoration strategy for archaeological resources has three parts:

Repair spill-related injury to archaeological sites and artifacts. Injuries may be repaired to some extent through stabilizing eroding sites, or removing and restoring artifacts.

Protect sites and artifacts from further injury and store them in appropriate facilities. Archaeological sites and artifacts could be protected from further injury through the reduction of looting and vandalism, or the removal of artifacts from sites and storage in an appropriate facility. Opportunity for people to view or learn about the cultural heritage of people in the spill area would also provide protection by increasing awareness and appreciation of cultural heritage and would replace services lost as a result of irretrievable damage to some artifacts.

Monitor recovery. Monitoring of archaeological resources may detect increases or decreases in rates of looting, vandalism, and erosion of archaeological sites.

Designated Wilderness Areas

The oil spill delivered oil in varying quantities to the waters adjoining the seven areas designated as wilderness within the spill area. Oil was also deposited above the mean high tide line in these areas. During the intense clean-up seasons of 1989 to 1990, hundreds of workers and thousands of pieces of equipment were at work in the spill area. This activity was an unprecedented imposition of people, noise, and activity on the area's undeveloped and normally sparsely occupied landscape.

Restoration Strategy. Any restoration objective which aids recovery of injured resources, or prevents further injuries, will assist recovery of designated wilderness areas. No objectives have been identified which benefit only designated wilderness areas without also addressing injured resources.

Services

Subsistence

Subsistence users say that maintaining their subsistence culture depends upon uninterrupted use of subsistence resources. The more time users spend away from subsistence activities, the less likely they will return to it. Continuing injury to natural resources used for subsistence may affect the way of life of entire communities.

Residual oil exists on some beaches with high value for subsistence. Continued presence of hydrocarbons may contaminate subsistence food resources or, at a minimum, create uncertainty about the safety of subsistence food resources that reduces their use and value for subsistence.

Restoration Strategy. Restoration of fish and wildlife resources are covered elsewhere in this chapter. The restoration strategy for subsistence services has four parts:

Promote recovery of subsistence as soon as possible. Many subsistence communities will be significantly harmed while waiting for subsistence resources to recover through natural recovery alone. Therefore, an objective of restoration is to accelerate recovery of subsistence resources and services. This objective may be accomplished through increasing availability, reliability, or quality of subsistence resources, or increasing the confidence of subsistence users. Specifically, if subsistence harvest has not returned to prespill levels because users doubt the safety of particular subsistence resources, this objective may take the form of increasing the reliability of the resource through food safety testing. Other examples are the acquisition of alternative subsistence food sources and improved use of existing resources.

Remove or reduce residual oil if it is cost effective and less harmful than leaving it in place. Removing residual oil on beaches with high value for subsistence may improve the safety of foods found on these beaches. This benefit would have to be balanced against cost and the potential for disrupting recovering intertidal communities.

Protect subsistence resources from further degradation. Further stress on subsistence resources could impede recovery. Appropriate protection can take the form of habitat protection and acquisition if important subsistence areas are threatened. Protective action could also include protective management practices if a resource or service faces further injury from human use or marine pollution.

Monitor recovery. Monitoring the recovery of subsistence will track the progress of recovery, detect major reversals, and identify problems with the resources and resource management that may affect the rate or degree of recovery. Inadequate information may require managers to unduly restrict use of injured resources, compounding the injury to subsistence.

Commercial Fishing

Commercial fishing was injured through injury to commercial fish species and also through fishing closures. Continuing injuries to commercial fishing may cause hardships for fishermen and related businesses. Each year that commercial fishing remains below prespill levels compounds the injury to the fishermen and, in many instances, the communities in which they live or work.

The Trustee Council recognizes the impact to communities and people of the Prince William Sound region resulting from the sharp drop in pink salmon and herring fisheries in past years. In the 1994 work program, the Trustee Council has committed to the expenditure of five million dollars to help address these issues through the development of an ecosystem study for Prince William Sound. Some of the pink salmon and herring problems may be unrelated to the oil spill. However, the Council will continue to address these important problems as they relate to the oil spill.

Restoration Strategy. Restoration of fish and wildlife resources are covered elsewhere in this chapter. The restoration strategy for commercial fishing has three parts:

Promote recovery of commercial fishing as soon as possible. Many communities that rely on commercial fishing will be significantly harmed while waiting for commercial fish resources to recover through natural recovery alone. Therefore, an objective of restoration is to accelerate recovery of commercial fishing. This objective may be accomplished through increasing availability, reliability, or quality of commercial fishing resources, depending on the nature of the injury. For resources that have sharply declined since the spill, like pink salmon and Pacific herring in Prince William Sound, this objective may take the form of increasing availability in the long run through improved fisheries management. Another example is providing replacement fish for harvest.

Protect commercial fish resources from further degradation. Further stress on commercial fish resources could impede recovery. Appropriate protection can take the form of habitat protection and acquisition if a resource faces loss of habitat. Protective action could also include protective management practices if a resource or service faces further injury from human use and activities.

Monitor recovery. Monitoring the recovery of commercial fishing will track the progress of recovery, detect major reversals, and identify problems with the resources and resource management that may affect the rate or degree of recovery. Inadequate information may require managers to unduly restrict use of the injured resources, compounding the injury to commercial fishing.

Recreation and Tourism

The spill disrupted use of the spill area for recreation and tourism. Resources important for wildlife viewing include killer whale, sea otter, harbor seal, bald eagle, and various seabirds. Residual oil exists on some beaches with high value for recreation. It may decrease the quality of recreational experience and discourage recreational use of these beaches.

Closures on sport hunting and fishing also affected use of the spill area for recreation and tourism. Sport fishing resources include salmon, Rockfish, Dolly Varden, and cutthroat trout. Harlequin duck are hunted in the spill area.

Recreation was also affected by changes in human use in response to the spill. For example, displacement of use from oiled areas to unoiled areas increased management problems and facility use in unoiled areas. Some facilities like the Green Island cabin and the Flemming Spit camp area were injured by clean-up workers.

Restoration Strategy. Restoration of fish and wildlife resources are covered elsewhere in this chapter. The following strategy applies specifically to recreation and tourism services.

Preserve or improve the recreational and tourism values of the spill area. Habitat protection and acquisition are important means of preserving and enhancing the opportunities offered by the spill area. Facilities damaged during cleanup may be repaired if they are still needed. New facilities may restore or enhance opportunities for recreational use of natural resources. Improved or intensified public recreation management may be warranted in some circumstances. Projects that restore or enhance recreation and tourism would be considered only if they are consistent with the character and public uses of the area.

Remove or reduce residual oil if it is cost effective and less harmful than leaving it in place. Removal of residual oil on beaches with high value for recreation and tourism may restore these services for some users. However, this benefit would have to be balanced against cost and the potential for disrupting the recovering intertidal ecosystem.

Monitor recovery. Monitoring the recovery of recreation and tourism services will track the progress of recovery, detect major reversals, and identify problems with the resources and resource management that may affect the rate or degree of recovery.

Passive Uses

Passive use of resources includes the appreciation of the aesthetic and intrinsic values of undisturbed areas, the value derived from simply knowing that a resource exists, and other nonuse values. Injuries to passive uses are tied to public perceptions of injured resources.

Restoration Strategy. Any restoration objective which aids recovery of injured resources, or prevents further injuries, will assist recovery of passive-use values. No objectives have

been identified which benefit only passive uses, without also addressing injured resources. Since recovery of passive uses requires that people know when recovery has occurred, the availability to the public of the latest scientific information will continue to play an important role in the restoration of passive uses.

Exxon Valdez Oil Spill Trustee Council

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

April 1, 1994

Mr. Roderick R. Shipley
Senior Vice President
National Bank of Alaska
P.O. Box 100600
Anchorage, AK 99510-0600

Dear Mr. Shipley:

Thank you for your recent letter regarding the Trust Department of N.B.A. I appreciate your taking the time to contact us regarding the investment of Trustee Council funds. However, under the terms of the Memorandum of Agreement between the State of Alaska and the United States, and in accordance with rules of the U.S. Department of the Treasury, our options are limited.

The settlement agreement provides that the funds must be deposited in the registry of the United States District Court for the District of Alaska. The court, in turn, has issued an order under which it invests the funds through the Court Registry Investment System. Neither the state nor the joint state/federal Exxon Valdez Trustee Council has discretion over where or how the funds are invested.

Again, thank you for your consideration.

Sincerely,

James R. Ayers
Executive Director

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Sincerely,

James R. Ayers
Executive Director

JRA/mir

National Bank of Alaska
Corporate Headquarters P.O. Box 100600 Anchorage, Alaska 99510-0600 (907) 276-1132

March 25, 1994

James R. Ayers
Executive Director
Exxon Valdez Oil Spill Trustee Council
709 West 9th St., Rm 453
Juneau, AK 99802-1668

Dear Mr. Ayers:

I am the manager of the Trust Department at National Bank
capacity I am writing to offer our custody and investment ma
and the Council. I recently became aware of the possibility
looking for ways to improve its return on trust funds. As on
managed banks in the United States, we have earned that reputation in part by investing intelligently. If you think we might be able to help, I hope you will give me a call. My phone number is 265-2841. Thank you for your time.

Sincerely,

Rod Shipley

Rod Shipley
Senior Vice President

may — Recently — we received a copy of a letter the Governor sent to Mr. Don Cuddy of NBA. LTR is in "Reserve" file I think. Pls pull it - I need it to respond to this letter. A

Dear Mr. Shipley
Thank you for your recent letter regarding the Trust Department of NBA. The Trustee Council does not manage

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