

RPWG
BB

**Exxon Valdez Damage Assessment Synthesis:
Schedule for Science Activities, 1990-1991**

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Resource/task	start	finish	By whom	Manhours	Comments
Sea Otters					
Assess loss of PWS otters	10/1/90	10/30/90	Garrott Eberhardt	160 160	The G-E report will estimate the reduction in size the sea otter population after the spill in PWS and model population recovery rates.
G-E Report Review	11/2/90	11/10/90	Siniff Estes Spies Statistician	24 8 8	
Assess loss of sea otters outside PWS	9/15/90	11/15/90	USFWS & GIS experts Siniff Estes Gertler	8	This report will estimate loss of otters outside PWS by development of an intersection model.
Development of a microintersection model	11/1/90		Bodkin Rotterman Costa Garrott Monnett	16 16 24 16	This will be an attempt to estimate the proportion of otters killed in a limited area of PWS as the oil contacted them. It could be the basis for estimating losses on a wider geographic area.
Ground truthing of boat survey methods	8/1/90	10/1/90	Costa Ames Utivitz Siniff	40 60 3	The field work for this project is complete.
Development of dead otter data base: 1. tooth aging 2. reproductive status 3. recovery information 4. gross necropsy	9/10/90	11/15/90	Bodkin Matson Monnet	16	Requires development of aging criteria for sea otters: intercalibration of observer scores on teeth ages
Analysis of Recovery Center information	9/15/90	11/15/90	Harris Haebler Bodkin	8 8	
Analyze hydrocarbon data	11/1/90	11/15/90	Malins	8	This completion date depends on receiving laboratory analyses.
Integration of additional information:	11/15/90	11/30/90	Costa Garrott	24	
toxicity			Malins	16	
thermoregulation			Costa	16	

1990 USFWS studies	12/15/90		Bellachey Burn Klosiewski Doroff	
Statistical critique	12/1/90	12/15/90	Statistician	16
Draft litigation product	12/15/90	1/2/90	Garrott Estes Costa Siniff	80 16 8
Recommendations for Oil Year 3 work	12/15/90			
Review of draft	1/15/91	1/16/91	Spies Siniff Estes	16 16
Project coordination	10/1/90	3/1/91	Gertler Garrott	40
Litigation Product: 1989-1990	1/5/91	2/1/91	Garrott	40

This will summarize all 1990 data, including results of going through morgue this summer. This is the 1990 NRDA studies report.

The synthesis group will be reconvened in a meeting to review the draft: to include Pls, Prince William Sound Science Center scientists and others.

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Marine Mammals

Synthesis Meeting 9/15/90 9/20/90 Spies 24
 Product complete

Draft revisions available when P.I.s return from the field in early September.

Killer whales:

1. 1990 data analyzed 10/25/90 11/30/90 Dahlheim

Contractors to give priority to checking all photos for missing whales from AB pod. This can be done before 10/1/90.

2. Conference call to organize synthesis group 9/26/90
 Dahlheim 2
 Ellis 2
 Ford 2
 Spies 2
 Malins 2

Ford to develop case for mortality based on absence from pod.

3. Development of damage assessment document 10/15/90 10/30/90 Ford 16
 Dahlheim

4. Toxicology risk assessment 10/1/90 10/30/90 Malins 24
 Inhalation toxicologist 40
 chemist 32

This will examine the possibility that whales surfacing through the slick in the first several days after the spill could have been acutely affected (by inhalation of volatile hydrocarbons).

5. Integration of additional information into draft litigation product 11/1/90 12/1/90 Ford 16
 Spies 8
 Malins 8
 Dahlheim

6. Final review of synthesis 1/30/91 Ford 24
 Dahlheim
 Geraci 24
 Costa 24

This will be a meeting to review the final synthesis product. All P.I.s and reviewers will attend.

6. Litigation product complete, 1989-1990 2/1/90 2/15/90 Ford 24
 Malins 24
 Spies 16
 Dahlheim

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Harbor seals:

1. Synthesis meeting	8/16/90	8/25/90	Spies	
2. Completion of 1990 studies report	11/1/90	12/1/90	Frost (PI)	
3. Meeting to review hydrocarbon data	11/6-7/90		Frost Loughlin Spies Malins	24 16
4. Statistical critique	12/2/90	1/1/91	Statistician	16
5 Toxicological risk assessment	12/15/90	2/15/91	Malins ?new expert	40 40
6. Updated synthesis product	3/1/91	3/30/91	Frost Malins Spies	4 4
7. Review of synthesis	3/15/91	3/30/91	Frost Costa Geraci	8 8
8. Litigation product: 1989-1990 studies	3/30/91	4/1/91	Frost Malins Spies	8 8

There is a strong case for damages here. There are population changes, internal and external hydrocarbon exposure, nervous system lesions and behavioral changes.

P.I. will not return to lab until Nov. 1

This could be the same toxicologist that is involved with the killer whales.

Possible meeting depending on the opinions as to the recovery value of harbor seals.

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Fish

Herring

1. Summary video on damages	8/1/90		Biggs Rosenthal		May be released for public information
2. Histopathological & teratological studies of larvae complete	11/15/90		Hose		
3. Report on 1989-- studies	8/1/90	11/26/90	Biggs Baker		Hydrocarbon analyses will be integrated into this report.
4. Draft synthesis document, 1989 results	1/12/90	12/25/90	Biggs/Baker Spies 8 Malins 8 Rothschild 16 Meacham		This is strong case for damages to eggs/fry.
5. Revision of synthesis document	3/1/91	3/30/91	Biggs Baker Spies 8 Meacham		Tasks from 1989 not completed by last report and new findings will be integrated into this draft.
6. Review hydrocarbon data	3/15/91	3/30/91	Spies 4 Mannen		
7. Statistical critique	3/1/91	3/15/91	statistician 8		
8. Final review Meeting	3/15/91	4/1/91	Kocan 16 Hose 16 Rothschild 16 Spies 4		This will be a meeting to come to consensus on the extent of damages that can be supported by the 1989-1990 studies.
9. Completed litigation product	4/15/91	4/30/91	Biggs Rothschild 24 Spies 8 Malins 8		

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Salmon:

1. Synthesis Meeting, PWS Pink Salmon	9/5/90	9/6/90	Spies Malins Meachem Hilborn Mundy	24 12 12 12
2. Draft synthesis document on PWS Pink Salmon	9/7/90	9/30/90	Meacham Mundy Spies Malins Sharr	 24 8 4 .
3. Draft report on sockeye	?	?	Hilborn	40
4. Reanalysis of egg mortality data	9/30/90	10/30/90	Mundy Hilborn Rothschild	2 2 2
5. Decision on scholarly paper on role of stock compensation in fisheries biology	10/30/90		Rothschild Spies	2 1
6. Possible paper on stock compensation	?	?	Rothschild	
7. Review of laboratory effects of HCs on pink salmon	10/30/90		Werheimer Spies	 2
8. 1990 study results available	9/15/90	11/26/90	ADF&G personnel NOAA personnel	
9. Histopath & MFO results available	10/15/90	12/15/90	Hinton	
10. Draft salmon litigation product	12/15/90	1/15/90	Meacham Munday Hilborn Rothschild	 8 4 8
11. Revision of salmon litigation product-- Meeting			Meacham Munday Hilborn Spies Malins Hinton Wertheimer Rothschild	 8 4 16 8 16 24

All available information on damage to eggs/fry/alevins and adult populations will be reviewed

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Birds

All studies

1. Draft overview of all bird studies	9/5/90	10/26/90	Fry	120	Fry in Anchorage 9/10-14 and 10/22-26 Meet with P.I.s and review 1990 studies and develop draft report
2. Review of draft overview	11/1/90	11/20/90	USFWS Personnel ADF&G Personnel		
3. Individual studies: completion of draft 1990 results	9/1/90	11/15/90	USFWS Personnel ADF&G Personnel		
4. Review of 1990 studies	11/25/90	12/10/90	Fry Hunt Ford Sharp	24 24 24 24	
5. Revision of draft overview	12/15/90	1/1/90	Fry Sharp	24 40	
6. Review of 1991 study plans	2/15/91	2/28/91	Fry Hunt Ford	24 24 24	
7. Statistics review	?	?	Bowden	32	
8. Integration of study pairs					Purpose: to evaluate common data, resolve inconsistencies, and to provide correlative data of damages.
a. 1 (beached bird surveys) & 3 (colony surveys)					
b. 2a (aerial surveys) & 2b (boat surveys)					Resolve data conflicts between studies; to provide groundtruth factor for Kenai Peninsula.
c. 2 (b) & 6 (murrelets)					
d. 2 & 9 (guillemots)					To resolve distribution of birds with respect to tides.

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e. 2 & 4 (bald eagles)

f. 2 & 11 (sea ducks)

g. 3 & 8 (kittiwakes)

h. 11 (sea ducks) and
Tech. Serv. 1 (hydrocarbons
in mussels)

i. Compare data of oil on water
with:
boat survey data
beached carcass data

Specific studies

Aerial Surveys

1. Modification of assumptions
on habitat oiling

Sea Ducks

2. Test methods of scoring
for body fat and muscle
atrophy

To correlate nest surveys with
data on nest locations; to resolve
differences in oiling distribution
categories.

Corroborate distance from shore
and overall distribution in oiled and
uniled areas.

To place PWS kittiwake data in context
of other Alaskan studies

We need Exxon's boat logs

Depends on outcome from group
examining inconsistencies on
oiling categories

Independent analysis of fat scores
should be done.

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Coastal Habitat/Air Water Studies

1. Synthesis meeting	7/23/90	7/24/90	Peterson 32 Boesch 32 Spies 32 Malins 32 Burns 32 Green 32 NOAA, USFS, UAF personnel
2. Formulation of recommendations	7/24/90	7/30/90	Peterson 8
3. P.I. reports on 1989-1990 results	8/1/90	11/26/90	NOAA, USFS, UAF personnel
4. Review by mail of 1989-1990 reports	12/1/90	1/1/90	Peterson 16 Boesch 16 Spies 16 Malins 16 Green 16 Simenstadt 16
5. Possible meeting to synthesize results	2/12/91	2/23/91	Peterson 16 Boesch 16 Spies 16 Malins 16 Green 16 Simenstadt 16

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Ecological Working Group

1. Review of 1989-1990 study results and make recommendations	1/15/91	3/1/91	Simenstadt Boesch McRoy Spies	16 16 16 8
2. Formulate potential actions for group		3/15/91	Spies	8

Statistics Working Group

1. Formulation of group	7/20/90		Green Bowden Robson	8 8 8
2. Questionnaire sent to P.I.s	10/15/90		Green Spies	4 4
3. Report on power analyses of sampling methods for key studies	10/15/90	12/15/90	Green	40

Shoreline Oiling and Fate of Oil Working Group

1. Formulation of working group	9/30/90		Sari Lyles McRoy	8 8 8
2. Problem identification and develop scope of work	10/15/90	11/30/90	Sari	160
A. Confer with Lyles and DEC				
B. Questionnaire to all P.I.s				
C. Overlay of maps				
D. Identify inconsistencies				
D. Recommend action				
3. Correction of data bases and use of oiled references by all P.I.s			Sari	?

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Doug Wolfe, two

Chemical Analytical Working Group

1. Meet to form consensus on criteria for presence of oil and means to quantify petroleum hydrocarbons	8/14/90	Spies Malins Mannen Robinson- Wilson Krahn	16 16
2. Draft criteria document produced	8/20/90	Spies	8
3. Final criteria document produced	9/30/90	Spies Mannen Malins	2

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Restoration Planning Work Group
Synthesis Meeting
November 1-2, 1990
Simpson Bldg.

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Thursday, Nov. 1, 1990

Introductions

Review of schedule for next two days.

Review of materials distributed.

Senner/Ross outlined process and schedule for decision making for upcoming restoration work plan which will appear as a federal register notice. In general, the draft work plan will be submitted to the Management Team (MT) by Nov. 28; this will include recommendations for feasibility studies and restoration projects for 1991. On Dec. 28, this draft plan will become public in the federal register.

Review of Status of Damages:

Each RPWG representative (or other session representative) briefly summarized damages presented at the recent resource sessions held last week. Meetings were held so far on coastal habitats (10/25), fish and shellfish (10/26), birds (10/30-31), and recreational resources (10/26). Please refer to notes from these meetings for information on damages. Seperate meetings were unable to be held for marine mammals or cultural resources, so a summary of damages will be presented here.

Marine Mammals:

John Strand (NMFS) and Carol Gorbics (USFWS) presented a brief overview of damages to marine mammals. (Note: The senior scientist, B. Spies, expressed concerns that this information may be too preliminary and possibly inconsistent with conclusions drawn to date by the NRDA process):

Killer Whales - NOAA/Seattle has followed four pods which actually had contact with the oil slick. Although not all of the 1990 data is complete, individuals are still missing from three of these pods (AB pod: seven missing in '89, six additional missing in '90; AE pod: two individuals missing in '89 and still in '90; AT pod: one subgroup [four individuals] missing in '89 and still in '90). Three stranded whales were found and samples were taken from at least one.

Humpback Whales - No short term population impacts apparent (four cow/calf pairings were seen in '89 compared with 8 pairings in '90 - this is a change in reproductive rate from approx. 6.3% to 10%)

Sea lions - declining population in general; reproductive rates continue to be low; hydrocarbons (HC) were found in samples of tissues and in bile.

Sea otters - 1000 were found dead during the spill; surveys done within PWS in '89, '90 showed the population decline continues; blood/semen studies are still ongoing; reproductive rate for rehabilitated otters is very low.

Harbor seals - declining population in general; 38% fewer animals counted in oiled areas in '89; collected 19 seals that were affected by the oil spill (tissue analysis links illness /mortality to oil)

Cultural Resources:

Judy Bittner (ADNR/SHPO) summarized damages to archaeological resources. Two studies are scheduled to begin within this next year: 1) contamination effects on radiocarbon dating technique, and 2) field assessment survey. Categories of damages are as follows:

- damage caused by the cleanup itself.
- increased general knowledge of sites and their location causing potential looting.
- contamination affecting dating techniques; also affecting ability to obtain other data, i.e., soil profile, etc.
- disruption of traditional life of natives; vulnerability of heritage.

There is an interagency effort (this winter) to pull together all information from, notes, etc. to determine how much is there and how it relates to damages. It is feared that Exxon's surveys missed some sites.

A question arose as to whether there is a basis to spend public money on sites located on private lands. "Selected" lands are treated by the National Park Service as being public. The USFS, however, has stayed away from surveying native lands; native groups are pursuing their own cases. In summary, restoration proposals on public lands can be considered by the RPWG.

Under the new oil spill legislation, natives can make claim to damages on "selected lands". Native groups would disagree that cultural resources on private lands are publicly-owned resources. It was noted that it is difficult to keep track of land ownership.

B. Spies would agree that studies such as the carbon dating study seems to fit under restoration feasibility.

Discussion of Issues facing RPWG:

The following issues for development of the 1991 restoration work program were discussed:

1. Definition of Restoration projects versus NRDA projects - The issue of monitoring projects, such as monitoring for natural recovery, were discussed. It was noted that natural recovery must be addressed to determine if restoration is needed; and monitoring is still needed even in cases where direct restoration can not be done (i.e., killer whales). Also, monitoring is an important part of a restoration project to determine effectiveness of the restoration effort. Since the PI's have been approaching these types of projects as part of restoration, the question was raised whether some of these projects should be done, or continued, under NRDA. Again, Spies cautioned that certain projects, i.e, markers of continuing exposure, should not fall through the cracks; they need to be flagged.

The Bird Group distinguished between two types of monitoring: 1) long-term monitoring as part of the post-settlement plan; and 2)

2. Identification of injuries by NRDA versus other sources:

- credibility/validity is more important than where data came from (i.e., NRDA). Documentation of data is necessary.
- FR Notice (RWP - restoration work plan) will address only that there is an injury; will not disclose NRDA results.
- Wash. Policy Group wants NRDA data released to public in Dec., however Susan Macmullen thinks that is technically unrealistic - it is not QA'd or synthesized. There is also the question of "what is data" - raw vs. interpretation.
- RWP should follow administrative procedures; all information that the plan is based on will be discoverable.
- RWP is not ultimate damage assessment or restoration plan; it is dynamic, this is only the first year. It can not preclude good scientific results which may come later.
- the state legislature (or OMB) could make a decision to front money without regard to the compensation issue.

3. Prioritization of Projects:

- RPWG does not want to prioritize projects, except to make the determination that they meet the "factors". Is this acceptable to the MT? Response from Macmullen is to keep as many projects available for public comment.
- Two issues are apparent: RWP must explain thinking and give public as much information as possible; however, need to make some choices for the budget process. The RPWG should not worry about cost in absolute terms but will need to worry about gross disproportionality. The RWP must communicate to the public that this is a "wish list".

4. Consolidation of Projects:

- certain projects can be consolidated to reduce cost; i.e, bird survey work could be coordinated with mammal work.

5. Cost sharing among agencies:

- don't know where money is coming from.
- state only can get funding for restoration projects through 1992 budget.
- federal problem: budget is already set for 1991, money for 1991 restoration will need to be redirected.
- RPWG cannot address split of funding, this needs to be addressed by the MT.
- regarding restoration vs. damage assessment funding - some agencies may have to go to Congress to transfer funding.
- RPWG needs guidance on this issue before the end of

November.

6. Lack of Consensus:

- given current time line, need to have real-time resolution of issues, and may simply have to pass some intractable issues up the line.

Review of Factors/Criteria:

- concern about duration of projects: will projects that require multiple years have strikes against them?
- questions about geographic scope: in reality, 1991 projects will be in spill area or directly connected to damaged resources.
- question of existing management activities and what is justified for funding under restoration? Birds and archaeology are to be monitored anyway.
- Nicoll: increased management must be justified by direct need to increase effort to restore injured resources.
- affects/conflicts with NRDA and clean-up activities - Bittner: spotty compliance with historic preservation law.
- need for studies to determine ecological requirements as well as perhaps to look at it from the other end, which is the ecosystem as a whole. Freedman: scientific relevance to identify injures may be different than science needed to generate restoration projects - need to instead answer some "conservation biology"-type questions. Lack of good background information exists, i.e., need a good model for PWS (integrate ecosystem information into model for entire area). One possibility is to bring on a systems ecologist (ie, Peter McRoy?) to review restoration projects.
- question about applicability of NEPA - Fox: there are real concerns; Nicoll: DOJ is looking into it.

Cultural Resources/Archaeology:

Nine projects were presented by Judy Bittner (not prioritized):

Protection: [from vandalism]:

- Education - what is law, value of resource; targets user groups.
- Enforcement - increase enforcement through increased surveillance; enhance existing programs.
- Stewardship - monitoring at the local level through

- existing programs; i.e., KANA program.
- Erosion control - stabilization of sites.

Data Collection:

- Excavation of sites; identify/evaluate 10 sites, restore one in 1991; little information exists on nature of sites in PWS, outer Kenai, and Kodiak.
- Inventory of PWS-origin artifact collection - removed from area and in private collections.

Education:

- Popular publications - describing cultural resources (not enforcement).
- Oral history - focusing on the spill event's effect on villagers in area.
- Traditional skills - disruption of traditional lifestyles, loss of skills through interruption.

Questions:

- is artifact inventory project needed in 1991? low priority, but could help identify future restoration (tech support).
- is control of erosion needed in 1991?
- can enforcement effort be increased in 1991?
- is traditional skills project related to damage assessment? hard to argue that spill caused loss of skills.
- is popular public project needed in 1991? Should it wait until more information is in?
- how does excavation project relate to existing NRDA study?

Comments:

- protection programs address "risk of ongoing impact", i.e., vandalism, erosion causing loss of data. Legally, it is preventing injury to an already injured resource. Loss of information is at risk. Protection can be reasonably looked at since at this stage we are looking at a broad range of options.
- certain projects above might be proposed under damage assessment (those dealing with archaeological sites themselves, not dealing with history) example: excavation is restoration, study is NRDA/tech. support.

November 2, 1990

Four categories set up to rate projects (RPWG conclusions as of

today):

- (A) Probable recommendation - looks good, write up proposal.
- (B) Possibly favorable for 1991, but need more information before RPWG will include.
- (C) Work is needed, but may be more appropriate under NRDA - RPWG will flag to MT.
- (D) Not appropriate for 1991; does not meet factors, RPWG can not recommend.

"Feasibility" studies will be further classified as feasibility, technical support, or monitoring.

RPWG will reconvene in mid-November for final decisions as to what proposals are included.

Summary of Cultural Resource Proposals:

Protection: [assuming specific sites are identified]

- Education - (A)
- Enforcement - (A)
- Stewardship - (A)
- Erosion control - (A)

Data Collection:

- Excavation of sites - (A)
- Inventory of artifact collections - (D)

Education:

- Popular publications - (A), but pick up as component under education.
- Oral history - (D)
- Traditional skills - (D)

all proposals will be sent to both state and federal attorneys.

- does erosion control conflict with damage assessment legal case
- should damage be documented before this type of restoration project.
- excavation should be timed such that injury studies will have already been done - coordination is needed.
- inventory of artifacts could be done post-settlement.
- popular publications can be picked up under education/recreation
- oral history might be more damage assessment, could be justifiable to do right away while information is fresh.

Recreational Resources:

Sandy Rabinowitch summarized the proposals received thusfar.

Sport fish improvement: [deferred to fish section]

- access/acquisition
- artificial reef
- trout streams
- coho habitat improvement

Marine litter pickup:

- trash removal- left over from clean-up. Cat. (B) - documentation of displacement.
- garbage barge - to work in heavily used waters; long-term project. Cat. (D) - no immediate link to damage.

Education Program: All Cat. (A), if targeted to recreation:

- Interpretive plan - use user survey to get at this question.
- Multi-media - video, brochures, etc.
- Natural histories - response to oil spill

Recreational Site Restoration:

- restoration of camp sites/recreational sites - reconfiguring disturbed sites, survey of more sites. Cat. (A), (B), (C). (attempt should be made to bill as response; permits on USFS land may require restoration to previous land contour).
- drinking water survey - for oil & Giardia - check water on high quality sites in concert with above. Cat. (D).

Replacement: All Cat. (B)

- cabins
- trails
- moorings, buoys, docks

Recreational User Survey - Cat. (B/C), economics studies may cover.

Management Plans:

- Review/rewrite all sections of exiting plans. Cat. (D) - probably premature.
- Phase II of of Current Land Status Study. Cat. (A).

Acquisition: [defer for later discussion].

- intersection of resources and non-government land.
- see A above.

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Fish/Shellfish Summary

Known Damage:

Salmon -

Pink salmon:

- egg and alevin in spawning gravel (>50% increase in mortality in oiled streams).
- stock work still inconclusive - decreased returns for hatchery (AFK) - survival rate less than 1/2 that for Ester Is. hatchery (usually similar).
- reduced growth of juveniles in oiled areas.
- increased HC body burden in '89; not in '90 samples.
- increased MFO induction in fish from oiled areas.
- significant fin erosion in '90 samples (chum?)

Herring

- morphologic & cytogenetic effects shown from eggs exposed to oil, but raised in lab (effects in '89 and '90; more drastic in '89).
- egg mortality surveys - survival decreased in oiled area ('89 and '90, less drastic in '90).
-

Dolly Varden

- heavy concentration HC in bile (highest of any fish)
- >30% increase in mortality in oiled areas.

Cutthroat Trout

- >30% increase in mortality in oiled areas.
- significant difference in growth.

Rockfish

- first finfish to show mortality due to oil.
- increased HC in bile (showed up in other bottom fish also - flatfish, halibut, pollock).

Nearshore fish

- (field info available in 2 weeks)
- increased levels of blood parasites in fish from oiled areas (153/ml vs 0.3/ml in control, 5/ml in lab exposed fish).
- increased rate of respiration in fish from oiled areas.
- increased MFO levels in oiled areas (DEC study, not NRDA).

Clam use

- highest level of HC in any organism (subsistence use shut down in Windy Bay).

Subsistence/Recreational uses

Probable Damage:

Ground fish

- some sublethal effects (data not yet available).

Clams

Shrimp

- increase in % spot shrimp with dead eggs in oiled areas (in '89; '90 data not in).

1991 Potential Projects:

Public Information (sport fish)

Habitat Rehabilitation

Identify multi-beneficial acquisition/protection

Access (sport fish)

Restoration survey (prioritization)

Continued exposure/sublethal effects monitoring

1990 Recommendations:

- Salmon/herring escapement
- Salmon/herring tagging
- Port sampling
- Otolith marking
- Herring spawning area catalogue

Meeting Notes - October 26, 1990

B. Ross reviewed the factors to be considered in evaluating projects and feasibility studies.

- Wash. Policy Group (WPG) will make ultimate decisions regarding projects. (MT, Peer Reviewers will look at package)
- Will proposals from the general public also be considered? Any such proposals that are submitted as comments to the FR notice will need to be addressed.
- B. Spies expressed concern that basic information on exposure/ contamination effects necessary for the NRDA case may be lost due to positics.
- RPWG will propose all projects that make sense scientifically and meet the factors; if one does not qualify under restoration, then RPWG will recommend to MT that they are proposed/continued as NRDA studies.
- NRDA projects will be harder to justify this year.
- C. Meacham expressed concern about stepping into this process before clean-up is complete, damages are not fully assessed yet; this expedited process for determining restoration projects is inappropriate.

Proposed Projects

1. ADFG (FRED) proposal (10/25 memo, Allee to Ross) - Jeff Hartman, Tom Kron:
 - Six restoration project ideas (four had detailed proposals) and eleven feasibility studies (six had detailed proposals) were included in the memo and discussed at some length.
 - Feasibility studies #3,4,5, and 6 on the list have problems with NRDA link to the particular species.
 - Coordination between Divisions is important.
 - one study must assess which tools should be used.
 - Is it more appropriate to do direct restoration than to enhance another system (direct vs. replacement)? - In short term (before settlement) the more directly related to an injury, the more likely a project will be reimbursable. A project that enhances a site beyond its original condition

(4)

must show that this is compensating for something you can't correct somewhere else. (M. Fox).

- Sometimes in order to pursue things that make the most sense you may need to move to a different system.
- If we move too fast with certain projects, might lose in terms of cost effectiveness; i.e., must look at all damaged streams before pick one is "best" to restore. (Peterson: this type of study may be a good "feasibility" study)
- Restoration effort taken in the end must enhance something in the long term; need to address the "rate of recovery issue"; But there is a risk in waiting, esp. if ongoing impacts are apparent. (Peterson).
- One legal case: Although the regs "favor lost use value over restoration", the court said that the statute does favor restoration, but it must be a reasonable relationship between restoration and what has been lost. (Fox)
- Can possibly use "local" groups to help with projects (i.e., stream rehabilitation).
- FRED package seems to be a series of tools, nothing specific in terms of what we're trying to address.
- This meeting should be a first step bringing ideas together and combining projects where appropriate.
- reference was made to the third paragraph of the 9/25/90 memo (Schmidt, Barrett to Senner) concerning using standard enhancement practices to accelerate the restoration process.

2. ADFG (Commercial) - outline submitted:

S.Sharr presented ideas for salmon restoration (see handwritten outline labeled salmon restoration studies). These ideas included escapement enumeration (aerial and ground surveys), stock identification (coded wire tags, otolith marking, adult tagging) and run reconstruction. The following comments were made in general about these ideas by Sharr:

- Referencing outline:

Stock Identification - The goal of the coded wire tag program is to assess contribution of stocks to commercial fishery; it will identify time and area distributions to eventually alter management. Cost for this type of program could run into the hundreds of thousands of dollars. The recovery portion of the project would need additional funds, approximately \$500,000. The otolith marking study will add greater precision. It could be done as a feasibility study; it could run approx. \$500,000, and additional funds would be needed for the recovery portion.

Run Reconstruction - historic data summaries would include information on escapement runtime, adult tagging (time and area densities), existing CWT data. It would maximize the likelihood of predicting exploitation of stocks in commercial harvest.

- The factors for consideration are addressed in the following ways: addresses known damage, technical feasibility established (most are extensions of ongoing programs), all

(3)

should be implemented rapidly, net environmental benefit includes nearshore and upland portion of ecosystem, duration of projects should include several generations of pink salmon, the geographic scope is PWS.

- historic data exists for oil impacted streams.
- It was suggested that some could fall under monitoring to determine recovery; however Sharr disagreed stating that these types of projects were needed to improve management precision. Without management precision, any enhancement may be futile effort.
- Monitoring is the tool needed to assess any enhancement, it is necessary to test whether direct restoration is effective. Besides monitoring for natural recovery, it is necessary to determine if restoration work is being effective.
- Another method of restoration is to implement conservation management strategies, especially if it will take awhile to address uncertainties.
- Otolith tagging could be proposed as a feasibility study, but coded wire tagging is necessary to truth. This would avoid gaps in the data base (Peterson).
- Since the oil spill, there is now a need for better management. (for example, when the quality of salmon declined, fishermen were directed to non-contaminated areas, this force a management situation which would not have occurred without the Spill.
- These types of management projects make sense legally, especially since they are also needed to monitor the restoration effort. (Fox)

3. NOAA Projects - three proposals submitted (A. Wertheimer):

- all represented work that needs to be continued can be categorized under NRDA, specifically, if 1990 NRDA data (yet to be analyzed) shows continued exposure in oiled areas.
- A question was raised regarding separating out the effects of oil on salmon relative to the effects on abundance of prey (less fish feeding on prey). In response, A. Wertheimer stated that the herpacticoid trophic link is well established.
- B. Spies expressed the concern that projects that are critical to establishing damages need to be highlighted by the group; important arguments need to be plugged into any decisions relative to the continuation of such projects. Economics should also be factored in.
- Project costs should decrease if projects are combined with other agencies.

4. E. Biggs (ADFG/Commercial) discussed restoration relative to the herring fishery. She was in agreement with previous participants that the biggest tool to rehabilitate a resource is management and maintaining and improving accuracy results in good management. The following were suggestions for improving management:

- Maintain spawn deposition studies - increase in sample size provides increased accuracy.
- Continue 1990 egg loss study for two more years - this is

(6)

a direct multiplier in model (increasing biomass estimation increases accuracy forecast).

- Improve forecast model - more time needed to study the biometrics.
- Stock separation studies needed to properly identify the unit that is being forecasted and measured (this could be a problem with herring). A tagging program would look at immigration/emmigration.

Most of the above programs are in place; writing and rewriting proposals impedes PI progress. Precision is needed to manage the salmon/herring fishery in finer detail since the oil spill; need to know what the damage is and how to predict. For example, the harvest rate for the weakest stock has already been chosen for salmon, harvest quota is based on forecasting. There is not much latitude in herring; market is set ahead, industry driven.

The following are ideas for direct restoration:

- transplant help to boost productivity (egg survival) of an area - hard to evaluate effectiveness, cost effectiveness.
- transplanting of stocks.

Restoration can also be accomplished through protection of the ecosystem:

- development of marine sanctuaries.
- establish limits on sedimentation effects.
- prevent upland damage.
- eliminate in-water log storage.

Monitoring for bird and mammal work can be piggy-backed with herring survey work.

5. ADFG (Sport fish) - Kelly Hepler discussed this proposal (10/3 memo, Roth to Meachem):

- high incidental take of Dolly Varden and Cutthroat trout; need greater resolution in PWS, need expansion of program.
- can piggyback on some of ADFG/Comm. projects, i.e., weir location, port sampling, etc.
- passage problems can be identified and proposed to address this year; preference over enhancement (question as to whether sportfishing wants enhancement).
- JSA doing study for J. Hartman - possibility for funding.
- Need to push sportfishing toward lesser impacted areas to allow recovery of affected stocks - could be done through alternative access, information brochures.
- Public information could be done in short-term, before all data is known. (makes sense legally, since it is connected to restoration)
- Specific impacts in Valdez & Cordova due to increased population during Spill clean-up; increased impact to roads and sanitation. (could have been Dingall-Johnson \$ in past, higher priority now)
- no management program existed before Spill for bottomfish (rockfish) in PWS. Basic needs for more information include

port sampling (catch information, cohort analysis) - NRDA studies designed for sublethal effects, not population effects. Some restoration ideas include artificial reef development to enhance sport fishing (may not actually increase population, maybe just redistribution) - also may be bringing fish back to impacted area (i.e., Bligh reef) - more feasibility studies may be needed.

- charters going to non-oiled areas may be impacting these areas; also increasing impact from gillnet and longline.

-a proposal for shellfish (clam) and spotted shrimp was discussed (9/25 memo, Donaldson to Senner). Use of clams (subsistence) was damaged, even if population is surviving.

Summary:

C. Meacham summarized the day's discussion with the following chart:

Known Damage:

- salmon
- herring
- Dolly Vardan
- rockfish
- cutthroat trout
- subsistence/recreational uses
- near-shore fish
- clam use

Known Exposure/Probable Damage:

- groundfish
- clams
- shrimp

1990 Recommendations (from Tech. Wkshp. 4/90) - still applicable:

- salmon/herring escapement
- salmon/herring tagging
- port sampling
- otolith marking
- herring spawning area catalogue

Potential Restoration Ideas for 1991:

- public information (sport fish)
- habitat rehabilitation
- explore and identify multi-beneficial acquisition/protection access (sport fish)
- restoration survey
- continued exposure/sublethal effects monitoring

Closing remarks:

- salmon/herring are key elements to ecosystem in PWS (nutrient enrichment)

- (8)
- more monitoring for natural recovery is needed.
 - the above list should not be prioritized at this time, too preliminary.
 - state proposals must be to legislature by Nov. 15.
 - RPWG will send (fax) a format to all participants.

October 23, 1990

RPWG
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MEMORANDUM

SUBJECT: Scoping Meeting with the Chugach Alaska Corporation

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

TO: File

On Monday, October 22, Stan Senner (ADF&G), Russ Meserole (EPA Alaska Native Coordinator), and I met with the following representatives of the Chugach Alaska Corporation (CAC):

Pio Parks, Vice President for Development
John Black, Special Assistant to the President
Peter Nagel, Vice President for Lands

The meeting took place in the CAC offices at 3000 A street, Anchorage. The purpose was to update CAC on the status of restoration planning activities, particularly with respect to the new directive to propose actual restoration projects for consideration in 1991, and to provide then the opportunity to have input to the process.

After we described RPWG's current activities and answering general questions, the CAC representatives raised the following specific points:

- Portage tunnel: they questioned whether modifying the tunnel from Portage to Whittier to allow automobile access could be considered for funding under a restoration program, noting that such access would have sped cleanup responses to the oil spill. We noted that actions relating to cleanup/response would be harder to justify under a restoration program than would more direct restoration approaches. (CAC is a major land owner in the Whittier area.)
- Habitat protection through purchase of development rights: several general ideas were exchanged. A new approach suggested by CAC as worthy of consideration was the idea of land swaps. The (perhaps joking) example given was a trade of Fish Bay for the Presidio in San Francisco.

- Archaeological site issues: the CAC representatives expressed concern about proposing high priority sites for restoration work because of a fear that vandals would gain access to sensitive information about locations, artifacts, etc. We relayed our understanding that any information presented in a public document could be conceptual only.

- CAC expressed concern about the prospect of any restoration work at KN-136 (Bay of Isles salt marsh), based on their direction from Bernard Fichaud to 'leave it alone and let it bleed for four years, and then it may need more work.' I assured them that EPA was interested in working closely with them before a proposal is finalized. It was agreed that EPA would provide a draft of the proposal for their comment as soon as it is available. They also noted the need for both EPA (on marshes) and whomever might do any beach wildrye restoration to coordinate any work with the appropriate Native landowners before beginning activity.

The meeting ended with the CAC stating that they may prepare written comments for RPWG to consider prior to our November 1-2 synthesis meeting, and at least before November 28 so that they could be reflected in our draft Federal Register notice.



November 1, 1990

Mr. Brian Ross, Team Leader
Oil Spill Restoration Planning
Restoration Planning Office
437 E Street, Suite 301
Anchorage, Alaska 99501

Dear Mr. Ross:

Thank you, Stan Senner and Russ Messerole for meeting with Chugach Alaska Corporation recently to update us on the status of the restoration planning process. This is to provide your team with CAC's input on the matter.

To begin, it is appropriate to remember the words of our Chairman, Edgar Blatchford, spoken at your Symposium last spring; "The [restoration] plan must include cultural and economic aspects such as fishing, logging and tourism industries - it must be a balanced approach." And again, "As we look into the twenty-first century, ...Chugach is a small corporation organized for profit, but [having] a moral and social responsibility to protect its cultural history."

The implementation of the Exxon Valdez Oil Spill Restoration Plan has tremendous potential to influence the quality of life for the residents of the "oil spill zone", Chugach Native region, Prince William Sound and lower Kenai Peninsula well into the twenty-first century. These comments are offered to assure that the Plan improves that quality of life by including community, economic and cultural programs.

Please note that the Chugach Heritage Foundation can provide cultural resource protection services to the CERCLA Trustee's for sites on federal or state lands. As you may already know, Chugach has already completed damage assessments on numerous sites and is negotiating directly with

Exxon on settling damage claims for cultural resources on Native lands proposing a program involving site monitoring, education and salvage. It makes imminent sense for the Trustees to engage the services of a Native American organization already mobilizing to address the restoration of these resources.

Enhancing response to future oil spills or other disasters in Prince William Sound is a very important role which the restoration fund could play. By assisting the construction of a twenty-four hour, 365 day, automobile road to Whittier, the public sector would significantly improve the agency/industry response capability currently being developed. Even more significant to the road's construction, however, would be the improved opportunities it will provide for restoring recreation, commercial and subsistence fisheries and other industries in Prince William Sound and its communities.

The restoration plan should pay substantial attention to improving community waste facilities in the oil impact zone. Maintaining and improving water quality is a key factor in restoring the biotic community of Prince William Sound. As the communities of Prince William Sound experience accelerated growth for various reasons in the wake of the spill, their waste handling capacities will be stretched to the breaking point. The restoration fund should be used to subsidize the construction of community waste facilities and thereby enhance the opportunities which the various communities can offer the public for natural resource use such as fish and wildlife, recreation and interpretation.

Concerning your notice that certain Chugach Alaska Corporation shoreline at KN136 is being considered for limited, "research-type" restoration work in 1991, we await a draft proposal for the work before we can decide firmly whether or not to permit such work. Based on the advice of one of the Chugach Oil Spill Task Force's response experts, the company is generally opposed to actual restoration work taking place on this shoreline until several years of natural scouring and possible subsequent man-powered treatment has occurred.

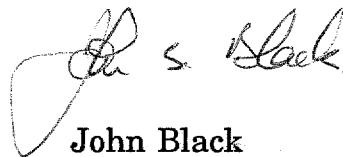
Finally, Chugach Alaska Corporation is reluctant to reveal its development plans but is not necessarily opposed to any given proposal to purchase certain rights to certain of its lands including its subsurface estate beneath

village corporation lands. If approached indiscriminately, however, the immature condition of the various natural resource inventories and values, would render any discussion of such a use of the restoration fund both premature and counter-productive to the growth of a multi-faceted economy in the oil spill impact zone. CAC will review again its holdings and development plans for any areas deemed sensitive by the Restoration Planning Office.

In closing, thank you for your time and consideration. Our Chairman's words again hit the mark: "[T]he Chugach people will remain....I have hope the Chugach people will be heard, because economic opportunities must be generated in areas where Natives live....Support our efforts to defend our traditional properties....Treat us as legitimate and equal partners."

As always, we are available to meet with you at your convenience to facilitate your goals.

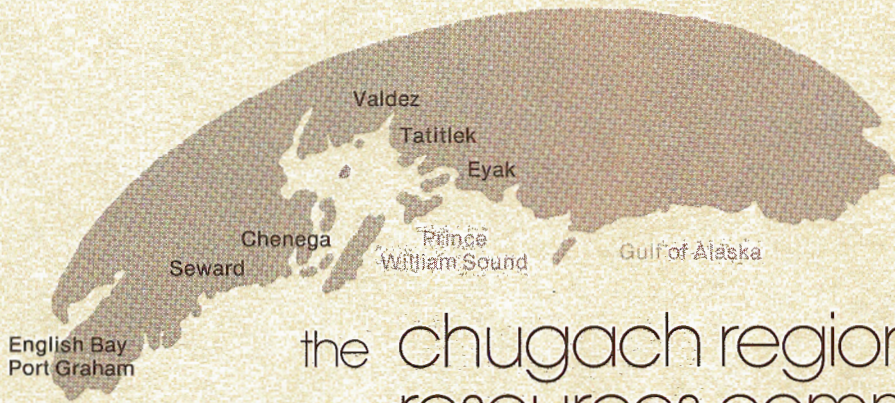
Sincerely,

A handwritten signature in cursive script, appearing to read "John Black".

John Black
Chugach Oil Spill Task Force

c: Chenega Corporation
 English Bay Corporation
 Eyak Corporation
 Port Graham Corporation
 Tatitlek Corporation

RAW
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the chugach regional
resources commission

November 9, 1990

Mr. Brian Ross
Oil Spill Restoration Planning Office
437 E Street, Suite 301
Anchorage, AK 99501

Dear Brian:

Per our conversation today, I would like to extend an invitation to your office to attend the Chugach Regional Resource Commission's (CRRC) next board meeting, scheduled for Friday, December 14th. Please let me know if this is possible, and what time would be best for you.

The purpose of the visit would be to update CRRC on restoration since our last meeting with Sandy in September. CRRC is very interested in being involved in restoration planning efforts that effect the Chugach Native region. We look forward to hearing from you.

Sincerely,

Tasha Chmielewski,
Natural Resources Planner



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November 10, 1990

Draft Preliminary NRDA Status Report

Study Title: Eucys Restoration Project

I.D. No.: University of Alaska, Fairbanks- Govt. Contract
No. 53-0109-9-00276 Mod. #4
San Jose State University Foundation- Project
No. TAZ01-25

Investigators: Michael S. Foster and Andrew P. De Vogelaere,
Moss Landing Marine Laboratories, P.O. Box 450, Moss
Landing, Ca. 95039 (408) 755-8658

Objectives:

To understand the causes of variation in
areas in and around Herring Bay affected
oil spill, and to document the extent of
natural recruitment of Eucys in areas of
alternative cleaning methods (particularly
heavily cleaned and those that have received
understanding of the causes of natural
recruitment should suggest restoration methods that
or future oil spills.

Methods:

A. Examine the extent, distribution
of areas coated with tar by:

- 1) surveying the extent of areas with residual oil (tar),
and the distribution of tar within these areas, at sites in
Herring Bay and on the more exposed northern end of Knight
Island.
- 2) sampling multiple sites with and without tar to
determine present differences in species composition and
abundance.
- 3) permanently marking some of the sites in A.2. so that
future surveys of the same areas can be used to determine how
fast recovery occurs on tarred substrates.

B. Determine differences in Eucys recovery at sites that
were oiled and cleaned vs. areas that were oiled and not
cleaned by:

- 1) sampling Eucys abundance and size frequency in
oiled/cleaned sites and sites that were not cleaned.
Replicate sites are sampled, and samples stratified by tidal
height within the Eucys zone, and by subhabitat (crevice,
slope, presence of barnacles) within tidal heights.
- 2) (based on the results in B.1. and previous
observations that Eucys recovery has been relatively slow in
the upper part of its range in areas that were heavily oiled
and cleaned) experimentally determining what factors affect
Eucys recovery in the upper part of its natural range. We

Copies to:
Stan S
me
Frieda
you
11/16
[Signature]

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November 10, 1990

Draft Preliminary NRDA Status Report

Study Title: Fucus Restoration Project

I.D. No.: University of Alaska, Fairbanks- Govt. Contract
No. 53-0109-9-00276 Mod. #4
San Jose State University Foundation- Project
No. TA201-25

Investigators: Michael S. Foster and Andrew P. De Vogelaere,
Moss Landing Marine Laboratories, P.O. Box 450, Moss
Landing, Ca. 95039 (408) 755-8658

Objectives:

To understand the causes of variation in Fucus recovery in areas in and around Herring Bay affected by the Exxon Valdez oil spill, and to document the extent and magnitude of natural recruitment of Fucus in areas subjected to alternative cleaning methods (particularly areas that were heavily cleaned and those that have residual tar). An understanding of the causes of natural variation in recovery should suggest restoration methods that could be used in this or future oil spills.

Methods:

A. Examine the extent, distribution, and recovery rates of areas coated with tar by:

1) surveying the extent of areas with residual oil (tar), and the distribution of tar within these areas, at sites in Herring Bay and on the more exposed northern end of Knight Island.

2) sampling multiple sites with and without tar to determine present differences in species composition and abundance.

3) permanently marking some of the sites in A.2. so that future surveys of the same areas can be used to determine how fast recovery occurs on tarred substrates.

B. Determine differences in Fucus recovery at sites that were oiled and cleaned vs. areas that were oiled and not cleaned by:

1) sampling Fucus abundance and size frequency in oiled/cleaned sites and sites that were not cleaned. Replicate sites are sampled, and samples stratified by tidal height within the Fucus zone, and by subhabitat (crevice, slope, presence of barnacles) within tidal heights.

2) (based on the results in B.1. and previous observations that Fucus recovery has been relatively slow in the upper part of its range in areas that were heavily oiled and cleaned) experimentally determining what factors affect Fucus recovery in the upper part of its natural range. We

CR

anticipate that factorial experiments will be done in at least two sites that involve manipulation of slope, surface roughness, water retention, and grazers.

Results:

Because of delays in receiving the final contract, we have only been able to complete ten days of field work (September 15 -24, 1990) on this study using two field personnel. During this period, two replicate sites each of not oiled (controls), intensely cleaned, and less intensely cleaned were sampled. Sampling (cover, density, size, and attachment sites of Fucus, nearest adult Fucus, density of macro-grazers, cover of barnacles, cover of tar, abundance of various substratum relief categories, and slope; quadrats were also photographed) was done using random quadrats in the upper portion of the Fucus zone because this was the region where prior observations indicated that Fucus was recovering slowly (at sites that had been intensely cleaned). In addition, tarred portions of a number of rocky intertidal sites within the vertical limits of the Fucus zone were permanently marked and photographed for long-term recovery assessment. Finally, weather allowed only a half day survey of exposed sites outside Herring Bay, and we did not have enough time to sample the mid-portion of the Fucus zone.

We are currently analysing the results of this work, so the following results should be considered tentative. 1) The most important factors that seem to influence recovery of Fucus are substratum relief, substratum slope, wave exposure, tar, freshwater run-off, and proximity of conspecific adults. 2) There appear to be differences in abundance of some, but not all, species between the two types of oiled sites and the controls. 3) There are trends of slower recovery in the intensely cleaned sites (whether or not the trends are significant is presently being evaluated). 4) Areas still covered by tar have almost no cover of macro-organisms.

The data suggest some promising experimental manipulations to be done in spring, 1991, and sampled in early summer and/or late summer, 1991. The results of these experiments should suggest methods to enhance recovery, as well as allow a determination of the factors that cause variation in recovery among oiled sites.

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DRAFT

Restoration Planning Work Group
Synthesis Meeting
November 1-2, 1990
Simpson Bldg.
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Thursday, Nov. 1, 1990

Introductions

Review of schedule for next two days.

Review of materials distributed.

Senner/Ross outlined process and schedule for decision making for upcoming restoration work plan which will appear as a federal register notice. In general, the draft work plan will be submitted to the Management Team (MT) by Nov. 28; this will include recommendations for feasibility studies and restoration projects for 1991. On Dec. 28, this draft plan will become public in the federal register.

Review of Status of Damages:

Each RPWG representative (or other session representative) briefly summarized damages presented at the recent resource sessions held last week. Meetings were held so far on coastal habitats (10/25), fish and shellfish (10/26), birds (10/30-31), and recreational resources (10/26). Please refer to notes from these meetings for information on damages. Separate meetings were unable to be held for marine mammals or cultural resources, so a summary of damages will be presented here.

Marine Mammals:

John Strand (NMFS) and Carol Gorbics (USFWS) presented a brief overview of damages to marine mammals. (Note: The senior scientist, B. Spies, expressed concerns that this information may be too preliminary and possibly inconsistent with conclusions drawn to date by the NRDA process):

Killer Whales - NOAA/Seattle has followed four pods which actually had contact with the oil slick. Although not all of the 1990 data is complete, individuals are still missing from three of these pods (AB pod: seven missing in '89, six additional missing in '90; AE pod: two individuals missing in '89 and still in '90; AT pod: one subgroup [four individuals] missing in '89 and still in '90). Three

stranded whales were found and samples were taken from at least one.

Humpback Whales - No short term population impacts apparent (four cow/calf pairings were seen in '89 compared with 8 pairings in '90 - this is a change in reproductive rate from approx. 6.3% to 10%)

Sea lions - declining population in general; reproductive rates continue to be low; hydrocarbons (HC) were found in samples of tissues and in bile.

Sea otters - 1000 were found dead during the spill; surveys done within PWS in '89, '90 showed the population decline continues; blood/semen studies are still ongoing; reproductive rate for rehabilitated otters is very low.

Harbor seals - declining population in general; 38% fewer animals counted in oiled areas in '89; collected 19 seals that were affected by the oil spill (tissue analysis links illness /mortality to oil)

Cultural Resources:

Judy Bittner (ADNR/SHPO) summarized damages to archaeological resources. Two studies are scheduled to begin within this next year: 1) contamination effects on radiocarbon dating technique, and 2) field assessment survey. Categories of damages are as follows:

- damage caused by the cleanup itself.
- increased general knowledge of sites and their location causing potential looting.
- contamination affecting dating techniques; also affecting ability to obtain other data, i.e., soil profile, etc.
- disruption of traditional life of natives; vulnerability of heritage.

There is an interagency effort (this winter) to pull together all information from, notes, etc. to determine how much is there and how it relates to damages. It is feared that Exxon's surveys missed some sites.

A question arose as to whether there is a basis to spend public money on sites located on private lands. "Selected" lands are treated by the National Park Service as being public. The USFS, however, has stayed away from surveying native lands; native groups are pursuing their own cases. In summary, restoration proposals on public lands can be considered by the RPWG.

Under the new oil spill legislation, natives can make claim to damages on "selected lands". Native groups would disagree that cultural resources on private lands are publicly-owned resources. It was noted that it is difficult to keep track of land ownership.

B. Spies would agree that studies such as the carbon dating study seems to fit under restoration feasibility.

Discussion of Issues facing RPWG:

The following issues for development of the 1991 restoration work program were discussed:

1. Definition of Restoration projects versus NRDA projects - The issue of monitoring projects, such as monitoring for natural recovery, were discussed. It was noted that natural recovery must be addressed to determine if restoration is needed; and monitoring is still needed even in cases where direct restoration can not be done (i.e., killer whales). Also, monitoring is an important part of a restoration project to determine effectiveness of the restoration effort. Since the PI's have been approaching these types of projects as part of restoration, the question was raised whether some of these projects should be done, or continued, under NRDA. Again, Spies cautioned that certain projects, i.e, markers of continuing exposure, should not fall through the cracks; they need to be flagged.

The Bird Group distinguished between two types of monitoring: 1) long-term monitoring as part of the post-settlement plan; and 2) monitoring to identify opportunities for restoration measures and natural recovery monitoring.

Freedman cautioned that the restoration plan should only be finalized after damage assessment. If damage assessment studies get restoration label, this will then decrease the opportunity to recover costs.

RPWG should present all recommendations/proposals to the MT, and let them categorize; RPWG will not specifically address reimbursability.

2. Identification of injuries by NRDA versus other sources:

- credibility/validity is more important than where data came from (i.e., NRDA). Documentation of data is necessary.
- FR Notice (RWP - restoration work plan) will address only that there is an injury; will not disclose NRDA results.
- Wash. Policy Group wants NRDA data released to public in Dec., however Susan MacMullen thinks that is technically

unrealistic - it is not QA'd or synthesized. There is also the question of "what is data" - raw vs. interpretation.

- RWP should follow administrative procedures; all information that the plan is based on will be discoverable.
- RWP is not ultimate damage assessment or restoration plan; it is dynamic, this is only the first year. It can not preclude good scientific results which may come later.
- the state legislature (or OMB) could make a decision to front money without regard to the compensation issue.

3. Prioritization of Projects:

- RPWG does not want to prioritize projects, except to make the determination that they meet the "factors". Is this acceptable to the MT? Response from MacMullen is to keep as many projects available for public comment.
- Two issues are apparent: RWP must explain thinking and give public as much information as possible; however, need to make some choices for the budget process. The RPWG should not worry about cost in absolute terms but will need to worry about gross disproportionality. The RWP must communicate to the public that this is a "wish list".

4. Consolidation of Projects:

- certain projects can be consolidated to reduce cost; i.e., bird survey work could be coordinated with mammal work.

5. Cost sharing among agencies:

- don't know where money is coming from.
- state only can get funding for restoration projects through 1992 budget.
- federal problem: budget is already set for 1991, money for 1991 restoration will need to be redirected.
- RPWG cannot address split of funding, this needs to be addressed by the MT.
- regarding restoration vs. damage assessment funding - some agencies may have to go to Congress to transfer funding.
- RPWG needs guidance on this issue before the end of November.

6. Lack of Consensus:

- given current time line, need to have real-time resolution of issues, and may simply have to pass some intractable

issues up the line.

Review of Factors/Criteria:

- concern about duration of projects: will projects that require multiple years have strikes against them?
- questions about geographic scope: in reality, 1991 projects will be in spill area or directly connected to damaged resources.
- question of existing management activities and what is justified for funding under restoration? Birds and archaeology are to be monitored anyway.
- Nicoll: increased management must be justified by direct need to increase effort to restore injured resources.
- affects/conflicts with NRDA and clean-up activities - Bittner: spotty compliance with historic preservation law.
- need for studies to determine ecological requirements as well as perhaps to look at it from the other end, which is the ecosystem as a whole. Freedman: scientific relevance to identify injures may be different than science needed to generate restoration projects - need to instead answer some "conservation biology"-type questions. Lack of good background information exists, i.e., need a good model for PWS (integrate ecosystem information into model for entire area). One possibility is to bring on a systems ecologist (ie, Peter McRoy?) to review restoration projects.
- question about applicability of NEPA - Fox: there are real concerns; Nicoll: DOJ is looking into it.

Cultural Resources/Archaeology:

Nine projects were presented by Judy Bittner (not prioritized):

Protection: [from vandalism]:

- Education - what is law, value of resource; targets user groups.
- Enforcement - increase enforcement through increased surveillance; enhance existing programs.
- Stewardship - monitoring at the local level through existing programs; i.e., KANA program.
- Erosion control - stabilization of sites.

Data Collection:

- Excavation of sites; identify/evaluate 10 sites, restore one in 1991; little information exists on nature of sites in PWS, outer Kenai, and Kodiak.
- Inventory of PWS-origin artifact collection - removed from area and in private collections.

Education:

- Popular publications - describing cultural resources (not enforcement).
- Oral history - focusing on the spill event's effect on villagers in area.
- Traditional skills - disruption of traditional lifestyles, loss of skills through interruption.

Questions:

- is artifact inventory project needed in 1991? low priority, but could help identify future restoration (tech support).
- is control of erosion needed in 1991?
- can enforcement effort be increased in 1991?
- is traditional skills project related to damage assessment? hard to argue that spill caused loss of skills.
- is popular publication project needed in 1991? Should it wait until more information is in?
- how does excavation project relate to existing NRDA study?

Comments:

- protection programs address "risk of ongoing impact", i.e., vandalism, erosion causing loss of data. Legally, it is preventing injury to an already injured resource. Loss of information is at risk. Protection can be reasonably looked at since at this stage we are looking at a broad range of options.
- certain projects above might be proposed under damage assessment (those dealing with archaeological sites themselves, not dealing with history) example: excavation is restoration, study is NRDA/tech. support.

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Four categories set up to rate projects (RPWG conclusions as of today):

- (A) Probable recommendation - looks good, write up proposal.

(B) Possibly favorable for 1991, but need more information before RPWG will include.

(C) Work is needed, but may be more appropriate under NRDA - RPWG will flag to MT.

(D) Not appropriate for 1991; does not meet factors, RPWG can not recommend.

"Feasibility" studies will be further classified as feasibility, technical support, or monitoring.

RPWG will reconvene in mid-November for final decisions as to what proposals are included.

Summary of Cultural Resource Proposals:

Protection: [assuming specific sites are identified]

Education - Cat. (A)

Enforcement - Cat. (A)

Stewardship - Cat. (A)

Erosion control - Cat. (A)

Data Collection:

Excavation of sites - Cat. (A)

Inventory of artifact collections - Cat. (D)

Education:

Popular publications - Cat. (A), but pick up as component under education.

Oral history - Cat. (D)

Traditional skills - Cat. (D)

All proposals will be sent to both state and federal attorneys.

Comments:

- does erosion control conflict with damage assessment legal case? - should damage be documented before this type of restoration project?
- excavation should be timed such that injury studies will have already been done - coordination is needed.
- inventory of artifacts could be done post-settlement.
- popular publications can be picked up under education/recreation
- oral history might be more damage assessment, could be justifiable to do right away while information is fresh.

Recreational Resources:

Sandy Rabinowitch summarized the proposals received thusfar.

Sport fish improvement: [deferred to fish section]

- access/acquisition
- artificial reef
- trout streams
- coho habitat improvement

Marine litter pickup:

- trash removal- left over from clean-up. Cat. (B) - documentation of displacement.
- garbage barge - to work in heavily used waters; long-term project. Cat. (D) - no immediate link to damage.

Education Program: All Cat. (A), if targeted to recreation:

- Interpretive plan - use user survey to get at this question.
- Multi-media - video, brochures, etc.
- Natural histories - response to oil spill

Recreational Site Restoration:

- restoration of camp sites/recreational sites - reconfiguring disturbed sites, survey of more sites. Cat. (A), (B), (C). (attempt should be made to bill as response; permits on USFS land may require restoration to previous land contour).
- drinking water survey - for oil & Giardia - check water on high quality sites in concert with above. Cat. (D).

Replacement: All Cat. (B)

- cabins
- trails
- moorings, buoys, docks

Recreational User Survey - Cat. (B/C), economics studies may cover.

Management Plans:

- Review/rewrite all sections of exiting plans. Cat. (D) - probably premature.
- Phase II of of Current Land Status Study. Cat. (A).

Acquisition: [defer for later discussion].

- intersection of resources and non-government land.
- see A above.

Comments:

- Regarding replacement, does Exxon have to compensate for the full cost of replacement? May be premature to replace cabin, trails etc.
- Regarding management plans, it is first necessary to determine if management plans need updating (i.e., PWS plan by DNR; Kenai Fjords plan by NPS).
- Phase II of Current Land Status Study will actually convert information gathered from different sources into the GIS system. Phase I needs to be completed first.
- Regarding acquisition, DOI is looking at several "postage stamp" (size) acquisitions, i.e., Gull Island.

Fish/Shellfish

1) NOAA/NMFS Proposals - John Strand described several proposals which are related to natural recovery monitoring. These all are current NRDA studies, however their likelihood for being continued under the NRDA process is unknown. The projects are as follows:

- Exposure of juvenile salmon to hydrocarbon contamination exposure is estimated through MFO induction, provides information for future management.
- Recovery of epi-benthic prey populations for juvenile salmon (copepods) - to determine if prey base was affected in oiled areas.
- Exposure of groundfish/shellfish to hydrocarbon contamination - indicators include bile, histopath, MFO induction.

All of the above were put in Category (A/C), and a discussion of monitoring in general followed. The following "types" of monitoring were described:

- Monitoring leading to restoration measures (OK as rest'n)
- Monitoring to determine additional damages (damage assmt)
- Monitoring to determine recovery
- Monitoring to determine lost use value (damage assmt)
- Monitoring for information to be used in case of future oil spill, maybe upon settlement.

It was decided that one proposal on Natural Recovery Monitoring for Exposure would be developed. This would combine the exposure monitoring portions of any study into one proposal. B. Spies, C. Meachem, C. Gorbics, and J. Strand will develop this proposal.

2) ADFG Proposals - Chuch Meacham described the proposals from ADFG:

Restoration:

- Herring Protection - stock Id., methodology to monitor population, supplements NRDA - Cat. (A/C).
- Sportfish Restoration - information to public - Cat. (A).
- Sportfish Public Access - access/sanitation proposal - Cat. (D).
- Spawning channel rehabilitation - (USFS projects) - reconstruction of Harrison Creek diversion, Chalmers River chum reintroduction, Piggot Bay spawning channel - Cat. (B).

Feasibility/Technical Support:

- C-W-T Salmon - to identify hatchery and wildstock for better management - Cat (A).
- Spawner Protection - expand existing aerial survey program in PWS, increases escapement information to allow altering harvest patterns - Cat. (A).
- Herring egg transplant - tests feasibility of transplanting spawning substrate and windrowed eggs - Cat. (A).
- Otolith marking - for better stock identification - Cat. (A).
- Adult Pit Tagging - tag a fraction of the C-W-T fish - Cat. (A).
- Clam Transplant - already part of NRDA for growth effects and time for purification - Cat. (D).
- Rockfish Transplant - transplant to "clean areas"; biology uncertain, more information needed - Cat. (B/D).
- Herring Stock Identification - Cat. (A/C).

Monitoring:

- Dolly Varden - hydrocarbon analysis - Cat. (A/C).
- Rockfish - hydrocarbon analysis - Cat. (A/C).
- Herring logging effects - measure rates of sedimentation, water quality, egg survival - Cat. (D).
- Rockfish - Cat. (A/C).

Sport Fishing: (from recreation session)

- Access acquisition - Cat. (D).
- Artificial Reefs - Cat. (D).

- Trout stream rehabilitation - Cat. (B).
- Coho habitat improvement - Cat. (B).

Comments:

- B. Freedman: the best package of proposals should go forward; they should include logical candidates for restoration, those having clear link to injury. For example, for pink salmon, where damage has been identified, should determine what is an appropriate restoration measure. If hatchery fish and wild stock are not equivalent, then reducing exploitation is a logical restoration measure; a monitoring project leads to a mitigation measure of harvest control.

Marine Mammals

There was no separate session bringing together peer reviewers and researchers, due to scheduling problems. Lisa Rotterman and Jim Bodkin (USFWS) presented their proposals. Both expressed the need for a marine mammal workshop.

Sea Otters:

Lisa Rotterman explained that documented damage exists, continuing damage is likely to occur, and recovery can be hastened by preventing further disturbance and by protection of habitat. She provided the following background information:

- good baseline information exists for sea otters; through capture/recapture, can monitor population health for possible population impacts.
- habitat use varies by season, sex, age, reproductive status; critical habitat is identified in eastern PWS, however unknown in oil spill areas in western PWS.
- disturbance greatly affects habitat use by females and pups; human activity has been documented to prevent haulouts.
- habitat quality affects recovery rate; areas emptied during the spill (even heavily oiled areas) are being reoccupied, however animals there are not doing well.
- to get precise information on populations one must understand the causation behind the population curve.
- information gained through proposed feasibility studies is

critical for modelling populations.

- direct rehabilitation through translocation is not practical, recent attempts in California were unsuccessful.
- the goal of the proposals are to make management/regulatory changes so that populations are not moved into less valuable habitat.
- studies on bark deposition affecting food supply are documented; no good studies on general effects of logging.

Proposals were submitted (see handout) and are summarized as follows (these were not categorized by the RPWG):

- Identification and prioritization of sea otter critical habitat areas by monitoring adult females and young with radio transmitters.
- Monitor population recovery through:
 - evaluating physical condition of pups
 - aerial survey of recolonization
 - evaluation of movement and survival of females and weanlings.
- Determine certain life history information through monitoring of adult and weanling females.

Jim Bodkin provided the following background information:

- direct damages to sea otters has been shown through a decrease in abundance (lower numbers in 1990 than 1989); a difference in blood chemicals (east vs. west PWS).
- increased hydrocarbon levels in shellfish affects prey base.

Proposals were submitted (handout) and are summarized below:

- Assessment of the effects of, and recovery from the oil spill on the Western PWS sea otter population (7 component studies):
 - population assessment
 - foraging
 - blood
 - tissue toxicology
 - mortality
 - prey selection
 - habitat determination

The following monitoring proposals can possibly be combined into one package:

- Aerial/boat survey of marine mammals proposed by NMFS.
- Aerial/boat survey proposed by USFWS (both birds and

mammals)

One proposal was submitted by Kathy Frost (ADFG) regarding the tracking of harbor seals to determine their ecological requirements. This could be classified as a technical support project; it will be discussed at the mammal synthesis meeting in Seattle on 11/6-7.

It was felt that peer reviewers should have the opportunity to identify components of studies needing to be addressed. A meeting should take place before Nov. 28. RPWG will recommend to the MT that this meeting occur.