

15.2.1 Vol. II (2 of 2)

**TRI-STATE BIRD RESCUE & RESEARCH, INC.**

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October 15, 1989

Hope Babcock, Counsel
National Audubon Society
National Capitol Office
801 Pennsylvania Avenue
Washington, D.C. 20003

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JAN 11 1994

EXXON VALDEZ OIL SPILL
TRUSTEE COUNCIL
ADMINISTRATIVE RECORD

Dear Hope,

Enclosed please find the review you requested of the Natural Resources Damage Assessment Plan for the Exxon Valdez spill. I found serious problems with the proposals you asked me to review. Although I have a fairly extensive background in conducting or directing research on the effects of oil on birds, my reservations about the Bird Injury Assessments outlined were serious enough that I called upon two colleagues to help me formulate a response.

Dr. Welte is our Coordinator of Research and Veterinary Programs and as, in addition to her doctorate in veterinary medicine, a master's in environmental education. Dr. Henry Bryndza is a research supervisor responsible for a dozen or more other Ph.D. researchers and their laboratories at DuPont; Henry is also a reviewer for NIH and the NSF. I attach some CV information on us.

We feel it is important to state here, or insert in our comments, the following reservations about the criteria for damage assessment:

The deleterious effects of oil spills extend far beyond the individual animals unfortunate enough to be the primary victims. In an effort to quantify this damage and to place a value on the loss, the federal government undertook the difficult job of establishing guidelines for damage assessment and providing a mechanism for compensation.

Under the Comprehensive Environmental Response, Compensation and Liability Act and the amended Clean Water Act polluters are liable for both clean up costs and damage and assessment costs resulting from oil-spills. Two sets of regulations have been developed by the federal government for assessing this damage:

Type A Assessments offer a simplified approach involving computer modelling and minimal field studies. The Natural Resources Damage Assessment Model for Coastal and Marine Environments (NRDAM/CME) has been prepared for codification at 43 CFR, Part 11, to provide a measure of coastal / marine damages in Type A assessments.

Type B Assessments include site-specific damage assessment and possible extensive field observation when real need for such studies can be demonstrated.

Hope Babcock Letter

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ASSESSMENT GUIDELINES RE: CERCLA / NRDAM

Efforts are always made, during pre-exploratory oil drilling evaluations ("risk analyses") and following oil spills, to identify the (potential) damage to the affected biological communities. This damage is defined in terms of decreased economic value based solely on the goods and services the resources provide to humans.

This means that the value of the dead and dying animals, polluted waters, contaminated benthic communities which form the base of the food chain for almost all life in marine communities can only be assessed as such destruction applies directly to lost hunting, trapping, fishing and tourism.

In the four most recent cases we have reviewed, this system of valuation had guaranteed that the profit-potential of drilling or shipping oil is always greater than the assessed value of potential or actual damage to the resources.

While it is recognized that it is extremely difficult to place values on living creatures or ecosystems, the current assessment guidelines do not take into consideration the ultimate values to the earth of such resources. Thus it should be noted that a wilderness area which has no hunting, trapping, fishing or tourism and might be poorly valued by CERCLA / NRDAM, can still possess abundantly rich integrated biological communities that are beyond price in terms of biological diversity and health of the planet. The CERCLA allowances for wilderness valuation are woefully inadequate.

Although we cannot alter this currently accepted system of valuation, we should not let it pass without comment. It is important to understand from the outset that as long as we play under these rules the deck is stacked against the natural resources in question.

Perhaps it is the frustration reviewers and assessors feel when confronted by these valuations guidelines that has prompted the large number of poorly delineated studies that appear in the Assessment Plan for the Exxon Valdez oil spill.

I hope our work on this will be of assistance. We will look for your guidance to tell us how you think our attached comments can be most effective.

Good luck. I look forward to hearing from you.

Sincerely,

Lynne Frink
Lynne Frink
President

Com.	Topic	Issue	Sug.	Sort
1	2	0100		2

COMMENTS ON THE

NATURAL RESOURCE DAMAGE ASSESSMENT PLAN
EXXON VALDEZ OIL SPILL

Com.	Topic	Issue	Sug.	Sort
2	3	1800		2

OVERVIEW*to end >*

In a legitimate research proposal, it is incumbent upon the principal investigator(s) to demonstrate:

- that prior research relevant to the current proposal is properly assessed in the context of what is proposed
- that the project is scientifically reasonable
- that the methods outlined will yield valid data
- that the results will be meaningful and applicable to the end goal
- that the detailed budget submitted is accurate and cost-effective
- and that the participating researchers have proper credentials in the proposed field of study to assure all of the above criteria will be met.

We feel the proposals summarized in the State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill (dated August, 1989) under "Birds Injury Assessment" fail to meet many if not all of these criteria and cannot recommend funding them at this time. Specific objections follow.

Lack of Utilization of Prior Art

One disturbing aspect of this Damage Assessment Plan: Bird Studies (DAP.BS) is that no discussion of prior art is included among the background or objectives sections. We can only assume, therefore, that the authors are unaware that there already exists a body of valid and current scientific literature concerned with the effects of oil on birds. Current research on the effects of oil on birds includes: acute and chronic effects, internal and external effects, and a variety of species including scavengers (23,24,26,30) and colonial nesters (1,2,11,27,33.) A partial bibliography of relevant literature is attached to this review.

The acute and chronic effects of oil contamination have been repeatedly documented in multiple species of birds with a variety of oils. (9,10,18,21,27,28,30) While the susceptibility of, and the pathologic changes of, each species of birds depends somewhat on the characteristics of the oil fractions and contaminants involved, the pathophysiology is consistent. There should be little difficulty extrapolating these results to the populations of interest in Alaska.

External effects such as feather damage, with its consequent loss of water-proofing, buoyancy and insulating properties, contribute to the direct mortality of the affected birds. (5,11,12,13,21,23) Internal effects may be sublethal but can act synergistically with other stressors to become fatal. (11,14,2)3 Multiple organ involvement is well-documented. Oil toxicosis is characterized by pulmonary, enteric, hepatic and renal disease. (5,11,13,22,23) Decreased reproductive ability, reduced hatchability of eggs and depressed growth rates in juveniles have been examined both experimentally and in field situations. (1,2,3,4,14,16,17,18,23,24)

The toxicology of thousands of organic chemicals, including many found in crude oils, has been similarly well-documented. These chemicals have been assessed for significant risk as carcinogens, reproductive

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and developmental hazards and direct toxicity (cf CRC Handbook of Laboratory Safety and EPA determinations of hazards). Quantitative determinations of toxicity (in the form of LD50 measurements) have been documented in laboratory animals and this research has been directly extrapolated to other animals (most notably humans) in medicine and industrial hygiene. At worst, a legitimate lab study involving mice, rats or domestic waterfowl subjected to North Shore crude could be easily conducted (and may very well already have been done).

In summary, we feel that the relevant data obtained in previous studies has been ignored by the authors and should be taken into account in the design of the proposals. Moreover, it is our opinion that extrapolation of previous results to species of interest in Alaska is likely to yield damage assessments at least as accurate as the poorly designed, disruptive and invasive studies proposed by the authors.

Improper Scientific Design

Even if the authors had taken into account the results of relevant prior research and found legitimate reasons to ignore them, the DAP.BS studies they have designed do not meet the barest criteria for scientific studies.

As devastating as the Exxon Valdez oil spill may have been to local and/or migratory wildlife populations, it hardly seems reasonable to subject the survivors of each species to the invasive disruption of their natural breeding grounds unless a clear and vital need to do so can be demonstrated. The authors propose to count and collect viable eggs, chicks, and adults and well as to perform necropsies on dead animals during nesting season. To us this seems an undesirable perversion of purpose to be conducted without requisite control experiments and at great expense.

Moreover, the tone of the DAP.BS makes it clear the authors have

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already arrived at their conclusions and are simply looking for some pseudo-scientific justification to assess damages for this oil spill. Otherwise, they would have proposed:

- ongoing studies to determine the variability of mortality data from year to year¹
- to examine dead animals for other causes of mortality
- the extrapolation of data already existing from studies on reduced hatchability, decreased reproductive success, delay of onset of breeding and decreased fertility of eggs to avoid traumatizing surviving birds by invasion of nesting sites
- non-invasive examination of control groups in local areas similar to Prince William Sound not affected by the spill

Lack of Rigor in Scientific Method

As written the DAP.BS proposals do not stand alone as well-defined research projects because of the lack of valid control experiments. Even the non-invasive census studies do not have long-term control groups (i.e. many years of pre-spill data to establish a baseline and many years of post-spill proposals to monitor fluctuations and determine trends) which can be used for comparison purposes.

¹ It has been stated that "the damage assessment document is essentially a one-year plan. In a majority of the proposed studies it would be almost impossible to acquire useful data in a 1 year study. Many of these studies require pre-spill baseline data and post-spill long-term studies to monitor fluctuations and determine trends.

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3	3	0201		2

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The authors have not designed proposals which enable them to determine, for example, if their results have been affected by a harsh winter or unexpectedly high mammalian predation. How can they be certain their observers will be correctly positioned for maximum effectiveness? How can they assure that counting eggs three separate times (after approaching the site by helicopter) will yield that justifies the possibility of frightening parents from the nest, with resultant reduced hatchability due to temperature fluctuations in non-brooded eggs, or damaging eggs through handling. These are some of the documented problems that arise during intra-colony census studies.

While the authors of Bird Study #5 are quite certain they're going to take 5 mL samples of blood from adult Peregrine Falcons and 3 mL of blood from young they do not spell out how these samples are going to be handled, derivatized and tested. They have also failed to show that 20 birds will provide a representative population sample and that this loss of blood will not act synergistically with other factors to raise mortality among the test group.

One goal in the collection of blood from wild birds, and from endangered species in particular, should be to collect optimum minimum amount of blood necessary to run the proposed tests. If 3 mL of blood is adequate, it should be adequate regardless of the age of the bird. It is generally accepted that blood can be collected from a healthy domesticated bird at 1 mL per 100 grams of body weight with no adverse affects.(8) Collection above 2-3% is strongly discouraged even in healthy adult birds. There is no description in this study of the age / weight of the Peregrine chicks to be sampled. If the chicks weighed 100 - 200 grams, the amount of blood taken could seriously compromise the bird's well-being. There is no indication of the qualifications or experience of the handlers, or the site of samples (jugular, brachial veins, toenail clips) each of which presents its own problems such as contamination of samples, stemming blood flow (clotting), etc.

It's quite clear to these reviewers that gas chromatographic analysis for organic chemicals will be meaningless without corroboration by

Com.	Topic	Issue	Sug.	Sort
4	3	1850		2

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mass spectral and infrared detectors. The methodology for "trace-metal analysis" is unstated, and the qualifications of the authors to carry out and interpret these analyses is not clear. In addition, one might normally expect to run GC/MS/IR analysis of organic extracts from feathers and examine blood for heavy metals, rather than the reverse, which is proposed by the authors. Moreover, without long-term control experiments how can the authors determine what "normal" levels of these contaminants might be?

Almost every proposed Bird study suffers from an incomplete project design and lack of rigor in scientific method. While the reviewers are willing to prepare detailed comment on each individual study, it will require that the reviewer do the "homework" and planning that should have been done by the study authors themselves before any proposals were drafted.

Meaningless Results

If the proposed studies are, in fact, carried out it is not clear to us the results will be any more meaningful than a simple extrapolation of previous results. Methods for the application of these results to the assessment of economic damage to the human population is as poorly elaborated as the methods and procedures for the scientific studies themselves. For example, Economic Uses #7 simply states "This study will use surveys designed to document an individual's intrinsic valuation of the resources in question" for the method of analysis!

Even Study #5 (one of the more extensive in this regard) fails to describe how the potential decline in populations of Pigeon Guillemots could (even if determined) be correlated with a drop in tourist dollars to the affected area (and how other local areas might actually benefit from increases in displaced tourism).

If it could be proved, for example, that Eagle populations had been reduced by 20%, how can we place a dollar value on the attraction of tourists to 400 rather than 500 Northern Bald Eagles? (Carried to

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their logical if absurd conclusions, one can argue that decreases in populations of otter or fish-eating birds will ultimately improve fishing yields for commercial and recreational fishermen.)

Questions of Budget

Given the lack of detail and planning evident in the proposal, it is apparent that the budget figures arrived at are nothing more than guesses. Since the authors propose to spend more than \$3MM in studies of bird populations alone, it is clear they must account for their proposed expenses in much greater detail than mentioned in their text.

For example, in Bird Study #5, how many man-hours are going to be required for the trapping/restrain study of 20 Peregrine Falcons? What type of equipment and cost is involved and what will happen to the equipment after the study? What scientific lab equipment will be needed for the proposed analysis of feather samples and blood and what does that equipment cost? What is the manpower required to operate that equipment? Where are the skilled technicians going to come from and what qualifications will they have? How many hours of helicopter service will be required for this study and what will the costs of those services be (based on documented local fees prior to this spill)?

In general, funding for research from Government agencies such as the National Science Foundation, the National Institute of Health, etc. is highly competitive and, as these are institutions of public trust, must be justified very carefully. This study should be no different if it is to be credible.

Lack of Credentials

One major factor in determining the level of funding a principal investigator may receive from a funding agency are the credentials that scientist brings to the proposed study.

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5	3	2300		2

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An economist would probably not attract much money for a proposed study in particle physics simply because the referees could not, in good conscience, assure the public money would be well spent. In point of fact, even investigators with a background in the proposed general field of study must demonstrate the project proposed is reasonable in light of previous results, that their methods are valid, and their results will be meaningful and that they are the most qualified people to carry out the study proposed.

The authors of DAP.BS have failed to meet any of these criteria. Moreover, none of the specific proposals in the plan is identified by author. An examination of names of the participants in the Plan Development Appendix fails to yield names immediately recognizable as published authors in the field of proposed Bird Studies.

We note as an aside that the reason we have limited our review to the proposed Bird Studies and the economic repercussions of those damages is because we, ourselves, are recognized experts in this field and not in the fields of fish/shellfish, marine and terrestrial mammals or air and water pollution. As scientists we feel many of the other sections of the Damage Assessment Plan contain flaws similar to those outlined above for avian studies but we leave our colleagues in other fields to evaluate those proposals in detail.

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6	3	0100		2

Conclusions

The 11 million gallons of North Slope crude oil spilled in Alaska's Prince William Sound had the potential to cause an environmental disaster of almost beyond human comprehension. We understand the importance of trying to comprehend the environmental effects of the oil spill. We understand the urgency required to begin assessing that damage at once.

But, precisely because of the magnitude of the event, because of the possible extensive and enduring damage that may have occurred to this

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vast and most magnificent natural area, it is especially important that every study be very carefully designed, implemented by those with the necessary expertise, and be scientifically unimpeachable.

These proposals represent poorly designed, invasive and disruptive projects requiring vast sums of money to be carried out by investigators with no apparent credentials to provide information which, largely, already exists in the literature. The majority of the programs proposed are budgeted without valid substantiation of costs and little thought has been given to how the detailed (if flawed) results can be applied to providing economic retribution to those affected by this oil spill.

Based on what we have seen, we cannot recommend funding for these projects without considerable revisions to the individual proposals. We are aware of the urgent need to begin studies; we feel that the revisions we request can be done within the current time frame.

There is a need to:

- a) consult with accepted authorities in the specific fields of reproduction, toxicology/pathology, and behavior (e.g. Leighton, Albers, Peakall, Miller, Cronshaw) and enlist their aid in design and execution of the projects.
- b) Refocus and tighten the very broad objectives of the studies; many of these represent a career goal rather than a one-year study.
- c) Substantiate methods and analyses. We presume there is considerable background information that has not been provided. This information must be incorporated into the proposal.
- d) Reduce, wherever possible the unnecessary disruptive and invasive design features in many of the proposals, through use of prior art or redesign of methods.

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7	2	0100		2

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8	4	0100		2

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- e) Provide a more thorough and detailed budget substantiating all costs.

We will be glad to be of help in any way to assist in the revision process.

Lynne Frink, B.A., M.A.
Henry Bryndza, B.S. Ph.D.
Sallie Welte, B.A., M.A, V.M.D.

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REFERENCES & BIBLIOGRAPHY

1. Ainley, D. G., C. R. Grau, et. al. Influence of petroleum on egg formation and embryonic development in seabirds. in Environmental Assessment of the Alaskan Continental Shelf. Annual Reports of Principal Investigators. Vol. 7. Boulder, CO NOAA
2. Ainley, D.G., C.R. Grau, et. al. 1981. Petroleum ingestion reduces reproduction in Cassin's Auklets. Marine Pollution Bulletin 12 (9): 313-317
3. Albers, P. H. 1978 The effects of petroleum on different stages of incubation in bird eggs. Bulletin of Environmental Contamination and Toxicology. 19.
4. Albers, P.H. 1983. Effects of oil on avian reproduction: A review and discussion. Presented at The Effects of Oil on Birds. A Multipdiscipline Symposium. Proceedings. Tri-State Bird Rescue & Research, Inc. Delaware.
5. Barnes, S.H. and D.G. Rosie (eds.). 1983. The Effects of Oil on Birds: Physiological Research, Clinical Applications and Rehabilitation. Tri-State Bird Rescue & Research, Inc. Delaware.
6. Beer, J.V. 1968. Post mortem findings in oiled auks dying during attempted rehabilitation. In: The Biological Effects of Oil Pollution on Littoral Communities (Carthy and Arthus, eds). Field Studies Council, London.
7. Bibby, C.J. and C.S. Lloyd. 1977. Experiments to determine the fate of dead birds at seas. Biol. Conserv. 12.
8. Campbell, T.W. and E.H. Coles. 1986. Avian Clinical Pathology. in E.H. Coles (ed.) Veterinary Clinical Pathology. 4th Ed. W.B. Saunders. Phila. PA 279-301.
9. Clark, R.C. and D.W. Brown. 1977. Petroleum: Properties and analyses in biotic and abiotic systems. In" Effects of Petroleum on Arctic and Subarctic Marine Environments and Organisms. (D.C. Mains, ed.) Academic Press, NY
10. Crocker, A.D. and J. Cronshaw. 1975 The effect of several crude oils and some petroleum distillation fractions on intestinal absorption in ducklings (platyrhynchos). Environmental Physiology and Biochemistry. 5, 92-106.
11. Dein, F.J. and L. Frink. 1982. Rehabilitation of Oil Contaminated Birds. In R.W. Kirk (ed.) Current Veterinary Therapy. Saunders, Phila.

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12. Ford, R.G., J.A. Wiens, et. al. 1982 Modelling the sensitivity of colonially breeding marine birds to oil spills: Guillemot and Kittiwake populations on the Pribilof Islands, Bering Sea. Journal of Applied Ecology 19(1):1-31.
13. Frink, L. 1987. An Overview: Rehabilitation of Oil Contaminated Birds. EPA/USCG/API Fate and Effects of Oil Conference. Wash. D.C. Proceedings 479-882.
14. Fry, D.M. R. Boekelheide, et. al. 1985 Long-term responses of breeding seabirds to oil exposure. Pacific Seabird Group Bulletin 12(1):22.
15. Gorsline, J. 1982. The effects of ingested petroleum on some hormonal regulatory mechanisms in seabirds. Dissertation Abstracts International B. Science and Engineering. 43(7):21-22
16. Grau, C. R. and T. Roudybush, et. al. 1977 Altered egg yolk structure and reduced hatchability of eggs from birds fed single doses of petroleum oils. Science 195: 779-781.
17. Harvey, S. and P.J. Sharp. 1982. Influence of ingested petroleum on the reproductive performance and pituitary-gonadal axis of domestic ducks. Comparative Biology and Physiology 72C: 83-89.
18. Hoffman, D.J. and P.H. Albers. 1984. Evaluation of potential embryotoxicity and teratogenicity of 42 herbicides, insecticides and petroleum contaminants to Mallard eggs. Archives of Environmental Contamination and Toxicology. 13(1): 15-27.
19. Holmes, W. N. 1985. Petroleum pollutants in the marine environment and some possible effects on hormonal regulation in marine birds in B.K. Follet Susumu 1983 Springer-Verlag New York. Japanese Scientific Societies Press. 8423-8: 201-212.
20. Holmes, W.N. and J. Cronshaw. 1977. Biological effects of petroleum on marine birds. in D.C. Mailns (ed.) Effects of Petroleum on Arctic and Subarctic Marine Environments, Academic Press, NY 3:359-398/
21. Lambert, G., D.B. Peakall, et. al. 1982. Effect of oil and oil dispersant mixtures on the basal metabolic rate of ducks. Bull. of Environmental Contam. Toxicol. 29 (5)
22. Langenberg, J.A. and F.J. Dein. 1983. Pathology of Ruddy Ducks contaminated with No. 6 Fuel oil. in S.A. Barnes and D.G. Rosie (ed.) The Effects of Oil on Birds. Tri-state Bird Rescue & Research, Delaware.
23. Leighton, F. P. 1983. The pathology of petroleum oil toxicity in birds: a review. in S.A. Barnes and D.G. Rosie (ed.) The Effects of Oil on Birds. Tri-State Bird Rescue & Research, Delaware.

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24. Lewis, S. J. and R.A. Malecki. 1984. Effects of egg oiling on larid productivity and population dynamics. Auk. 101(3): 584-592.
25. Macko, S.A. and S.M. King. 1980. Weathered oil: Effect on hatchability of heron and gull eggs. Bull. of Env. Contamination and Toxic. 25(2): 316-320.
26. McGill, P.A. and M.E. Richmond. 1979. Hatching Success of Great Black-backed Gull eggs treated with oil. Bird-banding. 50(2): 108-113.
27. Miller, D.S., D.J. Hallet and D.B. Peakall. 1982. Which components of crude oil are toxic to young seabirds? Env. Toxic.and Chemistry. 1(1): 39-44.
28. Miller, D.S. and R.G. Butler, et. al. 1980. Crude oil ingestion by seabirds: possible metabolic and reproductive effects. Mount Desert Biol. Lab. Bull. 20, 137-138.
29. Peakall, D.B. and D. Hallet et. al. 1980. Effects of ingested crude oil on Black Guillemots: A combined field and laboratory study. Ambio 9(1): 28-30.
30. Peakall, D.B. and D.S. Miller et. al. 1983. Toxicity of crude oils and their fractions to nestling Herring Gulls - 1. Physiological and biochemical effects. Marine Env. Research 8(2):63-71.
31. Samuels, W.B. and K.J. Lanfear. 1982. Simulations of seabird damage and recovery from oil spills in the northern Gulf of Alaska. Journal of Env. Management 15(2): 169-182.
32. Trivelpiece, W.Z. and R.G. Butler, et. al. 1984. Reduced survival of chicks of oil-dosed Leach's Storm-petrels. Condor 86(1): 81-82.
33. Vermeer, K. 1976. Colonial auks and eiders as potential indicators of oil pollution. Marine Pollution Bull. 7(9): 165-167.
CRC Handbook of Laboratory Safety / EPA Determinations of Hazards.

Part II: Development of the Restoration and Implementation Plans

This section is extremely vague. There is no attempt made to clarify what factors from specific research studies might be considered when designing specific restoration plans. This section never states whether Exxon or the federal/state agencies will be responsible for the restoration, or further clean-up. If money from the Exxon fines is to be used in the restoration programs, this is not clarified. Moreover, the current restoration plan appears to be primarily geared to restoring only commercial values. This plan is therefore not consistent with the ultimate purpose of the restoration plan, which should be to restore the damaged areas as soon as possible to pre-spill conditions. Although this goal may be unrealistic for some areas, every effort should be made to establish the most efficient and effective restoration plan for each area, population, species and ecosystem damaged by the spill.

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86	2	2110		2

Part III: Damage Determination - Economic Value of Resource Use

There is no apparent attempt in this section to deal with tourism directly. For example, Economic study 5 on damage to recreation does not include lost dollars to vendors, hotel owners, etc. from the reduced recreational use. There is no mention of the potential tourist industry losses that could result from a decline in servicing hunting and recreational fishing. Assessing potential lost tourism income is at least a start in evaluating the costs of damage to the wilderness and wildlife. A good analysis of tourism losses is essential in considering a dollar value for the ecological damage incurred in coastal habitats and in wildlife populations that do not have commercial values. Great care should be taken not to overlook these seemingly less tangible values, in favor of a perhaps "easier" route of focussing damage assessment and fines more heavily on those species with direct commercial value.

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87	3	2250		2

Appendix B-Histopathology Procedures

On p. 220 there is a reference to the Mixed Function Oxidase (MFO) enzymatic system which the livers of most higher animal species possess in order to detoxify ingested oil (hydrocarbons). Not only are the original hydrocarbons of the crude oil toxic, but some are actually less toxic than the metabolites from the MFO system. Metabolites in general are more reactive in body chemistry. Yet, there has been little study of the effects of the oil MFO metabolites on physiology. Nonetheless, the histopathology studies should not exclude assaying for these metabolites. The list of hydrocarbons that are required to be identified on Appendix A on page 219 should include the known metabolites of crude oil, and specifically north slope crude.

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88	3	2420		2



An Analysis of the State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill

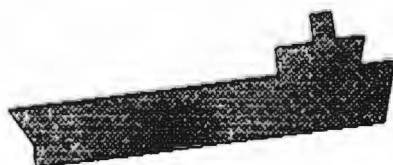
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National Wildlife Federation

joined by
Wildlife Federation of Alaska
Trustees for Alaska
Alaska Center for the Environment
Sierra Club Legal Defense Fund

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by
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with David Campbell, Ph.D., Rudy Rosen, Ph.D., and Ann Rothe



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EXECUTIVE SUMMARY

The government's draft natural resource damage assessment plan for the Exxon Valdez oil spill, while clearly reflecting substantial work by many well-intentioned scientists, has been undermined by several political decisions. These decisions to reduce budgets and eliminate many important aspects of the assessment apparently were made at the political level, primarily by federal officials. Thus, the draft plan suffers from several serious inadequacies, discussed briefly here and in greater detail in these comments, that likely will result in a severe undervaluation of the natural resources injured by the spill.

If the final assessment does not reflect substantial improvements, the United States, and indeed the global community, may lose this important opportunity to restore, replace, or acquire natural resources equivalent to those injured in the unique and pristine ecosystems in Prince William Sound, the Alaska Peninsula, Kodiak Island, and other areas devastated by the Exxon Valdez spill.

Problems With Damage Assessment Plan

- o Limiting the Exxon Valdez damage assessment to one year. The draft damage assessment plan would limit all studies to less than one year, to be completed by February, 1990. Any decisions to extend studies would depend on whether impacts were found in the first year. This approach is ridiculous scientifically and indefensible from a policy perspective. The plan itself admits the oil will persist and will have impacts for many years. Many biological and other impacts will take many years to become apparent. For example, impacts on reproduction of biota such as whales, bald eagles, salmon, and sea otters simply will not be fully manifested or documentable in one year. The plan must be revised to require and fund the multi-year studies needed to fully document the impacts of the spill.
- o Failing to study restoration, replacement, or acquisition of the equivalent of injured resources. The draft assessment reads as if the U.S. Court of Appeals for the D.C. Circuit never handed down its July 14, 1989 decision mandating that restoration, replacement, or acquisition of natural resources equivalent to those injured is the basic measure of damages. Ohio v. U.S. Department of the Interior, 880 F.2d 432 (1989). The 258-page draft assessment makes virtually no mention of restoration; it includes just one page stating that a restoration plan will be developed in the future, without including any studies of the costs of doing such restoration. The plan does not mention any plans to assess the costs to acquire resources equivalent to those lost, one of the primary statutory remedies available to Trustees. Neither does the plan commit to adding to restoration costs damages based on a summing up of all use and intrinsic values, as the Ohio court envisioned. The assessment plan must be overhauled to focus on restoration plus lost use and intrinsic values, and must follow the Ohio court decision by considering the costs of acquiring additional habitat or resources equivalent to those destroyed and not restorable.
- o Leaving the door open to letting Exxon do the damage assessment. The draft assessment says that the Trustees may let Exxon or other responsible parties do parts of the assessment. This is unacceptable. Exxon has demonstrated that it cannot be trusted to conduct unbiased studies when it will be asked to pay the tab

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for the damages it has done. This has been highlighted by Exxon's recent counterclaim against the State of Alaska for cleanup costs, and its refusal to commit to returning to finish the spill clean up next year. Exxon and the other responsible parties should have no role whatever in conducting the government's assessment, except to pay for it (without strings attached).

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3	1	0207		2

- o Vagueness of the Study. The draft assessment plan is vague and provides few if any details on how, when, by whom, and where the studies are to be conducted. Virtually every scientist and economist we have contacted says that intelligent comment is next to impossible on many key studies unless the public is provided with more details. The Trustees must make more details of the studies available for public scrutiny.

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4	4	0102		2

- o Failure to Focus on the "Big Picture" Ecosystem Impacts of the Spill. The draft plan fails to provide for detailed studies that will analyze the long- and short-term impacts of the spill on the entire food web and ecosystem devastated by the spill. Instead, the proposal focuses almost exclusively on specific species or discrete segments of the ecosystem that have some direct human use value. There is an urgent need for a full investigation of the impacts of the spill on Alaska's entire food web, and on the affected environment and ecosystem as a whole.

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5	4	0111		2

- o Inadequate Numbers of Samples to be Taken and Analyzed. There have been very troubling recent reports that the Trustees are severely restricting the number of samples that scientists can take and analyze in conducting their studies, apparently justified as a cost-cutting measure. For example, apparently each study team has been limited to an analysis of 10 tissue samples for timely analysis, meaning that decisions to terminate studies may be made in February 1990 based on inadequate data. These limits on samples may result in a failure to detect many impacts because of inadequate sampling or analysis, and could hamper the Trustees' efforts to recover damages from responsible parties.

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6	3	0112		2

The draft assessment plan, therefore, should be modified to assure that the Trustees will carry out their obligations under applicable statutes and under the public trust doctrine. As discussed in more detail in the comments, the National Wildlife Federation and several other environmental groups have filed suit in state and federal court seeking damages and other remedies that are broader than and generally complementary to the damages to be assessed by the Trustees. The Environmental Groups seek to assure that to the extent possible, the remedies in those suits are coordinated with those sought by the Trustees. However, without major changes in the Trustees' assessment plan, an important chance available to the Trustees to assure natural resource restoration in the wake of one of the world's worst ecological catastrophes may have been lost.

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7	3	0100		2

I. INTRODUCTION

... How do you weigh the forever cost of this catastrophe? ... I could go on, but what may be of most concern, ultimately, is those things that are not obvious, and often not visible. It's not just the otters, or the birds, or the herring, or the magical beauty of Prince William Sound. It's the countless invertebrates that live in the ocean and on the shores, it's the diatoms, the phytoplankton and zooplankton, the amphipods, the mollusks and crustaceans, the little fish, the bigger fish that eat them, and on and on through the food chain. It's the system.

... Sometimes I wonder just how many more shocks the environment can take before something goes remarkably, irreversibly sour. Because once something is gone from this planet -- any creature, any species, any system -- no matter how many billions of dollars we throw at it, we will never be able to bring it back.

Sylvia A. Earle, on leaving Prince William Sound, April 1989; excerpted from Wallace, White, "Her Deepness", The New Yorker, July 3, 1989, pp. 64-65.

The National Wildlife Federation ("NWF"), is the nation's largest nongovernmental conservation organization, with over 5.8 million members and supporters. The Wildlife Federation of Alaska, a non-profit organization with statewide membership, is affiliated with the National Wildlife Federation, and is dedicated to conservation, education and protection of the natural environment. Trustees for Alaska is a non-profit environmental law firm based in Anchorage, Alaska which protects natural resources and the environment of Alaska on behalf of its more than 1000 members. The Alaska Center for the Environment is a non-profit grassroots membership organization focusing on environmental issues in South Central Alaska. The Sierra Club Legal Defense Fund is a non-profit corporation created to support lawsuits brought on behalf of citizens' organizations to protect the environment. These commenters will be referred to jointly as the "Environmental Groups".

The Environmental Groups submit these comments on the August 1989 public review draft of the State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez oil spill ("draft assessment plan"). The Environmental Groups hereby join and incorporate by reference to the extent consistent with these comments, the comments of the Natural Resources Defense Council (NRDC) and the Defenders of Wildlife.

NWF has been involved in the development of the Federal natural resource damage assessment program since its inception. Most recently, NWF, along with ten states and two additional public interest groups, successfully challenged the Federal natural resource damage assessment regulations. As a result of our lawsuit, the

regulations were remanded to the Department of Interior for revision and repromulgation on three points critical to the Exxon Valdez assessment plan: (1) to incorporate the "clearly expressed intent of Congress" that "restoration costs ... be the basic measure of recovery for harm to natural resources" under both CERCLA and the Clean Water Act; (2) to include assessment procedures and valuation methodologies that "capture fully all aspects of the loss," whether or not the natural resource is used by humans or traded in the marketplace; and (3) to clarify how they apply to privately-owned resources in which there is some government interest. State of Ohio et al. v. Department of the Interior, 880 F.2d 432 (D.C.Cir. 1989).

NWF, WFA, and NRDC are also plaintiffs in a suit filed in Alaska Superior Court against Exxon, Alyeska Pipeline Service Company, and each right-of-way holder. This suit demands, among other things, that Exxon and the Alyeska consortium companies be required to establish a trust fund, to be overseen by independent experts, to pay for certain actions, including but not limited to: the short- and long- term study and compilation of all injuries and all damage done by the Exxon Valdez spill; removal or containment of contaminants; full restoration or replacement of injured resources; acquisition of resources similar to those lost; acquisition of resources to compensate for diminution in all values of injured resources; and, full compensation for all lost use, intrinsic and other values of the injured resources. This suit also seeks other equitable and legal relief, including punitive damages. Moreover, several environmental organizations, represented by the Sierra Club Legal Defense Fund in Juneau, have filed suit in the Federal District Court in Anchorage seeking relief under the Clean Water Act and the Resource Conservation and Recovery Act for certain environmental remedies and penalties under those laws in the wake of the Exxon Valdez spill.

The relief sought in those cases obviously is complementary with and broader than the activities that will be contemplated by this damage assessment plan, however we are commencing in part to seek to assure that the Trustee Council's assessment plan and future activities are coordinated to the extent possible with the relief sought and granted in Court. We also hereby request that we be fully involved in the development and implementation of the Trustee Council's restoration plan to assure maximum coordination of efforts.

Moreover, quite frankly, our review of the draft plan raises deep concerns. The draft is so inadequate that serious questions arise as to whether the Trustee Council intends to carry out its statutory and public trust obligations to assure restoration, replacement, and acquisition of resources equivalent to those injured by the spill.

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85	2	0100		2

The Environmental Groups are shocked by the superficiality of the draft assessment plan's descriptions of proposed actions, and at the lack of detail provided about each proposed study. The cursory descriptions of proposed assessment and valuation activities often preclude intelligent review or meaningful comment, making a mockery of the public participation process. To add insult to injury, the Department of Interior and the Trustee Council have prevented public access to any current information about the studies already underway (such as research plans, sampling protocols, data collected, or analysis of results), and have proceeded to conduct the first

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six months of assessment activities without any public scrutiny. Due to the gross generality of the draft assessment plan, and the lack of access to existing information that could provide additional detail, the Environmental Groups do not waive their right to make additional or contradictory comments about the proposed studies or assessment approach at a later time. In addition, the Environmental Groups expect, and respectfully request, that public comment will continue to be solicited throughout the assessment period.

The proposed assessment plan is legally inadequate in several respects. As a result, the natural resource damages resulting from the Exxon Valdez oil spill will probably be significantly undervalued, and full restoration¹ of the natural resources and the services they provided will not be accomplished. In the comments below, several of the most important generic problems with the draft assessment plan are raised. The Environmental Groups then comment on each set of studies, to the extent that the information provided made review and comment feasible. Our comments conclude with a discussion of the Trustees' legal obligation to provide increased public participation in both development and implementation of the Exxon Valdez assessment plan.

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87	3	0130		2

The fundamental objectives of the draft assessment plan must be changed to reflect the statutory requirements for natural resource damage assessments, as articulated by the D.C. Circuit in the Ohio decision. The restoration planning process must be initiated immediately, and restoration options and costs for all affected natural resources determined. The Trustees must make a firm commitment to carrying out a restoration plan, as is required by law. All potential injuries to all natural resources, including damage to the ecosystem regardless of human use, must be fully explored. Finally, studies to determine the short- and long-term effect of the oil spill on natural resources must continue long beyond the February 1990 date mentioned in the draft assessment plan.

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¹ As discussed in § II.B of these comments, CERCLA and the Clean Water Act require that natural resource damages be used to restore, replace or acquire the equivalent of the injured resources. The term "restoration" is used as shorthand to refer to all three components of the statutory requirement.

II. TRANSCENDENT PROBLEMS WITH THE DRAFT ASSESSMENT PLAN
A. The Proposed Studies Will Not Provide the Information Necessary to Calculate Natural Resource Damages According to the Statutory Measure of Damages

The appropriate measure of damages for natural resource damage assessments under CERCLA and the Clean Water Act has been litigated in detail. The U.S. Court of Appeals for the D.C. Circuit, in an unappealed decision, determined that "restoration [cost] is the basic measure of damages, but damages can exceed restoration costs in some cases."² Ohio v. Interior, 880 F.2d at 450. The draft assessment plan does not reflect the statutorily mandated measure of damages. Rather, it appears to be designed to calculate natural resource damages in accordance with the regulations expressly overruled by the D.C. Circuit.

Prior to the Ohio decision, the Federal natural resource damage regulations required trustees to calculate natural resource damages according to the lesser of: restoration or replacement costs, or diminution in use values. 43 C.F.R. § 11.35(b)(2) (before remand). Furthermore, the pre-appeal regulations incorporated a "hierarchy" of assessment methods that virtually excluded Trustee recovery for any natural resource values other than direct human use values (e.g. market values). 43 C.F.R. § 11.83(c) (before remand). The U.S. Court of Appeals for the D.C. Circuit specifically overruled the "lesser of" rule, as well as the hierarchy's limitation to direct human use values, saying that both concepts were contrary to Congressional intent. In the words of the Court, the measure of damages for natural resource damage assessments performed under CERCLA and the Clean Water Act includes: (1) "restoration [as] the basic measure of damages...", 880 F.2d at 450, plus, (2) "use values for natural resources [derived] by summing up all reliably calculated use values, however counted, so long as the trustee does not double count," Id. at 464; and "other factors in addition to use values," so that prima facie, option and existence values "ought to be included in a damage assessment." Id. at 464.

Thus, natural resource damages calculated for the Exxon Valdez oil spill should be the sum of restoration costs for all injured resources, the sum of all reliably calculated lost use values during restoration, and all non-use values. The draft assessment plan will provide inadequate information to calculate any of the three natural resource damage components.

Although the draft assessment plan does not reference the "lesser of" rule, there is similarly little mention of restoration costs. Restoration costs are mentioned briefly in the plan's introduction as a measure of damages. Plan, p. 24. Yet, restoration costs are not included anywhere as a subject for study. It is the Environmental Groups' impression that upon the completion of every study proposed in the draft assessment

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² As do the Environmental Groups throughout these comments, the court used the term restoration "shorthandedly" to include restoration, replacement, or acquisition of equivalent resources. Ohio v. DOI, 880 F.2d at 441.

plan, absolutely no information on restoration costs will have been developed. Since restoration costs are the statutory floor for calculating recoverable natural resource damages, the Trustees may have no legal basis for assessing damages against Exxon and other responsible parties after millions of dollars have been spent on the assessment studies. Beyond being a violation of the express provisions of the statutes, this would be a breach of the Trustees' fiduciary responsibilities.

The February 1990 cease date for many of the studies in the draft assessment plan will foreclose the opportunity for the Trustees to calculate lost use values during restoration, unless legally defensible extrapolations of long-term lost use can be made from this summer's data. See also discussion in § II.C., infra.

Finally, many sections of the draft assessment plan demonstrate the Trustees' limited focus on direct human use values. In addition to overlooking a potentially critical universe of recoverable natural resource damages, the failure to include all values (use and non-use, consumptive and non-consumptive) is contrary to the court's ruling in the Ohio case. By statute and the court's decision, all lost services provided by natural resources must be assessed, whether the services benefit humans directly, indirectly or are provided to the ecosystem as a whole. Yet the focus of virtually every injury determination study is narrowly anthropocentric. For example, there are no overall studies investigating effects of the oil spill on the functioning of the ecosystem, such as impacts on microbial action, algal growth, growth of plankton, growth of benthos, or contaminant cycling through the food web. The coastal habitat study, for example, was designed to investigate food for "valued resource species", to determine the effect on "higher order organisms of economic importance", and to collect data on species that "provide services directly to humans". Plan, p. 29.

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9	3	Oil		1

The plan's illegal focus on narrowly-defined direct human use values to determine natural resource injury may stem from the acknowledged difficulty of quantifying injuries that are not related to human use of a resource. As described above, however, quantification of natural resource damages is not limited to economic human use value methodologies, nor are the economic methodologies limited to use value calculations. There are at least two other ways to quantify natural resource injury, regardless of direct human use -- restoration cost and contingent valuation. Restoration cost is not included in the draft plan. Further, since no descriptions are given of the contingent valuation studies to be performed under Economic Studies 5-7, we cannot determine whether the surveys will be sufficient to capture the important non-use values of injured natural resources.

In order to fully recover for all natural resource injuries covered by CERCLA, the Clean Water Act, and the public trust doctrine, the full range of natural resource injury (including ecological damage) must be determined. In addition, the natural resource damage assessment will not be complete or meet statutory requirements until restoration costs for each natural resource injury have been estimated, long-term lost use values during restoration calculated, and all non-use values are considered.

B. The Draft Assessment Plan Does Not Meet the Statutory Objective of a Natural Resource Damage Assessment to Replace, Restore or Acquire the Equivalent of Injured Natural Resources

Restoration costs are a component of natural resource damages because both CERCLA and the Clean Water Act require that the damages recovered must be used to restore, replace or acquire the equivalent of the injured resources.

CERCLA § 107(f)(1); CWA § 311(f)(5) (trustees must use recovery to "restore, rehabilitate or acquire the equivalent of" injured resources). The primary objective of a natural resource damage assessment is to allow trustees to recover funds to restore the natural resources to their pre-release condition, and if that is not possible, to acquire equivalent resources providing the lost services. Recoveries in excess of restoration or replacement costs also must be used to acquire resources equivalent to those injured. While the dollar figure of a natural resource damage assessment can exceed restoration costs, as discussed in the previous section, restoration of the injured natural resources and the services they provided is the minimum end-product of the natural resource damage assessment process.

The draft assessment plan appears to include restoration as an afterthought, or as an optional future activity. See, Introduction to Plan, p. 27. Neither the injury assessment studies, nor the economic value studies, collect the information needed to fully explore restoration options or restoration cost. The ongoing assessment activities also do not reflect timely consideration of the statutory restoration objective.

Equally important is the draft assessment plan's total neglect of the third component of the statutory objective, namely acquisition of equivalent resources. There is absolutely no discussion in the plan concerning the Trustees' intentions for natural resources and their services which cannot be restored or replaced. For example, for those beaches that are likely to become essentially "paved" with asphalt as the oil weathers, and therefore may be unrestorable, the Trustees must be developing assessments and plans to acquire for protection some equivalent resources that will provide similar services to people and the ecosystem.

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The Trustees must investigate restoration options and estimate restoration costs; clearly, the Trustees must provide restoration, replacement, or acquisition of equivalent resources for each natural resource injury. For studies which use indicator species to determine injury (e.g., certain bird studies), restoration must be provided for each species within the class of species intended to be represented by the indicator species. Similarly, for natural resources providing multiple services (e.g., beaches and intertidal zones providing habitat for shellfish, fish, invertebrates, marine and terrestrial mammals, and many other species) each of the lost services must be recreated through restoration, replacement or acquisition of equivalent resources.

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The Environmental Groups suggest that the possibility of on-site restoration must be considered as soon as natural resource injury is suspected. If a determination is made that an injured natural resource or lost service cannot be restored within the spill area, immediate steps should be taken to identify equivalent resources and to acquire

them. Pristine marine habitats similar to Prince William Sound are few, and many (such as Bristol Bay) are threatened with imminent development. In order to fulfill their statutory restoration obligations, the Trustees must consider restoration options simultaneously with injury determination, and act quickly to accomplish restoration or acquisition of equivalent resources. Examples of possible equivalent resources are provided with our comments on resource-specific injury assessment studies.

C. The Time Period for All Studies is Grossly Inadequate to Determine Short- and Long-Term Injury to Natural Resources Affected by the Exxon Valdez Oil Spill

The draft assessment plan provides that it, "is essentially a one-year plan":

No further studies will be conducted after February 28, 1990, except those approved by the Trustees upon recommendation of the Trustee Council and scientific and legal groups as being necessary to promote restoration and to support assessment of legally recoverable natural resource damages.

Plan, p. i. It is ludicrous to suggest that both short- and long-term injury resulting from the largest oil spill ever in this country affecting a heretofore pristine area which the plan itself describes as the "largest undeveloped marine ecosystem in the United States" can be determined in less than one year, by February 28, 1990. At best, this would mean an assessment would be based on ten months' of data. Realistically, much less than 10 months worth of data will be available. All agencies' initial focus after the March 24 spill was on immediate spill reaction and cleanup. In addition, with winter weather arriving around mid-September, little data collection is possible between now and the February 1990 drop-dead date. The Environmental Groups are very concerned that data available from the 1989 sampling season alone will support only a very minimal natural resource damage assessment, compared to the enormous natural resource injuries that resulted from the spill, and that will continue to occur for years into the future.

A one-year assessment plan clearly violates the Trustees' public trust obligations to protect and preserve the public resources within their jurisdictions. The trustees' fiduciary responsibilities cannot be discharged without an assessment of both short- and long-term natural resource injury, as a basis for restoration efforts and damage quantification. The circumstances of the Exxon Valdez oil spill, and the type of natural resources affected, highlight the need for years, possible decades, of studies.

The Exxon Valdez oil has travelled far and has saturated many parts of the environment of Prince William Sound. Hundreds of miles of beaches were oiled, yet only a tiny fraction of these beaches enjoyed "treatment" efforts; oil remains under the surface layer of even the "treated" beaches. Very little of the total volume of oil spilled has been removed from the environment. We can expect oil to remain in the Prince

William Sound environment for many years, continually affecting natural resources during that entire time. See, Ecological Study of the Amoco Cadiz Oil Spill, Report of the NOAA-CNEXO Joint Scientific Commission (1982); National Academy of Sciences, Oil in the Sea: Inputs, Fates and Effects, (1985); Plan, pp. 20, 19.

The effects of oil on certain natural resources may be delayed and may not manifest themselves until after the first year. Reproductive effects, survival rates, and decreased longevity may all be effects of the oil spill which cannot be observed until possibly 10-20 years after the spill event. It may take several years for food chain effects to manifest themselves; e.g., birds affected by a decrease in plankton and fish populations. Plan, p. 143. Subtle impacts on population, and interactions between species that are changed by the spill may take many years to discover. Long-term changes in species makeup of the impacted ecosystem, for example, may require over a decade of studies. Finally, it could take years of surveillance to determine the cause of the die-off of grey whales, harbor seals and sea lions this year, and to determine whether a long-term decline in population will result.

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Many of the species affected by the Exxon Valdez spill are seasonal users of Prince William Sound. Plan, p. 143. The long-term effects on such species can therefore not be determined until they revisit the spill area. Many migratory birds, for example, will not return to the Sound until Spring of 1990, several months after the February drop-dead date. Herring present during the oil spill may not return to spawn for three years. Plan, p. 15. Many exposed salmon likewise will not return for years.

Little is known about the long-term effects of oil on certain natural resources; e.g., the effects of prolonged exposure of certain marine mammals to oiled waters or tainted food supplies. Without prior research and information about long-term effects, it will be difficult if not impossible to extrapolate such effects from less than a year's worth of sampling and analysis.

Finally, many of the study descriptions themselves anticipate long-term data collection. Several of the economic value studies will use a survey method, which is time consuming to develop, implement and analyze. (Economic Studies 5-7.) We cannot understand how contingent valuation surveys that will provide meaningful results can be completed by February 1990. One stated purpose of the coastal habitat injury assessment is to determine the recovery of various habitat types after clean-up. Plan, p.29. Since clean-up of the spill has not been completed, this aspect of the study cannot even begin before February 1990. Further, since full recovery of habitat such as oiled beaches can take years, possibly decades, and in some cases may never occur, a February 1990 drop-dead date completely undermines the study's objective.

The Environmental Groups agree that the studies should be reevaluated periodically, to review the scope of existing studies and to consider whether additional investigation is warranted. This approach is entirely different, however, from the automatic termination of studies after ten months presented in the draft assessment plan. The Trustee Council must overhaul its approach, both in light of its public trust

obligations and the defensibility of any future assessment.³ The public should be integrally involved in all decisions to terminate studies, or to change the scope or focus of a study.

D. Exxon Should Not Be Allowed to Participate in Any Portion of the Damage Assessment

The draft assessment plan states that the Trustees have not yet decided "whether, or to what extent, potentially responsible parties (PRPs) should participate in the damage assessment." Plan, p. iii. The Environmental Groups strongly object to any Exxon⁴ participation in data collection, analysis, or any other aspects of the natural resource damage assessment. Exxon's sole role in the natural resource damage assessment should be as a member of the public, with the same rights of review and comment as are provided to interested persons such as the Environmental Groups.

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It goes without saying that potentially responsible parties have an inherent conflict of interest; they cannot be expected to objectively collect and analyze natural resource injury and economic value data, which will be used to impose what may be a multi-billion dollar assessment on themselves. Indeed, some might argue that the corporate officers of Exxon owe a fiduciary responsibility to their stockholders to minimize the size of the damages assessed, placing them in direct and irreconcilable conflict of interest with the public Trustees who have an obligation to assure full recovery of the damages to which they are entitled. For these reasons, both CERCLA and the Clean Water Act require that the Trustee perform the assessment and calculate natural resource damages. CERCLA § 111(h)(1) ("damages ... [to] natural resources ... shall be assessed by Federal officials designated by the President ..." under the NCP); CERCLA § 107(f) ("[t]he President or the authorized representative of any state shall act on behalf of the public as trustee of such natural resources to recover for such [natural resource] damages"); Clean Water Act § 311(f)(4) ("costs of removal ... shall include any costs or expenses incurred by the Federal Government or any State government in the restoration or replacement of natural resources damaged or destroyed ..."); Clean Water Act § 311(f)(5) ("[t]he President, or the authorized representative of

³ Exxon has been actively gathering natural resource injury data since March 24. The Trustees' natural resource injury and economic studies must be viewed in light of their multiple purposes: (1) to assess natural resource injuries as the basis for restoration efforts; (2) to support a natural resource damage assessment; (3) to serve as evidence in support of the Trustees' assessment, and (4) to rebut Exxon's data. Termination of many of the studies in February 1990 may seriously jeopardize the data's effectiveness in serving each of these purposes.

⁴ For purposes of these comments, we use the name "Exxon" to refer to any and all parties potentially responsible for natural resource damages from the Exxon Valdez oil spill.

any State, shall act on behalf of the public as trustee of the natural resources to recover for the costs of replacing or restoring such resources").

In reviewing the Federal natural resource damage regulations, the D.C. Circuit affirmed the portion of the rules permitting PRP participation in an assessment, but relied heavily on the Department of Interior's assertions that "[t]he PRP functions in a strictly ministerial role. The final choice of methodologies rests solely with the authorized official." Ohio v. Interior, 880 F.2d at 467. More importantly, however, the Court made it clear that the decision to allow PRP participation in an assessment must be made by the Trustee case-by-case, in conformance with the trustee's fiduciary obligation to protect and preserve the natural resources:

The Trustee has absolute authority to direct and control the PRP in the assessment function: that should be enough to permit flexibility while still retaining ultimate accountability with a public trustee.

Ohio v. Interior, 880 F.2d at 467.

Exxon participation in this particular natural resource damage assessment would be contrary to the trust responsibilities of the Departments of the Interior, Agriculture and Commerce, and the State of Alaska. Trust law establishes fundamental fiduciary duties on the part of the Trustee; one of those is to protect the corpus of the trust. Another fiduciary duty is to avoid conflicts of interest, and to fully recover damages on behalf of the beneficiary public in order to restore or replace lost or injured resources, and to recover for other injuries when the corpus is destroyed or injured. See, e.g., In re Steuart Transportation Co., 495 F.Supp. 38 (E.D. Va. 1980); Maryland v. Amerada Hess, 350 F.Supp. 1060 (D. Md. 1972); NOAA, The Use of Economic Analysis in Valuing Natural Resource Damages at 71-76 (1984); W. Rogers, Environmental Law, 172 (1977); Sax, The Public Trust Doctrine in Natural Resource Law, 68 Mich. L. Rev. 471 (1970).

This case is clearly not appropriate for PRP participation, even on a limited basis. Implicit in the D.C. Circuit's decision was the reality that PRP participation requires a cooperative effort between the Trustee and the PRP. Such cooperation is not the reality of the Exxon Valdez spill. The State of Alaska, one of the Trustees participating in the draft assessment plan, has filed suit against Exxon; the requested relief includes a request for, among other things, punitive damages and certain natural resource damages. It is a clear conflict of interest for a defendant to perform the studies which will determine the total dollar figure of the recovery against it. No reasonable Trustee, Trustee's attorneys or Court would ever allow this to happen. Moreover, Exxon recently filed a counterclaim against the State of Alaska, alleging that much of the damage done by the spill resulted from the State's refusal to approve the use of dispersants. This hardly bodes well for "cooperative" efforts by Exxon and the Trustees.

Finally, the responsible parties in the Exxon Valdez case have repeatedly demonstrated their bias against full protection of the public and its natural resources. Exxon's clear conflict of interest with respect to cleanup and natural resource damages makes it an abuse of discretion, and a violation of fiduciary responsibility, for the

trustees to even consider allowing Exxon participation in the assessment. In late September, Exxon's internal decision to cease all cleaning activities after mid-September 1989 was uncovered. At Congressional hearings, however, Exxon agreed to revisit the issue in Spring 1990 to determine whether there was any need for additional cleanup. Because Exxon claims to have already spent \$1.3 billion in response to the Exxon Valdez spill, their motivation appears to be to limit any and all additional costs. In addition, it has been alleged that Exxon told its workers to treat beaches to the high mean tide line, whether or not oil was present higher up on the beach. Although Exxon reportedly provided no reason for selecting this arbitrary line for incomplete treatment, we can only assume that it was an attempt at cost control or an unfounded belief that Exxon's legal liability extended no further. Exxon has been only marginally helpful on the natural resource damage assessment itself. It "volunteered" to pay only \$15 million towards the assessment, less than half of the Trustees' estimated costs for the first ten months' studies alone.⁵

Alyeska Pipeline Company, the consortium of seven additional responsible parties, has continually refused to assist in long-term cleanup activities for the Exxon Valdez spill despite its legal obligation under its Contingency Plan to do so. Proposed Probable Cause, Findings and Recommendations of the State of Alaska. Before the National Transportation Safety Board, Docket No. DCA 89 MM 040, p. 97 (7-17-89). In August of this year, Alyeska also announced that its involvement in any future spills would be restricted to an "initial" response, leaving the bulk of cleanup responsibility to the tanker or cargo owner. New York Times, 10-18-89, p. A16. The clear motivation of Exxon and other responsible parties in the cleanup activities for the Exxon Valdez spill has been to cut costs and avoid liability, as is well illustrated by Exxon's recent counterclaim against Alaska. We can expect no different behavior for the natural resource damage assessment. This certainly is not the formula for an objective and comprehensive natural resource damage assessment which fully protects and preserves the public trust in the natural resources of Prince William Sound.

If the Trustee Council is concerned about funding for continued natural resource damage assessment activities, the Environmental Groups suggest the following options:

- Federal and State Trustees should request additional appropriations for the assessment from Congress
- State Trustees should request additional appropriations for the assessment from the State legislature and Congress
- All Trustees should file cost recovery or other actions against Exxon and other responsible parties immediately, and obtain declaratory injunctive relief for future assessment costs.

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13	0	0208		2

⁵ The \$35 million estimated cost figure for assessment studies through February 1990 itself underestimates the true cost of comprehensive injury determination and economic valuation studies for the Exxon Valdez spill.

E. No Discount Rate Should Be Applied to the Exxon Valdez Natural Resource Damage Assessment

The draft assessment plan indicates that "[t]he [discount] rate to be used as a basis for calculating the final damage claim against the potentially responsible parties has not yet been determined by the Trustee Council." Plan, p. 26. Especially in light of the unique ecosystem affected by the spill, no discount rate (or a discount rate of zero) should be used to calculate natural resource damages for the Exxon Valdez oil spill.

There are many risks associated with discounting future natural resource damages to present value, many of which were acknowledged by the D.C. Circuit.⁶ As resources become scarcer over time, and the demand for them increases, their value will also increase. Similarly, restoration costs may rise faster than the general price level. Indeed, the D.C. Circuit noted that Trustees "should take into account the possibility that the value of a particular restoration project will increase over time, as a function of scarcity, faster than the rise in general price level." Ohio, 880 F.2d at 465. Since these future increases in value or cost cannot be predicted with precision, and do not act like non-resource values for "widgets" that are normally discounted, any discounting to present value can result in significant underrecovery. For many natural resource injuries, there may be no way to value them fully. The draft assessment plan's description of bird injury assessment studies frankly acknowledges that "[a]ssessment of injury to birds, therefore, will be understated." Plan, p. 145. Thus, the undervaluation inherent in the natural resource damage assessment process will simply be magnified by discounting an inadequate damage amount to present value.

A discount rate requirement also runs directly against the grain of the Trustees' fiduciary obligations to future generations. Because of the importance of future generations of potential users, many economists believe that no discount rates should be applied where a public Trustee is recovering for injuries to natural resources. As has been pointed out:

discount[ing] the resource value to present value ... tends to reduce to insignificance the importance of the next generation's concerns. Some of the assumptions underlying this technique can be questionable when valuing natural resource damages.

Yang, "Valuing Natural Resource Damages: Economics for CERCLA Lawyers," 14 Envtl. L. Rep. 10311 (Envtl. L. Inst., Aug. 1984).

⁶ Although the D.C. Circuit did not overturn the 10% discount rate contained in the Federal natural resource damage regulations, it did note that the Department of Interior was free to revise the discount rate at any time in the future. The Court also expressed concern that assessments reflect the increased future value associated with resources that become scarcer over time. Ohio v. Interior, 880 F.2d at 464-65.

Com.	Topic	Issue	Sug.	Sort
90	0	0142		2

Discounting to "present value" is particularly inappropriate in the case of a spill of this magnitude in the unique Alaska ecosystem devastated by the Exxon Valdez oil. Discounting is justified only when there are ready substitutes for widely available marketed good. In the case of Prince William Sound, the Alaska Peninsula, Kodiak Island, and the other unique and pristine ecosystems affected by this spill, there are no ready substitutes. Thus, it is theoretically as well as practically inappropriate to discount future losses to present value, because these resources cannot readily be replaced with other easily purchased goods. Where, as in Alaska, the resources injured are unique, future demand for them undoubtedly will increase, future generations will want access to such resources, and uncertainties are large and essentially unpredictable (other than that values will increase substantially as the resource becomes more scarce), discounting is inappropriate.

Com.	Topic	Issue	Sug.	Sort
14	D	0142		2

F. The Trustees Need to Collect and Analyze Adequate Numbers of Samples

The Environmental Groups are very concerned by the recent decision limiting researchers to 10 samples for timely tissue hydrocarbon analysis. Moreover, we are deeply concerned by reports that other limits have been placed on the number of samples to be taken and analyzed. We have also heard that all marine and terrestrial mammal studies except sea otters may terminate in January 1990, because the minimal data gathered this year may not conclusively show injury.

From a scientist's perspective, conclusions about injury ideally should be based on a representative number of samples (samples per animal, and total number of animals sampled), as well as a level of analysis sufficient to identify the presence of oil and a relationship between injury and the oil spill. Samples also should be taken over an adequate geographical and temporal distribution if possible. From a lawyer's perspective, the natural resource damage assessment for the Exxon Valdez spill will be easiest to defend in court if it is supported by statistically significant conclusions.

Com.	Topic	Issue	Sug.	Sort
15	3	0112		2

The Trustees (presumably in reaction to perceived financial constraints) may be "penny wise", but "pound foolish". The entire assessment exercise will be a disaster (environmental, financial, public relations and public trust disaster) if the assessment produced after spending tens of millions of dollars cannot be defended in court or in negotiations with responsible parties. The Trustees have a fiduciary obligation to: (1) discover the full extent of damages to public trust resources caused by the oil spill; (2) restore, replace or acquire the equivalent of the injured natural resources; and (3) recover the costs of doing so from Exxon. The Trustees' recent actions, as well as the budgets proposed in the draft assessment plan, clearly violate the public trust duties.

In addition, and of more immediate importance, any decision to terminate studies in February 1990 must be based on adequate information about the presence of oil in the environment and its effect on individual species. If the Trustees improperly limit the number of samples taken or analyzed before February 1990, or limit the level of analysis, they may conclude, based upon an inadequate data base, that the Exxon Valdez oil spill did not cause certain environmental or ecological injuries, when further studies

would have confirmed the existence of such injuries. As discussed in the sections on resource-specific studies, many of the effects of the oil spill are long-term or cumulative, and cannot be determined in the year of the spill. Multi-year sampling for all studies should continue to confirm any preliminary study conclusions about the lack of injury.

III. COMMENTS ON PROPOSED STUDIES IN DRAFT ASSESSMENT PLAN

A. Coastal Habitat and Air/Water Studies

1. Lack of Detail

The coastal habitat and air/water studies provide no details about sampling or measurement methods, and do not describe the timing or frequency of sampling. It is therefore impossible to determine whether the study results will support reliable or defensible conclusions of injury to natural resources. This is particularly critical, since these six studies form the factual basis for many of the injury determinations to be made in the later-described species-specific injury assessment studies and economic valuation studies. If the coastal habitat or air/water studies provide incomplete, inaccurate or scientifically insignificant data, the injury assessment could be substantially weakened. Unless sampling and measurement methods are well-designed and implemented, the Trustees risk spending \$35 million dollars (prior to February 1990) for a damage assessment that might not stand up in court (or support negotiations). It is simply not possible to know from the descriptions of the studies whether these methods are adequate.

Com.	Topic	Issue	Sug.	Sort
16	3	1100		2

Com.	Topic	Issue	Sug.	Sort
17	3	1200		2

The meager study descriptions provide no indication that sampling methods will be the same across studies (compatible sampling methods for the coastal habitat and air/water studies, and compatible methods between the coastal habitat and air/water studies and the resource-specific studies). Again, adequate Standard Operating Procedures for these studies are important to valid, defensible injury determinations.

There is also inadequate information to determine whether comprehensive sampling and analysis will be done at a few representative locations, or less detailed analysis will be conducted at numerous locations. Since these studies should be used to discover gross and subtle effects of the oil spill on various habitats (ranging from identifying tar balls in the water column to investigating bacteria), the Trustees should consider, in addition to broad-scale studies, concentrating on characterizing fully a few carefully selected representative samples of each type of habitat.

2. Arbitrary February 1990 Deadline

The coastal habitat and air/water studies cannot serve their avowed purposes if they are terminated prematurely after February 1990. Multi-year sampling probably is necessary to document: (1) temporal persistence of oil and its components in the environment; (2) cause and effect relationship between many injuries and the oil spill; (3) recovery of the environment with and without cleanup efforts; (4) the effect (success or failure, and harm) of cleanup measures (such as steam cleaning), and (5) the fate and transport of oil in different parts of the environment (e.g. adsorbed to shallow sediments, diffused in water column, in shallow tidal pools, beneath the surface or beaches, etc.) It is an implicit assumption of most of the six studies that they will continue over a period of years.

It is well-known that oil can persist in the environment for many years. We note that evidence of oil remains in the subsurface sediments 20 years after the West Falmouth oil spill. Degradation of oil in cold environments is particularly slow; as the National Academy of Sciences has noted, "generally, the rate and extent of hydrocarbon biodegradation [is] severely restricted at low water temperatures." Oil in the Sea at 304 (1985). Under their trust obligations, the Trustees must therefore assess the continual injury (short-term and cumulative) occurring as long as the Exxon Valdez oil remains in the spill area. The initial foundation of such a complete assessment is an investigation of the presence of oil and its components in the environment over time.

3. Limited Definition of Injury to the Environment and the Need for Ecosystem-Based Studies

The ostensible purpose of the coastal habitat and air/water studies is to determine injury to the environment which serves, among other things, as habitat to wildlife. The study descriptions mention in several places that data demonstrating a violation of federal or state water quality standards or volatile organic compound (VOC) standards "constitutes de facto evidence that ... uses protected under regulation have been jeopardized." Plan, p. 42. While this may be true as a legal matter, contamination levels far below such standards may be injurious to many organisms. The draft assessment plan acknowledges that low levels of contamination can injure fish and wildlife. For example, "ingestion of small amounts of crude oil are known to have effects on reproductive hormones of birds." Bird Study 5. "Bioassays using crude oil from Prudhoe Bay and elsewhere have shown that exposure to concentrations as low as a few parts per billion in seawater will cause loss of limbs in Tanner crab, immediate death of eggs and larvae of herring, and death of Dungeness crab and shrimp." Plan, p. 48. Indeed, negative impacts ranging from chromosomal aberrations to behavior disorders and chronic toxicity have been documented in many species at low levels of exposure to oil and to oil-dispersant mixtures. See, NAS, Oil in the Sea at 369-548 (and references cited therein) (1985); NAS/National Research Council, Using Oil Dispersants on the Sea (1989).

Comparing "a few parts per billion" exposure to the water quality standard of 10 ppb raises the concern that these studies are merely trying to identify gross contamination of the environment. Exposure of marine mammals (e.g., sea otters) to VOC emissions from oil lying on the water surface can cause serious respiratory problems, and possibly death. It is therefore incorrect to use lax air emission standards based on human exposure from industrial sources and processes as the standard for "injury" in the Exxon Valdez case, although in the absence of any data on impacts of VOCs on marine mammals or other organisms, such human-based standards may merit consideration. In order to determine the full extent of injury to all natural resources, these studies must document any detectable presence of oil in the study area, no matter how small.

The draft plan's descriptions of these six studies reflects an unlawful focus on human use values. The purported reason for studying coastal habitat, air and water is to determine the presence of oil in the habitat used by "valued resource species" and

"higher order organisms of economic importance". Plan, p. 29. The law is clear, however, that all values (consumptive and non-consumptive, use and intrinsic) must be reflected in a natural resource damage assessment. Ohio, 880 F.2d at 463-64. In order to capture all values and all lost services, the groundwork must be laid in these studies which should document the presence and persistence of oil at all levels of the environment -- from the bottom to the top of the food web and of the beach, water, and sediment columns.

The studies should also investigate ecosystem health, including primary and secondary productivity. Ecosystem studies could be performed annually for five years, bi-annually for several years thereafter, and less frequently (perhaps every three years) for as long as oil or its constituents are present in the Prince William Sound environment. (See NRDC comments).

4. Lack of Coordination Between Coastal Habitat, Air/Water Injury Assessment Studies, Economic Value Studies and Restoration Plan

The study descriptions do not mention whether or how these six studies will be coordinated with the economic valuation studies. The data on coastal habitat, air and water is described solely as an input for species-specific injury determination studies, which themselves are then the inputs for the economic valuation studies. Without access to any of the results from this year's data collection, we are unable to suggest precisely how additional coordination could be accomplished. If, however, the data reflects extensive oil contamination at all levels of the ecosystem, this fact alone could be an important effect (injury) to be included in the surveys under Economic Studies 5-7 (recreation, subsistence and intrinsic values). The Trustees should be very careful to incorporate evidence of injury found in these six studies in relevant economic studies, to avoid undervaluation of the natural resource injury to the extent possible.

Restoration of habitat will be an important feature of any restoration plan. There is no discussion of how the data collected in these six studies will be used to develop a restoration plan, or to estimate restoration costs. Assuming that habitats have been destroyed, and that effects of the oil spill can be found even at the lowest levels of the food web, these habitats and the ecosystem functions of all injured organisms will have to be restored or replaced, or their equivalent acquired, for the mandatory restoration provisions of CERCLA and the Clean Water Act to be met.

5. Missing Studies

A study should be conducted to compare, to the extent feasible, the hydrocarbon concentrations in intertidal and subtidal habitats pre- and post-spill. It is our understanding that some historical baseline information exists for mussels and sediments in the Prince William Sound area, thus potentially providing important evidence with which to demonstrate causation of natural resource injury by the Exxon Valdez oil spill.

The air study relies primarily on assumptions of VOC release rates from the spill, and modeling, rather than direct sampling to determine the exposure to VOC emissions

Com.	Topic	Issue	Sug.	Sort
91	3	1260		2

resulting from the release. Many of the "clean-up" activities, including beach treatment and possible incineration have resulted, and will continue to result, in exposure of wildlife and humans, to heavy equipment, aircraft, and many other intrusions as well as air emissions. The Air/Water studies should document continuing air emission releases, whether from lingering oil, treatment or restoration activities.

The Environmental Groups are surprised that no studies have been proposed to explore the potential human health risks attendant with the Exxon Valdez oil spill and cleanup efforts. The draft assessment plan should include at least one study to estimate current and future risk to human health from all potential exposure pathways, including at a minimum ingestion of contaminated seafood, inhalation of air emissions or vapors, and absorption through the skin by cleanup workers or natural resource damage assessment researchers.

Finally, as noted earlier, there is a clear need for an ecosystem-wide study of the impacts of the spill on the food web, and on the species and population makeup in the wake of the spill. See, NAS, Oil in the Sea, at 436-448 (1985). Such a "big picture" study apparently is not envisioned by the plan, which focuses heavily upon developing injury assessments for species with direct human use values. This would severely undervalue the affected environment and ecosystem.

6. Study-Specific Comments

Despite the coastal habitat study's objective to provide information "on potential petroleum exposure either from contaminated food or through direct uptake from the environment," it is unclear whether the proposed study will provide all relevant (such as resilience, resistance, stability, species diversity) information. At a minimum, the study should provide information on fish prey species, planktonic invertebrates, planktonic algae, and bacteria, as well as primary and secondary productivity. Why will bioassays be performed for arthropods only? The study should address acute and chronic toxicity for organisms from several different trophic levels (including algae, phytoplankton, zooplankton, and microbiota).

Algae and plankton are an extremely important component of the Prince William Sound ecosystem. Recent research also indicates that bacteria play a very important role in the food chain. The full extent of injury to specific species, or injury to the Prince William Sound ecosystem as a whole, cannot be determined unless a comprehensive coastal habitat study is performed. In addition, restoration efforts for many species cannot be successful if their habitat (and the plankton, algae and bacteria that form the foundation of the food chain) has not been fully restored. For example, fish can be restocked in "clean" areas and survive, but fail to reproduce due to residual low-level ecosystem contamination. The Great Lakes region is an example of this phenomenon, where scientists suspect that low levels of contaminants in the ecosystem are having a negative effect on fish reproduction. Injury at all levels of the ecosystem must be determined in order to develop and implement successful restoration strategies.

Com.	Topic	Issue	Sug.	Sort
18	4	0113		2

Com.	Topic	Issue	Sug.	Sort
19	3	1100		2

More specific comments on the coastal habitat and air/water studies can be found in comments submitted by the Natural Resources Defense Council, which are incorporated herein to the extent not inconsistent with the Environmental Groups' comments.

B. Fish/Shellfish Studies

After review of the fish study descriptions, it appears that all injuries to all fish species potentially affected by the Exxon Valdez spill will not be determined. For most fish species, the focus of the assessment is limited to lethal impacts. In addition, the species to be studied are limited to those of commercial significance or of demonstrable recreational value (human use values). As a result, a natural resource damage assessment based solely on these studies limited to a handful of species will seriously undervalue the natural resource injuries caused by the spill.

1. Lack of Detail

The Environmental Groups have found it difficult to review the fish study proposals, because they lack detailed descriptions of study methodology and study scope, and do not discuss the various options for study considered. There may be easily explained rationales for the selected approaches, but we are unable to comment on their validity.

2. Arbitrary February 1990 Deadline

The arbitrary February 1990 study termination date is incompatible with the objectives of many or all of the fish studies, and will significantly limit the usefulness and defensibility of the data collected. The Environmental Groups understand that many or all of the fish studies were originally designed to continue for 3-6 years. Their termination in February 1990 is unexplained, and unreasonable. There are many reasons why long-term assessment of injury to fish is required.

A return to spawning grounds is an essential element of several studies. At a minimum, the "return" to spawning grounds cannot be determined until later in 1990. For many species, the fish hatched during 1989 will not return to their spawning grounds in Prince William Sound for two-five years. The long-term effect of the oil spill on fish reproduction thus cannot be determined in a 10-month study.

In addition, many fish have a variable life history in terms of the time spent in fresh water and at sea. The fish therefore need to be monitored over the course of a life cycle, in order to determine the full effect of the oil spill on behavior patterns.

The effects of oil in the marine environment can be measured for years after a spill. For example, oysters (an indicator species) studied after the grounding of the Amoco Cadiz continued to show levels of hydrocarbons in their tissues for seven years after the spill. Similarly, many lethal and sub-lethal impacts of oil have been

Com.	Topic	Issue	Sug.	Sort
20	3	1300		2

documented in marine ecosystems that persist for many years, including long-term perturbations in entire invertebrate populations, death of vulnerable stages of fishes' life cycles, metabolic perturbations, decreased growth, increased vulnerability to disease, reduced ability to repair tissues, and increased vulnerability to parasites in fish and certain other species. See, e.g., NAS, Oil in the Sea, at 383-548 (1985).

Thus, the Trustees must recognize that any injury to oysters (and all other species they are representative of) will continue for many years. The studies should include at least several years' data collection in the injury assessment and economic studies and dollar damage assessment, or a significant percentage of the injury to fish/shellfish could remain undocumented.

Oil remains in the reefs, sediments and water column of Prince William Sound, and is likely to remain for many years. Consequently, fish not exposed to oil during 1989 will be exposed during subsequent years. In addition, fish that were exposed during 1989 will be exposed again during 1990 and beyond. To accurately reflect the full scope of injury to the fish/shellfish resource, studies must be repeated each year to quantify the universe of fish affected by recent exposure to the Exxon Valdez oil. In addition, studies must address the cumulative impacts of long-term exposure by the fish present in the Sound during 1989.

3. Limited Definition of Injury to Fish

The types of injuries to fish and shellfish included in the 26 proposed studies are grossly inadequate. The studies almost totally ignore any sublethal impacts on fish, and frequently focus more on the impact of the oil spill on the people who fish than on the fish themselves. As public trustees of the natural resources, the Trustees' concern during injury determination should be all potential impacts of the oil spill to fish and the environment and ecosystem which support the fish. The changes in harvest or use of fish, while important, are relevant primarily for purposes of quantifying a portion of the impact (out-of-pocket economic loss studies). Such changes do not necessarily or completely document sublethal impacts to fish.

The studies taken as a whole do not appear to systematically investigate all potential impacts for each species of fish and shellfish. Not uniformly included in many of the fish studies are disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including reproduction) or physical deformations. See, injury determination criteria for biological resources, 43 C.F.R. §11.62(f)(1)(i). Yet, it is well documented in scientific literature that each of these impacts can be found in fish as a result of oil spills. See, Injury to Fish and Wildlife Species, Type B Technical Information Document, U.S. Fish and Wildlife Service, June 1987 (PB88-100169). Sublethal effects such as fin erosion, fish neoplasm, reduced fish reproduction, histopathological lesions should be included in the proposed study designs. The studies also should evaluate any resultant developmental problems, reductions or dysfunctions in growth, metabolism, and behavior impacts on food web microbes, plankton, macrophytes, benthic and intertidal invertebrates, and fish, whether or not they have direct human use value.

The Environmental Groups are encouraged that the acceptance criteria found in the federal regulations (43 C.F.R. 11.62(f)(2)) are not mentioned in the draft assessment plan. We urge the Trustees not to tie their hands with these overly rigid, often impossible to comply with, and scientifically unfounded, acceptance criteria. We suggest that the Trustees use the traditional tort law causation standard. See, Restatement 2d of Torts, §431 (1965) (showing that it is more likely than not that the defendant's "conduct is a substantial factor in bringing about the harm").

The Trustees should be particularly aware of the potential difficulties of demonstrating absolutely ironclad causation for injuries to fish from the Exxon Valdez oil spill. The proposed studies seem based on questionable assumptions about the significance of oil found in the vicinity of fish. Because fish are mobile, the causal link between fish injury and the oil spill often can best be determined by knowing where a fish has been, rather than by where a fish was caught. For example, a fish could spend considerable time in a heavily oiled area, and then swim to a clean area from which it is caught for analysis, or vice versus. A scientist could then draw the conclusion that fish in "clean water" are contaminated, thus providing evidence that some fish are "naturally" contaminated with hydrocarbons, and the oil spill did not contribute to such elevated contaminant levels. While this example may be simplistic, it illustrates the basic point that fish are mobile and must be considered as such. The Trustees must consider this reality when doing gross capture studies such as those described in the draft assessment plan by assuring that any "control" studies indeed are not affected by the spill. Where distributions are unknown, mark distribution studies should be considered to determine the extent of migratory pattern that might be encountered.

4. Lack of Coordination Between Fish/Shellfish Injury Assessment Studies, Economic Value Studies and Restoration Planning

Some of the fish studies are described as inputs into one or more of the economic studies. Several of the fish studies do not indicate the relevance of the data gathered to the assessment process, or whether they will be used in an economic valuation study. The information provided on coordination of the fish studies with other aspects of the draft assessment plan is totally inadequate for coherent review or intelligent comment.

The sampling and analysis approaches may differ significantly between the studies, for no apparent reason. Studies of the same species conducted in and outside of Prince William Sound (e.g., Fish Studies 18 and 24, trawl studies) have different sampling objectives. One study will analyze stomach contents, while another will not. Many of the other studies on the species are described so vaguely, that the exact sampling and analysis intentions of the studies cannot be compared.

No attempt has been made by the Trustees to integrate the fish injury assessment studies with the required restoration plans, or restoration cost analysis. The draft plan gives no indication that the fish or shellfish injuries documented will be reversed in the restoration process, or that such injuries will be economically quantified to the extent

possible. Since such actions are, however, the statutory minimum of the Trustees' responsibilities, the Environmental Groups assume that restoration plans will be developed concurrently with injury assessment studies, and that restoration costs will be calculated as the minimum measure of damages.

Restoration requirements for the fish and shellfish resources affected by the spill emphasize the importance of performing comprehensive ecological studies to determine direct toxicity and trophic level interactions. While fish can be restocked to levels that allow rehabilitation of the population, the restocked fish may themselves pose a hazard to other natural resources (fish-eating animals) or humans. To the extent that any constituents of the oil bioaccumulate in fish tissue, restocking without full restoration of the fish habitat (food supply) may have long-term secondary effects. The human impacts can be measured using EPA's guidance manual for assessing human health risks from chemically contaminated fish and shellfish, to be published shortly.

If the Trustees consider restocking as a restoration option, the Prince William Sound fish populations should not be restocked with foreign genetic material. An intensive restoration program should be based on hatchery work with remnant wild stocks, or instream enhancement of remnant wild stock.

5. Missing Studies

The most likely impacts of oil contamination on fish and shellfish populations (and their food) will be the subtle long-term changes in survival (at various life stages) and reproduction. Some studies seem designed to look only at gross impacts -- the fish are dead, fish are obviously oiled and dying or fish are packed with tar balls. Other studies look at differences in numbers of fish available at a given period -- something that is hard to predict in years before the spill -- and make comparisons between fish suspected of being oiled and fish not oiled. No studies appear designed to identify the subtle long-term changes in survival and reproduction. See, NAS, Oil in the Sea, at 383-424 (1985).

The studies proposed for salmon generally are weak and will not detect the full extent of injuries to this important resource. In general, the salmon studies do not look at contaminant body burdens nor do they look closely enough at impacts to the various life stages. Data collected may fail to predict long-term population declines. In addition, the gross nature of studies proposed will make it very difficult to detect subtle adverse impacts based upon the data collected. Use of laboratory/hatchery studies, in addition to field measurements, would be preferable.

No work, or very little, is proposed for prey species of principally studied fish. Numerous smaller species of fish, planktonic invertebrates, and algae were affected by the oil spill. These species have value as food in the intricate predator-prey web that allows for proper development of fish species such as salmon. The only work on algae is included in the section on green sea urchins; even that study is limited to looking at attached algae (kelp). It is unclear how extensively the coastal habitat study will investigate ecosystem/food chain effects. Whether included as part of the coastal

Com.	Topic	Issue	Sug.	Sort
21	4	1570		2

habitat study or fish studies, the data is critical to a complete natural resource damage assessment, and to successful restoration efforts.

Of course, in urging that a "big picture" food web and ecosystem impact study be completed, we recognize that full ecosystem analysis probably cannot be done given the proposed scope of sampling. The draft assessment plan looks somewhat superficially over a very large geographic area with only a limited number of samples of a few of the more "important" species. The Trustees should consider looking more closely at the entire food web in smaller geographic areas, and extrapolating what they find to the entire impact area. Major impacts on microbial action, algal growth, growth of plankton, growth of benthos, cycling through the food web of contaminants, growth, metabolism, behavior, and other subtle effects could be better addressed in a more focused study. Factors such as microbial growth or bacteria analysis are extremely important in understanding impacts as a result of the oil spill because of the tremendous potential shifts in the balance in "typical" relationships between these organisms and organisms further up the food chain.

6. Fish Study 1: Salmon Spawning Area Injury

This study must extend beyond the February 1990 deadline. This is a rather complicated study that can easily be confounded by key variables such as fishing pressure changes. All assumptions made must be clearly specified in the course of assessing results.

Com.	Topic	Issue	Sug.	Sort
22	4	1310		2

7. Fish Study 2: Egg and Preemergent Fry Sampling

The Trustees should consider conducting controlled laboratory studies to look at the overwinter mortality of eggs to pre-emergent fry, in addition to or instead of conducting the studies as proposed, *in situ*. If impacts are detected as a result of the proposed analysis of hydrocarbon content in alvins, an assessment of what these results will mean to future generations should be undertaken.

Com.	Topic	Issue	Sug.	Sort
23	3	1320		2

8. Fish Study 3: Coded-Wire Tagging

Sample sizes listed in this study appear to be low. Thus, it may be difficult to draw conclusions by comparing the limited number of streams and hatchery facilities, some heavily oiled and some not. In addition, this study looks at gross impacts. The Trustees should consider taking fewer fish and examining them more closely in a controlled environment than to conduct the gross examination proposed, looking at exposed versus non-exposed fish.

Com.	Topic	Issue	Sug.	Sort
24	3	1330		2

Work on mortality and chronic effects could be done with greater control over confounding variables in a laboratory or experimental environment. In addition, the methodology proposed (looking at survival rates at harvest of fish) may prevent the Trustees from identifying subtle effects of the oil spill on fish. Due to the confounding effects of natural factors that vary by year and by area, the proposed studies may only show the presence or absence of extreme anomalies (gross differences between oiled and

non-oiled). The study should be looking for subtle differences, such as small percentage changes in viability of eggs or fertility of sperm. It is this type of change that will have a profound long-term effect on the viability of the salmon population.

In addition, salmon may either distribute themselves evenly and mix with other stocks (spawning groups) or they may maintain fairly discrete groupings while at sea. One group may be subjected to differing environmental factors (and contamination-independent differences in survival and growth) than another group. If one group is oiled and the other non-oiled, then differences in growth/survival as a result of oil-related impact may be masked by differences resulting from natural causes. Unless gross differences between oiled and non-oiled groups exist, it could be erroneously concluded that exposed fish have a higher survival rate than non-exposed fish. Natural factors could enhance the survival of impacted fish, while differing natural factors elsewhere could adversely impact unexposed fish. In essence, the methodology proposed limits the conclusions that can be drawn from this study, and may not meet the stated study objectives.

9. Fish Study 4: Early Marine Salmon Injury

Objectives for this study appear appropriate. Documenting fish kills within the study area will be extremely difficult. Fish kills are hard to detect and are easily missed. Luck plays perhaps the greatest factor in whether or not this aspect of the study will yield useable or reliable results.

The proposal to look at food resources is helpful, but no sampling or assessment methodology is described in this study or elsewhere in the draft assessment plan that will provide an evaluation of fish food resources, especially planktonic food, which is very important to juvenile salmon.

Coded wire tag studies which will provide an assessment of fish movement may yield information useful in helping to sort out the confounding factors discussed as problems in Fish Study 3. This will require very sophisticated analysis, however, which is not described in the draft assessment plan.

10. Fish Study 5: Dolly Varden Injury

Reference is made in Fish Study 5 to how greatly fish survival can be affected as a result of impacts to prey species. As discussed previously, however, no work is proposed (or appears to have been done) to assess impacts of the oil spill on prey.

In general, this study is of fairly limited scope. There should be an additional examination of the fecundity of fish and survival of egg through juvenile life stages, between exposed and non-exposed groups of fish. Survival work can be done in the laboratory or hatchery. Inspection for anomalies -- gross and subtle -- should be part of the study.

Com.	Topic	Issue	Sug.	Sort
25	3	1340		2

Com.	Topic	Issue	Sug.	Sort
26	3	1350		2

Objective C (looking at exploitation rates) is unnecessary and unless accompanied by careful analysis and supported by additional data may provide misleading results. There may be better ways to measure fish impacts than to find out how good (or bad) the fishing is. Detailed assessment of catch data will be difficult since recreational fisheries are variable and influenced by many, difficult to control, factors. In addition, the confounding effects of mobility of fish must be considered.

In general, Fish Study 5 will provide a gross estimate of mortality of relatively large fish (the most hardy stage in the fish's life cycle). Unstudied will be long-term chronic effects, such as heart and kidney disease, cancer, damage to gills, gut, vertebrae, eye lenses, stomach, brain and olfactory organs, and many other sublethal impacts well documented in the literature. See e.g., NAS, Oil in the Sea, at 420-24 (1985). Also unmeasured will be the impacts on reproduction. The Trustees should consider an analysis of body burdens of hydrocarbons and other potential oil-spill related toxics. An estimate of long-term population impacts could be made based on predicted impacts, using existing experimental work.

11. Fish Study 6: Sport Fishery Harvest and Effort

This is the first study purporting to "estimate" the presence of body burdens of hydrocarbons. The level of detail, however, is unacceptable. The gross analysis should be replaced by actual measurement of hydrocarbon content in a statistically sufficient sampling of organs and flesh. Relative concentrations can then be compared between groups of fish, producing much more reliable and defensible results.

Com.	Topic	Issue	Sug.	Sort
27	3	1360		2

12. Fish Study 7: Salmon Spawning Area Injury, Outside PWS

The gross method of analysis (simple counts of live and dead salmon by species, and egg and pre-emergent fry densities) does not provide a close enough look at what is happening to draw conclusions beyond gross impacts as a result of hydrocarbon presence. The study should measure the contaminant body burden of spawning adults, and bring eggs and fry into a controlled environment to watch them develop. Abnormalities in development should be assessed and compared between exposed and non-exposed groups. Egg and fry survival should be compared between groups. The natural differences between spawning and rearing areas that could confound the study can best be factored out in a controlled environment. The type of work suggested is not very difficult or expensive, yet the increased reliance one can place on the data after conducting such work is well worth the additional effort. If possible, field measurements ideally should be taken to "confirm" the more controlled laboratory/hatchery analyses.

Com.	Topic	Issue	Sug.	So.
28	3	1370		2

13. Fish Study 8: Egg and Preemergent Fry Sampling, Outside PWS

As in Fish Study 7, a closer look at eggs and fry is needed to provide a greater measure of reliability. In addition, juvenile fish should be subjected to a more thorough analysis of growth. For maximum information (perhaps necessary if impacts as a result of oil exposure are subtle), the Trustees should consider examining the daily growth

Com.	Topic	Issue	Sug.	Sort
29	3	1380		2

rings of otoliths, which provide the age of fish, to determine an estimate of daily growth rate. Comparison can then be made between growth of fish in exposed and unexposed groups.

14. Fish Study 9: Early Marine Salmon Injury, Outside PWS

A more rigorous examination of juvenile growth is warranted.

15. Fish Study 10: Dolly Varden and Sockeye Injury, Lower Cook Inlet

Fish Study 10 is the first to mention the importance of zooplankton in the food chain of fish. Direct reference is made here to copepods. There is, however, no plan to assess the impact on copepod populations or any other assessment on food sources for the fish under study. It is unclear whether the coastal habitat study will provide the necessary data. Objective A is important. It should be considered that Objective C (comparison of marine survival rates of sockeye salmon in oiled areas with known survival rates prior to the spill) could be confounded by natural factors during the year of study.

Fish Study 10 is clearly a multi-year study, making the February 1990 deadline for completion of this study ludicrous. All fish should be analyzed for body burdens of hydrocarbons, whenever and wherever there is likelihood of contact.

The information provided by a comparison of marine survival rates for both stocks to data collected before the oil spill will be useful only if gross anomalies are found. Subtle effects on marine survival will not be captured, and should be studied through the development of additional information or data.

16. Fish Study 11: Herring Injury

This study provides for a much more detailed analysis than the previous studies proposed for salmon. The salmon studies could benefit from redesign. The Fish Study 11 design should permit valid comparison between exposed and non-exposed groups, and should allow analysis of population trends in a way that will be useful in determining actual impacts, and making some estimates regarding long-term population consequences.

17. Fish Study 12: Herring Injury, Outside PWS

From the available superficial description, this appears to be a well-designed study.

18. Fish Study 13: Clam Injury

From what we can discern from the summary description, this appears to be a well-designed study.

Com.	Topic	Issue	Sug.	Sort
30	3	1390		1

Com.	Topic	Issue	Sug.	Sort
31	3	1400		2

Com.	Topic	Issue	Sug.	Sort
32	3	1410		1

Com.	Topic	Issue	Sug.	Sort
33	1	1420		1

Com.	Topic	Issue	Sug.	Sort
34	1	1430		1

19. Fish Study 14: Crab Injury

Based on the simplified description provided, this appears to be a well-designed study. Especially important is the assessment of abnormalities in newly formed crab shells, and examination of reproductive factors such as fecundity, egg loss, and condition and development through time. This is exactly the kind of work that should be conducted for salmon, but which is not included in the aforementioned proposed studies.

Com.	Topic	Issue	Sug.	Sort
35	1	1440		2

20. Fish Study 15: Spot Shrimp Injury

From the brief description, this appears to be a well designed study. Unlike many other studies, this study addresses lethal and sublethal impacts. It measures hydrocarbon concentrations in the target species (shrimp) and looks at factors such as egg fecundity, mortality, and sublethal effects in oiled and non-oiled areas.

Com.	Topic	Issue	Sug.	Sort
36	1	1450		2

21. Fish Study 16: Injury to Oysters

From the brief description, this also appears to be a well designed study. It is the first use of any sort of quasi-controlled analysis found in the draft assessment plan. Three oyster farms will be compared. Existing growth data will be compared to data collected after the spill. The use of "experimental techniques" and control populations is well justified, given the probable subtle nature of oil impact. Consideration should be given to using similar methodologies for other fish and shellfish species.

Com.	Topic	Issue	Sug.	Sort
37	1	1460		2

22. Fish Study 17: Rockfish Injury

This study appears to be well conceived. Analysis of hydrocarbon burdens is included in the study plan. An assessment of the effects on reproduction as a result of hydrocarbon loading should also be included. For example, impacts such as fecundity, egg and larval abnormalities, and survival should be assessed. In addition, research should focus on identifying any possible long-term chronic effects that decrease survival of exposed fish.

Com.	Topic	Issue	Sug.	Sort
38	3	1470		2

23. Fish Study 18: Trawl Assessment

This study is primarily a simple fish assessment involving fish sampling by trawl. While few details are provided, it appears to be a well designed study, yet simple in concept. In addition to fish sampling for gross anomalies and gross reductions in number, tissue and organ samples will be collected for analysis of hydrocarbon content and apparent injuries. Of course, it is critical that an adequate number of samples be collected and analyzed. This greatly expands the value of this study, relative to many of the fish-specific studies.

Com.	Topic	Issue	Sug.	Sort
39	1	1480		2

24. Fish Study 19: Larvae Fish Injury

This study appears to be well designed based on the limited description. It is difficult to work with a multi-species mix of larval fish. In addition to the studies

Com.	Topic	Issue	Sug.	Sort
40	3	1490		2

contemplated, the Trustees should consider conducting an age-growth study of larvae, looking at daily growth rings of otoliths to determine age. Such analysis will allow an examination of subtle differences in "fitness" between oiled and non-oiled larvae. Conducting such a study will provide tremendously valuable fine-tuned information, without having to resort to internal examination or any type of forensic analysis. Minute differences in fitness between groups of fish can nevertheless be detected.

25. Fish Study 21: Clam Injury, Outside PWS

This study appears well designed, but more details are needed to fully evaluate it.

26. Fish Study 22: Crab Injury, Outside PWS

This study appears well designed, but again, more details are needed to fully evaluate it.

27. Fish Study 23: Rockfish Injury, Outside PWS

This study relies on the detection of fish kills. Fish kills are extremely hard to detect and luck plays a great deal in success. Otherwise, Fish Study 23 provides a good design to detect the presence of oil-impacted fish. The study appears to be relatively weak, however, in assessing what the presence of hydrocarbons means in terms of current and future population impacts. The study would be stronger if more detailed analysis of impacted fish were conducted, especially if the Trustees were to correlate hydrocarbon loads and known effects (from laboratory work).

28. Fish Study 24: Trawl Assessment, Outside PWS

This study will provide a rather gross analysis of effects in terms of population impacts. The methods appear to be good; the study should yield useful information assuming that the skeletally-described study in fact will be well designed and carried out.

29. Fish Study 25: Scallop Mariculture Injury

This is, in general, a good study, although again, more details are needed. There appears to be no proposed assessment of impacts on reproductive potential. Additional analysis will allow an assessment of long-term effects on population size.

30. Fish Study 26: Sea Urchin Injury

While this study is among the best fish study presented, it is again impossible to fully comment upon it in light of the sparse description provided.

Com.	Topic	Issue	Sug.	Sort
41	3	1510		1

Com.	Topic	Issue	Sug.	Sort
42	3	1520		1

Com.	Topic	Issue	Sug.	Sort
43	3	1530		2

Com.	Topic	Issue	Sug.	Sort
44	3	1540		1

Com.	Topic	Issue	Sug.	Sort
45	3	1550		1

Com.	Topic	Issue	Sug.	Sort
46	3	1560		1

C. Marine Mammal Studies

Although the study descriptions are brief, the Environmental Groups are very concerned that the budgets provided for the marine mammal studies are inadequate to locate a significant number of affected marine mammals, or to provide the sampling and analysis necessary to properly determine the extent of injury. The small budgets, combined with the difficulties inherent in studying sublethal and long-term impacts in protected species, virtually assure that the marine mammal portion of the natural resource damage assessment will fail to detect the full impact of the spill on marine mammals, and thus that marine mammal damage will be significantly undervalued.

1. Lack of Detail

As with the other studies, the marine mammal study descriptions are sadly lacking in detail on study methodologies, such as time and frequency of sampling and analysis, and timing and frequency of locating potentially affected animals. The Environmental Groups understand that each field researcher will be limited to submitting only 10 samples for timely analysis. This number is absurdly low for any study, but potentially fatal to attempts to detect the full extent of injuries in the case of marine mammals. Under this limitation, data can be submitted for few samples (e.g., liver, stomach content, muscle tissue) of three animals, or one sample from ten different animals. In either case, it is questionable whether the sample results will be sufficient to detect or fully document impacts of the spill on one of the richest marine mammal ecosystems on earth.

We cannot overemphasize the importance of having clear methods, lucid hypotheses and fixed end-points in the research plans for marine mammal studies, to avoid wasting money for statistically questionable and otherwise unreliable studies that are of an insufficient level of resolution to detect subtle or difficult to discern impacts, or that will be attacked as statistically insignificant. The study design must clearly anticipate how perturbations will be measured, and how an effect's relationship to the oil spill will be determined.

In addition, as the Trustees are undoubtedly aware, it is preferable to gather fresh samples for necropsy (e.g., viral and bacterial samples at the time of death) in order to isolate the cause of death. This requires steady monitoring of the coast to locate carcasses, perhaps as frequently as several times a week. The study descriptions are too vague to determine whether adequate surveys and sampling will be conducted to fully document the impact on marine mammal population, or to relate marine mammal injuries to the oil spill. The budgets are not broken into enough detail to determine whether sufficient airplane and boat surveying support has been provided. At a cost of approximately \$300/hour for twin-engine aircraft (in great demand for virtually all the injury assessment studies), it is doubtful whether the budgets proposed will be adequate to locate marine mammals (especially cetaceans) in a timely manner to guarantee full necropsy results.

Com.	Topic	Issue	Sug.	Score
47	3	1600		2

2. Arbitrary February 1990 Deadline

It is absurd to think that complete data on lethal and sublethal impacts to marine mammals can be collected during ten months after the spill; as proposed, the studies will significantly underestimate impacts on marine mammals. The Environmental Groups understand that portions of the sea otter study are just getting under way, thus there may be less than 4 months of data by the February 1990 deadline. Other studies, such as whale necropsies, have apparently been discontinued for the Winter.

These are long-lived animals, many with birth and death rates smaller than for most other animals. Due to their mobility and small total populations, there is great difficulty in locating the affected marine mammal population. For these reasons, it has taken multiple years to develop baseline information, to the extent that it exists. One-year cetacean studies, for example, cannot be expected to give an accurate portrait of distribution or abundance, and therefore likely will underestimate the impacts of the spill. Cetacean studies conducted in the Farrollon Islands, and off Barrow, Alaska, have confirmed that humpback populations can vary significantly from year to year, so that one could readily conclude from a one year study that no impact or minimal impact had occurred, when in fact significant impacts may be documented by a multi-year investigation. Since marine mammal populations in the Sound vary year-to-year, and the effect of the oil spill on prey species is likely to be long-term, studies to determine the lethal and sublethal effects of the oil spill on marine mammals must continue beyond February 1990.

The research teams themselves (and the study descriptions) assume that the marine mammal projects will continue for at least 3-4 years. Several experts consulted by NWF opined that marine mammal studies should continue for at least 10-15 years, in order to document long-term injury from the Exxon Valdez oil spill.

3. Limited Definition of Injury to Marine Mammals

It is not clear that the studies will be investigating lethal and sublethal impacts for each marine mammal species. Although we understand that it is difficult to study impacts such as disease, cancer, genetic mutations, physiological malfunctions or physical deformations for living protected species, every effort should be made to gather relevant data wherever and whenever possible. Moreover, certain sublethal impacts are documented in certain marine mammals, including increased vulnerability to predation, interference with baleen functioning, interference with thermoregulation and metabolism, and aberrations in hematological parameters or enzyme activity (adrenal steroid exhaustion, for example), renal or other organ dysfunction, or even serious eye damage. NAS, Oil in the Ocean, at 424-30 (1985). It is our understanding that autopsies were not systematically performed during 1989 on dead marine mammals such as whales or sea lions. Unless remedied, this failure could seriously hamper the Trustees' ability to assess and recover for all potential injuries to marine mammals, including those listed in 43 C.F.R. §11.62(f)(1).

We also urge the Trustees to develop data to document injury resulting from both the oil spill cleanup efforts.

Again, the Environmental Groups are encouraged that the acceptance criteria found in the federal regulations (43 C.F.R. 11.62(f)(2)) are not mentioned in the draft assessment plan. As noted before, we urge the Trustees not to tie their hands with these overly rigid, often impossible to comply with, scientifically unfounded, acceptance criteria. We suggest that the Trustees use the traditional tort law causation standard. See, Restatement 2d of Torts, §431 (1965) (showing that it is more likely than not that the defendant's "conduct is a substantial factor in bringing about the harm").

4. Lack of Coordination Between Marine Mammal Injury Assessment Studies, Economic Valuation Studies and Restoration Planning

The draft assessment plan does not indicate how the seven marine mammal studies will be coordinated, how data relevant to multiple marine mammal species will be shared, or how these seven studies will be used to determine injury for the more than 25 species of marine mammals found in Prince William Sound. There also appears to be no coordination between the marine mammal studies and other proposed injury assessment studies for prey species, such as fish and shellfish. Data gathered and conclusions reached should be shared between the study teams, so that the marine mammal researchers can make injury determinations on the basis of relevant data not collected directly under the marine mammal studies.

The marine mammal studies are cited as inputs for those economic value studies using survey techniques (Economic Studies 5-7, recreation, subsistence and intrinsic values). While this is appropriate, the marine mammal studies should also be used to develop restoration plans, and to estimate the statutorily mandated measure of damages - restoration costs.

Restoration efforts for marine mammals must include restoration of their Prince William Sound habitat and prey species. This, in turn, requires restoration of the entire ecosystem to the extent possible, since many prey species (e.g., shellfish eaten by sea otters) themselves feed at the lower end of the food chain. If full restoration of Prince William Sound is determined to be infeasible, the Trustees must consider acquiring equivalent resources elsewhere.

The Environmental Groups suggest that options for equivalent resources include protection of other marine mammal habitats that are threatened by development or human activity. For example, the Cordell Bank area, near the Gulf of the Farallones Marine Sanctuary could itself be declared a sanctuary, thus protecting it from oil exploration and development. Similar actions could be taken to protect the offshore parklands of the Olympic National Park from oil and gas leasing. The Trustees could buy back the leases for Bristol Bay. Or marine mammal habitats in Southeast Alaska, such as Frederick Sound or the Alexander Archipelago, could be protected from human

interference through purchase of logging or other development rights. Finally, actions could be taken to control high-seas drift-net fisheries, thus providing long-term increases in certain marine mammal and other affected populations.

The Trustees also should be considering the development of management plans for marine mammals in Prince William Sound and contingency plans for future oil spills to avoid impacts on marine mammals; designation of sections of Prince William Sound and other areas as a sanctuary and elimination of all tanker traffic; and acquisition of habitat or development or harvesting rights for marine mammals or their prey, to assure protection.

5. Missing Studies

As noted earlier, we recommend careful field studies be undertaken, if they have not already been initiated, to determine sub-lethal long-term and chronic effects on marine mammals. Such studies must be supported by adequate autopsies and histopathological and other analytical work.

Most of the more than 25 species of marine mammals found in and around Prince William Sound are not specifically described as being included in the plan's studies, and we are therefore deeply concerned that they will be overlooked by the Trustees. While we recognize that many of the small cetaceans are difficult to study, and little baseline data may be available, the Trustees must nevertheless attempt to determine injury to these species to the extent possible. In addition, all species must be included in restoration planning. The limited focus on only a subset of the potentially affected marine mammal species underscores the serious undervaluation that will result from the Exxon Valdez natural resource damage assessment.

6. Marine Mammal Study 1: Humpback Whale

What proportion of the 40-50 animals appear in Prince William Sound in a given year? How many years of study were required to find the 40-50 animals? A decrease in the animals using the Sound in one year (found through an increase in effort) could easily and incorrectly be dismissed as yearly variation. Multi-year studies are needed.

Objective A is achievable as long as one remembers that all whales will not be counted or identified.

Objective B is unclear. The Trustees should consider putting more effort into the Sound and Kodiak area studies, which should reveal whale distribution on a much finer and more sensitive scale.

Objective C is the key to the damage assessment. Yet, the hypothesis and methods are not explained. How will this be done?

The emphasis on individual identification methods of animals is sound and has the highest chance of revealing subtle changes in distribution and abundance. The key

Com.	Topic	Issue	Sug.	Sort
48	4	1680		Z

Com.	Topic	Issue	Sug.	Sort
49	3	1610		Z

to success in this project will be the quality of past data. Thorough data are available from Southeast Alaska, a region biologically isolated from and unaffected by the spill; competent, but unfortunately limited effort, has been conducted in the Sound area. To our knowledge, no photo identification work and limited surveys have been conducted near Kodiak. With this weak "control" (the "before" picture), it will be difficult to measure anything less than serious gross impact; more subtle impacts will be overlooked.

7. Marine Mammal Study 2: Killer Whale

This study has a clear justification. As a predator near the top of the food chain, killer whales may be sensitive to large-scale changes in the Sound ecosystem. A multi-year study is critical.

Objectives A-C might be achieved, largely due to the quantity and quality of past research. Objective D is the key to the damage assessment. Yet, the hypothesis and methods are not explained. How will this be done?

Why was Kodiak not included in the survey? Kodiak was affected by the spill, and we believe previous data exist. Excluding Kodiak from this and other marine mammal studies is unjustified and may lead to a substantial underestimate of the spill's impacts.

8. Marine Mammal Study 3: Cetacean Necropsy

The determination of cause of death of cetaceans is notoriously difficult. Often the carcass is found days or weeks after death. Microbial enthusiasm sometimes renders the necropsy as unpleasant as it is futile. Autolysis starts shortly after death; the insulating blubber forms a kind of crock pot that incubates a disheartening array of microbes. While such studies can be done, the Trustees should recognize the difficulty of determining definitively the cause of death in the case of beached cetaceans. Inferences that document oil exposure – e.g. tarballs or oil on baleen – may be sufficient to conclude that oil was, more likely than not, a factor in the cetacean's death, which is all that is required to be proved under the law.

9. Marine Mammal Study 4: Sea Lion

The study description does not indicate the size and adequacy of the "before" data existing on seal lions. A multi-year study is critical.

This study seems to be designed to succeed. Much of the data will be collected by ADF&G, the organization that has the largest "before" data set.

How will effects of a documented population trend towards decline be separated from the effects of oil contamination? The Trustees should be careful of dismissing a reduction in numbers as the continuation of a trend, rather than as the result of petrochemical poisoning.

Com.	Topic	Issue	Sug.	Sort
50	3	1620		2

Com.	Topic	Issue	Sug.	Sort
51	1	1630		2

Com.	Topic	Issue	Sug.	Sort
52	3	1640		2

10. Marine Mammal Study 5: Harbor Seal

This study seems to be designed to succeed. Much of the data will be collected by ADF&G, the organization that has the largest "before" data set.

How will effects of a documented population trend towards decline be separated from the effects of oil contamination? The Trustees should be careful of dismissing a reduction in numbers as the continuation of a trend, rather than as the result of petrochemical poisoning.

Com.	Topic	Issue	Sug.	Sort
53	3	1650		2

11. Marine Mammal Study 6: Sea Otter Injury

We recognize that long-term and chronic effects in marine mammal studies can be difficult, expensive and time-consuming to isolate, yet we believe that Objectives A-C are achievable. Objective B should be clearer. For example, what long-term effects will be determined?

The scope of this work is breathtaking. Can this many animals be tagged without significantly disturbing the remnant population? The Trustees should consider using minimum targets for tagging, rather than maximum (up to 100) numbers.

The Trustees should be careful of drawing incomplete or incorrect conclusions, based solely on where an otter was found for study. Many areas were emptied of sea otters directly after the spill through death and rescue efforts, but have now been repopulated with otters. Without knowing the returning otters' life history, the data they provide will not fully document the extent of injury to otters surviving the plume of the oil spill. The discussion of methods and analysis are too superficial to allow meaningful review.

How many sites will be studied? What type of surveys and equipment will be used? We assume that receivers with autologging capability will be used at unobserved sites, and that receivers will be aboard all boat and aircraft surveys. The Trustees should be careful that the study yields a large amount of useable data, rather than becoming a lesson in logistics.

There is one major problem that is not addressed. What percent of the sea otters that die from oil are ever recovered? The number of carcasses found in the freezer is merely a minimum body count, and a significant underestimate. The Trustees must devise a method of estimating the percentage recovery of sea otter carcasses. We describe one possible crude method. Some otter carcasses could be instrumented, tossed into the Sound, and observed to determine how many are ultimately found on a beach through existing routine search efforts. In addition, observers' (those who polished rocks and recovered sea otters) ability to locate otter bodies that have beached could be tested by placing some oiled carcasses on or near oiled and non-oiled beaches. Similar studies are needed to determine the recovery rates for carcasses of other species, including other terrestrial and marine mammals and birds. From these crude experiments, one could probably measure a recovery of far less than 10-30%. While

Com.	Topic	Issue	Sug.	Sort
54	3	1660		2

more refined methods are undoubtedly possible, this concept of underrecovery is critical to a complete natural resource damage assessment.

12. Marine Mammal Study 7: Sea Otter

The Environmental Groups are pleased to see a study evaluating the effect of cleanup measures on wildlife, but the description of the study is so inadequate that it is difficult to understand exactly how it will be carried out. See, Comments of Defenders of Wildlife. More "rehabilitation" efforts on other creatures should be evaluated.

Com.	Topic	Issue	Sug.	Sort
55	3	1670		2

D. Terrestrial Mammals Studies

1. Lack of Detail

The terrestrial mammals studies provide no indication of sampling locations or methods, and do not describe the timing or frequency of sampling. It is therefore impossible to determine whether the study results will be statistically significant, or will support reliable or defensible conclusions of injury to natural resources.

Com.	Topic	Issue	Sug.	Sort
56	3	1700		2

2. Arbitrary February 1990 Deadline

The terrestrial mammal studies themselves reflect a multi-year sampling and analysis effort. Terrestrial Mammal Studies 2 and 4 seek to document the effects for bears of "subtle long-term population reductions as chronic effects of hydrocarbons stored in fats are expressed." Similarly, the mink reproduction experiment (Terrestrial Mammal Study 6) assumes over two years preparation (feeding mink with oil-contaminated food) before chronic effects will be studied.

A February 1990 termination of terrestrial mammal studies would significantly limit the data available to determine long-term injury. Since many mammals use tidal areas that were oiled this year during the spring, long-term behavior changes cannot be identified until at least one additional spring passes. Further, many of the mammals under study hibernate, and are no longer available for observation prior to February 1990. Effects on reproduction also will not be seen until they emerge from hibernation.

3. Limited Definition of Injury to Terrestrial Mammals

The proposed studies focus on terrestrial mammals that are of "value" to humans, presumably subsistence, recreational or intrinsic value. There are nevertheless many other mammals affected by the oil spill, for which no injury determination studies are provided. To fulfill their trust obligations, the Trustees must determine short- and long-term injury to all terrestrial mammals, from rodents, to Soricidae (shrews), to bats, to lagomorphs (e.g. hares). The assessment plan should specify how injury to all mammals potentially affected will be determined. See, Defenders of Wildlife comments.

Apparently missing from all the terrestrial mammals studies, including the laboratory experiment using mink, is an evaluation of sublethal effects from the oil spill listed in 43 C.F.R. §11.62(f)(1). The Trustees should be assessing all injuries to terrestrial mammals, including death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (in addition to reproduction) and physical deformations. These injuries are known to occur as a result of oil spills. See, "Injury to Fish and Wildlife Species," Type B Technical Information Document, U.S. Fish and Wildlife Service, June 1987 (PB88-100169).

As with the previously discussed studies, we urge the Trustees not to tie their hands with the overly rigid, often impossible to comply with, scientifically unfounded, acceptance criteria found in 43 C.F.R. §11.62(f)(2). We suggest that the Trustees use the traditional tort law causation standard. See, Restatement 2d of Torts, §431 (1965) (showing that it is more likely than not that the defendant's "conduct is a substantial factor in bringing about the harm").

4. Lack of Coordination Between Terrestrial Mammals Studies, Economic Value Studies and Restoration Planning

Although the laboratory studies on minks (Terrestrial Mammal Study 6) purports to develop data relevant for the remaining five studies, no means of coordination is specified. Similarly, no coordination is specified between these terrestrial mammal studies and other injury assessment studies on their prey species. Such coordination is important to allow the Trustees to document all potential injury to terrestrial mammals, whether input data is gathered under the terrestrial mammal studies or not.

The terrestrial mammals studies are described as inputs into one or more of the three contingent valuation economic studies; namely, Economic Studies Nos. 5-7 measuring recreational, subsistence and intrinsic values. The study results are also critical for development of the restoration plan, yet no coordination for that effort is specified. In addition, these studies must be used as an input to calculate restoration costs, the statutorily-mandated measure of damages.

There are multiple restoration options for injuries to terrestrial mammals resulting from the Exxon Valdez spill. One obvious option is restoration of the habitat supporting the species. In the case of oiled beaches, this may not be feasible. The Environmental Groups urge the Trustees to consider alternative restoration measures, such as protection of new habitat for the injured species. For example, the trustees could obtain title or conservation easements to land that serves as habitat for injured prey species, or that are habitat for injured terrestrial mammals.

5. Study-Specific Comments

We join and incorporate the terrestrial mammal study comments submitted by Defenders of Wildlife, to the extent consistent with these comments. We also are extremely disturbed by reports indicating that the black bear study data collection has

not been undertaken as proposed. If correct, this is a serious problem; immediate commencement of data collection is imperative.

E. Bird Studies

After review of the sketchy study descriptions, the Environmental Groups are extremely concerned that all injuries to all bird species potentially affected by the Exxon Valdez spill will not be determined, and that the natural resource damage assessment will seriously undervalue the injury to birds caused by the spill.

1. Lack of Detail

As with all the proposed studies, the one- or two-page summary of each study is grossly insufficient for an understanding of what actions are actually contemplated, or to allow for meaningful analysis of the studies' effectiveness in determining short- and long-term injury to birds. Since few details are provided about sampling or analysis methodology, no conclusions can be reached about the statistical significance of data collected. Since the geographic scope of the studies is not described, we cannot evaluate whether injury to birds will be assessed for all areas potentially affected by the oil spill. Further, the "control areas" are not identified, making it impossible to determine whether they are in fact comparable to the oiled areas under study, and whether they will produce the most reliable comparative data. We have been denied access to data collected in 1989 or to information on the extent and quality of existing baseline data and the variability between years, making it difficult to review whether sampling protocols or injury determination methods are adequate to document injury.

2. Arbitrary February 1990 Deadline

The arbitrary February 1990 study termination date is incompatible with the objectives of many of the bird studies. The Environmental Groups are surprised to see that studies originally designed to extend from 3-5 years have all been reduced to 10-month projects. It is difficult to imagine how the Trustees can make this proposal with a straight face. Ten-month studies, ending only a few months before the next spring migration influx or reproduction season, cannot gather enough data to draw reliable conclusions on migratory patterns, population reduction or recovery, reproductive success, or survival rates, all purported objectives of many of the 14 bird studies. For example, we have learned that glaucous-winged gulls sustained high mortality among the subadult population. This mortality would have a big impact on breeding, but would not be discernable if the study ended after the 1989 breeding season. In addition, many of the beaches that birds use as staging areas are still heavily oiled, possibly resulting in additional short-term behavior changes during 1990. These natural resource injuries are all critical to a complete natural resource damage assessment, and will not be studied under the current approach.

The February 1990 termination date is also of great concern because of the potential incompleteness of the data actually collected in 1989. It is our understanding

Com.	Topic	Issue	Sug.	Sort
57	3	1800		2

that some of the projects were begun many months after the anticipated starting date, and data collection remains incomplete. Field studies in 1990 and beyond are therefore especially important, to develop adequate evidence that will demonstrate the connection between the oil spill and the long-term injuries.

3. Limited Definition of Injury to Birds

The nature of the injuries to birds addressed in the draft assessment plan is far too limited, and does not even follow the provisions of 43 C.F.R. 11.62(f)(1), referenced in the draft plan as the guideline for injury determination for birds. The bird studies focus almost exclusively on lethal impacts. Carcass counts (death) are included for virtually all species to be studied. Reproductive effects are included for only selected species (e.g., bald eagles and peregrine falcons), possibly selected because of their emotional appeal to humans. Studies that document the efficiency of the carcass recovery efforts -- which likely are far less than 10% -- should be a high priority. Apparently not included in the bird studies are disease, behavioral abnormalities, cancer, genetic mutations, other physiological malfunctions, or physical deformations. All injuries to birds, including those listed in 43 C.F.R. 11.62(f)(1) should be studied and included in future restoration plans.

The Environmental Groups are encouraged that the acceptance criteria found in the federal regulations are not mentioned in the draft assessment plan. Again, we urge the Trustees not to tie their hands with these overly rigid, often impossible to comply with, scientifically unfounded, acceptance criteria. We suggest that the Trustees use the traditional tort law causation standard. See, Restatement 2d of Torts, §431 (1965) (showing that it is more likely than not that the defendant's "conduct is a substantial factor in bringing about the harm").

4. Lack of Coordination Between Bird Injury Assessment Studies, Economic Value Studies and Restoration Planning

Each of the bird studies is described as an input into one or more of the three contingent valuation economic studies; namely, Economic Studies Nos. 5-7 measuring recreational, subsistence and intrinsic values. It is not clear, however, how the economic studies will consider the injury to birds documented in a study using an indicator species. The economic value must be calculated for each bird species injured, as extrapolated from the indicator species data.

Economic value studies are not the only use that should be made of the study results documenting injury to birds. The study results are critical for development of the restoration plan, yet no coordination for that effort is discussed. Restoration plans must also address all bird species for which the indicator species study documented injury. The plan does not identify the larger group of species represented by the indicator species. Finally, these bird injury studies must be used as an input to calculate restoration costs, a statutorily-mandated measure of damages.

There are multiple restoration options for injuries to birds resulting from the Exxon Valdez spill. Restoration of populations in many oiled areas may not be successful because of introduced predators, such as the arctic fox. The Environmental Groups urge the Trustees to consider alternative restoration measures, such as enhancement of other populations of the same species in other areas, or protection of new habitat for the injured species.

We mention only a few possibilities of equivalent resources for the Trustees' consideration. The Trustees could obtain title or conservation easements to land that serves as overwintering or staging areas for injured species. They could purchase commercial development rights for critical habitat areas, and logging rights in the Chugach National Forest, (e.g., Chugach Corp. holdings on Montague Island). They could obtain conservation easements for large stands in MacLeod Harbor or Patton Bay that provide habitat for nesting marbled murrelets and tree-nesting ducks such as mergansers. Similar opportunities should be investigated in Southeast Alaska. The numerous private land holdings throughout Prince William Sound should be reviewed for their importance as wildlife habitat, and title purchased or conservation easements obtained to protect the habitat.

Another option is to buy back the oil and gas development leases in Bristol Bay. While these options are not "tit for tat" replacement of the Prince William Sound resource or restoration of the damage caused by the Exxon Valdez oil, they are measures that can serve to decrease the cumulative (even synergistic) impacts of past and future threats to the affected bird populations from human activities such as oil spills. They can therefore provide long-term benefit to the natural resources injured as a result of the Exxon Valdez spill.

5. Missing Studies

A number of important groups of birds have not been included in the planned studies. Hardest hit of all seabirds were the Barren Island murres. Except in general abundance and distribution surveys, murres have been excluded. In addition, the draft plan does not include studies on cormorants or loons, despite earlier plans to do so. Finally, soft-substrate shorebirds should be examined west of Prince William Sound. Impacts on these shorebirds and on their prey in soft substrates could be significant. Studies must be undertaken to estimate the impacts of the spill on these species, or the assessment will significantly undervalue the spill's impacts on birds.

6. Bird Study 1: Beached Bird Surveys

Objectives A and B should integrate data collected by Exxon capture boats to the extent they are determined to be reliable. This may be the intent, but it is not clear from the project description whether the study will rely solely on data collected by the USFWS and ADF&G.

Beach surveys were particularly intensive in 1989. How does the effort of 1989 compare with the effort of previous surveys conducted from 1977 to 1988? Is there

Com.	Topic	Issue	Sug.	Sort
58	4	1950		2

Com.	Topic	Issue	Sug.	Sort
59	3	1810		2

adequate information on the effort to draw accurate conclusions from post-spill survey data, as stated in Objective D?

A single season of observations immediately after the spill will be inadequate to meet Objective E.

7. Bird Study 2: Migratory Bird Surveys

How soon after the spill were migratory bird surveys initiated? Timing is critical. Without more information on the surveys already completed, it is difficult to determine whether Objective A can be met adequately. How has the study integrated the impacts of oceanographic factors that may have affected seabird distribution and abundance in 1989? How good are the baseline data to be used in Objective B?

It will not be possible to determine recovery rates (Objective C) after a single breeding season. Moreover, such population impacts cannot be determined until the birds hatched in 1989 return to breed. As many species of seabirds have delayed reproduction, it will be some years before recovery rates can be assessed adequately. Has the study design taken into account the possibility that age of first breeding will be affected if a large proportion of adults died in 1989?

8. Bird Study 3: Seabird Colony Studies

A 1990 survey is essential to determine declines in seabird numbers (Objective A). Not only is it important to examine numbers of returning birds, but because 1989 was an aberrant breeding year, a second year is necessary. Is the only control the lack of oiling at a nesting colony? Aren't there other factors that must be taken into account to make certain that unoiled sites serve as adequate controls, such as beach profiles and colony size?

Objective B should be stressed and should be as creative as possible. Possible strategies for restoring populations should include habitat acquisition and protection, predator control, and minimizing the impacts on seabirds from fisheries. Restoration should not be limited to those colonies that were directly affected by the spill, but should be expanded to include restoration or protection of other colonies of the same species.

9. Bird Study 4: Bald Eagles

The decline or recovery of bald eagles cannot be measured after a single year. In addition, Objective A aims to determine a rate of change. Is there a known rate from historical data? If not, it will not be possible to determine how the oil spill affected that rate of population change.

Because of the lack of information about the progress of the study, it is difficult to judge whether additional years are necessary to achieve some of the other objectives. For example, was productivity measured in oiled and unoiled areas during 1989?

Com.	Topic	Issue	Sug.	Sort
60	3	1820		2

Com.	Topic	Issue	Sug.	Sort
61	3	1830		2

Com.	Topic	Issue	Sug.	Sort
62	3	1840		2

(Objective B)? Were data from the Exxon Eagle Team integrated to the extent those data are determined to be reliable? To evaluate oil-related winter mortality, the study proposes to fit 60 eagles with transmitters. Was this done already? If not, what sorts of data will be used to measure winter survival? Are Exxon Eagle Team data valid and available for Objective F?

10. Bird Study 5: Peregrine Falcons

A 1990 survey will be required to complete this study. It is our understanding that there were no peregrines occupying breeding sites in Prince William Sound in 1989, which simply would preclude accomplishing Objectives B and C for that area.

Com.	Topic	Issue	Sug.	Sort
63	3	1850		1

11. Bird Study 6: Marbled Murrelets

As with other studies attempting to determine population declines, a 1990 survey (at least) of breeding colonies will be necessary to achieve Objective A. Are there good pre-spill data for all of the areas to be surveyed?

Com.	Topic	Issue	Sug.	Sort
64	4	1860		1

12. Bird Study 7: Fork-tailed Storm Petrels

We are concerned that the methods planned (but not stated in the proposal) to assess Objective B are not adequate. We understand that the field work was to consist of 2-3 weeks during the incubation period to find active nests, and 2-3 weeks late in the nestling period to check reproductive success. If this indeed is the schedule to be followed, the study may not yield important information on the percentage of eggs that failed to hatch and why. Although hatching success will be monitored and addled eggs will be collected, the study should also attempt to determine whether eggs failed to hatch because they were addled, infertile, abandoned, or contaminated. Likewise, the methods should include determining the proportion of nestlings that fail to fledge and why. The amount of fat reserves is apparently critical in determining whether a young bird leaves the nest or survives after fledging. The study should address whether the birds fail to fledge because they didn't have sufficient fat reserves, were abandoned, were oiled or fed contaminated food. Establishing the causal link between reproductive failure and oil pollution is key, to the extent it is possible.

Com.	Topic	Issue	Sug.	Sort
65	3	1870		2

The study should be continued beyond 1989 and should be expanded geographically to get better results on the persistence of crude oil in the environment. Because storm petrels breed from Prince William Sound to the Aleutians, continued and more widespread sampling of these colonies would enable better monitoring of the persistence of oil.

13. Bird Study 8: Black-legged Kittiwakes

1989 appears to have been a particularly poor year for kittiwake reproductive success. Special care must be taken to seek to document impacts that can be attributed to the oil spill. Will all 26 sites be monitored? If not, how will control sites be selected? Although Objective C will involve analyzing petroleum contamination of eggs,

Com.	Topic	Issue	Sug.	Sort
66	3	1880		2

the study should examine the percentage of eggs that failed to hatch and determine why. The proposal states that contaminated adults may not feed their chicks. Will the study assess the impacts on chicks from inadequate food supply as separate from contaminated food?

14. Bird Study 9: Pigeon Guillemots

Although guillemots can provide good data on local oil conditions in Prince William Sound, this study cannot claim to "represent puffins, auklets, and murre," as puffins and murre breed largely in other areas, and therefore this assumption could lead to a significant underestimation of impacts on other species.

It is unclear how colony areas will be "surveyed for degree of oiling," as guillemots are black and external oiling will be difficult to assess.

Com.	Topic	Issue	Sug.	Sort
67	3	1890		2

15. Bird Study 10: Glaucous-winged Gulls

Because of the distance of Egg Island from the major impacts of the spill, a study of this colony may not provide the most comprehensive data possible. Impacts from oiling are most likely to be seen among immature gulls, which tend to stray from the colony. Adults are more likely to remain in the vicinity of the colony. It is our understanding that a big loss in the subadult population has already been observed. This points to the need to continue this study, and others, beyond 1989. The impacts on the subadult population will not have appeared as an impact on reproductive success in 1989.

Com.	Topic	Issue	Sug.	Sort
68	3	1900		2

16. Bird Study 11: Sea Ducks

We understand that funding for this study was not released until quite recently. This is unfortunate because it may have precluded gathering of data on birds that Summer in the Sound and around Kodiak, when oil contamination would have been greatest. Nonetheless, it can provide valuable data because it is one of the few studies that focuses on over-wintering birds. The February deadline will have to be extended in order to complete contaminant analysis on samples taken this winter.

Com.	Topic	Issue	Sug.	Sort
69	3	1910		2

17. Bird Study 12: Rocky Intertidal Shorebirds

We understand that studies for shorebirds were not initiated until mid-June. This is too late to have provided certain information needed to assure fulfillment of many of the study's objectives, and therefore this study may significantly underestimate the spill's impacts on affected species. This study excludes surfbirds, which do not nest in the Bering Sea, from Objective G. Impacts on shorebirds from contaminated prey could be felt for years, and the study must continue beyond 1989.

Com.	Topic	Issue	Sug.	Sort
70	3	1920		2

18. Bird Study 13: Passerines

We understand that as of mid-September, the passerine study had not been initiated. Although some species are year-round residents, much information from the critical period following the spill has been lost. Although information on secondary contamination would be valuable, the samples may be of limited usefulness if they have not already been collected. This study must be salvaged by intensive monitoring and data collection next year, and by researching any available baseline data.

Com.	Topic	Issue	Sug.	Sort
71	4	1930		2

19. Bird Study 14: Effects of Exposure to Oil

There is not enough information in this proposal to understand what "devise and implement laboratory or field experiments" means. However, the budget alone precludes significant experimental work on the effects of oil. The budget may not even be adequate to cover Objective A (literature review). Laboratory and field studies easily require in excess of \$100,000 to be carried out properly. This budget is a gross underestimate for literature review and actual experimentation.

Com.	Topic	Issue	Sug.	Sort
72	4	1940		2

F. Technical Services

The technical services studies are the linchpin of the entire natural resource damage assessment. The credibility and defensibility of the Exxon Valdez assessment will depend in large part on the extent of sampling and the validity of sample analyses. Many economic value studies, regardless how sophisticated and well-designed, could result in undervaluations if the input data (injury determinations) are inaccurate or inadequate. Likewise, the conclusions about injury to specific resources will only be as reliable as the data (e.g., tissue samples and necropsies) supporting it.

Com.	Topic	Issue	Sug.	Sort
73	3	2000		2

The success of the technical services studies is a function of both number of samples analyzed and the level of timely analysis. The Environmental Groups are extremely concerned that the budgets proposed for Technical Services Studies 1 and 2 appear to be grossly inadequate to document the full extent of the injury to the Prince William Sound resources in a scientifically acceptable or legally supportable manner. Our concern is aggravated by recent Trustee actions limiting researchers to submission of ten tissue samples each for timely hydrocarbon analysis. Exxon has been actively collecting samples since the spill, and will undoubtedly continue to do so in an effort to demonstrate that injuries confirmed are not related to the Exxon Valdez oil spill. The Trustees risk failure in court if they have insufficient or incomplete evidence of injury and cannot tie the injuries to the oil spill.

The universe of potential samples to be taken and analyzed is enormous. Hundreds of miles of beaches have been oiled by the spill. Over 1000 square miles of seawater and sediments have been contaminated. It is estimated that over 34,000 bird, 1,000 sea otter and 12 whale carcasses have been found since the spill. Representative samples of just the existing storehouse would greatly exceed the limited technical services budgets provided. If, as the Environmental Groups have demanded, all studies continue into future years, greatly increased budgets should be provided to assure that

enough samples can be taken to provide a representative view of the resource in question, and that all analyses required to determine the injuries, including all those listed in 43 C.F.R. § 11.62(f)(1), can be performed.

Neither the injury assessment study descriptions, nor the technical services study descriptions, provide details about the numbers and types of samples to be analyzed, or the locations from which they will be taken. It is therefore impossible to determine whether the sampling to be conducted in any one study is adequate to document the distribution of hydrocarbons in the ecosystem, or to measure accurately contaminant or enzyme levels in the species' tissues. It is clear, however, that the budgets outlined for technical services are totally inadequate to reach comprehensive conclusions of injury for all the studies proposed. Environmental sampling can easily cost several \$100/sample to \$1000 or more to document the precise levels of various hydrocarbons at levels that are biologically significant. The cost of enzyme studies can range from the \$100s to \$1,000s to fully document the impacts of the oil spill in a particular geographic region or a particular species. With a budget of \$2.7 million for chemistry and histopathology it will be difficult to support statistically significant conclusions for all proposed studies. This takes on particular importance when one considers that Exxon is conducting a broad sampling effort that undoubtedly will be used to discredit the Trustees' assessment.

To stay within the budgets proposed, the Trustees may be required either to severely limit the number of samples to be analyzed, or to limit analysis to gross levels of contamination by a few specific hydrocarbons (or total hydrocarbons), or both. Recent instructions to field researchers indicate that such limitations have already been imposed. This result is totally unacceptable, and could compromise the Trustees' ability to assess the full extent of injury to natural resources from the Exxon Valdez spill, as they are required by law to do. In addition, incomplete sampling and analysis could directly undercut the Trustees' legal case for damages, and may prevent or complicate full recovery of the natural resource damages owed by Exxon, or the assessment costs incurred by the Trustees.

The Environmental Groups are pleased to see that QA/QC will be provided for all sample analyses, but are concerned that there is no description of what the QA/QC plan will be, of what field auditing methods will be used, who will be doing such audits, what Standard Operating Procedures are being used, what types of sampling techniques and preservation techniques are contemplated, or how sites are selected. It is equally important to QA/QC all field studies. We urge the Trustees, in conjunction with EPA, to develop standardized QA/QC programs for all field studies, following established procedures where they exist (e.g. ASTM, EPA draft guidelines for conducting ecological effects assessments).

G. Economic Value Studies

1. Lack of Detail

The economic value studies suffer more than most proposed studies from lack of detail about purposes and methodologies. Studies to determine the value of natural resources and to quantify natural resource damage are sophisticated, complicated, and often controversial. The information provided in the draft assessment plan precludes peer review of the proposed studies. Since the total budget for the economic value studies is \$2.8 million dollars through February 1990 alone, (an average of \$14,000 per day since the spill), it could be considered irresponsible to proceed with these studies on the basis of the scant design planning reflected in the draft plan.

No information is presented on which agency, or which contractors, will be performing each study. EPA is a collaborative agency for the natural resource damage assessment effort, and should be considered seriously as a lead agency for economic studies.

Further, the budget is not broken down by study. Since the validity and defensibility of any economic study depends largely on the credibility and experience of the study team, and the resources provided to perform a study, we are unable to comment whether the Trustees' money is being well-spent in these efforts. For example, contingent valuation is the only economic methodology available to quantify intrinsic values. Yet, few natural resource economists in the United States have practical experience designing contingent valuation studies in natural resource damage cases. Such studies can easily cost as much as \$5 million to develop and conduct a detailed and comprehensive contingent valuation survey. The total budget for all economic studies is about half of the possible cost of only one contingent valuation study. Further, it is likely that intrinsic values will represent a large proportion of the economic damages assessed for the Exxon Valdez oil spill. See, e.g., Natural Resource Damage Assessments conducted for the Eagle Mine Facility and Idarado Mining & Milling Complex in Colorado. For these among other reasons, the Environmental Groups are very concerned that the economic studies may result in serious undervaluation of natural resource damages from the Exxon Valdez oil spill.

No details are provided on study methodologies. Economic Value Study 5 (recreation) identifies three different methodologies, without specifying whether one or all of them will be used. We are particularly concerned about the studies using contingent valuation or survey methods (Economic Value Studies 5-7). It is critical to the defensibility of the damage assessment that the survey instrument be carefully designed and free of bias. See, Ohio, 880 F.2d at 474-80. The Environmental Groups suggest that the survey instruments be developed with a focus group, to ensure understandability and completeness. To the extent that multiple surveys will be conducted (e.g., separating subsistence values from recreational and intrinsic values), focus groups should be convened that are representative of the recipients of each survey.

Com.	Topic	Issue	Sug.	Sort
74	3	2200		Z

Finally, the study descriptions do not reflect how damages assessed under the plan will be collected by multiple Trustees, or divided between plaintiff classes and Trustees. In considering this issue, the Trustees should bear in mind their legal obligation to use all damages recovered for public injuries to natural resources (including long-term injury to ecosystem productivity) to restore, replace or acquire the equivalent of such resources, regardless of whether state or federal Trustees recover the damage money. In addition, the Trustees should devise an efficient and cost-effective method to ensure that damages assessed for private losses (e.g., lost use of commercial fisheries) are distributed appropriately.

2. Arbitrary February 1990 Deadline

It is inconceivable that the economic value studies described can be completed by February 1990. Some may not even be initiated (beyond design) by that date. Many of the studies (e.g., Economic Studies 3, 5-7) will rely at least upon preliminary results from the resource-specific injury assessment studies. If we accept for purposes of argument that these injury assessment studies will end in February 1990, the economic value studies cannot begin in earnest until that date. As we have argued earlier in these comments, however, the injury assessment studies should continue for years, possibly decades, to document all long-term injury resulting from the spill. The full array of economic value studies therefore cannot be completed until after at least the preliminary injury assessment studies are completed.

In addition, many of the study methodologies are themselves time-consuming. The contingent valuation survey method, for example, should take longer than four months⁷ to design, let alone implement. Imposition of any termination date on the economic value studies is counterproductive to the objective of a natural resource damage assessment -- namely to calculate accurately and completely the economic loss associated with an oil spill.

3. Limited Definition of Injury in Economic Value Studies

The Environmental Groups are concerned that the unlawfully limited focus of the injury assessment studies on human use values and short-term lethal effects will be aggravated by limiting the scope of the economic value studies.

The Trustees cannot assign zero estimates to non-use values. To prevent this result, the plan should direct researchers to use more than one valuation technique if necessary to measure damages to a resource or attribute that generates more than one good or service, without double counting. See, Ohio, 880 F.2d at 463-64.

Changes in human behavior, as a result of perceptions of the damages should also be considered for evaluation. Gardner Brown has noted that there is substantial

⁷ It is our understanding that contingent valuation surveys have not yet been initiated.

evidence that hundreds of thousands of potential vacationers did not come to the noninjured portions of the Brittany Coastline after the Amoco Cadiz oil spill in 1978. The potential tourists suffered economic losses by vacationing in less attractive sites or paying more for similar quality vacations. This loss, termed "natural resource slander" by Professor Brown, should be addressed in the Exxon Valdez economic value studies.

The assessment should provide the Trustees with a qualitative and quantitative description of the damages to the ecosystem -- the complex interactions of the invertebrates that live in the ocean and on the shores, the diatoms, the phytoplankton and zooplankton, the amphipods, the mollusks and crustaceans, which in turn may feed the small fish, the bigger fish and so on through the food web. The damages to the non-monetary ecological, cultural, and aesthetic properties of the resources of Prince William Sound are not trivial. The oil spill has significantly affected these attributes. Economic measurements techniques exist to estimate these damages in monetary terms; the total value of these damages could well overshadow the damages that can be estimated by other methodologies.

The study, analysis, and presentation of the quantitative and qualitative changes in the non-monetary ecological, cultural, and aesthetic properties of the affected resources will help the assessment and the Trustees in several ways by:

- providing information and functional relationships for the valuation of the economic use and non-use values, e.g. lost recreation values from bird and mammal watching;
- facilitating monetary estimates of some of these losses through contingent valuation methods, e.g. cultural effects on the way of life of residents of Prince William Sound; and
- presenting additional evidence for negotiating settlement of the restoration, mitigation, and compensation amounts.

The current and future scarcity of the affected resources should be evaluated in order to better estimate value. The work plan should include tasks to describe substitutes for damaged resources, e.g., recreation sites, habitat, etc. Scarce resources, such as whales, are generally more valuable than abundant resources.

Analysis of changes in quality of a resource can be helpful in the determination of economic values. V. Kerry Smith has estimated the elasticity of quality for recreational fishery benefits in Albermarle and Pamlico Sounds in North Carolina to be between +0.4 and +0.6. That is, for every 10% decline in quality, recreation benefits decline between 4% and 6%. For some heavily damaged resources in Prince William Sound, such as entire fisheries that are closed, or if the ecosystem is irreversibly impaired, the quality elasticity coefficient may approach 1.0.

4. Lack of Coordination Between Economic Value Studies, Natural Resource Injury Assessment Studies, and Restoration Planning

Many of the proposed individual scientific studies of coastal habitat, marine mammals, etc. appear to be an end in themselves, rather than a systematic approach to determining the magnitude, duration, and functional relationships of the damages. Moreover, the proposed economic studies appear to have little connection to the scientific studies. Planning the injury impact studies, as well as carrying them out, should be an iterative process. Natural resource scientists will be undertaking studies to provide information for economists. Injury assessment studies in the natural resource damage assessment plan should explain how their results will be integrated with the objectives of estimating the cost of restoring or replacing lost goods and services, the acquisition of resources similar to those lost, and the residual losses of future goods and services that are not likely to be restored or replaced. Many of the studies described (briefly) in the draft plan are not focused toward assessing and valuing resource damages.

Economists and natural scientists should work together to determine the long-term (possibly forever) cost of this catastrophe. The plan assumes that each profession is myopic. The economic literature on valuing goods and services from natural resources would be helpful to natural resource scientists in preparing their work plans. See, e.g., Yang, et al.; NOAA, The Use of Economic Analysis in Valuing Natural Resource Damages (1984). The U.S. Forest Service supports ongoing research in recreational economics at universities. Many members of this "W-133 group" are available to assist the damage assessment team. In addition, the Benefits Evaluation Branch at the Washington, D.C. headquarters of the Environmental Protection Agency also has skills and experience in dealing with non-market traded attributes of natural resources.

Although the requirements of the damage assessment are complex, matrices's displays would help the managers integrate the various disciplinary studies. "A Procedure for Evaluating Environmental Impact" USGS Circular 645, Luna Leopold et al., 1971, is the seminal report on the matrix approach. The draft assessment plan fails to show the relationships among the studies and treats dissimilar aspects of the plan the same.

The Plan should lay out a detailed, yet flexible, schedule of tasks and activities for the economic studies and outline their relationship to the scientific studies. The work plan for the economic studies is too brief. It should describe what techniques and methods are to be used and include a bibliography of the relevant literature.

5. Missing Studies

None of the economic value studies attempt to quantify the economic damages caused to human health as a result of the oil spill. The Environmental Groups find it ironic that an assessment plan that focusses so strongly on human uses of the natural resources totally ignores human health effects resulting from the oil spill. In addition, as

Com.	Topic	Issue	Sug.	Sort
75	4	2295		2

discussed in detail previously, there is no study proposed that will estimate the cost of restoring, replacing, or acquiring equivalent resources, the most basic measure of damages under the law. Ohio, 880 F.2d at 444.

6. Economic Value Studies 1-3: Commercial Fisheries, Fishing Industry Costs, Bioeconomic Models

These three studies are portions of the tasks necessary to evaluate the economic losses as a result of damages to public resources that involve commercial fisheries. The steps to value these damages should be all under the heading, "commercial fisheries." The subheadings should be a listing of all the affected commercial fin and shellfish.

The objective is to measure the changes in consumers' and producers' surplus (rent) as a result of the oil spill. This will require estimates of shifts in supply (cost) and demand curves. Determination of price effects should be an outcome of other steps, not a primary task of the evaluation activity. Nevertheless, the estimation of price effects is important especially for calculating losses in consumer surplus. We would expect that prices will rise for fish species for which the harvesting in Prince William Sound has been historically a significant share of the market.

Although some, or all of the private damages, to the commercial fishing industry may be recovered by private lawsuits, the plan should direct that all of the losses as a result of damages from the spill to commercial fisheries be estimated and valued. The private lawsuits will not capture all of the restoration and residual costs, and the lost consumer surplus of the spill.

The U.S. Water Resources Council's Principles and Guidelines, 1983, Sections 2.9.1-11, contains a brief step-by-step evaluation methodology for calculating the benefits of improvements to the commercial fishery infrastructure that can be adapted to evaluate damages from the oil spill. These guidelines are of limited help in evaluating lost consumers' surplus.

Scott Matulich has evaluated the decline in the Alaskan King Crab industry in a paper that provides a thought provoking model for bioeconomic studies of the commercial fishing industry (Department of Agricultural Economics, Washington State University, Pullman WA 99164 Ph. (509) 335-1607).

7. Economic Value Study 4: Value of Public Land

The valuation of changes in the value of public land will be difficult to calculate because the literature on the appropriate methodology is limited. The confidence interval of the range of estimates may be large. Therefore, the work plan should develop methodologies and subject them to review by qualified economists.

Com.	Topic	Issue	Sug.	Sort
76	3	2210		2

Com.	Topic	Issue	Sug.	Sort
77	3	2220		2

Com.	Topic	Issue	Sug.	Sort
78	3	2230		2

Com.	Topic	Issue	Sug.	Sort
79	3	2240		1

8. Economic Value Study 5: Recreation

This study should estimate the growth in recreational activities that would have occurred without the oil spill, rather than assuming that 1988 participation rates would have continued in the future. The Trustees should hire consultants who have extensive experience in evaluating outdoor recreation and/or peer reviewed publications in the field. Experienced practitioners will be able to reduce the time necessary to complete the studies and generate acceptable estimates. Nevertheless, many of these studies will take two to three years to complete and analyze.

Com.	Topic	Issue	Sug.	Sort
80	3	2250		2

9. Economic Value Study 7: Intrinsic Values

In designing the contingent valuation surveys to capture intrinsic values, the Trustees should be careful to address all natural resource injuries, not just those that have immediate emotional appeal (e.g., sea otters, bald eagles). Prince William Sound's existence as a pristine, intact ecosystem which supported a food chain unaffected by human intervention (pre-spill) represents a significant portion of the area's intrinsic value. Conversely, the economic value studies must capture the loss associated with injury to the food chain and ecosystem, in particular the potential synergistic effects of such injury. In addition, the survey design should address the uncertainty about long-term impacts of the oil spill, so that human perceptions of the oil spill's effects are captured accurately and completely.

Com.	Topic	Issue	Sug.	Sort
81	3	2270		2

Economists have performed several travel cost studies in Alaska, mostly on recreational fishing. Because much of the loss is intrinsic, the Contingent Valuation Method should be employed. The assessment should use both willingness to accept and willingness to pay approaches in order to obtain a range of values. The response of over 65,000 people donating to NWF's Alaska Fund since the Exxon Valdez oil spill, are an indication that people are willing to pay something for existence and option values of the resources of Prince William Sound.

The contingent valuation surveys should be conducted throughout the United States. The Exxon Valdez oil spill is a disaster that created a global sense of loss, due to its location and the unique sensitivity of the environment affected. We recognize, however, that conducting surveys of the global community is impractical. It is crucial to survey the entire United States, however, regardless of logistical difficulties. Prince William Sound was the only area of its kind – an easily accessible pristine marine environment abundant with unique wildlife viewing and recreation opportunities. As a result, the entire nation felt, and continues to feel, a strong sense of loss and outrage as a result of the area's inundation with over 11 million gallons of highly toxic oil. This intrinsic value for the Prince William Sound resource can only be captured through nationwide surveys.

The Trustees should also consider conducting and analyzing the contingent valuation surveys for intrinsic value in subgroups, to capture fully the varying levels of

loss possibly felt by discrete populations with distinct relationships to the Sound. Three potential subgroups come to mind immediately: the entire nation, Alaska residents, and subsistence users.

10. Economic Value Study 9: Archaeological Sites

The spill's impact on archaeological sites should be included as a component of the contingent valuation studies performed in Study 7 to determine intrinsic values. Alternatively, a contingent valuation study specific to archaeological sites could be developed, that targets the Alaskan Native, and the scientist/ archaeologist populations for surveying.

Com.	Topic	Issue	Sug.	Sort
82	3	2290		1

H. Restoration Study

It is ironic that the most important aspect of the natural resource damage assessment process -- restoration -- has the most cryptic (one-page) description of all the studies. The Environmental Groups hope that this does not reflect a cavalier attitude on the Trustees' part towards their statutory and fiduciary duties to restore, replace or acquire the equivalent of injured resources.

Com.	Topic	Issue	Sug.	Sort
83	3	2110		2

The first objective -- to "incorporate ecological concepts and ecosystems perspectives in the overall restoration recommendations" -- is gratuitous and totally unclear. The restoration plans must be designed to restore the productivity of the entire affected ecosystem, and cannot be limited to restoring or replacing human uses provided by the natural resources. Indeed, as discussed in greater detail in our comments on resource-specific studies, restoration efforts for human uses (e.g., restocking of fish) will not necessarily enjoy long-term success unless the ecosystem (from the bacteria up the food chain) has been restored first. To this end, each of the natural resource injury assessment studies should be investigating options for restoration of lost use, populations and habitat (the study descriptions use the word "or"). The existing boilerplate regarding restoration in the objectives section of the studies seems to have been added as a last minute afterthought, with no thought given to actually considering restoration in the study protocols themselves.

The restoration study description does not mention several critical concepts: natural resource, restoration and replacement cost, and acquisition of equivalent resources. All studies, including natural resource injury assessment, economic value, and the restoration planning effort must consider the ability of the resource to recover, and the time necessary for recovery. If recovery (whether naturally or through restoration efforts) is anticipated, the economic value studies should quantify all lost use and other diminutions in value (e.g. option and existence values) until recovery or restoration is complete. The restoration plan should contain an estimate of the time to recovery. If recovery is not anticipated, or if recovery may exceed restoration costs (which it will under the Ohio formulation of damages), the restoration plan must investigate acquisition of equivalent resources.

Restoration cost is, of course, a statutory minimum measure of damages. It is therefore a critical component of any restoration plan.

The restoration plan must include plans to restore, replace or acquire the equivalent of each natural resource injured. The concept of injury includes all lost services provided by the natural resource. The economic valuation of damages should include the existence of a resource, in addition to all lost uses until restoration is complete. See, Ohio, 880 F.2d at 464. The objective of restoration efforts should thus be to replace lost resources, as well as lost services, or where direct replacement or long-term rehabilitation is not likely, acquire equivalent resources and services.

Whenever restoration or rehabilitation is determined to be infeasible, as with many of the oiled beaches, the Trustees should immediately work to identify equivalent resources. This is particularly true of resources that are important (and valued) for the services they provide for other natural resources. Taking oiled beaches as an example, the Trustees should currently be evaluating options available to replace the habitat services provided by oiled beaches for birds, terrestrial and marine mammals, and other species. We have provided some suggestions of alternative resources available for acquisition in the context of our comments on resource-specific injury assessment studies. Included are concepts such as purchase of timber and oil leases or other development rights, legal protection (sanctuary or wilderness designation) for sensitive habitat areas, cessation of activities outside of Prince William Sound that threaten migratory species, and reductions or elimination of allowed drift net fishing to reduce pressures and stress on the Alaskan ecosystem affected by the spill. Since many opportunities to acquire easements or development rights for these alternative resources will be lost if not acquired quickly (e.g. Bristol Bay leases, Chugach timber cutting rights), prompt action is urgently needed to identify and secure equivalent resources providing the services affected by the Exxon Valdez oil spill.

IV. THE PUBLIC MUST CONTINUE TO BE INVOLVED IN DEVELOPMENT AND IMPLEMENTATION OF ALL STUDIES

Virtually every person with whom the Environmental Groups have discussed the draft assessment plan has complained about the superficiality of the study descriptions. The public, including experts in the field of natural resource damage assessment (biologists and economists), has been unable to understand what the Trustees plan to do to identify and quantify natural resource damages resulting from the Exxon Valdez oil spill, or how they plan to do it. Many members of the public will nevertheless attempt to comment extensively on the draft plan, because of their overwhelming concern for the natural resources in once-pristine Prince William Sound.

The public participation provided to date for the natural resource damage assessment process is woefully inadequate and violates federal law. Significant decisions regarding study design and scope have been made (and significant federal funds spent) without any prior public review or comment. If the Trustees disregard the public outcry, and stick with their decision to terminate studies in February 1990, many of the studies will receive no public review whatsoever. Since sampling for most studies has already been completed for the season, this could result in a natural resource damage assessment being prepared for the worst oil spill in U.S. history, termed by many as an environmental catastrophe, without benefit of any peer review. Given the relative youth of the science and economics of natural resource damage assessments, this shortsightedness on the Trustees' part may prove fatal to their ultimate success in collecting full damages from Exxon.

The Trustees' actions in the Exxon Valdez case are directly contrary to the minimal public participation procedures provided in the federal natural resource damage regulations, which themselves have been the subject of substantial controversy because of the inadequate public participation opportunities. See, Ohio, 880 F.2d at 467-68. Under the regulations, the Assessment Plan (containing proposed studies and methodologies) must be made available for public comment review at least 30 days "before the performance of any methodologies contained therein." 43 C.F.R. §11.32(c)(1) (emphasis added). Further, any significant modifications to the assessment approach or studies described in a plan must be made available for public review and comment "before tasks called for in the modified plan are begun." 43 C.F.R. §§11.32(e)(2)(i), 11.32(f)(3) (emphasis added). The assessment plan to be implemented must reflect the Trustees' responses to the public comments. 43 C.F.R. §11.32(c)(2). CERCLA requires no less. See, e.g., CERCLA §117.

Despite this clear mandate to involve the public before any significant assessment activities are undertaken, and to consider the public's comments in deciding how to perform the assessment, the Trustees have in essence planned, implemented and completed the entire Exxon Valdez natural resource damage assessment before receiving public comment (if we take the February 1990 termination date at face value). While we recognize that some data collection must begin prior to the solicitation and analysis of public comment to avoid data loss, it is unacceptable to essentially have completed most or all of the data collection and study design without consulting the public. The

Com.	Topic	Issue	Sug.	Sort
84	6	0200		2

Trustees have refused to provide the Environmental Groups and other interested persons access to data collected, analysis results, more detailed research plans, or any other information that would facilitate informed public comment. The Trustees' insular approach to the most complicated and extensive natural resource damage assessment ever is both bad science and bad policy.

Development and implementation of a natural resource damage assessment plan involving millions in federal funds and the public trust also violates the Administrative Procedure Act (APA) 5 U.S.C. § 551, et seq.; and the National Environmental Policy Act (NEPA) 42 U.S.C. § 4331-4335; 40 C.F.R. § 1501.1-1501.2 (Council on Environmental Quality NEPA rules emphasizing importance of early public participation); Thomas v. Peterson, 753 F.2d 754, 760 (9th Cir. 1985) (early public participation in NEPA process important and required). Furthermore, in the event Exxon has played any role in the development or implementation of the draft assessment plan, the APA has been further violated. See, e.g., 5 U.S.C. § 553; K.C. Davis, Administrative Law Treatise §§6:1, 6:18, 13:0 (1978 and 1982 Supp.) (APA and basic fairness require that interested persons be provided some opportunity to respond to adverse arguments presented by other persons in agency proceedings).

The Environmental Groups recognize that it would be impractical to require the Trustees to revise and republish the draft assessment plan prior to undertaking any of the studies described therein. The Trustees cannot, however, be allowed to circumvent public participation requirements on the basis of practicality or time limitations. Indeed, increased public participation (possibly beyond legal requirements) is appropriate to counteract the unlawful actions taken to date in performing assessment studies without any public review.

At a minimum, prior public review and comment on the Exxon Valdez natural resource damage assessment activities must be solicited at the following stages:

- development of detailed research or study plans for any of the proposed studies
- decision to end or abort any study, including decision to abide by the February 1990 termination date
- decision to pursue additional studies; public review should include detailed research or study plans
- development of restoration plans⁸
- initiation and pursuit of settlement discussions with potentially responsible parties

⁸ Note that the draft assessment plan anticipates additional public review and comment at the restoration plan development stage. Plan, p. 27.

-- development of proposed natural resource damage assessment

In addition, the public should be given access to detailed study designs and to the data collected and analysis results, as they become available, in order to provide informed public comment on the assessment as it progresses. Moreover, data collected and analysis results should be released whenever a decision to terminate a study is contemplated.

The following comments were coded later and are found on the listed pages

Comment	Page
85	2
86	1-3
87	3
88	3
89	9
90	12
91	17

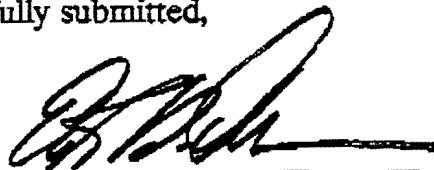
V. CONCLUSION

These comments highlight significant flaws in the draft natural resource damage assessment plan for the Exxon Valdez oil spill. They identify legal inadequacies in the overall approach, as well as suggestions for improvements in individual study designs. The Environmental Groups recognize that time is of the essence in proceeding with the assessment, and therefore do not suggest that the draft assessment plan be reissued for additional public comment. Rather, the Trustees should release for further comment the detailed study designs or should incorporate suggested changes immediately in all future activities under the plan. In addition, increased public participation should be provided, as discussed in the previous section.

Respectfully submitted,



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ON BEHALF OF:

NATIONAL WILDLIFE FEDERATION
WILDLIFE FEDERATION OF ALASKA
TRUSTEES FOR ALASKA
ALASKA CENTER FOR THE ENVIRONMENT
SIERRA CLUB LEGAL DEFENSE FUND

The National Wildlife Federation has discussed the draft assessment plan with many interested persons in preparing these comments. We thank the following experts for their assistance in development of this document, without any implication that they have reviewed or approved its contents, or that they represent NWF's views on all issues discussed in this document.

Partial List of Expert Reviewers on NWF's Behalf:

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James Cubbage, Research Biologist, Cascadia Research, Olympia, WA

Jeffery A. Foran, Assistant Professor of Medicine and Health Care Sciences, George Washington University, Division of Occupational and Environmental Medicine, Washington, DC

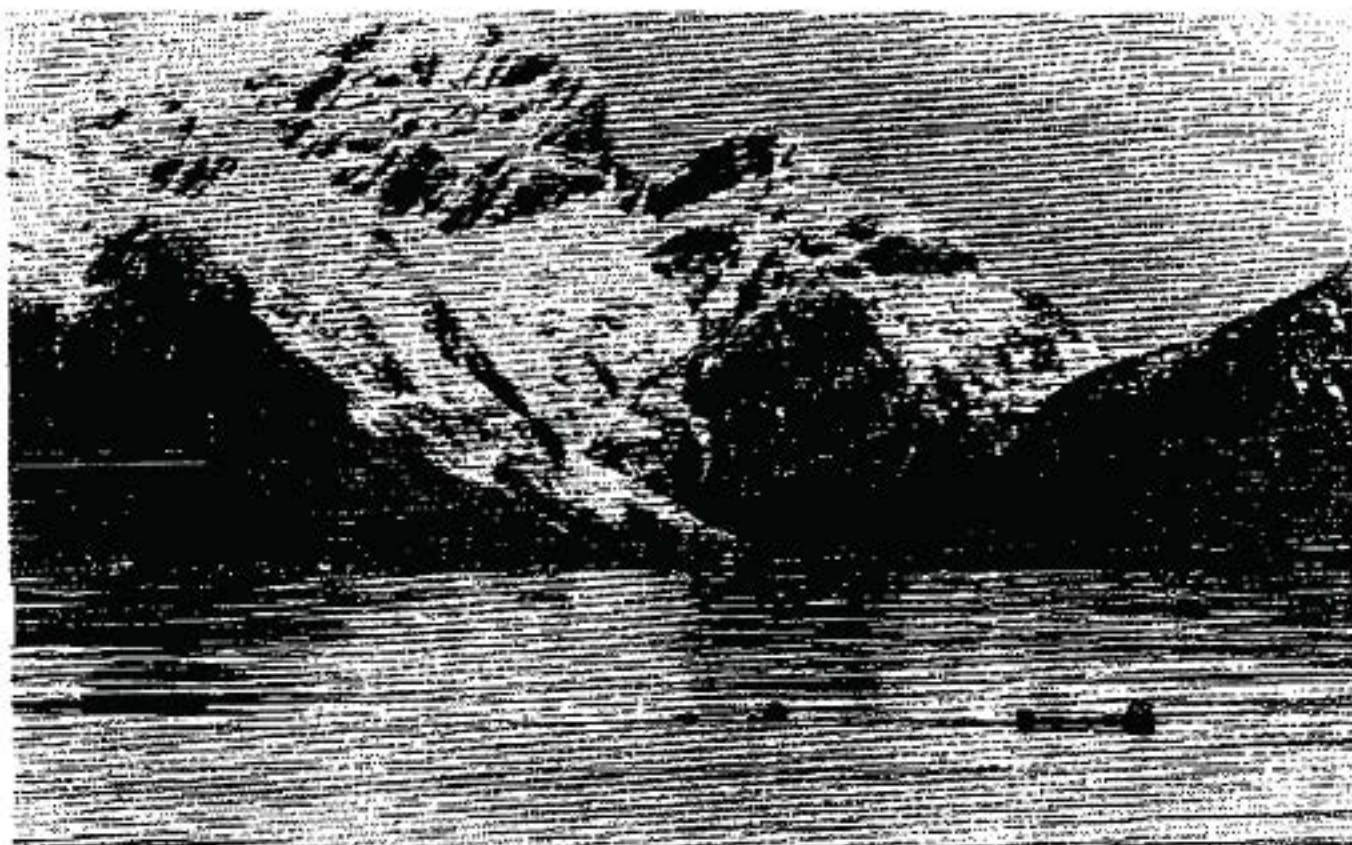
Michael Fry, Assistant Researcher, Department of Avian Science, UC Davis, CA

Michael Kavanaugh, Natural Resource Economist, Washington, D.C.

Daniel Roby, Associate Professor of Biology, Co-op Wildlife Research Lab, S. Illinois University

Paul Scodari, Natural Resource Economist, Environmental Law Institute, Washington, DC

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John Hynes, Alaska Department of Fish & Game

Otters in Prince William Sound



National Wildlife Federation
1400 16th Street, N.W.
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October 30, 1989

Don Collinsworth, Commissioner
Alaska Department of Fish and Game
Juneau, AK

Manuel Lujan, Secretary
U.S. Department of Interior
Washington, D.C.

Robert A. Mosbacher, Secretary
U.S. Department of Commerce
Washington, D.C.

Clayton Yeutter, Secretary
U.S. Department of Agriculture
Washington, D.C.

Dear Trustees:

We are writing to you in your capacity as Trustees responsible for the natural resource damage assessment for the Exxon Valdez oil spill. We write to express our grave concern about several aspects of the draft damage assessment plan for which public comments must be submitted by October 30th. Many of the undersigned groups have submitted detailed comments on the scientific and economic studies proposed in the draft plan. However, several overarching issues stand out and merit particular comment. We ask that you carefully reevaluate the approach contained in the draft plan and take the steps as recommended herein. We would like to make five key points.

1. The government commits to only one year of study.

The document states that "the damage assessment document is essentially a one-year plan." We understand that all prior drafts of the plan were for five years of study and that it was only at the last moment that it was made a one-year plan. That decision is an arbitrary one, not justified by science. Limiting the studies to one year will lead to a serious underestimation of damages and inadequate recovery from Exxon, because the first year damages tell only part of the story. Oil will not disappear in a year and the environment will continue to feel its pernicious effects for years to come. For many species such as salmon and bald eagles, the young that were born this year and are most vulnerable to the spill will not return to Prince William Sound for two, three or four years. Only then will the extent of the damage begin to be known. Thus the assessment must cover a multi-year period.

Com.	Topic	Issue	Sug.	Sort
92	4	0201		2

October 30, 1989

Page 2

2. The plan deprives the public of an effective opportunity to influence the assessment process.

The draft assessment plan is so vague that every scientist and economist we have contacted says that intelligent comment is virtually impossible without more details. Moreover, the plan makes no commitment to provide for public review and comment prior to a decision to extend or terminate assessment studies after February 1990. These defects must be remedied so that the door is not closed on public input into this extremely important process.

Com.	Topic	Issue	Sug.	Sort
93	6	0100		2

3. The government has not foreclosed Exxon's role in the damage assessment.

The draft assessment says that no decision has been made as to whether or not to allow Exxon to implement parts of the assessment. Considering the potential liability faced by Exxon as a result of this catastrophic oil spill and Exxon's poor performance in the clean-up, it would be folly to give them responsibility for conducting any part of the assessment. The company has every incentive to minimize the magnitude and severity of the damages to reduce their liability. Allowing Exxon to participate in the assessment is akin to asking the fox how many chickens it ate. Exxon should not be given a role in the conduct of the assessment.

Com.	Topic	Issue	Sug.	Sort
94	2	0207		2

4. The plan says almost nothing about restoration, replacement or acquisition of equivalent resources.

The draft assessment devotes one page to restoration and says nothing about evaluating the acquisition of equivalent resources, where restoration is not possible. In addition, there is no mention of the need to evaluate the costs of restoration or acquisition of equivalent resources. Since restoration is the basic measure of damages, restoration must be made an integral part of the plan.

Com.	Topic	Issue	Sug.	Sort
95	3	0151		2

5. The plan lacks an ecosystem focus.

One of the most serious scientific criticisms of the draft plan is the lack of an ecosystem focus. For example, there is no evidence that there will be an examination or quantification of foodweb effects related to the oil spill. In order to get a complete picture of the damages to the ecosystem a comprehensive damage assessment plan should focus not only on individual species but also on their interactions and the functioning of the ecosystem as a whole.

Com.	Topic	Issue	Sug.	Sort
96	3	0111		2

October 30, 1989
Page 5

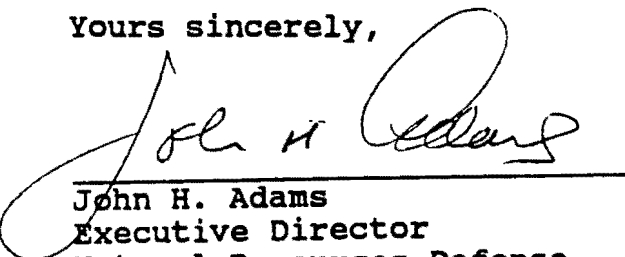
cc: President George Bush
Governor Steve Cowper
Mike Barton, Dept. of Agriculture
Al Ewing, EPA
LaJuana Wilcher, EPA
Steve Pennoyer, Dept. of Commerce
Walt Stieglitz, Dept. of the Interior

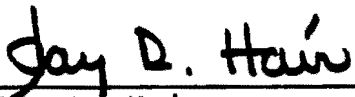
To address these concerns, we recommend that the Trustees take the following steps:

1. Commit to a multi-year plan of study that will allow the government trustees to assess not only the short-term effects of the spill but to predict with some certainty the long-term ecosystem effects.
2. Provide the public with the opportunity to comment on proposals for additional research before these studies are set in motion and to participate in future decisions about whether to continue or discontinue damage assessments studies and in the development of the restoration plan.
3. Provide sufficient details about the results of studies carried out to date and the nature of future studies to permit meaningful scientific and technical review.
4. Prohibit Exxon or any other responsible party from participating in the conduct of the assessment.
5. Focus the plan on strategies to restore, replace or acquire equivalent resources and on evaluating the costs of these options.
6. Use an ecosystem approach in the assessment.

We look forward to working with you to accomplish our shared goal of making the environment of Prince William Sound and the other affected areas as whole as possible and ensuring that Exxon and the other responsible parties are held fully liable for the damages that they have wrought.

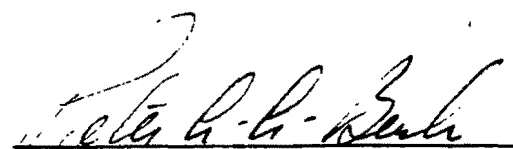
Yours sincerely,


John H. Adams
Executive Director
Natural Resources Defense
Council



Jay D. Hair
President
National Wildlife Federation


Com.	Topic	Issue	Sug.	Sort
9.7	3	0200		2

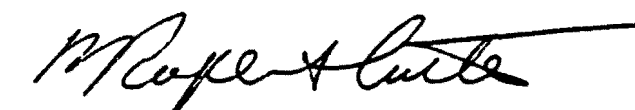
October 30, 1989
Page 4



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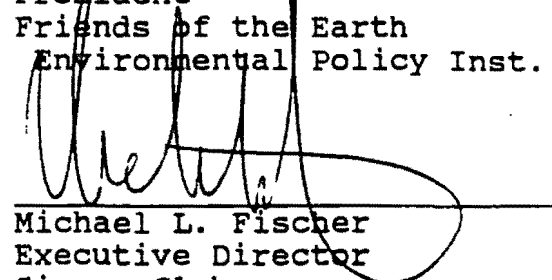

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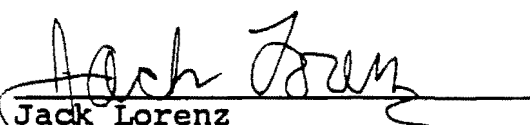

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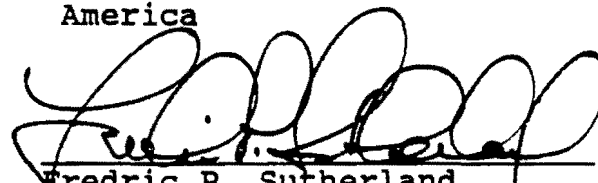

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October 30, 1989

Trustee Council
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Juneau, Alaska 99802

Re: Comments on Draft Natural Resource Damage Assessment
Plan for the Exxon Valdez Oil Spill

Dear Ladies and Gentlemen:

These comments on the draft assessment plan are filed in behalf of the Alaska Sportfishing Association and others who have filed a class action in behalf of those who recreationally use the area and resources affected by the Exxon Valdez oil spill. That class, referred to as the "Use and Enjoyment Class" in the litigation, seeks creation of an environmental restoration and mitigation fund and does so under both damage and injunctive theories. It does not seek individual recovery for class members. The recreational uses include not only sport fishing, which is a common activity that overlaps many of the recreational uses, but also includes sea kayaking, sailing, motor boating, camping, wildlife viewing, hunting, and similar consumptive and nonconsumptive uses of the geophysical and biological resources impacted by the spill. Therefore, these comments address many of the resources that are of importance directly or indirectly to those who use and enjoy Prince William Sound and other affected areas.

The Use and Enjoyment Class adopts the comments of the National Wildlife Federation and Wildlife Federation of Alaska, except as added to below.

I. GENERAL COMMENTS

A. The Cut-Off Date

The most glaring inadequacy in the plan is the cut-off of all studies in February 1990 unless further work is authorized. Many of the studies require longer periods of

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EXXON VALDEZ OIL SPILL
TRUSTEE COUNCIL
ADMINISTRATIVE RECORD

Com.	Topic	Issue	Seq.	Sort
1	4	0201		2

assessment in order to determine injury and assess damages. Therefore, the plan risks greatly underestimating the actual injuries and damages. ↑

B. Absence of Any Damage Assessment based on Restoration

The plan assesses damages only through assessing the loss of use values and non-use values. This is an incomplete measure of damages and is legally insufficient.

The fundamental objective of the assessment process under CERCLA and the Clean Water Act is restore, replace and acquire the equivalent of the injured resources, both geophysical and biological. The draft plan fails to serve this objective in that it neglects any assessment of damages based on the costs of restoration, replacement and acquisition of equivalent resources, habitats or lands. Instead, the plan only refers to development of a restoration plan and fails to articulate whether costs of restoring, replacing or acquiring will be part of the measure of damages as required.

Com.	Topic	Issue	Sug.	Sort
2	3	0151		2

In Ohio v. Department of the Interior, No. 86-1529 (D.C. Cir., July 14, 1989), the court held that restoration cost is the basic measure of damages plus lost use values. Ohio at 45. The court specifically rejected Interior's regulation requiring that damages be the "lesser of" restoration costs or lost use values. Ohio, at 55.

Nevertheless, the assessment plan focuses exclusively on lost use values as the measure of damages and thus effectively still retains a "lesser of" approach. Lost use is not an inappropriate element; it is simply an incomplete measure. As the sole source of measurement of damage, it does not comply with the Ohio decision.

Therefore, the plan would benefit from an additional study that measures damages in terms of restoration costs, so that total damages would be restoration cost (meaning restoration, replacement and acquisition of alternative habitats) plus lost use values.

Com.	Topic	Issue	Sug.	Sort
18	3	2295		2

The plan says only that a restoration plan will be developed, including cost estimates for restoration projects. This is not the same as a damages assessment based on restoration.

We realize that restoration in a narrow sense may not be feasible for many of the biological resources injured.

Therefore, we urge the trustees to look broadly at acquisition of replacement habitats and resources that bear some relationship to the injuries suffered by the biological resources, the geophysical resources, the services they provide and use and non-use values they provide.

The Use and Enjoyment Class urges that the trustees immediately initiate such a plan and the assessment of damages based on restoration, replacement and acquisition in addition to damages based on lost use and non-use values.

C. Lack of Detail and Public Comment

Most of the study descriptions are so lacking in detail that they frustrate public comment about the design of the studies. The draft plan fails to identify studies already underway, sampling protocols, data collected. Therefore, the Use and Enjoyment Class does not waive any right to make additional or contradictory comments at a later time when more details become available. In addition, we request that the trustees establish a more open process to facilitate further comment throughout the assessment process.

Com.	Topic	Issue	Sug.	Sort
3	3	0102		2

D. Exxon should not participate in the damage assessment.

The plan says that the trustees have not decided whether potentially responsible parties, Exxon and other defendants, should be allowed to participate in the damage assessment. The Clean Water Act and CERCLA both require the trustees to assess damages. 33 U.S.C. 1321(f)(4)-(5); 42 U.S.C. 9607(f). The responsible parties may act only in a ministerial role. Ohio at 73.

Com.	Topic	Issue	Sug.	Sort
4	5	0207		2

E. A regulatory discount rate appears inappropriate in this instance.

The recreational demand for areas affected by this spill has been increasing rapidly in recent years, as ADF&G use figures indicate. Therefore, any measure of damages must take into account the projected increases in demand. If projected increases cannot be estimated without uncertainty, then it only makes sense to adjust or eliminate the assumed discount rate, as permitted by the Ohio, at 69, in its discussion of the authority, 43 C.F.R. 11.84, of the trustees to adjust for uncertainty in assumptions.

Com.	Topic	Issue	Sug.	Sort
5	3	0142		2

F. General Absence of Laboratory Modeling

Most of the biological studies are field surveys. Few laboratory studies are planned to simulate conditions in the field. Where the study design does not permit extensive field work or where only a few sights are used for field survey, we would urge that laboratory simulations be undertaken.

Com.	Topic	Issue	Sug.	Sort
19	3	0240		2

G. Inconsistency in the methods used to model amounts of oil over time.

The air/water studies have the goal of creating an integrated model over time of the fate of the oil, but it is not clear that the studies are consistent with each other in focusing in the parameters of quantity, volume, concentration, distribution, persistence, composition and time. For example, it is not clear that either Air/Water Study No. 2 or the Coastal Habitat Study address the quantity of oil and hydrocarbons that end up in the marine sediment or the intertidal zone, while Air/Water Study No. 1 address the quantity of floating oil. If an inconsistency of focus such as this occurs across these studies and across what should be common parameters, then it may make difficult the job of creating a total model. The Air/Water studies, and also the coastal habitat study should be re-examined to facilitate creating such a model.

Com.	Topic	Issue	Sug.	Sort
6	5	1200		2

H. Absence of Assessment of Damage to Recreation Industry and other businesses outside of the commercial fishing industry.

CERCLA requires that damages measured for purposes of the Clean Water Act and CERCLA must take into account all uses of the injured resource. 42 U.S.C. 9651(c). The assessment plan totally neglects tourist industry uses of the resource. Taxidermists, charter boat operators, water and air taxi services, guides, lodges and similar businesses have suffered from the spill. These damages should be assessed, since they are use values just as much as commercial fishing, recreation and subsistence.

Com.	Topic	Issue	Sug.	Sort
7	3	0111		2

I. Budget for Economic Studies

The absence of a budget breakdown for the economic studies does not facilitate public comment. Among the economic studies, the contingency valuation studies, particularly Economic Uses Study No. 5 (recreation) and Economic Uses Study No. 7 (Intrinsic values) deserve substantial budgets to accomplish the complex survey work

Com.	Topic	Issue	Sug.	Sort
8	3	2200		2

needed. We expect that the budgets for those studies are substantial and that they will not be cut to facilitate studies that provide less prospect for recoveries that will serve the purposes of restoration, replacement and acquisition.

Nevertheless, we urge that all budgets be disclosed.

J. Lack of Attention to Sublethal Effects

Many of the biological studies ignore sublethal effects and focus exclusively on population surveys and causes of mortality. Throughout the biological studies we urge greater attention to sublethal effects, such as mutagenic, reproductive, predation effects arising from the spill.

Com.	Topic	Issue	Sug.	Sort
9	3	0111		2

II. SPECIFIC COMMENTS

A. Coastal Habitat and Air/Water Studies

The plan would benefit from describing how these studies will be coordinated with the economic uses studies and the restoration plan. These studies obviously form a foundation for estimating long term biological impact. However, the plan should make clear that they also will relate geophysical impact to the economic uses studies -- i.e. that the mere fact of oiled shorelines, habitat aside, is an injury that should be measured in these studies and assessed as part of Economic Uses Study Nos. 5 (recreation) and 7 (intrinsic values). The trustees should be careful to include both biological and geophysical injury determined in these studies in the contingent valuation studies in order to avoid undervaluation.

Com.	Topic	Issue	Sug.	Sort
10	3	1100		2

Similarly there is no mention in the restoration plan of how these studies will be used to support the restoration plan, including acquisition of habitat. That needs to be addressed.

Com.	Topic	Issue	Sug.	Sort
11	3	2100		2

The coastal habitat study says it will address toxicity at several different trophic levels, but detail is lacking. Algae, phytoplankton, zooplankton, microbiota and other organisms at the bottom of the food web need to be addressed in these studies.

Com.	Topic	Issue	Sug.	Sort
12	3	1100		2

B. Fish Studies

These studies are frequently lacking in attention to sublethal effects, such as genetic mutation, reproductive

Com.	Topic	Issue	Sug.	Sort
13	3	1300		2

failure, behavioral abnormalities, disease, increased predation, deformities. See 43 C.F.R. 11.62. The studies also are limited to species for which there are human use values; they should be expanded to include non-use species in order to avoid underestimating the damage assessment in the intrinsic value study.

Many of these studies cannot be completed by the February 1990 deadline.

Fish Studies 1, 2, 7, 8 would benefit from laboratory control studies to support the impact on eggs and fry.

Fish Studies 3, 4 and 9 would benefit from control studies in simulated laboratory environments to control marine variables, such as natural predation and mortality at sea.

Fish Study 5 (Char and Trout) ignores sublethal effects. This study also seems to ignore the lack of control of exposure in the coastal waters thorough which juvenile and adult char and trout migrate. The study also suffers from few study areas, and would benefit from controlled laboratory simulations.

Fish Study 6 -- more detail should be given; other tissue samples in addition to stomach contents should be taken.

Fish Studies 7 and 8 -- laboratory control studies would benefits these studies, as in nos. 1 and 2.

Fish Study 11 -- Kelp growth should be measured, since there have been reports of reduced kelp growth in oiled areas.

Fish Study 17, 18, 19 -- We adopt NWF comments.

C. Marine Mammal Studies

Marine mammals are tremendously important to the recreationists of the affected areas, yet the plan gives them short shrift, lack of detail in the study designs and lack of budget. Sublethal effects need to be examined more fully. See NWF comments. More attention should be given to prey species. The cut-off date undermines the ability to assess long term effects.

D. Terrestrial Mammals

Com.	Topic	Issue	Sug.	Sort
14	3	1600		2

There is so little money in these studies, little effect will be detected.

Com.	Topic	Issue	Sug.	Sort
15	4	1700		1

E. Bird Studies

Again, these studies ignore sublethal effects. These studies focus mostly on immediate effects and reproductive success. Long term effects are neglected.

Com.	Topic	Issue	Sug.	Sort
16	3	1800		2

Bird Study 14 on migratory birds appears grossly underfunded for the work described.

In other respects we adopt NWF's comments.

F. Economic Uses Studies

Our focus here is chiefly on economic uses studies 5 (recreation) and 7 (intrinsic values), though a two other comments should be addressed.

Com.	Topic	Issue	Sug.	Sort
17	3	2200		2

First, these studies need to be supplemented with a study addressing the market impact the spill has had on tourist businesses and other business outside of the commercial fishing industry. (See General Comments.)

Second, creating bioeconomic models, as in Economic Uses Study No. 3, may be useful for other user classes than just commercial fishing.

Economic Uses Study No. 5 seems to have several problems. First, current users may have existence, option and bequest values in addition to consumer surplus values. Yet, this study focuses only on consumer surplus.

Com.	Topic	Issue	Sug.	Sort
20	3	2250		2

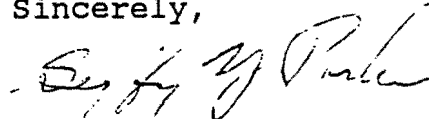
Second, the existence, option and bequest values of actual users may be substantially larger than those of nonusers. However, in ignoring existence, option and bequest values of users, this study effectively lumps those values for users in with the existence, option and bequest values of nonusers in Economic Uses Study No. 7, thereby losing track of these substantially larger values for the recreational use class and thereby underestimating the total value, regardless of whether that value is measured in study 5 or 7. The result is most likely to be an underestimate of damage in Economic Uses Study No. 5.

Com.	Topic	Issue	Sug.	Sort
21	3	2270		2

Third, in Economic Uses Study No. 5 there is no description of how a survey respondent is determined to be a

recreational user or not a recreational user -- i.e., is a respondent who recreated in the impacted area two years before the point of survey still a user? Those with the most diminished consumer surplus may be those who recreated previously and will never again go. How will they be surveyed? One method might be to rely partially on the names of respondents in the raw field creel survey and mail survey data for past years. Those records should be available for past years.

Sincerely,



ADLER, JAMESON & CLARAVAL
By: Geoffrey Y. Parker

See pg 2 for
Comment 18

See p 4 for 19
p 7 for 20
p 7 for 21

JESS LANMAN
2600 FAIRBANKS ST.
ANCHORAGE, AK 99503

OCTOBER 27, 1989

TRUSTEE COUNCIL
P.O. BOX 20792
JUNEAU, AK 99802

RE: DAMAGE ASSESSMENT (EXXON/VALDEZ)

GENTLEMEN:

I appreciate the opportunity to participate in the planning and implementation of the largest damage assessment ever undertaken for the most catastrophic oil spill in the world, however; to respond after seven months is simply "closing the gate after the cows are out!". Obviously, it is too late to change the scope, direction, or priorities of the studies, since they will be completed within a few months.

While the abortive attempt to diminish this catastrophe has continued; those of us most impacted can merely observe. The multitude of red tape and bureaucrats are successfully keeping us from participating in efforts to minimize the damage or the restoration of our natural resources, while those in charge continue to misdirect and "muddy the water in a feeding frenzy" to expend monies allocated by Exxon. These monies have successfully circumvented intervention by the Federal government as required by CERCLA and ultimately, alleviated the responsible party from liabilities as required by Federal law.

The primary and most essential factor still missing, as identified and provided for by Congress under CERCLA, is the

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Com.	Topic	Issue	Sug.	Sort
1	2	0200		2

Com.	Topic	Issue	Sug.	Sort
2	3	0209		2

recognition and designation of all Traditional Tribal Governments impacted by the Valdez/Exxon oil spill as "Trustees". Our continued exclusion from participation as Trustees to date is criminal! All expenditures to date without our input and/or concurrence warrant a Federal audit to insure the integrity that has been absent since the beginning of this debacle.

We all share a common frustration in dealing with a disaster of such magnitude, however; because it is our home, we alone have not only the motivational factor, but the uncompromising integrity essential to insure a responsible and reasonable attempt to minimize further damage, and provide for restoration of our resources, for our posterity.

While this accident has been a learning process for all concerned, I believe it is time for those with proprietary interests to be recognized and the "foxes separated from the chickens!". It is ludicrous for those most responsible for this calamity to remain alone at the helm...(Exxon, State..DEC, and Federal..USCG) while those most severely impacted (Traditional Governments) remain bound, and quartered unable to change course, or even be heard.

While no individual, company, office, or agency is totally responsible for this unfortunate but predictable calamity, it is our mutual responsibility to minimize and restore the impacted natural resources to the greatest extent possible.

The Tribes alone have been subjected to the greatest

Com.	Topic	Issue	Sug.	Sort
3	5	0209		2

damages, not only immediately, but for an indeterminate future (not only health, food, clothing, and economic but genetic) and with no recourse or control over our destiny other than to continue to rely on the somewhat tarnished integrity and benevolence of a distant if unresponsive administration. If this is not the recipe for genocide it lacks only the oven.

The time is late, and while the other "Trustees" still have as yet been unable to meet, we recognize our priorities and are committed to participating at every opportunity!

The necessary Federal laws are in place and need only be applied as required (SUPERFUND-CERCLA). I ask each Trustee and/or designee to recognize the futility of attempting to resolve this problem without the local planning and participation provided by Traditional Governments as legislated by Congress and overlooked by the present administration. Traditional Governments alone retain the integrity intrinsic to those with the responsibility of providing a safe and secure environment for our children in our land.

SINCERELY YOURS,


JESS LANMAN

DESIGNATED AUTHORITY

CHICKALOON TRADITIONAL COUNCIL

Com.	Topic	Issue	Sug.	Sort
4	6	0209		2

Com.	Topic	Issue	Sug.	Sort
5	6	0209		2



UNIVERSITY OF ALASKA FAIRBANKS

INSTITUTE OF ARCTIC BIOLOGY

311 Irving Building

Fairbanks, Alaska 99775-0180 U.S.A.

Office of the Director
(907) 474-7648

October 30, 1989

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

Gentlemen:

I am pleased to have this opportunity to provide some comments on the public review draft of the State/Federal Natural Resource Damage Assessment Plan and Restoration Strategy for the Exxon Valdez Oil Spill.

My first comment relates to the "Note" that appears on the un-numbered page prior to page 29 and that reads as follows: *"Each of the following studies contain a description of one year costs. These are projected obligations accrued for the onset of the project through February 28, 1990, and includes all field and analysis activities. Budgets are presented in 1,000's of dollars."* My comment is that when we prepared our portion of the damage assessment plan we were asked to provide 3 - 5 year budgets for all of the field and analysis activities, and the previous editions of the "plan" included 3-5 year budgets. It is important for us to mention this matter in that University of Alaska Fairbanks (UAF) did not receive monies needed for work on damage assessment until August of 1989, and cannot possibly conduct adequate injury assessment studies (field and laboratory) in far less than one field season. Obtaining a true picture of the damage assessment requires sample collections and data analysis beyond the short period which would occur if funding stops in February. A realistic plan should include the budgets for 3-5 years as originally proposed through this review process.

The UAF is one of the major participants in the Coastal Habitat Injury Assessment Study described on pages 29-33 of the plan. On page 32, the Alaska Department of Fish and Game and the U.S. Forest Service are listed as the lead agencies while the cooperating federal agencies are listed as EPA, NOAA, and U.S. Department of the Interior. The cooperating State agencies are listed as the Department of Environmental Conservation and the Department of Natural Resources. The budget given is for the Alaska Department of Fish and Game and the U.S. Forest Service. It concerns me that the UAF with its two participating institutes (Institute of Arctic Biology [IAB] and Institute of Marine Science [IMS]) is not included among the list of cooperators. In contrast, on pages 134 and 135, is the description of Terrestrial Mammal Study Number 3 entitled "Assess the effect of the Exxon Valdez oil spill on river otter and mink in Prince William Sound" and the UAF is listed (page 135) as a State cooperating agency and the amount of the contract, \$36,000 to the IAB, is identified in a footnote to the budget. Similarly, Terrestrial Mammal Study Number 6 entitled "Influence of Oil Hydrocarbons on Reproduction of Mink," is described on pages 140-142. The lead agency is listed as the Alaska Department of Fish and Game and the cooperating agency as the University of Alaska Fairbanks (IAB). On page 142 under Budget, it is indicated that the study will be conducted by the UAF under contract to the Alaska Department of Fish and Game.

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DULAC
See reference paper
for list of supporting
material.

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Com.	Topic	Issue	Sug.	Sort
1	4	0201		2

Com.	Topic	Issue	Sug.	Sort
2	6	0100		2

INSTITUTE OF ARCTIC BIOLOGY

In light of the precedent of the two proposals cited above, we would like clarification of the budget for the Coastal Habitat Study Number 1 entitled "Comprehensive Assessment of Injury to Coastal Habitats" on pages 30-33, particularly the fact that the University of Alaska Fairbanks is not referenced in the budget portion of the study. Also, we have no clear indication as to the duration of the study.

Com.	Topic	Issue	Sug.	Sort

I noticed that there is no mention in this plan of the proposal by the IAB/UAF to measure the biochemical and physiological confirmation of exposure in selected mammals and invertebrates to North Slope crude oil spilled in Prince William Sound. This proposal was recommended for funding in earlier versions of the plan, and is of unquestionable importance in the successful conclusion of natural resource damage assessment related to the oil spill. The studies proposed will tell us, for instance, whether animals died or became sick due directly to exposure to oil in their environment. This confirmation of exposure can then be used in economic models to determine cost assessments for the loss of natural resources. It also will be possible to determine how long after an oil spill it takes for the biochemical parameters of animals living in exposed areas to return to normal levels. The analytical techniques we will use are not being used by others so there will be no duplication of effort. These techniques provide an inexpensive alternative to hydrocarbon analysis for continued monitoring. The expertise at IAB and IMS in analytical chemistry and pathology was ignored by the Trustees. I am attaching a copy of this proposal for your perusal in the event that the omission of this extremely important study was simply inadvertent (Attachment 1).

Com.	Topic	Issue	Sug.	Sort
3	4	0100		2

Earlier on in the planning for damage assessment it was decided that the U.S. Fish and Wildlife Service (Department of the Interior) would conduct all of the studies of the sea otter. However, we do not find in your plan the important project earlier proposed by the University of Alaska Fairbanks on the extent to which the spill has reduced the genetic stock of the sea otter in Prince William Sound, e.g., to the point that its continued existence as a genetic entity may be endangered. It would seem that this study is another example of an inadvertent omission of an important part of the damage assessment plan.

Com.	Topic	Issue	Sug.	Sort
4	4	1680		2

Thank you for this opportunity to provide you with some comments on the public review draft of the plan. We look forward to receiving information on the second and successive years of the studies.

Sincerely yours,

Francis S. Williamson
Francis S.L. Williamson
Director

FSLW/sw
Attachment
cc: Brian Rogers
Vera Alexander

Valdez

Tatitlek

Eyak

Chenega

Seward

English Bay
Port Graham

the north pacific rim

October 30, 1989

Trustee Council
P.O. Box 20792
Juneau, AK 99802**Subject: Comments on Draft State/Federal Natural Resource
Damage Assessment Plan and Restoration Strategy for the Exxon
Valdez Oil Spill****Dear Sirs:**

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

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

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

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

*The Non-Profit Corporation Serving The People Of The Chugach Native Region*RECEIVED
JAN 11 1990EXXON VALDEZ OIL SPILL
TRUSTEE COUNCIL
ADMINISTRATIVE RECORD

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

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1	5	0209		2

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

Subsistence

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

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

Com.	Topic	Issue	Sug.	Sort
2	5	0102		2

Com.	Topic	Issue	Sug.	Sort
3	3	2260		2

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

Com.	Topic	Issue	Sug.	Sort
4	3	2260		2

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

Com.	Topic	Issue	Sug.	Sort
5	5	2260		2

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

Com.	Topic	Issue	Sug.	Sort
6	3	2260		2

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

Cultural Resources

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

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

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

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

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

Com.	Topic	Issue	Sug.	Sort
7	5	2290		2

Com.	Topic	Issue	Sug.	Sort
8	5	2290		2

Com.	Topic	Issue	Sug.	Sort
9	3	0201		0

Com.	Topic	Issue	Sug.	Sort
10	3	0100		2

Com.	Topic	Issue	Sug.	Sort
11	3	2290		2

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

Schedule

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

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

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

Funding Levels

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

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

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

Com.	Topic	Issue	Sug.	Sort
12	3	0201		2

Com.	Topic	Issue	Sug.	Sort
13	3	0100		2

Com.	Topic	Issue	Sug.	Sort
14	2	2200		2

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

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

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

Very truly yours,

THE NORTH PACIFIC RIM



Derenty Tabios
Executive Director

Com.	Topic	Issue	Sug.	Sort
15	1	1400		2



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

(617) 929-8255

ENVIRONMENTAL SCIENCES PROGRAM

October 31, 1989

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

Dear Trustee Council and Staff,

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

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

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

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

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

73 DuLac

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

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

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

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

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

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

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

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

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

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

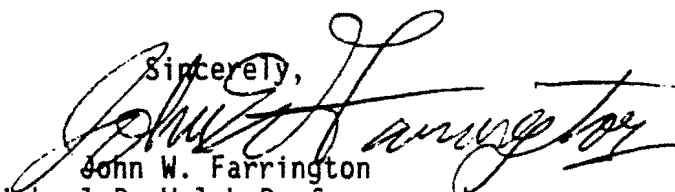
Com.	Topic	Issue	Sug.	Sort
4	3	0240	X	2

Com.	Topic	Issue	Sug.	Sort
5	3	0201		2

Com.	Topic	Issue	Sug.	Sort
6	4	0240		2

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

Sincerely,


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

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

American Petroleum Institute
1220 L Street, Northwest
Washington, D.C. 20005
202-682-8240



G. William Frick
Vice President and
General Counsel

October 27, 1989

*See attached
appendices*

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

Dear Council Members:

The American Petroleum Institute (API) welcomes this opportunity to comment on the Draft Natural Resource Damage Assessment Plan and Restoration Strategy for the Exxon Valdez oil spill. API is a national trade association whose corporate and individual members are engaged in all facets of the petroleum industry: exploration, production, transportation, refining, and marketing. Many of API's members conduct operations which might expose them to potential liability for damages to natural resources under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the Clean Water Act (CWA). As such, API's members have a direct interest in the propriety of methodologies and processes utilized by the trustees in this assessment.

API recognizes the magnitude of the task facing the trustees and believes that through cooperative efforts between the government and the petroleum industry, an effective restoration of Prince William Sound can be achieved. However, the preparation of a comprehensive and scientifically sound assessment plan is the essential first step toward achieving that final goal. Attached are API's detailed comments on the adequacy of the Draft Plan. API urges the trustees to consider its observations and recommendations as constructive responses to meeting a serious environmental challenge.

Sincerely,

G. William Frick

Attachment

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COMMENTS OF THE
AMERICAN PETROLEUM INSTITUTE
ON
"DRAFT NATURAL RESOURCE DAMAGE ASSESSMENT PLAN AND
RESTORATION STRATEGY FOR THE EXXON VALDEZ OIL SPILL"

U.S. Department of the Interior
54 Fed. Reg. 33618 (Aug. 15, 1989)

October 30, 1989

For More Information
Please Contact:

Phillip Cooney, Esq.
American Petroleum Institute
1220 L Street, NW
9th Floor
Washington, D.C. 20005
(202) 682-8246

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APPENDICES

COMMENTS OF THE
AMERICAN PETROLEUM INSTITUTE
ON
"DRAFT NATURAL RESOURCE DAMAGE ASSESSMENT PLAN AND
RESTORATION STRATEGY FOR THE EXXON VALDEZ OIL SPILL"

U.S. Department of the Interior
54 Fed. Reg. 33618 (Aug. 15, 1989)

The American Petroleum Institute (API) appreciates the opportunity to comment on the Public Review Draft of the "State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill, August 1989," (Draft Plan) that was announced as available for public comment on August 15, 1989. 54 Fed. Reg. 33618. API would like to commend the Department of the Interior (DOI) and other trustees for extending the public comment period for an additional 30 days to allow interested parties more time to review and respond to the Draft Plan.

The grounding of the Exxon Valdez on March 24, 1989, which resulted in the largest oil tanker spill in U.S. history, presented major challenges to both the petroleum industry and the natural resource trustees. The expeditious cleanup of discharged oil from the water and land represented a crucial first step in minimizing any environmental injuries associated with the spill. A second major step is the sound restoration of injured resources in Prince William Sound. Meeting this challenge requires the preparation of a restoration plan that will properly identify the problems, formulate practical and efficient solutions, avoid the creation of new adverse environmental effects, and implement these actions in well-planned, timely fashion.

The development of such a plan is an ambitious and difficult undertaking. It is, nonetheless, a task that must be successfully accomplished in order to allow the resources of Prince William Sound to return to their baseline conditions. With this in mind, API has reviewed the Draft Plan. Although many important restoration issues are generally discussed in the Plan, taken as a whole, the Plan lacks sufficient detail in terms of its scope and design to ensure that the restoration of Prince William Sound will be undertaken in a scientifically sound, well-organized, and cost-effective fashion. The Plan is more a compilation of research studies rather than a blueprint for restoration; in fact, the subject of restoration only receives a few pages of discussion and limited study.

Com.	Topic	Issue	Seq.	Sort
1	3	0102	X	2

API does not disagree that additional study of the resources in the Sound and the impact of the spill may be needed. However, unless such studies are well-designed and focus on specific data-gathering goals, the studies are unlikely to generate useful information. The Plan, as currently drafted, provides little more than short descriptions of the studies. Indeed, most of the studies appear to be geared toward collecting very generalized and basic research data that are not clearly linked to resource restoration or compensation. It is, therefore, difficult to determine whether these studies are the ones which are most appropriate and will provide the trustees

and on next page

with necessary information. Moreover, API questions whether potentially responsible parties should have to pay the costs of what is background research rather than a focused restoration and compensation plan.

same as
p. 2

It is also troubling that many of the studies described in the Plan have already been undertaken or even completed. In essence, this makes the Draft Plan an "after-the-fact" research description rather than decision-making document which reflects an investigation into the data available about affected resources and the identification of the means to fill key data gaps using cost-effective research techniques. The benefits of using a "planning approach" to accomplish efficient resource restoration have, therefore, been limited by the actions of the trustees.

API believes that many of the inadequacies in the Draft Plan would have been avoided had the trustees followed the step-by-step approach described in the DOI natural resource damage assessment regulations (NRDA). See 43 C.F.R. Part 11 (1988). These regulations, which direct that an assessment plan be prepared by identifying existing resource-related data and then, careful planning of additional information gathering, would have provided the trustees with a framework of analysis that would have resulted in a far more detailed Draft Plan. For example, by following the regulatory criteria regarding sampling locations, quality assurance, confirmation of exposure, and economic

Com.	Topic	Issue	Sug.	Sort
2	3	0/30	X	2

and on next page

assessment methodologies, the trustees would have developed an assessment that addressed each of these areas in a thorough and organized fashion. These analyses also would have been completed prior to the initiation of any field studies.

Compliance with the regulations may have also improved aspects of the Plan because the trustees would have recognized the need for the early involvement of potentially responsible parties (PRPs) and other interested members of the public before the initiation of data gathering. The publication of the Draft Plan has been the first opportunity that PRPs and interested parties have had to provide formal input to the trustees. This is unfortunate because the PRPs may have possessed data or information regarding the affected resources, fate and effects of spilled oil, and viable restoration approaches. These materials may have helped the trustees in preparing a more effective plan.

API believes that revisions to the Draft Plan are needed to demonstrate that a comprehensive planning process is being undertaken by the trustees. In addition to the points already discussed, API urges the trustees to consider the following issues in revising the Plan:

- o The need to ensure that the assessment focuses on resources and uses that are of a public rather than a commercial nature;

Com.	Topic	Issue	Sug.	Sort
3	2	0206	X	2

Com.	Topic	Issue	Sug.	Sort
4	3	0132	X	2

- o Establishment of resource restoration and use values based upon the "committed uses" of the resources;

Com.	Topic	Issue	Sug.	Sort
5	3	0140	X	1

- o Use of existing data and study design to confirm resource exposure to spilled oil before undertaking additional studies of the resource;

Com.	Topic	Issue	Sug.	Sort
6	3	0108	X	1

- o Identification of baseline resource measurements that reflect the dynamic nature of Prince William Sound;

Com.	Topic	Issue	Sug.	Sort
7	3	0108	X	1

- o Qualifications in the use of models to extrapolate long-term injuries from data collected over very short time periods;

Com.	Topic	Issue	Sug.	Sort
8	3	0100	X	1

- o Use of appropriate assumptions about the impact natural forces have had on the toxicity and concentrations of oil that may have affected natural resources; and,

Com.	Topic	Issue	Sug.	Sort
9	3	0108	X	1

- o Greater investigation and analysis of the role that natural recovery can have on the possible long-term impacts on Prince William Sound and the means for effecting a successful restoration of resources.

Com.	Topic	Issue	Sug.	Sort
10	3	0105	X	1

API recognizes the magnitude of the task facing the trustees and believes that through cooperative efforts between the

government and the petroleum industry, an effective restoration of Prince William Sound can be achieved in a timely fashion. API will continue its efforts to provide useful research on the ecological effects of oil and effective restoration methods to the trustees as it is available. API urges the trustees to consider the following recommendations and observations as sincere and constructive responses to meeting a serious environmental challenge. A well-planned and thorough assessment plan is fundamental to the successful restoration of the injured resources of Prince William Sound.

I. The Draft Plan Appears To Be A Compilation Of Research Studies Rather Than A Well-Designed Approach To Assess Any Injuries To The Resources Of Prince William Sound

API's principal observation regarding the Draft Plan is that it is extremely general and largely amounts to a compilation of short descriptions of the studies that are planned or underway. Many of the studies appear to entail data gathering of an extremely broad nature and more closely resemble basic research into the impact of oil spills on natural resources rather than a focused effort to identify the resources actually affected by the spill and appropriate restoration measures. Most studies lack a well-articulated technical justification.

There is also little discussion in the Plan of the data that have already been gathered regarding the spill; nor do the study

Com.	Topic	Issue	Sug.	Sort
27	5	0100		2

descriptions cite data or literature available on the resources under study. The "restoration study plan" on page 186 of the Draft Plan amounts to a one page summary that basically states that the data which will be gathered will be reviewed, and strategies, schedules, and plans developed. The discussion of the restoration plan in the Introduction (pp. 26-28) is also brief and vague. Both fall considerably short of what could and should be discussed to demonstrate that the trustees are prepared to take appropriate restoration actions.

Com.	Topic	Issue	Sug.	Sort
11	3	0108	X	1

Com.	Topic	Issue	Sug.	Sort
12	3	0151	X	1

There is no question that data gathering is of key importance in determining sound restoration techniques and for identifying resource injury and compensable damages. However, the Draft Plan discloses no real description of why each of these studies is necessary, the alternate studies or approaches that were considered and rejected, or how the studies relate to determining how much restoration will be needed. Perhaps these issues have been discussed by the trustees, but unless the details of these decisions are included in the Draft Plan, it is difficult to determine whether the studies are appropriate.

Com.	Topic	Issue	Sug.	Sort
13	3	0102	X	2

API recognizes that many of these studies are currently underway. However, it is not too late to reorient and revise the Plan to provide a more definitive, step-by-step approach toward implementing this effort. In this regard, API strongly advocates that the trustees reconsider whether the DOI Natural Resource

Com.	Topic	Issue	Sug.	Sort
14	3	0130	X	2

to next page

see p. 7

Damage Assessment (NRDA) regulations provide a better means of addressing the restoration of Prince William Sound.

II. The Trustees Have Failed to Employ the NRDA Regulations or Concepts Deemed Central To CERCLA In Preparing the Draft Plan

A. The Trustees' Indecision In Using The Approach Contained in the NRDA Regulations Has Had Counterproductive Results

In enacting the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) in 1980, Congress recognized that more information was needed regarding the potential environmental injury and economic damage associated with the release of oil and hazardous substances into the environment. CERCLA Section 301(c) required the President, acting through designated federal officials, to promulgate natural resource damage assessment regulations that identified "the best available procedures" to determine damage, "including both direct and indirect injury, destruction, or loss," taking into consideration factors "including but not limited to, replacement value, use value, and ability of the ecosystem or resource to recover."

see comment #14

The Department of the Interior, in promulgating regulations to implement this directive, codified in 1986, 1/ what it believed to be the "best available procedures," and although aspects of those regulations have been remanded to the Department

1/ 51 Fed. Reg. 27725 (August 1, 1986)

by the U.S. Court of Appeals for the District of Columbia Circuit in State of Ohio v. DOI, 880 F.2d 432 (D.C. Cir. 1989), the bulk of the assessment process contained in the regulations was upheld. These regulations provide a step-by-step guide to trustees in conducting damage assessments that would be accorded a judicial presumption of validity.

The trustees state at page 18 of the Draft Report that a decision whether to use the NRDA regulations has not been made. A relevant question, though, is whether the trustees have, in effect, made the decision not to use the regulations by commissioning and initiating studies prior to the preparation of the assessment plan. In 43 C.F.R. Section 11.30(a), trustees are instructed to delay any assessment methodologies until an assessment plan is developed.

API recognizes that there are provisions for conducting emergency restoration actions in 43 C.F.R. Section 11.21, 2/ and for sampling potentially injured resources during the preassessment phase to preserve data and materials that are likely to be lost if not collected prior to the completion of the assessment. See 43 C.F.R. Section 11.22. However, the Draft Plan fails to discuss either an emergency or other conditions

2/ However, this authority is limited to undertaking only those actions necessary to abate the emergency situation and the burden of showing the necessity and reasonableness of the costs is with the trustees.

see comment #14

that would support beginning (and completing some) studies prior to the finalization of the Plan.

see
comment # 14

In addition, by initiating many of these studies, the trustees have limited the opportunity of the public to comment on the Draft Plan and restricted the role any potentially responsible party (PRP) could have in the process. ^{3/} The regulations clearly contemplate PRP involvement before the sampling of natural resources and that this input should be more than the mere submission of written comments. Indeed, in light of the PRP's knowledge of the environment and conditions associated with a spill, PRP information could be very useful in preparing an assessment plan.

Com.	Topic	Issue	Sug.	Sort
15	5	0200	X	1

Com.	Topic	Issue	Sug.	Sort
16	3	0206	X	2

As noted earlier, a significant shortcoming of the Draft Plan is its lack of detail. Had the trustees followed the provisions in the regulations, there would have been determinations regarding:

- o sampling locations within the geographical areas affected,
- o survey designs, numbers and types of samples and the analyses to be performed,

Com.	Topic	Issue	Sug.	Sort
17	3	0102	X	2

^{3/} See 43 C.F.R. Section 11.32(a)(2) & (c).

- o procedures and schedules for sharing data, split samples and the result of analyses with PRPs or other trustees, and
- o estimation of the natural recovery period.

see comment #17

None of these considerations is adequately addressed in the Draft Plan.

Moreover, in making an economic methodology determination, the trustees were supposed to determine whether a restoration/replacement cost or a diminution of use value approach would form the basis of the measurement of damages. Arguably, the Draft Plan selects a restoration cost approach, although the majority of the studies deal with use values. Although, the court in State of Ohio indicated that CERCLA was primarily intended to achieve the restoration of natural resources and that DOI could not compel a trustee to select a methodology because it resulted in the lesser amount of damage, the court also indicated that a restoration cost approach may not be appropriate where restoration is infeasible or will result in unreasonable costs.

Com.	Topic	Issue	Sug.	Sort
18	3	0140	X	2

In 43 C.F.R. Section 11.35(c)(1), trustees are instructed to estimate and document the costs of restoration or replacement and the benefits gained by the restoration of the resource or

resource services. Such an analysis, if it had been undertaken in the Draft Plan, would be directly relevant to the pros and cons of using the restoration cost method and perhaps would have suggested that studies, other than those contained in the Draft Plan, were more appropriate and useful. However, without this analysis, there is little objective support for the trustees' selection of economic studies.

*see comment
#18*

The lack of meaningful analysis and discussion with regard to the sampling plans, economic methodological determination, or even the confirmation of resource exposure is at odds with the careful planning processes laid out in the NRDA regulations. One of the clear goals of the regulations was to identify the existence of relevant data and to limit additional data gathering to that which is reasonable and necessary to identify the magnitude of the injuries and the resource damages. By using these procedures, the trustees would ensure that the assessment process was both accurate and cost-effective.

Com.	Topic	Issue	Sug.	Sort
19	3	0130	X	2

API recommends that the trustees reconsider the Draft Plan and take the steps necessary to bring the Plan into conformity with the DOI regulations. This may require additional work or even new work, but in the long run it will result in a better assessment. There can be little doubt that additional detail and other revisions of the plan are needed and by using the NRDA

regulations as a guide, the trustees could substantially improve the quality of the plan.

B. The Plan Also Ignores Other Key Elements Of CERCLA And The NRDA Regulations That Would Avoid Miscalculations Of Environmental Injury Or Economic Damage

1. The Plan Appears To Address Resource Uses That Are Not Public

A number of the studies that have either been undertaken or planned relate to injuries or damages associated with private rather than public resources. Although the State of Ohio case indicated that a "public resource" may include resources that are not subject to direct "ownership" by the public or a trustee, the court did hold that CERCLA denies recovery for injured commercial resources or uses.

API recognizes that there is no simple distinction between the "public" and "private" uses of certain resources. In particular, with regard to studies of commercial fisheries, there may be elements of both public and private uses. However, some discussion of how the plan will differentiate between these uses and/or avoid the problem of the double counting of damages is needed. At a minimum, an acknowledgement of the need to make such a distinction would demonstrate the recognition that damage assessments should not be conducted to identify and quantify private losses.

Com.	Topic	Issue	Sug.	Sort
20	3	0132	X	2

API is not suggesting that commercial losses should go uncompensated or be ignored. However, such private interests are simply not encompassed within the compensation scheme of either CERCLA or the Clean Water Act (CWA). Instead, the means for the recovery for these losses are addressed by other statutory or common law authorities.

*see comment
20*

API maintains that the studies pertaining to fisheries require additional refinement to ensure that data gathering does not focus on private commercial losses. Again, the lack of detail associated with the study descriptions may be the source of API's apprehension and, with additional explanation, the concern can be alleviated. Nonetheless, the studies, as currently described, are subject to significant ambiguities that could result in the wasteful evaluation of resource injury or uses that are not compensable under CERCLA or CWA.

2. The Draft Report Does Not State That Only Committed Uses Of Resources Will Be Considered

One of the significant issues that was resolved in the favor of the DOI in State of Ohio was that CERCLA properly addresses only those resources with "committed uses." A committed use is defined under the regulations as:

either: a current public use; or a planned public use of a natural resource for which there is a documented legal, administrative, budgetary, or

Com.	Topic	Issue	Sug.	Sort
21	3	0140	X	2

financial commitment established before the discharge of oil or release of a hazardous substance is detected. 4/

The use of a "committed use" approach makes sense, because it prevents the expenditure of assessment costs to study resources for which damages will be speculative.

Nonetheless, a review of the Draft Plan fails to reveal any analysis of the various "potentially affected" resources from the perspective of their committed uses. This is an important oversight because it may result in a misallocation of assessment funds to study uses that were never contemplated.

The concept of committed uses should serve as an aid to the trustee in identifying the resources that should be studied and the extent of restoration or type of uses that are related to the resources. The Draft Plan should contain some analysis of the various resources that have been confirmed to have been exposed in relationship to their committed uses.

*see commit
21*

4/ See 43 C.F.R. Section 11.14.

III. Many Important Scientific and Economic Factors Are Inadequately or Improperly Addressed In The Plan

A. The Draft Report Appears To Assume Rather Than Confirm The Exposure of Resources To Spilled Oil

One of the important shortcomings of the Draft Report is its relatively generalized discussion of the resources that may have been exposed to spilled oil. There is no question that eyewitness accounts confirm that particular species of animals and birds were exposed to the oil. However, for a substantial number of other organisms and plants, actual exposure information is lacking.

Nonetheless, rather than seeking to first confirm exposure, the Draft Plan appears to assume that every resource in Prince William Sound and surrounding areas was exposed to the spilled oil. Although it is understandable that where a question of exposure is raised, the proper approach should be to undertake further investigation, it is not appropriate to assume exposure. At a minimum, the Plan should discuss the cost-effective means that the trustees will use to confirm the exposures for these "potentially affected" resources before undertaking more substantial environmental or economic studies about the resources.

For example, water column data collected by NOAA raise serious questions about the degree to which spilled oil may have

Com.	Topic	Issue	Sug.	Sort
28	5	0100		2

Com.	Topic	Issue	Sug.	Sort
22	3	0203	X	2

affected the marine environment below the upper level of the water column. If a substantial amount of the oil or oil constituents did not affect deep water environments or sink to the bottom of the Sound, then many of the studies discussed in the Draft Plan may be unnecessary. These data are not discussed in the Draft Plan; nor is there any mention in the study descriptions for bottom dwelling species that the trustees will confirm exposures to the oil before initiating more intensive studies of the species.

Although API strongly supports the pursuit of a "comprehensive" evaluation of the potential impacts of the oil spill, the level of intensity and the design of individual studies should be shaped by the extent and quality of the available data. This must begin with a objective discussion of the existing data or information about the spill that has been collected or assembled during cleanup efforts and the likelihood that various resources have been exposed. 5/ Where existing data cast doubt upon the exposure of certain resources, then studies should be designed to first, confirm that an exposure has occurred and second, to evaluate the impact of an exposure. Where an exposure cannot be confirmed, additional study should not be pursued.

*see comment
22*

5/ By "objective" discussion API means that the Draft Plan should evaluate the existing data in relationship to the likelihood of exposure. Currently the Plan contains a very conversational discussion of the spill and the affected resources. Far more precision and factual support is needed.

The studies described in the Draft Plan do not reflect such considerations. Therefore, the Plan should be amended to ensure the accuracy of the exposure confirmation.

B. The Baseline Measurements Are Not Well Designed

Throughout the Draft Plan, the trustees suggest that "pre-spill" conditions will serve as a "baseline" for the determination of environmental injuries and the computation of damage. Although historical conditions are clearly relevant to the determination of the possible injuries to the ecosystem of Prince William Sound, these factors must be properly utilized and are not necessarily the only factors to be considered.

Ecosystems are not static environments. Even in the absence of human impacts on the environment, there are natural forces that, in any one year, can affect the number of species in a particular location, the likely human uses (e.g. recreation, tourism, etc.) of the resources in the area, and the mortality of the individuals of different species. In marine and coastal regions, such as Prince William Sound, the temperatures, currents, rainfall and other climate-related factors in the Sound affect the population of seals, otters, fish, birds, and other animal and plant organisms. In addition, for the migratory species, conditions, and disruptions in other ecosystems can also have an effect on the Sound's wildlife. No single year is the

Com.	Topic	Issue	Sug.	Sort
23	3	0131	X	2

same as the previous year, although there may be patterns that have some relevance in estimating future conditions.

The use values of the Sound may also be affected by economic or other physical conditions that change over time. 6/ Tourism, recreation, and other human uses of the Sound are also related to factors that are dynamic rather than static.

The relative, rather than absolute, nature of both the environmental and economic factors that may affect the Sound must be taken into consideration in defining a "baseline" to assess the possible injuries and damages associated with the spill. Merely looking at "pre-spill" conditions does not reflect an appreciation of the complexity of these many factors. Nor does it indicate that the trustees or the studies will attempt to consider the natural variations in the ecosystem of the Sound in accordance with the conditions that are known to have occurred in the past and may occur in the future.

API believes that a proper determination of the baseline conditions is critical to an accurate and fair assessment of the injuries and damages associated with the spill. Based upon conversations with member company staff familiar with the Sound, API believes that much of the resource-related data in existence

6/ For example, general economic conditions throughout the Nation will greatly impact expected tourism whether within the U.S. or abroad.

*see comment
23*

prior the spill may be limited and ambiguous in meaning. Therefore, the trustees should consider developing baseline measurements on the basis of "control areas." These control areas should be selected on the basis of their comparability to the areas affected by the spill. The trustees could review the NRDA regulations for assistance in making these determinations. See 43 C.F.R. Section 11.72(d).

*see comment
23*

The Draft Plan does not adequately address the determination of baseline conditions with the degree of scientific sophistication that is needed to ensure reliable results. Since the determination of appropriate baseline conditions is critical to the end result of any restoration or compensation effort, trustees must amend the Draft Plan to state with specificity how these conditions will be determined and used.

C. The Draft Report And Studies Do Not Provide Ample Assurances That Injuries Will Be Scientifically Determined

A key element of any restoration plan will be the identification of the injured resources. Several aspects of the Draft Plan raise doubts about the potential accuracy of the assumptions and studies designed to determine the scope of natural resource injuries associated with the spill in Prince William Sound.

Com.	Topic	Issue	Sug.	Sort
24	3	1000	X	2

*This comment applies
from here through
p. 23*

First, the studies appear to be geared toward identifying the short-term or immediate effects of the spill and then, through the use of models or other predictive techniques, extrapolating these losses into the future. While API recognizes that modeling techniques and other "predictive" approaches may have some utility in determining the potential range of environmental impacts, API is concerned that such a "front-loaded" study approach, whereby short-term data are used to make long-term impact conclusions, has significant conceptual limitations which could overestimate the extent of resource injuries. The use of such an approach, therefore, should be very limited.

The Draft Plan does not discuss whether there are alternatives to these short-term analyses that would provide information useful in conducting restoration actions, but would also allow study to continue for certain resources over some acceptable time period. Since there is no real discussion in the Draft Plan regarding the time frames for resource recovery, see infra, the trustees do not appear to have considered whether a phasing of the analyses to account for dynamic changes in environmental conditions would be useful. Regardless, the margin for error in using a limited set of short-term data is evident from the caveats that DOI has noted regarding the use of the Type A coastal and marine damage assessment computer model, which

see
comment
24

predicts damage based upon certain immediate and short-term inputs. See 43 C.F.R. Section 11.33.

API believes that the Draft Plan should address the limitations and the steps that will be taken to avoid a misdirection of restoration resources due to inaccurate extrapolations from short-term impacts. Many resources, such as plankton or other organisms, may have undergone substantial recovery within a few months of the spill. An extrapolation to some future time period may be largely unnecessary. Other resources that would be expected to recover over short time periods may be amenable to the use of an extrapolation from short-term data because the potential impact of any errors in the short-term data would not be magnified over long time periods. However, where resources are expected to require longer time periods to recover, it is critical that any estimates of injury derived from extrapolations of short-term data be subject to close scrutiny and adjusted to account for the uncertainties associated with models being used. 7/

*see comment
24*

7/ The selection of an appropriate model must reflect a site-specific decision that takes into account the unique aspects of each environment affected by the spill. Models that, for example, assume linear recovery rates are not appropriate for conditions such as those which exist in Prince William Sound. Use of a model must always be balanced against the option of undertaking additional observations of the extent to which resources have recovered.

Second, the studies designed to evaluate the potential effects of the oil spilled into Prince William Sound do not reflect the fact that natural environmental forces may have significantly affected the toxicity or nature of the oil to which many organisms may have been exposed. The oil discharged was subject to drift, spreading, evaporation, dispersion, dissolution, emulsification, oxidation, and host of other factors that would "weather" the oil. The fate and effect of the oil exposed to these natural forces is a relevant consideration in any studies or determinations of the potential environmental injuries associated with exposure to the oil. Unfortunately, the Draft Plan fails to take adequate consideration of such factors and indeed, certain of the studies suggest that fresh crude oil will be used to determine potential environmental impacts.

*see comment
24*

API believes that such fate and effects considerations should be taken into account in conducting toxicological and similar studies. The NRDA regulations indicate that, in conducting such studies, the same or equivalent substances as those released should be used in determining potential environmental injuries. Accordingly, the Draft Plan should be amended, or at the least expanded, to discuss the feasibility of conducting such analyses. Experiments based upon worst-case assumptions should be avoided or the results of such studies should be subject to specific qualifications in their use.

D. The Use Of A Restoration Approach Will Impact The Determination Of Economic Losses

Com.	Topic	Issue	Sug.	Sort
25	3	2200	X	2

*This comment
applies to the
supper 2/3 of p. 25 too*

Although the comprehensiveness of the trustees' plan for determining an appropriate restoration plan for the affected resources has already been discussed, API believes that the commitment to gear the plan toward restoration has certain ramifications that are not adequately addressed in the economic studies being proposed or underway. In particular, this approach concerns the study of "intrinsic values."

The court in State of Ohio upheld the DOI's consideration of passive use or non-use resources values, such as option and existence values. The court also upheld the use of certain techniques, such as contingent valuation, in establishing the damages associated with such values. Nonetheless, the trustees' avowed intent to pursue a restoration-based approach must be consistent with any studies to establish the values.

Both option and existence values represent subjective estimates of values that are associated with the knowledge that a resource is there, but may not be immediately or ever used. When such resources are no longer in existence, then a frame of reference regarding a lost opportunity or a lost value is most easily established. However, when there is an intent or plan to restore or replace the resource, then the determination of these

values is more complicated. For example, how is existence value determined when a person who, by definition, will never use the resource, but merely wants to know it exists, is told that the resource temporarily will not exist today, but will exist again in the near future? Or, is a person who has an option to use a resource in the future injured if the resource does not exist today but will exist (and, could be used) in the near future?

These esoteric questions are made relevant by the trustees' intent to conduct studies into intrinsic values. Since the study descriptions are so brief, it is impossible to determine how the studies will be designed to be consistent with the restoration approach that will be pursued in the Draft Plan. Without belaboring these points, API believes that more specificity is needed in the description in the design and goal of these studies. The measurement of option and existence values remains a matter that is subject to considerable controversy in the economic community and greater detail is needed to ensure that the studies are designed in a manner consistent with goals of the Draft Plan.

*see comment
#25*

IV. The Draft Plan Does Not Adequately Address The Role Of Natural Recovery In The Restoration Of Natural Resources Or Determination Of Damages

One of the factors that would be addressed were the trustees to follow the NRDA regulations in preparing the assessment plan, would be a determination of the resource "recovery period." 40

Com.	Topic	Issue	Sug.	Sort
26	3	0105	X	2

*This comment applies
to p 26 and p 27 too*

C.F.R. Section 11.31(a)(2) Although the propensity of a natural resource or ecosystem to recover is an express consideration in CERCLA Section 301(c), the Draft Report fails to devote much more than a cursory discussion of the role it may play in the process. Indeed, notwithstanding the \$ 35 million earmarked for study of the spill, there are no funds devoted to determining the impact or effect of natural recovery in restoring the environment.

In reviewing the considerable literature and research associated with oil spills, API observes that the biodegradability of oil coupled with the ability of natural resources to recover from the exposure to petroleum, represents a major factor in the identification of appropriate restoration actions. For example, in the case of the Amoco Cadiz spill, which involved seven times more oil than the volumes discharged in Prince William Sound, the marshes and environment of the Brittany Coast recovered naturally within a 4-5 year period. See Appendix A. The empirical evidence of the favorable effect that the forces of natural recovery can have to abate the damage associated with oil spill cannot be overlooked in any assessment plan.

API has attached to these comments references that address the impact that natural recovery can have on any ecosystem affected by an oil spill. See Appendix B. These sources and information should be discussed in the Draft Plan, especially

*see comment
26*

insofar as a restoration approach will be pursued by the trustees for Prince William Sound. At a minimum, the assessment plan should attempt to determine the role that natural recovery may play in the restoration of this environment and the effect that it could have on both the longer term environmental injuries and economic damages associated with the Exxon Valdez spill.

see comment
26

Comment 27 is
on p 6.

Comment 28 is
on p. 16.



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EXXON VALDEZ OIL SPILL
TRUSTEE COUNCIL
ADMINISTRATIVE RECORD

Dear Trustees:

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

Com.	Topic	Issue	Sug.	Sort
1	2	0100		2

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

Com.	Topic	Issue	Sug.	Sort
2	3	2290		2

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

Com.	Topic	Issue	Sug.	Sort
3	4	2290		2

Cercla Trustee Council
October 31, 1989
Page 2

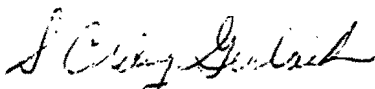
agencies both have a legal mandate to protect cultural resources, the need to provide funding sufficient to implement this mandate must be considered in more detail.

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

Com.	Topic	Issue	Sug.	Sort
4	2	2260		2

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

Sincerely,



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

sao

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

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

October 30, 1989

Trustee Council
 Box 20792
 Juneau, AK 99802

Dear Trustees:

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

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

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

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

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

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 JAN 11 1994

EXXON VALDEZ OIL SPILL
 TRUSTEE COUNCIL
 ADMINISTRATIVE RECORD

Com.	Topic	I	Sug.	Sort
1	3	1000	X	1

Com.	Topic	Issue	Sug.	S
2	3	0150	X	2

Com.	Topic	Issue	Sug.	
3	1	2200	X	1

Com.	Topic	Issue	Sug.	
4	3	2210	X	2

Trustee Council
October 30, 1989
Page 2

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

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

Sincerely,

CITY OF KODIAK



Gordon J. Gould
City Manager

GJG:WC/keh

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



77 DuLac

PO Box 202045
Anchorage, AK 99520
October 30, 1989

Trustee Council
PO Box 20792
Juneau, AK 99802

Dear Council Members,

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

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

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

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

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

Com.	Topic	Issue	Sug.	Sort
1	3	2290	X	2

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

Com.	Topic	Issue	Sug.	Sort
2	3	2260	X	2

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

Com.	Topic	Issue	Sug.	Sort
3	4	2200	X	2

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

Trustee Council
page 2

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

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

Com.	Topic	Issue	Sug.	Sort
4	2	2290	X	2

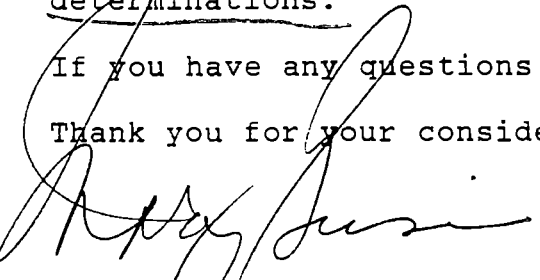
NPCA urges that the Trustee Council reconsider its responsibilities under Section 106.

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

Com.	Topic	Issue	Sug.	Sort
5	3	0200	X	2

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

Thank you for your consideration,


Mary Grisco
Alaska Regional Representative

Katherine G. Halgren
167 N. W. 73rd St.
Seattle, WA 98117
(206) 782-0763
October 30, 1989

Trustee Council
Natural Resource Damage Assessment Plan
PO Box 20792
Juneau, Alaska 99802

via FAX (907) 278-7022

Dear Trustee Council:

In response to the August 1989 Public Review Draft of the State and Federal Natural Resource Damage Assessment Plan (Plan), I offer the following thoughts and comments:

My primary concern is for the human inhabitants in the immediate spill zone. The Plan mentions "Terrestrial mammals near the coast where exposed to hydrocarbons by breathing fumes...."[1]; the human aspect has only been addressed with regard to economic value and resource use. Can we afford to ignore this exposure to humans?

Com.	Topic	Issue	Sig	Cal
1	3	0113	X	2

"Trustees also may recover the cost of assessments to determine injury to the resource and the dollar value required as compensation for that injury, 42 USC 9607(a)(4)(C)"[2] The Plan does not address Part(D) of 42 USCA 9607(a)(4) as it pertains to the people living in the area at the time of the spill and those actively involved in the emergency response.

North Slope crude "naturally contains significant quantities of toxic metals including vanadium, nickel, chromium, and zinc. The oil is also highly toxic because it is about 25 percent aromatics, which are generally considered the most toxic hydrocarbon components. As it degrades through physical, chemical, photochemical and biological processes, additional toxic materials are likely to be generated."[3]

What effects did the attempted burnings have on the air and was there any injury to the people of Tatitlek? Why were pregnant women evacuated while others were left to experience the ill affects of the burning techniques and dispersants which caused death on beaches at Elamar and Tatitlek (starfish, mussels, etc). No oil contamination was found but these beaches are located close to areas used for dispersant trials in the early days of the spill. Surely the health of the people should be studied to watch for possible long term effects on dispersants on the human populations.

I would like to encourage the trustees to continue studies beyond February 28, 1990 with as many inquiries as possible. As the Draft states, "Hundreds of miles of coastlines and islands along this route have received oil from this discharge, and large quantities of oil remain at sea." [4] The spill is still very dynamic as headlines five months after the incident proclaim "Massive bird die-off" hits gulf" [5]. Throughout the Plan there are references to the uncertainty of the effects of the spill over time. Any one of the following should be justification enough to continue:

Com.	Topic	Issue	Sug.	Sort
2	4	0201	X	0

"...the stranded oil may persist for decades." [6]

"oil is likely to be moved deeper into the fjords rather than being flushed out....The potential exists for the oil released in the "Exxon Valdez" incident to persist in and on these Prince William Sound coastlines for many years." [7]

"Herring do not return to their natal areas to spawn until they are at least three years old." [8]

"...could result in lower returns of adult fish in 1991." [9]

"The production and survival of the 1989 [salmon] fry from all of these species are at risk, as is the spawning success of adults returning in the fall of 1989." [10]

"...possibility of delayed population effects in some species." [11]

Participation in this assessment by potentially liable parties should be minimal. It is a little like asking the fox how many chickens are left in the chicken coop.

Com.	Topic	Issue	Sug.	Sort
3	1	0207	X	1

Exxon's research tends to disagree with the general scientific community as experienced at the Conference on the Alaska Crude Oil Spill and Human Health, held on July 29,30, 1989 in Seattle, Washington.

The chronology in the Plan also shows Exxon's bias. "This action was successful, but there was not enough equipment left to contain the oil or protect other areas" [12] is absolutely untrue. Citizens were able to locate boom one week later; all that was needed was a purchase order for the equipment to be shipped on a flight arranged by Ted Billings from Alaska State Senator Kertulla's office.

A week after that shipment there was still equipment available in Seattle and Anchorage. It was only lack of purchase that kept equipment in warehouses and vans rather than containing or removing the oil.

I would like to see the following points added to the chronology:

The quantity of oil intentionally pumped from tanks aboard the "Exxon Valdez" in attempts to float the crippled vessel, a listing of which tanks, especially non damaged tanks, and the time at which the pumping started.

The location and time where the ballast water from the "Exxon Baton Rouge" was pumped prior to lightering crude oil from the "Exxon Valdez."

A list of chemicals used in attempts to burn or disperse the oil, as well as locations of the tests so that potentially toxic effects to natural resources can be monitored.

The refusal of assistance from the Russian Oil Skimmer in the first week when it would have been very effective removing oil from the water.

Com.	Topic	Issue	Sug.	Sort
4	3	0109	X	2

When reviewing all the facts on this tragedy please keep in mind one sentence: "At 70 hours - the point at which the (contingency) plan stated a spill of more than 200,000 barrels would be picked up - no more than 3,000 barrels had been recovered." [13]

Thank you for considering my input for the implementation of the Plan.

Very truly yours,

/s/

Katherine G. Halgren

References:

- [1] Plan, P. iii Para 1
- [2] Plan, P. 16 Para 2
- [3] Plan, P. 233 Para 2
- [4] Plan, P. 239 Para 2
- [5] Oil Spill Chronicle Vol. 1 No. 8, August 29, 1989, Valdez AK.
- [6] Plan, P. 13 Para 1
- [7] Plan, P. 13 Para 3
- [8] Plan, P. 15 Para 2
- [9] Plan, P. 15 Para 3
- [10] Plan, P. 15 Para 4
- [11] Plan, P. 15 Para 5
- [12] Plan, P. 8 Para 6
- [13] State of Alaska Winter Operations Plan 1989-1990 Initial Response to the Spill under the subtitle "Was Help Really on the Way?" Paragraph 2

**Kodiak
Area
Native
Association**



402 Center Avenue
Kodiak, Alaska 99615
Phone (907) 486-5725

79

DULAC

October 27, 1989

The Trustee Council
Post Office Box 20792
Juneau, Alaska 99802

To Whom It May Concern:

On behalf of the Kodiak Area Native Association we would like to introduce ourselves for further involvement.

Due to the economic and social impact in our seven villages on Kodiak Island it is imperative that the study concerning the impact within our Native communities be developed as soon as possible. This study will help ensure us that no further loss will be felt in our heritage or subsistence way of life.

Com.	Topic	Issue	Sig.	File
1	1	2260	K	2

Sincerely,

KODIAK AREA NATIVE ASSOCIATION
GARY N. ARENSON, PRESIDENT

August Aga, Oil Spill Coordinator

P.O. Box 7
Moose Pass, Alaska 99631
(907) 288-3667

12 September, 1989

Dear Sirs:

Alaska Aquafarms Incorporated (AAI) operates an oyster farm at Fairmount Island, Prince William Sound. We have read Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill August 1989 and offer the following comments and suggestions.

Research from the Amoco Cadiz spill offers a myriad of information on the effects of oil on oysters. It is clear that the affects are highly variable depending on the type of oil, concentrations and lifestage of the animals. It would benefit AAI if a study could be done in vitro to determine the effects of various concentrations of Prudoe Bay oil on juvenile oysters (20mm to 60mm).

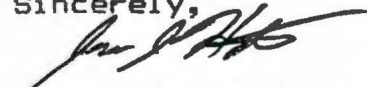
We were successful in containing our operation with booms after the spill and our exposure to oil, to our knowledge has been minimal. The claim we have with Exxon is the loss of growth and mortality associated with keeping the animals behind a boom with essentially little or no flow. It is unclear at this point how Exxon perceives this claim. Regardless, we would like to add a test to the project proposed in the Assessment plan (Fish and Shellfish Study Number 16) to attempt to mimic the conditions the oysters were under this spring. Fortunately we have 3 years of monthly growth measurements to use as a baseline. The Alaska Department of Fish and Game assures us it could accomodate this parameter in the study.

It is unfortunate that this study was not carried out this summer. Implementing the study in the fall is worthy but belated. It is equally dissapointing that the MAC group out of Cordova did not follow the sampling routine as promised this spring. We can never recover the loss of these tests.

It is important to note that mariculture and other similiar activities are likely to increase in this region and shellfish such as oysters are ideal sentinell organisms. Secondary contamination from fishing vessels and ballast are : a growing concern. Studies concentrating on low level chronic exposure and their effects on shellfish would be valuable.

AAI is appreciative that this study will be funded. We will be more than willing to assist in whatever capacity necessary to insure the project is successful.

Sincerely,



James "Jeff" Hetrick
President

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JAN 11 1994

EXXON VALDEZ OIL SPILL
TRUSTEE COUNCIL
ADMINISTRATIVE RECORD

Com.	Topic	Issue	Sug.	Sort
1	4	1570		1

Com.	Topic	Issue	Sug.	Sort
2	3	1460		1

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(907) 263-7219

September 22, 1989

Trustee Council
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Juneau, AK 99802

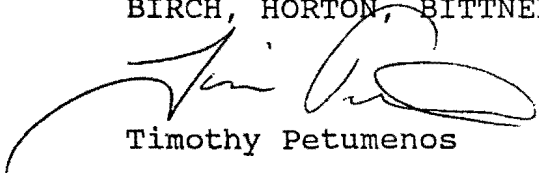
Gentlemen:

As one of the Co-Chairman of the Damages Committee of the Plaintiffs' Coordinating Committee, representing all private party litigants in the coordinated proceedings before Judges Holland and Shortell in Anchorage, we wish to advise you that we have received a copy of the Draft Natural Resource Damage Assessment Plan and Restoration Strategy for the Exxon Valdez Oil Spill. We intend to review this and provide comments. However, given the size and significance of the plan and the breadth of the studies identified in it, we request a 30-day extension of the comment period from September 30 to October 30, 1989.

This request is made in accordance with 43 C.F.R. 11.32(c)(1) of the Natural Resource Damage Assessment Regulations. Your prompt response will be appreciated.

Very truly yours,

BIRCH, HORTON, BITTNER & CHEROT


Timothy Petumenos

TP:srb