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EMNON VALSEZ CU. SPILL 70 TRUSTER COVECH. ADMINISTRATIVE RECORD

JESS LANMAN 2600 FAIRBANKS ST. ANCHORAGE, AK 99503

OCTOBER 27, 1989

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

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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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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 <u>alone</u> have not only the motivational factor, but the <u>uncompromising integrity</u> 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 <u>alone</u> 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

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damages, not only immediately, but for an indeterminate future (not only health, food, clothing, and economic but <u>genetic</u>) and with no recourse or control over our destiny other then 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 LANMÁN

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EXXON VALUEZ ON SPILL TRUSTER COUNCIL 74 ADMINISTRATIVE RECORD

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

G. William Frick Vice President and General Counse!

October 27, 1989

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 <u>Exxon Valdez</u> 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,

& William Frich

Attachment

An equal opportunity employer

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

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

October 30, 1989

For More Information Please Contact:

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

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APPENDICES

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### COMMENTS OF THE AMERICAN PETROLEUM INSTITUTE ON

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"DRAFT NATURAL RESOURCE DAMAGE ASSESSMENT PLAN AND RESTORATION STRATEGY FOR THE EXXON VALUEZ 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 <u>Exxon Valdez</u> 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.

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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, wellorganized, 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.

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

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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 2

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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-bystep 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

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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:

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

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

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- Use of existing data and study design to confirm
  resource exposure to spilled oil before undertaking
  additional studies of the resource;
- Identification of baseline resource measurements that reflect the dynamic nature of Prince William Sound;
- Qualifications in the use of models to extrapolate
  long-term injuries from data collected over very short
  time periods;
- 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,
- 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.

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















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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.

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# 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

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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.

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.

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

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

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## 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."

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

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

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by the U.S. Court of Appeals for the District of Columbia Circuit in <u>State of Ohio v. DOI</u>, 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.

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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. <u>See</u> 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.

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that would support beginning (and completing some) studies prior

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.

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:

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

<u>3/ See 43 C.F.R. Section 11.32(a)(2) & (c).</u> -10-

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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.

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 <u>restoration/replacement cost or a diminution of use value</u> 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 <u>State of Ohio</u> 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.

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

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. : . 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.

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.

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

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

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## 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 <u>State of Ohio</u> 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.

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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.

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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 <u>State of Ohio</u> 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 -14-

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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. 200 cmmt # 21

<u>4/ See</u> 43 C.F.R. Section 11.14. -15-

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

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# 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

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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.

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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. <u>5</u>/ 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.

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.

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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.

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B. The Baseline Measurements Are Not Well Designed

Throughout the Draft Plan, the trustees suggest that "prespill" 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

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

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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.

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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).

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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

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William Sound.

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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 "frontloaded" 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.

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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, <u>see infra</u>, 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

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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/

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<sup>7/</sup> The selection of an appropriate model must reflect a site-specific decision that takes into account the unique aspects of each enviornment 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 cil spilled into Prince William Sound <u>do not</u> reflect the fact that natural environmental forces may have <u>significantly affected the toxicity or nature of the cil to which</u> many organisms may have been exposed. The cil discharged was subject to drift, spreading, evaporation, dispersion, dissolution, emulsification, oxidation, and host of other factors that would "weather" the cil. The fate and effect of the cil exposed to these natural forces is a relevant consideration in any studies or determinations of the potential environmental injuries associated with exposure to the cil. Unfortunately, the Draft Plan fails to take adequate consideration of such factors and indeed, certain of the studies suggest that fresh crude cil will be used to determine potential environmental impacts.

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.

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

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 <u>State of Ohio</u> 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

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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

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

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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 <u>Amoco Cadiz</u> 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. <u>See</u> 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. <u>See</u> Appendix B. These sources and information should be discussed in the Draft Plan, especially

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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 <u>Exxon Valdez</u> spill.

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National Trust for Historic Preservation

October 27, 1989

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

## Re: Draft Natural Resource Damage Assessment <u>Plan - Exxon Valdez Oil Spill (August, 1989)</u>

Dear Trustees:

The following comments are submitted by the National Trust for Historic Preservation in the United States (the National Trust) in response to the draft State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill (the Draft Plan), prepared by the Trustee Council for public review. The National Trust commends the cooperative efforts of the State of Alaska, the U.S. Department of the Interior, the U.S. Department of Agriculture, and the U.S. Department of Commerce, in undertaking this comprehensive assessment, and hereby provides its comments on the portion of the Draft Plan dealing with injury to archaeological resources.

The National Trust is the congressionally chartered private nonprofit organization with over 225,000 members nationwide, which is charged with facilitating public participation in the preservation of the Nation's historic and cultural resources. The National Trust has a strong commitment to the preservation of our nation's irreplaceable archaeological sites and resources, the protection of which is critical to our ability to understand and learn about our past. For example, most recently, the National Trust has been working to secure passage of federal legislation designating the West Mesa petroglyphs near Albuquerque as a National Monument, in order to protect this unique archaeological resource. Congress has expressly recognized the importance of archaeological resources in enacting statutes such as the Archaeological Resources Protection Act, 16 U.S.C. § 470aa et seg., which protect archaeological resources on federal lands from loss and destruction, and the National Historic Preservation Act, 16 U.S.C. § 470 et seq., which requires federal agencies to consider the effects of their actions on historic properties.

On March 24, 1989, the tanker Exxon Valdez spilled 11,000,000 gallons of crude oil into the waters and onto the coastline of Prince William Sound, Alaska, causing devastating harm to that region's natural resources, and precipitating one of the

> 1785 Massachuserts Avenue, N.W. Washington, D.C. 20036 (202) 673-4000

Trustee Council October 27, 1989 Page 2

largest, most costly clean-up efforts ever undertaken. The damage assessment process described in the Draft Plan seeks to identify the studies necessary to determine the extent and magnitude of this injury, and the corresponding damages. Adequately identifying the extent of the injury is a critical step in developing strategies for restoring or obtaining reparation for these lost resources under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

Under the Draft Plan, the injured natural resources are divided into six resource categories (coastal habitat, air/water, fish/shellfish, birds, marine mammals, and terrestrial mammals), and a number of studies are recommended to assess the damage to each category. Each separate study is assigned its own budget, and the agencies responsible for undertaking or participating in each of the studies are identified. These studies are cumulatively allocated approximately \$ 27 million.

After the injury to all categories of natural resources is quantified, the next step of the damage assessment process is to determine the economic value of the loss or injury to the natural resources. The Draft Plan describes nine "economic use" studies designed to measure the value of "services" provided by the various categories of natural resources (commercial and subsistence uses, recreation, research, intrinsic value, etc.) which provide the models used to measure the economic damages caused by the oil spill. The impact of the oil spill on archaeological resources is assessed as one type of economic use. These "economic use" studies are not assigned a lead agency, presumably because they assess the economic losses of several different types of natural resources, nor are they assigned separate budgets. The cumulative budget allocated to these studies is \$ 2.8 million.

We are pleased that the Trustees have included in the Draft Plan a provision for studying the impact of the oil spill on archaeological resources. It is clear that the spill has had a devastating impact on these sites. For example, archaeological sites containing fire-cracked rock slate fragments, slate tools, and whale tooth fragments from early pacific eskimo cultures dating back to the first millennium were discovered in the areas overlooking McArthur Pass and Ragged Island, many of which were injured by the oil spill, and further threatened by clean-up activities.

We believe that the Draft Plan is flawed, however, due to its

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failure to address the impact of the oil spill on archaeological resources as a type of natural resource rather than as an "economic use" of natural resources. As will be discussed further below, classification of archaeological resources as a "natural resource" is important for several reasons. First, archaeological resources are tangible, publicly-owned resources that are properly classifiable as "natural resources." This classification will enable the extent of this injury to these irreplaceable resources to be more comprehensively studied in the injury assessment phase of the process. By contrast, classification of archaeological resources as one type of "economic use" of resources deprives archaeological resources of the benefit of all applicable economic models for measuring damage to natural resources. Finally, we suggest a number of specific changes that should be made to the proposed studies in the Draft Plan to ensure that the injury to archaeological resources, and the associated economic damages, are adequately assessed.

## Archaeological Resources Are "Natural Resources"

As the Draft Plan indicates, archaeological sites on the coastline area of the Prince William Sound and Gulf of Alaska include petroglyphs and pictographs (rock or cave drawings), weirs, and submerged stratigraphy. These sites clearly fall within the broad definition of "natural resources" under CERCIA. See 42 U.S.C. § 9601(16). First, they are owned either by the federal or the Alaska government. Moreover, archeological sites are tangible, physical resources that include "land" and "biota" such as rocks, shells, pollen grains, animal bones, carbonized seeds, wood samples, and a whole host of other materials. These are "natural resources" in the traditional sense that also, if properly studied, can provide important information about human history that is undocumented in any other way.

The far larger budget allocated to the "injury determination" phase of the damage assessment process reflects that assessing the nature and extent of injury to natural resources is by far the most complex and important aspect of the damage assessment process. Accordingly, it is important that archaeological sites be properly classified as a natural resource in order to ensure that the injury to these resources is accurately assessed, by the appropriate agencies with a specific budget.

Moreover, a comprehensive assessment of injury to archaeological resources is an inherently valuable process, since Alaska's coastlines have been largely untouched and contain a veritable

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neither surveyed nor identified by the Alaska State Historic Preservation Office. Those resources that have not already been harmed by the oil are facing continued, and greater, threats of destruction or looting as a result of the ongoing clean-up activities. Adequate, comprehensive identification of these resources may be the most important contribution to the ultimate goal of protecting and preserving archaeological resources from further injury, as well as assessing the extent to which they have been already harmed.

On the other hand, assessing damages to archaeological resources only in the context of one of the studies designed to determine the economic value of lost resources will not result in an accurate measurement of monetary damages caused by the loss of archaeological resources. The primary value of these resources is intrinsic, not economic. The injury to and loss of archaeological resources, like other natural resources, is best measured by including this injury as an objective of several economic use studies, such as the study to determine the loss of intrinsic value of natural resources (Economic Uses Study Number 7), or the study to assess the loss of research programs or investigations (Economic Use Study Number 8). Moreover, inasmuch as measuring damages resulting from the spill involves a comparison with a "base-line" (i.e. pre-spill level) of use, a thorough process of identifying the injury to archaeological sites must first be undertaken in order to ensure that that economic damages caused by the spill are accurately measured.

#### Assessing Injury

In designing studies to carry out the injury identification/ quantification process, we offer the following comments. First, we suggest that the Damage Assessment Plan specifically identify the Alaska State Historic Preservation Office (SHPO) as the Lead Agency for coordinating archaeological injury assessment studies. The Alaska SHPO is the agency most knowledgeable about the existence and significance of archaeological sites in the affected area, as part of its statutory responsibility under federal and state law as guardian of these resources. 16 U.S.C. § 470a. Indeed, the SHPO has already played an important role in mitigating harm to these resources caused by the oil spill clean-up activities. In addition, federal agencies that manage federal lands affected by the spill (e.g., National Park Service, Bureau of Indian Affairs, Bureau of Land Management), Λ.

and land managing state agencies, should be assigned appropriate ' responsibility for carrying out assessment activities affecting lands under their jurisdiction or control.

Second, we suggest that the injury to archaeological sites from oil spill clean-up activities, as well as injury from the oil itself, be made part of the injury assessment process. For example, the use of high-pressured hot water as part of the initial oil spill clean-up effort may have damaged archaeological sites, and the vastly increased human presence in these areas as part of the clean-up effort has resulted in the unauthorized removal of archaeological resources. Even the process of studying and assessing the injury to other natural resources in carrying out the Damage Assessment Plan may disturb fragile archaeological sites. These injuries are causally related to the oil spill and should be assessed as well.

#### Measuring Economic Damage

We believe that the unique value of archaeological resources requires changes in the proposed economic use studies in order to measure adequately the damages resulting from their loss. The value of lost or injured archaeological resources simply cannot be measured by the cost of restoring or replacing these resources. In contrast to traditional natural resources, archaeological sites cannot be regenerated by breeding, planting, or purification. Once lost, they are irreplaceable, and once injured, they cannot easily be restored. Nor does their economic value stem from the "services" these resources provide to humans, since archaeological resources are optimally "used" by leaving them undisturbed. Hence, the "intrinsic value" (Economic Use Study Number 7) and the "research value" methodologies (Economic Use Study Number 8) provide the most helpful starting points for measuring damages. However, these methodologies require some modifications to measure adequately the loss of archaeological resources.

For example, the proposed economic use study for assessing damage resulting from research investigations and programs (Economic Use Study Number 8) limits the loss to research-based expenditures made or committed to before the oil spill. In the case of archaeological resources, however, few if any research studies had been planned prior to the spill for the simple reason that research studies to inventory and collect data on

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archaeological resources frequently do not become necessary until the archaeological resources are threatened with loss or destruction. Thus, the threats to these resources from the oil spill, and the oil spill clean-up activities may make necessary studies not previously contemplated. Accordingly, we suggest that this economic use study focus on resource-based expenditures that are themselves necessitated by the oil spill, as well as studies planned or begun before the spill.

The "intrinsic valuation" study (Economic Use Study Number 7) is best suited for valuing the loss of resources, such as archaeological sites, whose value does not lie in providing services or uses for humans. This valuation methodology should specifically refer to archaeological resources, and should specifically address the need to develop "contingent valuation" methodologies to determine the value of resources the extent of which, by their very nature, humans had been largely unaware.

In devising methods and analyses for each of the economic use studies, we urge you to explore and incorporate into those studies some alternative analytical models that have already been developed to determine the value of archaeological resources. One such valuation methodology is contained in the regulations developed by U.S. Department of the Interior under the Archaeological Resources Protection Act, which include methodologies for determining the commercial (i.e. fair market) value of archaeological resources, the lost "research" value, and the costs associated with restoration and repair of injured archaeological resources. See 43 C.F.R. § 7.14.

#### Compliance with Federal Historic Preservation Laws

As a final note, we urge you to consider the costs of complying with and enforcing federal historic preservation laws, such as the Archaeological Resources Protection Act, 16 U.S.C. § 470aa <u>et seq</u>., which prohibits the unauthorized removal of archaeological resources from federal lands, and Section 106 of the National Historic Preservation Act, 16 U.S.C. § 470f, which requires federal agencies to consider the effect of their undertakings on historic and archaeological resources, and, in consultation with the Advisory Council on Historic Preservation, to study ways in which to avoid or mitigate adverse impact. In particular, compliance with Section 106 may be required in connection with the damage assessment process itself, which

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employs sampling and study techniques that may harm historic resources.

#### <u>Conclusion</u>

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In conclusion, the National Trust strongly urges the Trustee Council to strengthen the draft Damage Assessment Plan to assess more comprehensively and accurately the extent of injury to and loss of archaeological resources, and the damages associated with restoring these resources or compensating the public for their loss. The study contained in the Draft Damage Assessment Plan is a step in the right direction, but it is not strong enough.

The National Trust intends to continue monitoring this project, in light of the strong level of public interest in preserving and protecting archaeological resources among our constituency. We would appreciate being notified of the Trustee Council's issuance of a final Damage Assessment Plan. In the meantime, if the National Trust can be of any further assistance, please do not hesitate to contact us.

Sincerely, Jackson Walter resident

cc: Judith Bittner, Alaska SHPO John F. W. Rogers, Chairman, Advisory Council on Historic Preservation James Ridenour, Director, National Park Service Kathryn Burns, Director, Western Regional Office, NTHP



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## National Audubon Society

NATIONAL CAPITAL OFFICE

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October 27, 1989

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

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Dean Collinsworth Commissioner Alaska Department of Fish and Game P.O. Box 3-2000 Juneau, Alaska 99802

Re: Comments on State/Federal Natural Resource Damage Assessment <u>Plan for the Exxon Valdez Oil Spill (August 1989</u>)

Dear Members of the Trustee Council:

These comments on the Public Review Draft of the State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill (August 1989) (Draft Plan) released last summer by the Trustee Council are submitted on behalf of the National Audubon Society and Tri-State Bird Rescue & Research, Inc.

Audubon is a non-profit conservation organization with over one half million members, 4,500 of whom reside in Alaska. Audubon is dedicated to conservation of natural resources and protection of the natural environment. Audubon has an office in Anchorage, Alaska where its staff has worked to preserve Alaskan wildlife and wildlife habitat. Audubon has many programs to study, protect and enhance habitat along the Pacific Flyway for several of the bird species that migrate through Prince William Sound.

Recycled Paper

Tri-State Bird Rescue & Research is a multi-disciplined group of biologists, veterinarians, government agents, chemists, and statisticians formed in 1977 to study the effects of oil on birds and to implement the necessary measures to deal with affected widlife. Tri-State operates a fulltime wild bird rehabilitation/research center in Delaware. The organization conducts research, trains both professionals and volunteers in wild bird rehabilitation, and maintains a 24-hour-a-day oil spill response capability. A list of some of the published research by the organization is enclosed with their comments.

This letter contains the general comments of both organizations on the Draft Plan. More detailed comments prepared by the staffs of both organizations on the specific proposed studies, especially on the proposed "birds injury assessment," are set forth in an enclosure to this letter.

When an agency releases a document for public review and comment sufficient information must be set forth in that document for meaningful public comment. Section 553 of the Administrative Procedure Act (APA), 5 U.S.C. Sec. 553., sets forth the minimum standards an agency must follow for public notification of proposed rulemaking. The Draft Plan is a "rule" within the meaning of Section 551(4) of the APA, 5 U.S.C. Sec. 551(4). At minimum, the APA requires that the public must be apprised of the "terms and substance" of the proposed rule or given "a description of the subjects and issues involved." 5 U.S.C. Sec. 553(b)(3). The Draft Plan falls far short of this legal standard.

Our general comments are set forth below:

1. The Draft Plan contains insufficient information even for the most imaginative reviewers. This has been compounded by the unwillingess of the Trustee Council to make underlying data, more explicit study design, and experts available to our experts. Had the process been more open, deficiencies in the information disclosed in the Draft Plan might have been cured, and our comments less harsh. Because it was not, many of our comments are based on inference; while others raise questions that might have been avoided or address concerns that may now be moot.

The dearth of information created serious problems for the technical reviewers in our two organizations. For example, our reviewers had to assess the adequacy of proposed studies that did not identify the individual(s) or organization(s) conducting the proposed work, contain an implementation schedule for study completion, nor describe what of the

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work had already been accomplished. Descriptions of experimental methodology were sparse at best; most were lacking sufficient information to allow assessments of their merits. It is even unclear from the Draft Plan what, if any studies have been undertaken, let alone completed to date. The sparse information made it equally difficult to assess the adequacy of the proposed study budgets.

2. The proposed termination date (February 28, 1990) is unacceptable because many of the studies described in the Draft Plan will be unable to complete data acquisition by that date. We do not advocate "long-term research" here for the sake of long-term research. Rather, we insist that the research proposed in the Plan be realistic in its expectations about the time scale of ecological impact, and that sufficient investment in time and resources be made to accomplish the research goals as outlined in the Draft Plan's introductory remarks. The Trustee Council should propose individual termination dates for the various studies based upon a scientific determination of the length of time required to assess the projected impacts being studied, and not upon other considerations, such as available funding.

3. The selection of an economic value standard for natural resources that is based upon the "goods and services" these resources provide humans is unsupportable in law and science. While it is generally recognized that it is extremely difficult to place an economic value on wildlife or ecosystems, this does not justify the selection of a method of valuation that will significantly undervalue natural resources, as has been done in the Draft Plan.

Application of this standard to species at lower trophic levels or to ecologically important geographic areas that do not attract tourists or hunters will result in those resources being undervalued. For example, a wilderness area which has no hunting, trapping, fishing or tourism may still possess abundantly rich integrated biological communities which are priceless in terms of biological diversity and health of the planet.

Such an unnecessarily "crabbed" approach to evaluating natural resource values was rejected by the U.S. Court of Appeals for the District of Columbia Circuit in <u>Ohio</u> v. <u>Interior Department</u>, 880 F.2d 432 (D.C. Cir. 1989). <u>See also Colorado</u> v. <u>Interior Department</u>, 880 F.2d 481 (D.C. Cir. 1989). In that case, the Court held that restoration, meaning restoration, replacement or acquisition of equivalent resources, is the basic measure of damages, although damages can exceed restoration costs. The Court further ruled that use values for natural resources, including non-





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consumptive use values, should be derived by summing up all reliably calculated use values, and that costs should not be limited to use value. Other relevant factors should be considered. The economic value standard proposed in the Draft Plan should be revised to reflect the Court's guidance.

4. Crucial elements are left out of the research design. The most important of these is an assessment of the impact that reduced sea otter populations will have on the movement of carbon through the affected ecosystems, and the significance of induced changes in carbon flow for wildlife and fisheries. Elimination by hunting of otters from different Aleutian Islands during the 19th Century has had profound and lasting impacts on marine ecosystems around those islands that otters did not re-establish populations (Science 245:170-173). The impacts arise because the otters feed on sea urchins. Where otters are not present, urchins reduce primary productivity by heavy grazing on kelp. The effect is large enough to be manifest at many trophic levels.

Another omitted element from the research design are potential chronic impacts from the spill, such as possible teratogenic, mutagenic and carcinogenic effects on wildlife.

We also recommend more work focused on habitat impacts as opposed to the predominantly single-species focus of the Draft Plan. More attention should be be given to integrating single-species studies with habitat and ecosystem work. Lack of detail on the proposed habitat studies makes it impossible to assess the degree to which habitat work can be integrated with species work.

5. Inadequate attention is paid, at best, in the Draft Plan to the need to synthesize the separate, patchwork studies into an holistic assessment of damages from the spill. In the bird studies, for example, while mention is made of using indicator species to provide a basis for estimating overall damage, no procedures are outlined that will accomplish this objective. The studies, in fact, appear to have been designed separately, in isolation, and without rigorous thought to their ultimate integration. Thought should be given to the development of a synthesis process that will integrate the individual studies into an overall damage assessment.

6. We recommend that the Trustee Council apply "worst case analysis" methodology throughout the studies, particularly in those studies where logistical and timing problems prevent the









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gathering of definitive information about the full range of impacts. See 40 C.F.R. Sec. 1502.22. Applying "worst case analysis" to the effects of the oil spill will lend a needed measure of scientific conservatism to the assessment phase. Although the Draft Plan is not <u>de facto</u> an environmental impact statement, the goals of the two documents are comparable -- the assessment of future environmental impacts from an human intrusion onto the natural landscape.

7. The proferred page and a half strategy for development of restoration plans for the area is woefully inadequate for the task at hand. It contains neither criteria by which the effectiveness of individual restoration plans can be analyzed, nor any plan for monitoring or testing the success of restoration efforts. No standard for what will be considered adequate restoration or rehabilitation is proposed. There is no discussion of the possible need to acquire replacement resources, even though that is authorized in Section 311(f)(5) of the Clean Water Act, 33 U.S.C. Sec. 1321(f)(5). The strategy offers no clue as to whether Exxon will participate in the design or implementation of these plans -- a factor of some importance.

8. The Draft Plan is dominated by proposed research on the effects of the spill on fisheries, both in terms of the actual number of studies and in the percent of the potential funds to be spent. Almost 30% of the proposed funds will be spent on fisheries/shellfish research; only 8% will go to studies on seabirds, and even less to studies of marine mammals. Virtually nothing goes to the impact of the spill on adjacent terrestrial habitats. While the emphasis is understandable given the regional economic importance of commercial fishing, the balance in the Draft Plan is too tilted in that direction. This imbalance should be rectified in the final Plan.

Given the substantial nature of our concerns, we ask that the Trustee Council consider offering the public an opportunity to review a revised, more informative version of the Draft Plan. In making this recommendation, we recognize the need to proceed expeditiously in the research, and thus do not ask that all studies be delayed until a second comment period is concluded. Rather, we are more concerned that the gaps and failures in the Plan as a whole be addressed, and that the public have an opportunity to comment on revisions. We assume that any revisions to the proposed studies will reflect the results of work now underway; although that is not clear from the Draft Plan. Com. Topic Issue Sug. Sort 10 3 051 2

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We appreciate this opportunity to submit these general comments on the Draft Plan and hope that they will be helpful in the development of a final plan. Detailed comments on the proposed studies by the staffs of the National Audubon Society and Tri-State Bird Rescue and Research, Inc. are enclosed together with the curriculum vitae of the individuals who prepared the comments. We hope they will be helpful as well. Our experts are available to discuss their comments in greater detail.

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Sincerely,

Dr. J.P. Myers Senior Vice President Science and Sanctuaries

buch Hope M. Babcock General Counsel

Comments on Specific Bird Studies Proposed in the August 1989 Public Review Draft of the "State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill"

> Prepared by Staff of the National Audubon Society Science and Sanctuaries Division

> > September 1989

#### GENERAL COMMENTS ON BIRD STUDIES

1. Our over-riding concern for the bird injury assessment is the lack of focus on synthesis and overall assessment. The plan states (p144) that the bird studies "will focus on species that best represent larger bird groups with similar life cycles..." and that " data on injury to indicator species will be related by inference to the larger groups they represent." This requires careful choice of indicator species and a well-developed plan for extrapolating measured damage to total impact. The Draft Plan as currently devised includes several poor choices of indicator species, lacks other important ones, and gives no description whatsoever as to how the results will be integrated. The most likely result, given its current state, is that the Draft Plan will result in a hodge-podge of single species studies with no hope of any synthesis or extrapolation even to species closely related to those chosen as indicators. It may be that the investigators have concrete and detailed methodologies developed to meet these goals; the Draft Plan gives no hint of them.

2. The desired outcome for the indicator species work undertaken should be estimations (most likely and worst case) for each species of (i) the number of individuals that were exposed to oil, (ii) the extent of exposure, (iii) the likely impact on survivorship and reproduction of exposure, and (iv) the population consequences of those impacts, including (iv.1) immediate as well as predicted (iv.2) for at least 10 (or preferably, the generation time for each species) years into the future. This set of

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predictions for each indicator species would then have to be extrapolated to other members of the group represented by a given indicator and then the impacts would have to be summed across groups. This work will not be very precise and it will be dependent upon extensive computer simulations that match bird distributions, behavioral and ecological characteristics, and life histories with oil spill trajectories. We see no evidence in the Draft Plan that the studies are leading to integrated results of this nature.

3. A completion date of 28 February 1990 is unacceptable. While most direct mortality due to oiling should have taken place already, the population effects of oiling may take several years to unfold. These may be positive, negative, or neutral, depending upon the response of individual birds to oiling (Did they die, simply abandon the area for a year, or leave permanently?. Are breeding colonies in Prince William Sound net contributors to the Gulf of Alaska population of birds or are they sinks? If the former then the spill's impact will be vastly greater than what is now understood. If the latter it may be significantly less. Do pairs of seabirds breeding in Prince William Sound respond to oiling like seabirds studied in Hawaii, where oiling of eggs resulted in lower productivity for at least two years?). These various questions are representative of many that must be asked to gain a realistic estimate of the damage caused by the spill. None of them can be completed within a single season.

Unless studies involving breeding birds have been conducted this summer (1989) all of the studies except No. 14 will be seriously impaired. This requires at a minimum that the schedule be moved back a year, to conduct the proposed studies during the 1990 breeding season (May-August). With respect to restoration, one primary lesson from our restoration programs on the Maine coast is that the planning horizon is a decade, not a year. This is not due to a misplaced fascination for "long-term research." It is a simple recognition that the population effects must be dealt with on a time scale consistent with the generation time of the organism under consideration.

4. Each study has as its last objective "Identify potential alternative methods and strategies for restoration of lost use, populations, or habitat where injury is identified." None of the proposals however, provide any information on how this goal is to be met, nor do the study designs appear to be directed toward restoration strategies for populations or for damaged habitats (instead they are directed exclusively toward damage assessment).

5. The detailed studies on foraging behavior should not interfere with broad-scale population assessments. Only if real evidence should be presented that there are continuing problems with the spilled oil in known foraging areas would a detailed feeding study be warranted.



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7. In many cases the specific sampling methods are not identified, and it is therefore not possible to review whether the intensity of the sampling is adequate. The geographic scale of the sampling in general seems appropriate; most studies cover a range of areas. Middleton Island should act as a control colony for some of the studies.

8. We cannot evaluate the adequacy of the personnel to do the studies because they are not named nor are their experience and qualifications described. Furthermore, if and where contractors are to be used, there is no mention of who they will be, nor the extent of their participation. For these reasons also, it is not possible to evaluate the contract budgets.

9. The budgets are not reasonable as presented. In particular, equipment budgets seem outrageous, and travel budgets seem too small. It may be that aircraft and boat charter and operating expenses are included under "equipment" but this is not intuitive. If travel to and from study sites is included in the travel budgets, then the amount of field work to be done may be inadequate. In the budget throughout, it is also difficult to determine how much money is to be used for chemical analyses.

10. The success of the synthesis of effort depends on the GIS system working on schedule. Is it currently on schedule?

11. Overall, the proposed studies can document possible poor reproduction in the aftermath of the spill. Discovery of reduced breeding population size in affected areas, and a correlation between contamination and poor reproduction will point to the spill as the causative agent. Care should be taken, however, that not all "problems" are automatically blamed on the spill. Some reproductive failures, for instance, may result from other causes.

12. Where possible, we recommend that researchers collect random non-pathological samples of a small number of whole birds (both adults and chicks) for necropsy, and random pathological and non-pathological samples of feathers and blood (pathological samples of the latter will only be possible for moribund birds) for contaminant analysis. This will allow determination of the mean level of contamination of the population in relation to demonstrated pathological levels of contamination, and estimation of the lethal threshold of toxicity.

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Review of the individual studies follow. The authors that have contributed to each review are specified.

<u>Bird Study 1</u>. Beached Bird Survey to Assess Injury to Waterbirds from the <u>Exxon</u> <u>Valdez</u> Oil Spill

Comments contributed by Dr. Wayne Hoffman, Biologist, Department of Field Research and Dr. Carl Safina, National Raptor Coordinator and Principal Investigator, Department of Field Research

It is unclear to us how Objectives A and B differ. In addition, mortality is not defined; is it used here to mean total numbers or the fraction of the population. The language in Objective F is likewise unclear; what is "lost use?" and how does that differ from "habitat"?

The methods are too telegraphic to be evaluated. We need to know what "Appropriate numbers" of beaches are. The flotation time, longevity, and drift experiments can be valuable contributions, but again they are difficult to evaluate without information on carcass condition, species chosen, tracking methods, sample sizes, and locations of beaches. Care needs to be exercised in interpretation of the drift experiments because confidence limits in the proportion of birds reaching the beaches will be large and may vary seasonally.

<u>Bird Study 2</u>. Surveys to Determine Distribution and Abundance of Migratory Birds in Prince William Sound and the Northern Gulf of Alaska

Comments contributed by Dr. Wayne Hoffman, Biologist, Department of Field Research

Once again, the methods are too briefly presented. What are aerial survey parameters (altitude, speed, strip widths, etc.)? What size "plots" are intended? Assuming that sampling intensity and statistical designs are adequate to factor out the normal seasonal and geographic variability in bird



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numbers, this study will probably provide some of the best information on mortality in the whole package.

<u>Bird Study 3.</u> Population Surveys of Seabird Nesting Colonies in Prince William Sound, the Outside Coast of the Kenai Peninsula, the Barren Islands, and Other Nearby Colonies Likely to be Impacted

Comments contributed by Dr. Wayne Hoffman, Biologist, Department of Field Research and Dr. Stephen Kress, Principal Investigator, Department of Field Research

Assuming plot sizes are adequate and locations are appropriate, the methods for this study seem fairly straight-forward. However, more specific details concerning census methodology would prove useful. Natural population changes may mask any effect of the spill, unless the spill has a massive effect on many colonies.

We suggest that Middleton Island should be included as one of the controls. In general though we feel that "non-oiled" colonies are not a good control as these could also be suffering various effects from the spill.

Given the timing of the spill, it will be necessary to be very careful in comparing numbers at affected colonies to numbers at colonies not visited by the oil, because birds from "non-oiled" colonies could have been exposed to and affected by oil on their staging or winter habitats.

We do not agree with the choice of species here, and feel that the criteria for selecting "certain species" should be detailed. Burrowing alcids should also be included - Tufted Puffins, and perhaps Horned Puffins, as well as one or two auklets. Burrow occupancy rates might be a good measure of population changes.

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Bird Study 4. Assessing the Injury of the Exxon Valdez Oil Spill to Bald Eagles

Comments contributed by Peter Bloom, Biologist, Department of Field Research and Dr. Carl Safina, National Raptor Coordinator and Principal Investigator, Department of Field Research

Objective 'A' appears to be actually two separate objectives. It is also unclear in the methods whether just two surveys or weekly surveys are planned. We suggest that more than one remote nesting site be used in comparing this data with data from previous years (page 153, lines 3-4.)

Our suggestion for this study is that chlorinated hydrocarbons be looked at as closely as the hydrocarbons produced from the oil spill. If reproductive failures do occur we want to know which contaminants are responsible. If we don't have CH levels we may be left wondering whether the oil related hydrocarbons were really the principal culprits in declines of eagle populations.

This study involves feather, blood, dead bird, and addled egg samples. It would be useful to know how many blood samples of eagles will be analyzed. We suggest that a small (20) sample of fat be taken from adults of this species since blood reflects only the contaminants (CHs) consumed within the last few days (meals). Fat reflects the contaminants that have been stored over months or years.

An aspect of the Bald Eagle study which we strongly support is the determination of toxic effects of oil on eagles. Although it is likely that a few crippled eagles will need to be sacrificed for this study, we think it is worth it.

<u>Bird Study 5.</u> Impact Assessment of the <u>Exxon Valdez</u> Oil Spill on Peale's Peregrine Falcons

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Comments contributed by Peter Bloom, Biologist, Department of Field Research

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As with the Bald Eagle study, we likewise suggest for the Peregrine Falcon study that chlorinated hydrocarbons be looked at as closely as the hydrocarbons produced from the oil spill. Again, if reproductive failures do occur we want to know which contaminants are responsible. If we don't have CH levels we may be left wondering whether the oil related hydrocarbons were really the principal culprits in declines of bird populations.

This study also involves feather, blood, dead bird, and addled egg samples. We again suggest that a small (20) sample of fat be taken from adults of this species since blood reflects only the contaminants (CHs) consumed within the last few days (meals) whereas, fat reflects the contaminants that have been stored over months or years.

Assessment of the Abundance of Marbled Murrelets at Sites Along Bird Study 6. the Kenai Peninsula and Prince William Sound

Comments contributed by Dr. Wayne Hoffman, Biologist, Department of Field Research and Dr. Stephen Kress, Principal Investigator, Department of Field Research

This study does not specify what analyses will be done on the collected adults. Furthermore, the number of observation periods (5), seems too small to accurately sample breeding activity.

Control sites for this assessment should be very distant from oiled sites, to minimize chances that the control population is not also suffering some effects. Even control birds may pick up oil at sea during migration or on the wintering range. We are especially concerned here about the validity of the "non-oiled" site within Prince William Sound as a control. Birds breeding in that area might well have dispersed to other parts of the Sound, especially in winter, and might have been affected as well. An additional control, perhaps in the Kodiak area would be valuable.

We also suggest that an attempt be made to assess numbers of Kittletz's Murrelets.

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# <u>Bird Study 7</u>. Assessment of the Effects of Petroleum Hydrocarbons on Reproductive Success of the Fork-Tailed Storm Petrel

Comments contributed by Dr. Fred Schaffner, Biologist, Department of Field Research and Dr. Stephen Kress, Principal Investigator, Department of Field Research

The statement "This species generally represents the shearwaters and fulmars," is a gross oversimplification. Petrels are neither shearwaters, nor are they fulmars. Although many Procellariiformes (other than diving petrels) feed on surface prey, some of which is considered "plankton", specific prey types and prey species vary and the distributions and habits, including diurnal vertical migrations, of the prey vary as well. This means that prey species may vary in their risk of exposure to oiling. Fork-tailed Storm Petrels appear to be an excellent subject for this study (because of the years of baseline data on distribution and population size, and because of the work already conducted concerning the impact of oil on these "easy to get at" seabirds.) Nevertheless, without studying other Procellariiformes in the area, we urge caution in extrapolating these results to many other species not studied. The shearwaters with which we are concerned (Sooty and Shorttailed) are largely divers.

Objective B states "Assess the impact of crude-oil exposure on storm petrel reproduction by measuring the relationship between exposure and breeding adult foraging efficiency, chick physiological condition, and nesting success." 1) The term "exposure" is not adequately defined. Methods indicate that they will actually measure the amount of petroleum hydrocarbons in the proventricular fluids ("stomach oil"), an extremely indirect measure of the amount of North Slope Crude to which the adult birds were exposed, although it is a less indirect measure of the chicks' exposure. 2) "Breeding adult foraging efficiency" - the draft has made a very poor choice of terminology, and they have made no attempt to define this term. Foraging occurs at sea, and can never be studied directly at a breeding colony. No methodology is presented to study foraging. Does the draft really mean to study the adequacy of parents' provisioning of their young with food? However, the draft presents no methodology to address this question either.

Foraging: An overall foraging rate can be measured as either (1) the amount of prey collected per unit time, or (2) the amount of food energy collected per unit time. Foraging efficiency can be measured as (1) the energy acquired by collecting food / the energy expended in collecting the food, and capture efficiency can be measured as the proportion of successful prey capture attempts.









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Provisioning: An overall provisioning rate can be measured as the amount of food (energy, biomass, items) delivered to chicks by their parents per unit time. The chick provisioning performance of breeding adults can be affected by numerous factors, including:

- (a) Food availability to foraging adults.
- (b) Adult foraging efficiency. This could be reduced if adults are weakened by ingestion of petroleum (perhaps inducing anemia?).
- (c) Distance prey must be transported to the colony. If parents must now transport food over distances much greater than the usual, they will require more food themselves, and will on average deliver food to chicks at longer, less frequent intervals.
- (d) Transport ability of parents. If adults are weakened by petroleum ingestion they may have to reduce the size of the food payload brought back to chicks.

At the breeding colony, the draft proposes to measure:

- 1) The amount of petroleum hydrocarbons in the proventricular fluid of chicks and occasionally adults, and oiling on plumage.
- 2) Oiling of eggs by incubating adults, and hatching success.
- 3) Survival of chicks.

4) Incidence of petroleum hydrocarbons in pathological samples of eggs and birds, and fresh eggs.

Clearly, the proposed methodology is inadequate to address any of the elements of Objective B other than nesting success. Chick physiology is not addressed. Crude-oil exposure is not addressed directly. Foraging is not addressed. Provisioning is not addressed.

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Suggestions: All birds examined should be weighed and bill, tarsus, and wing chord measured in order to document overall physical condition of chicks and adults, and whether there is any abnormality in development of chicks. Conduct more detailed field work to measure provisioning, including continuous watches of several nests and periodic weighings of chicks during the feeding hours for several consecutive days, in order to determine the feeding intervals and payload sizes. Underweight chicks might be getting as much food as ever, and low body mass might be due to toxic effects of petroleum ingestion.

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Bird Study 8. Assessment of Injuries to Waterbirds from the Exxon Valdez Oil Spill on the Reproductive Success of Black-legged Kittiwakes in Prince William Sound

Comments contributed by Dr. Fred Schaffner, Biologist, Department of Field Research and Dr. Stephen Kress, Principal Investigator, Department of Field Research

This proposal is modest, and realistic in its objectives to document possible poor reproduction in the aftermath of the spill. Discovery of reduced breeding population size in affected areas, and a correlation between contamination and poor reproduction will point to the spill as the causative agent. Caution should be taken however, to consider the potential role of other factors that might have contributed to poor reproduction in that breeding year. Control colonies should be remote, but not so distant that local factors could further confound a comparison with the oiled colonies.

This is a good choice of species for population monitoring because of the extensive baseline data and accessibility of chicks. It is important though that sample sizes be indicated in the methods section. The replicate counts are very important and should be an integral part of the study.

Suggestions: As with Bird Study 7, all birds examined should be weighed, and bill, tarsus, and wing chord measured in order to document overall physical condition of chicks and adults, and whether there is any abnormality in development of the chicks.

Bird Study 9. Assessment of Injury to Waterbirds Based on the Population and Breeding Success of Pigeon Guillemots in Prince William Sound

Comments contributed by Dr. Fred Schaffner, Biologist, Department of Field Research and Dr. Stephen Kress, Principal Investigator, Department of Field Research

This proposal has many of the same shortcomings as Bird Study 7. It proposes to assess habitat use and food availability, but provides no methodology to do this. Food availability in foraging areas,



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and foraging habitat use can not be studied directly at a breeding colony. For chicks, however, food availability is exactly their parents' provisioning performance. Unfortunately, the study methodology described is inadequate to assess adults' provisioning of chicks.

For this species, the chick provisioning performance of breeding adults can be affected by numerous factors including:

- (a) Food availability to foraging adults. In particular, will the spill's effects alter the age and size structure of prey populations such that individual food items are now smaller?
- (b) Adult foraging efficiency. This could be reduced if adults are weakened by ingestion of petroleum (perhaps inducing anemia?).
- (c) Distance prey must be transported to the colony. If parents must now transport food over distances much greater than the usual, they will require more food themselves, and will on average deliver food to chicks at longer, less frequent intervals.
- (d) Transport ability of parents. If adults are weakened by petroleum ingestion (perhaps inducing anemia?), will their poorer condition also translate to longer, less frequent food delivery intervals.

Are chicks really only fed during a specific 5-hour period of the day? If petroleum contamination has altered the adults condition, it might also alter the feeding schedule. Watches alone cannot measure amount (size, mass) of prey per delivery.

This group probably has the greatest appeal to tourists, which enhances their "intrinsic value". Great care should be taken in generalizing from guillemots to puffins, auklets and murres. While they are all diving birds which sit on the water, they vary both in the depth of their dives and the distance at which they feed from the islands. The inshore feeding habits of the guillemots might make them more vulnerable if the spill happened near their colony, but less vulnerable if the colony was more remote. Such colonies could prove useful controls, especially if the guillemots stay near the breeding colony throughout the year.

Suggestions: At oiled and control colonies all birds examined should be weighed and bill, tarsus, and wing chord measured in order to document overall physical condition of chicks and adults, and whether there is any abnormality in development of chicks. Conduct more detailed field work to measure provisioning, including continuous watches of several nests and periodic weighings of chicks during the feeding hours for several consecutive days in order to determine the feeding intervals and payload sizes. Underweight chicks might be getting as much food as ever, and low body mass might be due to toxic effects of petroleum ingestion. Also, through observation, it may be

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possible to compare oiled vs. non-oiled parents at the same colony. Effects on hatching success and success in rearing young could also be compared- that is if guillemots with oiled plumages survive long enough to attempt breeding. Also consider conducting a similar study with puffins or murres which feed further from colonies.

<u>Bird Study 10</u>. Assessment of Injury to Glaucous-Winged Gulls using Prince William Sound

Comments contributed by Dr. Wayne Hoffman, Biologist, Department of Field Research and Dr. Stephen Kress, Principal Investigator, Department of Field Research

This appears to be a straight-forward, well-thought-out study. Nevertheless, the assumption that the Glaucous-winged Gull "generally represents" scavenging passerines (corvids) is incorrect. In the first place, their physiology is different (e.g. salt excretion). Secondly, different habits (swimming vs. not) greatly affect the thermal consequences of light oiling. Thirdly, differences in plumage thickness and texture, and uropygial gland oil amount and properties could have major unpredictable effects on oiling consequences.

As with almost all the proposals, this study should definitely be updated to include the 1990 field season. We think the egg analysis work will be particularly valuable. We also suggest that this study include growth studies of chicks reared by oiled and non-oiled parents. Because of the previous work done with this colony, this could be an especially useful study.

We foresee one potential confounding factor: the closing of the fishing seasons in Prince William Sound may have major effects on the gulls' food supply, thus reducing productivity in a less direct manner.

<u>Bird Study 11</u>. Injury Assessment of Hydrocarbon Uptake by Sea Ducks in Prince William Sound and the Kodiak Archipelago

Comments contributed by Dr. Fred Schaffner, Biologist, Department of Field Research

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A basic assumption of this study seems to be that short-term effects observed in other species (seabirds) will translate to long-term effects in sea ducks. The term "reproductive potential" is not adequately defined and there is no indication in the methods as to how this will actually be measured. Similarly, it is not clear what is meant by "intrinsic values", nor is it stated in the methodology how this will be measured. In addition, how will birds be collected, and how many will be collected?



<u>Bird Study 12</u>. Assessment of Injury to Shorebirds Staging and Nesting in Rocky Intertidal Habitats of Prince William Sound and the Kenai Peninsula

Comments contributed by Dr. J.P. Myers, Senior Vice President for Science & Sanctuaries, Dr. G. Thomas Bancroft, Principal Investigator, Department of FieldResearch and Dr. Carl Safina, National Raptor Coordinator and Principal Investigator, Department of Field Research

The most important part of this study as estimated by the potential impact on numbers is Item G, as by far the majority of shorebirds using the Sound and likely to be affected by the spill are those that breed in western Alaska. It is not clear from the description of the work, however, whether the studies enabled by previous base line data are anything more than a shot in the dark, given the vastness of the breeding area. Were baseline data available on fall migration indices of breeding season success then it might be possible to gain insight as to whether the 1989 summer productivity was comparable to pre-spill years. Individual researchers working along the US Pacific flyway may have such results (see Point Reyes Bird Observatory or Bodega Marine Laboratory). Useful information might also be gleaned with a thorough review of selected Audubon Christmas Count data on well-known sites in Oregon, California, or Washington, combined with field work in the 1989-90 winter.

On the whole, the remaining objectives of the study appear good and complete. Methods for the remaining parts of the study, however, lack sufficient detail to determine if the objectives can be met. For instance, how can "the minimum proportion of shorebirds" as discussed in objective C actually be measured? As stated, it does not appear to be a realistic objective and the methods section provides no further clarification.



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delayed migration and breeding. The census techniques need to be carefully set up to be sure they are providing repeatable estimates. No information was given on the technique.

The species mentioned as having individuals captured and marked was sufficients and the reason for	
this was unclear. It seems that other breeding (oystercatchers) and migrant species will need to be	
marked to determine the amount of time individuals were exposed to contaminated beaches. Estimates	
of the proportion of shorebirds directly contaminated with oil will need to take into account the length	
of time individuals stay on contaminated beaches and in Prince William Sound. How will these	(
estimates be made; what species will be studied intensely to determine reproductive success at the	
Sound and further north? No information was given on how breeding success was to be determined.	~
Are body counts to be made and individuals collected to determine the importance of direct mortality	
by oil?	

Bird Study 13. Impact Assessment of the Exxon Valdez Oil Spill on Passerines and Other Nongame Birds in Prince William Sound

Comments contributed by Dr. G. Thomas Bancroft, Principal Investigator, Department of Field Research

This study appears straight-forward, although census techniques were not detailed and those used will be critical for determining the accuracy of population estimates. How will the effects of hydrocarbon levels in tissues be related to health, survival and reproductive potential?

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#### Bird Study 14. Effects on Migratory Birds of Exposure to North Slope Crude Oil

Comments contributed by Dr. Fred Schaffner, Biologist, Department of Field Research and Dr. Stephen Kress, Principal Investigator, Department of Field Research and Dr. Carl Safina, National Raptor Coordinator and Principal Investigator, Department of Field Research

This is purely a contracts proposal, but the contracts budget cannot be evaluated because the  $\begin{bmatrix} c_{om} \\ b \\ b \end{bmatrix}$ 

The methodology is vague. It is unclear whether, or to what extent, otherwise healthy birds will be intentionally oiled. Which species will be examined? How will they be oiled? Basically, the methodology proposed will allow only for a comparison of the pathology of oiling in several species. It is unclear whether the proposed study will allow determination of pathological levels of contamination, and estimation of the lethal thresholds of toxicity. A comparison of fresh vs.weathered oil would also be useful. We further suggest including studies of banded birds to \_\_\_\_\_\_ compare inter-year survival in oiled vs. non-oiled areas.

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Before new research is initiated concerning the effects of petroleum on seabird physiology, contact David Peakall, Chief, Toxic Chemicals Division, Wildlife Management Branch, Canadian Wildlife Service, Ottawa, Ontario K1A OH3. He has conducted extensive research on the effects of ` on puffins, storm-petrels and other North Atlantic seabirds.

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#### Review of Bird Studies

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## Specific Comments on Damage Assessment Plan

Comments contributed by Dorene Bolze, Environmental Policy Analyst, Science Division

## Part I: Injury Determination/Quantification - Coastal Habitat Injury Assessment

The damage assessment plan appears to focus on the effects of the oil spill to various habitats through the Air/Water studies and the Coastal habitat study. It is very important that a comprehensive assessment be made by habitat as well as by wildlife species, since many species will be greatly affected by the indirect injury to habitat from the spill as well as by direct contact with the oil. Yet, the description of the coastal habitat study gives no details of the 45 types of categories that will be studied. It does not discuss which benthic species will be studied or whether or not kelp beds will be studied, nor does it describe how the other studies will be coordinated with it. This section should also explain how fines will be established based on the damage assessed from the coastal habitat study. In this section and elsewhere in the plan, those studies which compare oiled sites with non-oiled areas, laboratory data and field baseline data should be consistently used. Obviously when evaluating areas that have been oiled where there are no pre-spill data, then the effects need to be compared to a comparable clean site. But, pre-spill baseline data is best and should be used wherever possible.

## Part I: Injury Determination/Quantification - Air/Water Injury Assessment

The implication of this section is that studies on the water column will focus on violations of water standards for various pollutants, i.e. hydrocarbons. This is inadequate if this is the only approach to water column issues. Federal and state standards for hydrocarbons are typically based on human health effects only. Although these studies are important in determining fines for violations of the Clean Water Act, etc., the studies also need to focus on determining water concentrations of those components of the oil spill that have biological effects on the wildlife and ecosystems. Though study #3 states this as one of its objectives, it should be a major objective. It appears that study #2 plans to use the same submersible as that used for Fish study #20. In this case a variety of depths should be collected, not just the top 2 cms to determine how the oil has become incorporated into the sediments.







As an alternative it may prove less expensive to use grabs deployed from ships rather than deploying a submersible to collect sediment samples of only the top 2 cms. None of the air/water studies, including study #2, plan to use plots and do wildlife density studies of the benthos. Such plots are used in other studies and are important here to assess the effects of the oil on the bottom sediments. For both studies #2 and #4, it may be possible to estimate the total acreage of bottom sediment oiled and then base the fine on this figure, thus, attempting to assess the fine in terms of the ecological damage rather than just the commercial damage.

## Part I: Injury Determination/Quantification - Fish/Shellfish Injury Assessment

Of the 26 proposed studies, this group recieves by far the most attention in the damage assessment plan. The fisheries studies appear to be more concerned with determining the long-term effects of the oil spill than any of the other major study sections. Study #3 directly states the long-term effects of the spill as an objective. This appears to be in contradiction to the introduction of the damage assessment plan, which states that studies are not designed for long-term issues. There is no rationale given for why the three species of clams were specifically selected in study #13. The tremendous lack of information on which species will be studied in the Coastal Habitat Study has made it extremely difficult to evaluate in this study which clam species that are important wildlife food sources have been overlooked. A similar concern is raised for study #26 on green sea urchins. Although this species may be commercially important, they are also an integral part of the marine food chain and affect habitat structure. High sea urchin density keeps kelp bed growth low and thus, lowers a significant source of carbon to the coastal community. Sea otters feed on urchins and as a result kelp bed acreage expands with sea otter populations. This translates into increased biomass production. The plan does not discuss whether these important roles in habitat productivity will be examined either in this study or in the coastal habitat study. One possible means of putting a value on the damage to a kelp bed would be to estimate the reduced number of commercially valuable fish the habitat will not produce until it is restored (or forever). In considering the overall damage assessment plan we are concerned with the fact that both for seabirds and marine mammals a representative species was chosen for study. While for the fisheries, almost every commercial species is targeted for at least one study if not for several studies addressing the effects on various stages of the life cycle (ie., pink salmon). This would appear to be too heavily weighted towards the study of those species that are obviously commerically valuable, while ignoring those species that appear to have only intrinsic values (i.e., fish that are important wildlife food sources, seabirds, wilderness, etc.)











## Part I: Injury Determination/Quantification - Marine Mammals Injury Assessment

There is no explanation in this section of why a porpoise species has not been selected for study, or if it is intended that information from the Orca study will be extrapolated to this group of mammals. For study #3 on necropsies, it might be useful to include strandings that occur in the Bering Sea (for the migrating species like the gray whale). Not all effects from the oil spill will be acute and result in strandings in the Gulf unless the migrating individual moves slowly. Depending on the rate of migration, some strandings even as far north as St. Lawrence Island, near where most gray whales feed in the summer, could be a result of exposure to the spill during migration. It is not clear instudy #5 on the harbor seal, how the researchers will be able to decipher the effects of the spill from the effects of other stresses that have recently been causing a sharp decline in the harbor seal population. The plan does not explain why there is interest in the long-term effects of the spill on sea otters (study #6) as opposed to the long-term effects on other species. Study #7, does not mentionwhere individual otters to be released have come from, nor the intended release sites. It is not clear whether rehabilitated otters will be released in various areas for comparison (such as non-oiled sites and treated sites.) In addition, the plan does not identify how a fine would be set based on a finding that the sea otter population will be depressed for 5 years. There is no rationale in this section to explain why only seven studies are designed for marine mammals even though numerous other species are identified as potentially being affected. This section also does not clarify whether Exxon will be fined under the Marine Mammal Protection Act or the Endangered Species Act, or whether information from these studies will be available for such consideration.

#### Part I: Injury Determination/Quantification - Terrestrial Mammals Injury Assessment

Study #6 does not specify whether minks will be exposed only to various concentrations of new crude oil, or also to various weathered samples. Study #5 appears to involve only a minimal effort to trap small mammals (considered here as a food source) on some oiled areas. However, these small mammal studies can give a good idea of the effect of the spill on the food source, which may be as important, if not more, than the larger mammals (predators) actually being oiled or eating oiled carcasses. A more extensive trapping program to determine density should be done at a variety of sites, i.e., clean to heavily oiled areas as well as treated sites.

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#### 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.

#### 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 commerical 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 commerical value.

#### Appendix B-Histopathology Proceedures

On p. 220 there is a reference to the Mixed Function Oxidase (MFO) enzymatic system which the livers of most higher animal species posess 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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WRITER'S DIRECT NUMBER: (212) 839-7083

October 27, 1989

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

Dear Sirs:

We are in receipt of the public review draft of the State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill ("the Plan"), and offer the following comments for your consideration, pursuant to 43 C.F.R. §§11.32(c). These comments, which relate primarily to the assessment of resource and cultural damages in the Chugach Native Region, are submitted on behalf of the Chugach Alaska Corporation and the Native Village Corporations of Chenega, English Bay, Eyak, Port Graham and Tatitlek.

Chugach Alaska Corporation is the Native Regional Corporation for the Chugach Region, which includes Prince William Sound and Lower Kenai Peninsula, incorporated under the Alaska Native Claims Settlement Act and the laws of the State of Alaska. The village corporations of Chenega, English Bay, Eyak, Port Graham and Tatitlek are Native Village Corporations incorporated under the Alaska Native Claims Settlement Act and the laws of the

State of Alaska for Native Villages in the Chugach Region. The aggregate land holdings of the six corporations comprise the third largest block of ownership, after the State of Alaska and the U.S. Department of Agriculture, in the oil impact zone between eastern Prince William Sound and Kachemak Bay. Their shareholders residing in the area comprise 15% of the local population. The corporations also represent the largest group of private landowners in the entire impact zone, and because of their commitment to the preservation of Chugach Native culture, they are particularly concerned about the damage to archaeological and other culturally-sensitive sites caused by the oil spill.

The Native Corporations of the Chugach Region have joined forces in filing a single lawsuit against Exxon, et al., claiming, among other things, damages to lands and natural resources from oil contamination and the cleanup process. Since the date of the oil spill, the corporations have endeavored to cooperate with Exxon and federal/state authorities in providing input to the clean-up process in order to mitigate further damages by bringing their knowledge to the planning tables through a professionally-staffed oil spill response team. By this involvement, they have acquired a sound working knowledge of the event and bases for the subject draft report.

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#### 1. <u>Study Termination Date</u>

The Native corporations believe that the proposed study termination date of February 28, 1990 is totally unrealistic and inconsistent with the goal of making a complete assessment of the damages to the impact area and the length of time that the oil will be adversely affecting the entire ecosystem. Preliminary scientific studies indicate that the environmental havoc caused by the oil spill may well last for many years into the future, and it would be irresponsible for the Council not to make specific plans for in-depth, long-term studies of natural resources and economic damages, and studies concerning the longterm cultural and social impact on Alaska natives within the spill zone through at least 1995. For example, since some fish species are on a multi-year life cycle, it will take at least several years of study to determine the actual, rather than projected, impact.

#### 2. <u>Native Corporation Participation in Design of Studies</u>

The Native corporations believe that the Council should establish a mechanism whereby the Native corporations will be allowed to participate directly with relevant state and federal personnel in the design of detailed study objectives and methodologies regarding all scientific and economic studies.

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Participation by the Native corporations as property owners and "available parties" in joint Federal/State actions such as the studies described in the Plan is, in our view, mandated by 36 C.F.R. 800, Subpart B (the Section 106 Process). As property owners, the Native corporations have a particular interest in the preparation, coordination and execution of any CERCLA Damage Assessment Plan because of the federal government's special obligations arising from ANCSA §\$12(a), 12(b) and 14(h)(1) selections, 3(e) determinations and other lands which have been selected but not yet conveyed to the corporations. Under Subpart B, the Native corporations also have a special interest in providing input regarding damage assessment of archaeological and culturally-sensitive sites.

Participation by the Native corporations in the planning process would provide the Council with the benefit of our detailed knowledge of Prince William Sound and much of the rest of the impacted area. For example, we could have advised the Council prior to the publication of the Plan that the map of the Wilderness Study Area on page 5 of the Plan is outdated in that the site for the village shown as "Chenega" was abandoned following its destruction by a tidal wave in the aftermath of the 1964 Good Friday earthquake. The new village of Chenega Bay on Evans Island should be shown on the map.

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As another example, on page 14 of the Plan, the references to the locations where the oil first came ashore should indicate reference to Bligh Island. In addition, the description of the "important human activities" affected by the spill (p. 16) should make specific reference to the villages and communities encompassed by the Native corporations, which were in the direct line of the oil flow and which have been severely damaged by its impact on their lands, economy, culture and way of life. Tatitlek was the closest community to the spill and experienced severe air pollution during the Exxon burning mentioned on page 9 of the Plan. Eyak also suffered serious damage, and the lands owned by the Village Corporations of Chenega, Port Graham and English Bay, as well as lands owned by Chugach Alaska Corporation, were oiled more heavily than anywhere else in the impact zone. Indeed, Chenega Bay was surrounded by oil and its lands, as well as lands owned by other Native corporations, remain directly threatened by the oil trapped in the intertidal zone and seabed.

The need for the Native corporations to participate in the design of ongoing studies is particularly urgent since the studies described in the Plan generally lack the requisite specificity regarding methods, analyses, objectives, and procedures for determining the margin of error, for the corporations to provide meaningful comment. We, therefore, reserve the right to supplement these comments in the event

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additional information is provided as to methodology, historical baseline data and other relevant factors.

#### 3. Data Sharing

The Native corporations also believe that the Plan is inadequate in that it does not provide for access by them and other plaintiffs to the data and test results that will be collected as a result of the implementation of the studies. Timely access to data is, in our view, absolutely necessary in order that we may knowledgeably monitor the progress of the damage assessment studies and suggest appropriate study modifications or expansions.

4.	Studies	Relating	<u>to Clez</u>	in-Up_and_	Restorati	.on
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The Plan is deficient in that it does not encompass a study assessing the effectiveness of the clean-up operations, or the additional damage to property and the ecosystem directly resulting from the clean-up effort, including vandalism and other damage to archaeological sites. The Plan also lacks a study of which shoreline clean-up techniques should be continued and which ones should be abandoned (<u>e.g.</u>, use of chemicals) because of their actual or potential danger to the environment. Particular emphasis should be placed on a study of the effectiveness of

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bioremediation techniques, including a study of such techniques in a controlled and carefully monitored laboratory environment.

Although a study of restoration plans is proposed (pp. 184-188), there should be a recognition that cultural resources restoration is a vital and necessary part of the restoration process, especially where it involves the restoration of resource-based archaeological sites that are clearly part of the natural environment.

In general, the restoration planning process needs to involve the ANCSA landowners, just as they are included in other land planning programs.

## 5. Inclusion of Non-Economic Studies for Cultural Resources

Within the Section of the Plan dealing with "Inquiry Determination/Quantification" (pp. 28-184) should be included non-economic studies for cultural resources.

(a) For example, a study program should be implemented in consultation with the Native corporations to monitor the effect of increased activity and vandalism that has occurred since the oil spill on culturally-sensitive areas. It would be appropriate for the Native corporations to conduct such

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monitoring on their own fee lands, selected lands and 14(h)(1) sites.

(b) Since numerous ANCSA 14(h)(1) sites have been oiled, a study should also be conducted of the impact of the oil spill and clean-up operations on properties and site locations critical to the preservation of intrinsic heritage values.

(c) A study should determine the injury to the radiocarbon integrity of cultural resource sites. While "Economic Uses Study Number 9" (pp. 200-201) makes vague reference to such a study, a specific design and methodology for this study must be developed. For example, experimental contamination and cleaning of samples of known (C14) age should be undertaken to determine whether a sample means can be found for removing oil contamination from radiocarbon samples.

(d) A study should involve test clean-up of a hypothetical site constructed under controlled conditions in a laboratory. The site should be contaminated and test-cleaned using a variety of methods (<u>e.g.</u>, hydrocarbon solvents, water-based solvents, hot water, bioremediation, sponging and <u>in situ</u> cleaning by hand) to determine the injury from clean-up methods used.

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The Native corporations, because of the special knowledge and expertise in these areas of their shareholders and staff personnel, should participate in the process of selection of which agency experts and/or consultants will be conducting these studies. In addition, all raw data, reports and field notes should be made available to the Native corporations and others for review and comment during the study process.

# <u>Comments on Part II Studies: "Development of Restoration</u> <u>Plans," pp. 184-188</u>

In general, it should be recognized in the development of restoration plans that cultural resources are closely linked to natural and ecological resources in that cultural ecology includes resource-based archaeological sites that are clearly part of the natural environment.

(a) Concerning "Technical Services" (pp. 176-177),
 this study should extend to cultural resources, and a
 fourth "major objective of these analyses and
 subsequent evaluations" should read as follows:

Conduct an exposure assessment of petroleum and chemical contamination on archaeological site radiometric dating techniques, especially radiocarbon. Measure controlled samples and measure contaminated samples for changes in the

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ratio of radiocarbon as might affect oiled cultural resource sites.

(b) "Economic Uses Study Number 7" (p. 198) should be extended to include cultural resources such as historical places, archaeological sites, rock art, subsistence sites, and other cultural resources having great intrinsic value. However, a protective mechanism should be initiated to protect against disclosing in the study reports the location of important cultural sites. Publication of specific site locations will, unfortunately, only increase the rate of trespassing on and vandalism of these sites.

(c) In the "Concern/Justification" section of "Economic Uses Study Number 9" (pp. 200-201), the types of impact listed fail to include the following impacts on cultural sites: increased widespread knowledge of "sunset" information on site location, etc.; visitations by clean-up personnel; unauthorized removal of material and remains (including human remains); heavy pedestrian traffic; vandalism; and an anticipated increase in "pot hunting" in coming seasons.

(d) In the "Objectives" Section, additional objectives should be:

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 determining how many cultural sites have been indirectly impacted by the spill;

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- predicting what the future impacts on these sites will be;
- 3) determining the present and potential impact of the spill on cultural sites where human remains are located (an area of particular sensitivity to Native Alaskans).

(e) In the "Methods and Analyses" Section, it must be recognized that, in addition to model building, each cultural site must be studied individually as to its characteristics and value rather than being lumped together with other sites if the "degree of impact" is to be adequately determined. Recognizing the uniqueness of cultural sites, additional thought must be given to the definition of what a "representative sample" is and what is meant by the use of the term "sites with high potential" (para. 1). Certain objective standards must be developed and applied since the criteria for what is important to Native cultural interests may be different from those characteristics which makes a site significant for museum collection or private research purposes. In that regard, the connection between cultural sites and living cultures should also be explored.

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(f) Criteria must also be developed as to what "archaeological tests" will be conducted (<u>e.g.</u>, random, non-random, destructive, non-destructive); what criteria will be required to regulate entry on private lands during the study period, and provision should be made for the return of culturally-manipacitive materials which have been curated as a result of the studies (as well as by Exxon personnel and contractors).

(g) We recommend that a fourth paragraph be added to the "Methods and Analyses" section setting forth precise criteria and methods for analyzing the degree of increased public knowledge of sites resulting from the spill and clean-up activities; whether increased vandalism can be predicted using historical data on public knowledge of affected sites as a baseline; what the life span is of a cultural resource once information about it becomes common knowledge; and how the spill has affected the cultural resource from the standpoint of the living culture of the Native communities.

We thank you for your consideration of our comments, and we look forward to participating in the process of assessing natural resource damages and planning for their restoration. We are

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available to meet and discuss our comments in further detail at your earliest convenience.

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Very truly yours,

Hill, Betts & Nash 1 World Trade Center Suite 5215 New York, New York 10048 (212)839-7000

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EMMON VALLEZ ON SPILL TRUSTEE COUNCIL 624011111STRATIVE RECORD

26 October 1989

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

Dear Sir(s):

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The purpose of this letter is to comment on the draft of the "Natural Resource Damage Assessment Plan," open to review under the provisions of the Clean Water Act and the Comprehensive Environmental Response, Compensation, and Liability Act. As COPA (Council on Public Archaeology) representative from the State of Alaska to the Society for American Archaeology, I would like to enter some comments on behalf of three constituencies: the professional archaeologists of the State of Alaska; the members of the Department of Anthropology of the University of Alaska; and the members of the Society for American Archaeology. As such, there appear to be a number of important omissions or inadequacies in the plan as currently formulated. As you are aware, the plan attempts to document what studies will be necessary to assess injuries to the natural and social environment created by the oil spill, including determination of damages to be claimed for the loss of the resources in question. The economic value of lost or loss of the resources in question. The economic value of lost or injured resources is to be based on "the services they provide [to] humans," by calculating "the reduction of these services (lost-use values) resulting from the spill." However, there is no provision in the plan as to how this might be applied to cultural resources, such as archaeological sites. I am not sure that the services they provide to humans" can be accurately measured, but "the reduction in services (lost-use values)" might be calculated by the number of man-days and other costs (in equipment, supplies, transportation, and per diem subsistence) that it would take to excavate all portions of sites affected by the oil spill. This might be a large figure, but should be included in claims for damages presented to the "potentially responsible parties." In large part, it is difficult to say what that figure is, until a detailed assessment can be made of all sites and parts of sites affected by the spill, as called for in the draft. In terms of the latter, the main problem with assessing the relationship of such potential costs to the amounts already included in the budget of this draft is that, although there are studies called for under a variety of categories, each of which has a dollar figure attached [for one-year field and analysis costs], impact to archaeological sites is not considered under any of these categories, including [budget: \$5.44 injury to coastal habitats million]. Archaeological sites are considered only under a separate category involving determination of the economic value of resources impacted by the oil spill. Here, a total budget of \$2.8 million is called for, but the dollar amount of the archaeological subcategory is unspecified. It is true that both literature search and field survey would be involved, with the latter

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including determination of the number of sites affected, extent of impacts on the sites, types of sites lost or damaged, and uniqueness of those sites or parts of sites. However, a realistic budget needs to be developed for all of this work, which is not present here, as far as I can determine. And again, such work can only be looked at as prefatory to determining the actual cost of damage to the sites, which can only be assessed through excavation of damaged areas.

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I thank you for the opportunity to comment on this draft on behalf of the Alaskan archaeological community.

Sincer ély, aned. David R. Yesner

Dept. of Anthropology University of Alaska 3211 Providence Drive Anchorage, AK 99508

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### Writer's Direct Dial No. (907) 263-7219

October 26, 1989

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

#### Re: In re the EXXON VALDEZ Case No. A89-095 Civil (Consolidated) Comments to Federal/State Exxon Valdez Assessment Plan

#### Dear Sirs:

On behalf of the Plaintiffs' Coordinating Committee, representing all private party litigants in the consolidated federal and state actions currently pending in the United States District Court for the District of Alaska and the Superior Court for the State of Alaska, Third Judicial District, we set forth below our comments in accordance with 43 C.F.R. - to the Public Review Draft of the State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill (the "Plan") dated August, 1989.

1. We believe that the termination date of February 28, 1990 for all studies is excessively premature and that many significant damages to the interests of the plaintiffs represented by the Committee and the ecosystems of the impacted area will continue in subsequent years. In our view, in addition to the proposals set forth therein, the Plan should encompass at least some in-depth long-term studies of the economic and natural resource impact of this spill through, at least, the end of 1995. It is generally recognized by those scientists involved that, in the Amoco Cadiz oil spill which occurred off the coast of Brittany, France in March, 1978, the environmental impact continued for a number of years and that the ecosystems did not return to their prior state for a period in excess of five years. <u>See, Ecological Study of the</u> Amoco Cadiz Oil Spill, Report of the NOAA-CNEXO Joint Scientific

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BIRCH. HORTON, BITTNER, CHEROT AND ANDERSON

Trustee Council October 26, 1989 -Page 2

<u>Commission</u>, US Department of Commerce, October 1982 at vii.<sup>1/</sup> Further, the federal judge assessing damages to private and governmental plaintiffs in that case recognized losses incurred several years after the spill, including, for example, lost profits of oyster growers for 1979 and 1980. <u>In re Oil Spill by the "Amoco Cadiz" off the coast of France on March 16, 1978</u>, Findings of Fact, Conclusions of Law and Memorandum Opinion dated January 11, 1988, at 409-416.

We understand from scientific experts who have reviewed the Plan on behalf of certain plaintiff interests that the long-term impact of the Exxon Valdez spill both from an environmental and economic perspective will continue substantially beyond 1990 and that any assessment plan which does not contemplate further studies beyond next year would be incomplete and misleading. We therefore strongly urge the Trustee Council to expand significantly the scope of the Plan by including proposals for natural resource and economic damage assessment through, at least, December 31, 1995.

2. Part 1 of the Assessment Plan concerning injury determination and quantification contains insufficient information regarding laboratory and field-work procedures, techniques and protocols to enable us to comment intelligently on the methodologies proposed to be adopted in the various studies. In many instances, the proposals lack sufficient detail on the availability of historical data, personnel and methodology to permit meaningful comments on the individual study's ability to meet stated goals or to interpret data. Furthermore, no information is provided on the qualifications of the scientists who will be conducting the projects and doing the laboratory analysis. Examples of some of the laboratory and field-work methodologies in respect of which detail is lacking include, but are not limited to, fingerprinting of hydrocarbons in sediment and tissue samples, preservation procedures for oil and water samples, visual recordation procedures,

<sup>1/</sup> The preface signed by the co-chairs of the joint NOAA-CNEXO Commission including Wilmot N. Hess, then Director of the Environmental Research Laboratories of the National Oceanographic and Atmospheric Administration, provides in pertinent part as follows:

> Today [October, 1982] many of the areas impacted by the [Amoco Cadiz] spill appear to the casual observed to be recovered from the effects of the oil. However, investigations have shown that differences still exist between some of the current ecosystems and those present prior to the spill. Hopefully, other studies will continue to watch and document the recovery processes.









BIRCH. HORTON, BITTNER, CHEROT AND ANDERSON

Trustee Council October 26, 1989 Page 3

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for field and tissue sample collections, cataloging procedures and guidelines for field and laboratory notating procedures. We therefore reserve the right to supplement these comments in the event additional information is provided on, <u>inter alia</u>, (a) the methodologies to be used; (b) the availability of certain historical data; and (c) the qualifications and experience of the scientific personnel who will be carrying out the projects.

3. The lack of information regarding methodologies and detail is especially apparent in the proposed economic studies set forth in Part III of the Plan. As regards these proposals (Economic Uses Studies, nos. 1-9), it is our view that substantially more detail regarding methods, analyses and objectives is required before we would be in a position to provide any meaningful comments regarding the actual studies proposed. Examples of gross inadequacies in the descriptions provided include, but are not limited to, the objectives, methods and analyses of the effect of the spill on commercial fisheries and fishing industry costs, methodologies to be adopted for the projections of market values of lands impacted by the spill, details regarding the surveys to be used in assessing loss of intrinsic value and methods by which the archaeological sites impacted by the spill have been affected and their injury assessed and valued.

It is also our view that the economic use studies are incomplete in that they omit consideration of the impact of the spill on tourist businesses and other commercial interests outside of those in the commercial fishing industry. There are many small and large businesses outside the commercial fishing industry that use or are directly or indirectly dependent upon natural resources injured by the spill. Those resources may include not only the biological resource, but also lands and waters that have been affected. Businesses omitted from any consideration by the Plan include, but are not limited to, guide services, lodges, taxi-dermists, water taxi operators, charter boat and aircraft operators, rental and retail firms for marine equipment and specialty equipment such as sea kayaks, fish transport businesses and other businesses which use or rely upon injured lands, waters, fish and wildlife. Because CERCLA at 42 U.S.C. 9651(C) requires that damage assessments shall take use value into consideration, we believe the economic use studies should include assessment of the impact of the spill on the foreging business interests. We strongly urge the Trustee Council to expand significantly the scope of Part III of the Plan to include the above-described business interests which, unquestionably, have suffered direct, tangible economic harm as a result of the spill.

4. We believe the Plan should include several toxicological studies of the spill both long- and short-term. Although we

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BIRCH. HORTON. BITTNER, CHEROT AND ANDERSON

Trustee Council October 26, 1989 Page 4

understand Exxon has initiated a highly relevant marine toxicology study, no similar efforts appear to have been undertaken by state and federal government agencies and none appear contemplated in the Plan. In our view, such studies may generate significant data regarding the long-term impact of the spill on the marine environment and the economic interests affected and represented by this Committee.

5. The Plan does not encompass a study of the effects of the clean-up operations and the advisability or impropriety of certain shoreline techniques used following the spill. The Plan should include a proposal for such a study, including a comparison of contamination levels at sites which were treated as compared with those which were not, and an analysis of the appropriateness and potential effect on the environment of the shoreline clean-up techniques employed by Exxon and its contractors. An example of at least one subject for study could be the appropriateness of using dispersants with high-pressure hoses to clean rocks. Many other shoreline clean-up-related issues need to be addressed but are not contemplated by the Plan.

6. The Assessment Plan does not include a proposed study dealing with the social and psychological effects of the oil spill on the human population, particularly Native Alaskans. Our constituency includes the class of Native Alaskans impacted by this spill and, in our view, a social and psychological study of this nature is crucial to a complete overall assessment of the spill's impact.

7. On the whole, it would appear that the Plan is designed to meet CERCLA needs and adopt a regional approach to damage assessment and economic loss. Many of the proposals appear designed to develop macro-evaluations but do not deal with microevaluations which are site, locality or industry specific. We strongly urge the Trustee Council to consider a site/industry specific approach in addition to that adopted in the Plan.

8. Economic Use Study number 9 is too limited in scope. The study should be expanded to include other primary and secondary effects of the oil spill on archaeological, historical and cultural sites. These impacts may include, but are not limited to, an effect on the radiocarbon integrity of cultural sites due to the increased presence of hydrocarbons in the sediment, increased vandalism occurring as a result of the clean-up, unauthorized removal of artifacts, human remains or other material, and the effect of excessive pedestrian traffic due to the clean-up. Further, this study should be coordinated with the study recommended in paragraph 5 for an assessment of the shoreline clean-up operations on lands and resources. Finally, Study number 9 does not take into account the non-economic damages caused by the

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BIRCH. HORTON, BITTNER, CHEROT AND ANDERSON

Trustee Council October 26, 1989 Page 5

violation of the integrity of cultural and archaeological sites on the physical and mental health and well-being of Native Alaskans.

9. The Plan does not contemplate the providing of data and results as collected to the plaintiffs. Clearly, plaintiffs and their scientific consultants must have timely access to data and results in order to monitor the progress of the impact and assess the appropriateness and reliability of the studies embodied in the proposed Plan.

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The foregoing is submitted without prejudice to the rights of the plaintiffs herein and does not purpose to supersede or preempt the right of individual counsel to provide other or different comments from those set forth herein.

Very truly yours,

BIRCH, HORTON, BITTNER & CHEROT

Ву

Timothy Returnenos, Co-Chairman Plaintiffs' Damages Committee of the Plaintiffs' Coordinating Committee

:srb

LAW OFFICES

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BIRCH, HORTON, BITTNER AND CHEROT A PROFESSIONAL CORPORATION

127 WEST SEVENTH AVENUE + ANCHORAGE, ALASKA 99501 - TELEPHONE (\$07) 278-1550 - TELECOPIER (\$07) 278-2822 - TELEX 28-355

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. THOMAS ALBUTT LUANH E BALLET J. BLOWTREY SEATULET ROMALD G. BARCH <sup>11</sup> MILLIAM R. BITTHER <sup>44</sup> RATHETH A. BLACK BOHGES BLARERSHIP PHILIP BLUNSTEN CORT R. SORGESON WILLIAM BUHPERS <sup>4</sup> JOHN J. BURGESON BURGHE BUGBERS <sup>4</sup> JOHN J. BURGESON BURGHE M. CANRAF <sup>44</sup> JOBECH M. CHOMEL <sup>44</sup>	натиск в. LOLE паш. с. Dillon Sim Gunin Eric A. Dista" Jobchy IV. Evanst" Jobch IV. Evanst" John IV. Evanst" John IV. Evanst" John IV. Evanst" John IV. Evanst" John IV. Evanst" Marke North" Marke K. John Evany R. Letchlast Stanlet Y. Lewis	LEBLE C. LONGENBLUGH JEFFRE R. LONGENFELS** MULH HILAN GREEDON'A MILLER INCHAEL J. MARRE THOOTHY J. PETUHENDE BITVEN PRADELL MICHAEL V. REUBING ELIBARETH N. ROSS** E. BUDD BIMPBON STEMEN N. ROMENEN SHERIDAN BTRCHAND' SHERIDAN BTRCHAND' DANIEL W. WESTERBURG T. NENRY WILBON	PF COLARE, LAMES D. MORDALE 	 KEY BANK BUILDING IGO CUBHMAN STREET, SUITE SII PAIRBANKS, ALASKA 8870) (807) 482-1866 TELECOPICE 1807 488-5035 ONE SEALASKA PAZA, SUITE 301 JUNEAU, ALASKA 88800 TELECOPIER (807) 888-8810 TELECOPIER (807) 888-8810 TELECOPIER (807) 888-8810 TELECOPIER (807) 888-8810 TELECOPIER (807) 888-8810 TELECOPIER (807) 888-8810 MASHINETON, 5. C. 20038 (202) 858-8800 TELECOPIER (807) 888-1027
				TELECOPIER (202) 659-(027

#### Writer's Direct Dial No. (907) 263-7219

September 22, 1989

Trustee Council P.O. Box 20792 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

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3035 Riverview Drive Fairbanks, AK 99709 24 October 1989

Trustee Council State/Federal Natural Resource Damage Assessment Plan P.O. Box 20792 Juneau, AK 99802

Council members:

I have reviewed the public draft of the "State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez Dil Spill" (August 1989) and present the following comments.

The proposed scientific studies on the effects of the Exxon Valdez oil spill appear to have been prepared by knowledgeable specialists, and lacking sufficient background I cannot comment on those proposed studies. However, I am concerned about what is NOT in the plan, particularly studies dealing with the human impacts of the oil spill. Mention must be made of the archaeological sites which were disturbed by oil spill clean-up workers, particularly by the pot-hunters and souvenir collectors.

Most significantly, the plan made no mention of how people living in the oil spill-affected areas will be assessed; if this is not in the mandate of your study, then I urge that it be added. I particularly urge such an assessment be done as there is little, if any, human assessment information currently available. During the recent Alaska Science Conference session on the Prince William Sound oil spill, knowledge of only one human impact study was voiced. Your assessment plan MUST address the human impacts, particularly of subsistence-based villagers who have no other food sources then that fouled by the oil, and many of these individuals couldn't earn money in the clean-up because of age or other responsibilities. These folks will have no cash and very litte untainted subsistence foods.

I appreciate this opportunity to respond and am eager to see the final plan. I urge you to distribute copies to all Alaskan libraries so people can see the final plan; your work on behalf of the public is appreciated as long as it truly reflects that public's concerns.

> Thank you. Romand K. Inouge Ronald K. Inouge

cc: 5. Cowper

- R. Eluska, AFN
- F. Murkowski
- T. Stevens

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October 20, 1989

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

Dear Members of the Trustee Council:

Enclosed please find my comments on the August 1989 State/Federal Draft Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill. Please read them over carefully and integrate the recommendations into the Final Plan. I believe they are worthy of consideration.

Sincerely,

lishan N G

Thea Liskamm 2731 1/2 Ashby Place #3 Berkeley, California 94705 415/848-1336

Enclosure

## MEMORANDUM

 TO:
 Trustee Council

 FROM:
 Thea Liskamm

 RE:
 Comments on August 1989 Draft Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill

 DATE:
 October 20, 1989

#### I. EXECUTIVE SUMMARY

In order to evaluate the Draft Plan I chose five major categories which merit attention, described their current status and provided a recommendation for the Final Plan. The five categories are: Internal consistency, relationship to key ecological concepts, linkage to policy choices, mechanism for public disclosure of findings, appropriate summary discussion and graphics. I chose these five categories because I decided they were particularly relevant to the process of environmental planning. There are, of course, many other areas for evaluation because any plan can always be improved.

While evaluating the draft plan I had the opportunity to speak with a number of people who are working with the Trustees or have reviewed the document. My colleague Daniel Suman at the Boalt School of Law, Michael Herz of the Baykeeper, Professor Suzanne Scotchmer of the Graduate School of Public Policy have all been particularly helpful.

The Final Plan should incorporate the major recommendations given in this evaluation. Establishment of a control environment as a baseline for comparison studies will provide a clearer picture of the extent of the actual damage incurred. In order to

interpret the studies, more information regarding sampling sites and techniques is needed. The cumulative impacts on all categories should be addressed both systemically and programmatically. Information is needed regarding the linkages between the environment and the people who are devoted both economically, culturally and spiritually to the uniqueness of Alaska. Avenues for public input into the development of a restoration strategy should be more clearly outlined in the Final Plan. A full summary discussion would help emphasize the main goal of the damage assessment plan.

# II. INTRODUCTION

The March 1989 Exxon Valdez tanker spill dumped 11 million gallons of crude oil into the pristine environment of Prince William Sound making it the biggest spill in U.S. history. Exxon has thus far spent 15 million dollars in a massive effort to clean up the disaster. Towards the end of the summer the State of Alaska, joined with the participating federal agencies, the Department of Agriculture (DOA), Department of the Interior (DOI), and the Department of Commerce (DOC) as "Trustees", and the Environmental Protection Agency (EPA) worked together to produce the State/Federal assessment plan. The EPA is the overseer of the two acts which provide authority for the damage assessment and restoration activities: The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Clean Water Act (CWA).

The stated goal of the plan is to define the process by which damage to the environment is evaluated in order to seek payment from responsible parties for restoration.

The total cost for completion of the studies outlined in the assessment plan is estimated to be 35 million dollars through the end of February of 1990. The plan is broken up into three major categories: determination and quantification of injury, determination of damage, and development of a restoration strategy.

The largest part of the draft plan (Part I) is composed of injury determination and quantitative studies. The stragegy for damage assessment uses scientific information to support the estimates of economic damage for lost or injured resources. Scientific information is needed to verify the nature and magnitude of the injury sustained, to provide proof that the injury was caused by the spill and to identify potential needs and approaches for restoring the resources. (p.20) Damage assessment is based on nine areas of study: coastal habitat, air/water, fish/shellfish, marine mammals, terrestrial mammals, birds, economic uses, technical services and restoration.

While the damage assessment plan seeks to evaluate damage it is not a restoration plan. According to the report, the evaluation of the studies will lead to the development of a restoration plan. Part II, Development of the Restoration Plans is only two pages long in the Draft Plan and summarizes only the rationale and potential costs associated with developing a restoration plan. The objectives of the restoration plan include the incorporation of ecological concepts, a review of natural resource/injury assessment reports, and an evaluation of restoration techniques and strategies. The Trustee Council will confer with scientists, agency representatives and the concerned public prior to the implementation of restoration activities. Lead agencies are the EPA and the State of

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Alaska, and the U.S. Forest Service (USFS), National Oceanic and Atmospheric Administration (NOAA), and U.S. Department of the Interior (USDI) are cooperating agencies.

Part III, the section on Damage Determination: Economic Value of Resource Use divides the economic value determination into nine categories: Commercial fisheries, fishing industry costs, bioeconomic models for damage assessment, effects of the oil spill on the value of public land, economic damages to recreation, losses to subsistence households, study of loss of intrinsic values, economic damage assessment of research programs and survey of archaeological sites impacted by the <u>Exxon Valdez</u> oil spill. <u>None</u> of these categories adequately address the intrinsic value of the environment. The study of loss of intrinsic values will use a survey method to document individual's intrinsic valuation of the resources in question, however the plan is not explicit about how it will use the information derived from the survey. Reversibility is assumed.

# III. ANALYTICAL METHODS

#### A. Internal Consistency

Throughout the entire document there is a lack of baseline data for comparison. The post-spill damage assessment cannot adequately be completed without a clear idea of the status quo prior to the accident. Without sound baseline data, it will be difficult to determine the extremity of the damage. For example, how can the Trustees distinguish between population changes caused by the oil from changes as consistent with natural

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variability? The Draft Plan states that "Where possible, the basic approach of the injury determination/quantification phases is to compare conditions." and that "Pre-spill conditions have been documented for some ecosystems and sites in the Sound." "Where possible" and "some ecosystems" are vague terms and furthermore, the injury determination studies in the Draft Plan show little or no comparison to pre-spill conditions.

Figure 6, the diagram of The Damage Assessment and Restoration Process, (p. 19), shows the Assessment Report date as indeterminate. After the assessment report is completed a demand letter is sent to the responsible parties and later a settlement or award is reached. After this process completed, the restoration is strategy/planning/implementation takes place. The diagram shows a direct connection between the completion of the three studies and the restoration strategy as well as a direct connection between the results of the studies and the restoration strategy. Realistically, what will be undertaken prior to the settlement or award? The plan reads, "In concert with the studies, the Trustees will begin preliminary restoration planning so that final restoration can begin as soon as possible after recovery of the claim." (p.18) This is inconsistent with the diagram which implies that the completion of the studies will have a direct impact on restoration, prior to the assignment of responsibility and collection of settlement monies.

In addition, sampling strategies are addressed quite generally in the plan. An inaccurate or poorly chosen <u>sampling strategy</u> could potentially underestimate or overestimate damages. Regarding the patchiness of oil in Prince William Sound and other

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coastal areas, for example, the sediments near heavily oiled areas might show high concentrations of petroleum hydrocarbons, while those in less affected areas might display different results. Without explicit information regarding the specifics of the sampling techniques used it is difficult to evaluate data which is laboriously collected.

#### B. Relationship to Key Ecological Concepts

The damage assessment plan covers an extremely short period of time. The assessment plan is being addressed only six months after the spill occurred and does not even cover an annual cycle. A study completed hurriedly in the short-run cannot and will not address potential long-run damages. Natural resources are which are inherently renewable suffer damages far different than damages suffered by inanimate objects because long term natural variations can hide significant impacts to natural systems. A speedy damage assessment ignores the potential for ecosystemic consequences to continue for many years. It will be impossible to quantify long-term effects with only half a year's data. It will takes years and perhaps decades to fully understand the damage done to the ecosystem by the oil spill. Some say it is primitive and distasteful to measure the environmental impacts at this point in time and speculate that the damage assessment will grossly underestimate the actual natural resource damage done by the oil spill.

The plan does not consider the damage done to phytoplankton nor zooplankton, it considers only larvae of commercially important species (See Fish/Shellfish Study #19). It does not study the effects on marine bacteria in the water column or sediments. Daniel Suman, a marine biologist, informs me that plankton and bacteria are the bases for the Com.TopicIssueSuj.Ecrt540201X0

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marine food chain and should not be overlooked in assessing ecosystem damage. In addition, there is no study of primary and secondary productivity in the waters. While marine algae and kelp are eaten by many fish, provide a key link in the food chain of subpolar Alaskan waters and are a habitat for many marine animals, the plan does not consider marine plants.

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# C. Linkage to Policy Choices

As I understand it, there is currently a problem within the Trustee Council. The multiple Trustees are having trouble delegating the lead to one of the member agencies. While I believe it is a good idea to join together to form the Council, I am skeptical of the effects of such internal political confusion at a time of severe environmental crisis. While tradeoffs are inevitable, I sincerely hope the Trustees can come to a speedy decision without adversely affecting the natural resource damage assessment questions which they have joined together to address.

The Secretaries of the respective Departments are working with the Commissioner of the Alaska Department of Fish and Game on the damage assessment plans. Development of a restoration plan is contingent upon the findings outlined in the assessment plans. "Restoration efforts will begin as soon as practical after information is obtained on the extent of resource injury." (p.17) What policy choices does this leave the rest of us with? Clearly, both the environment and the public must wait until resource injury is assessed.

Is the situation reversible? The implicit assumption in the draft plan is that

eventually Prince William Sound and the biological life in the surrounding areas can and will return to pre-spill conditions. Policy choices are contingent upon this assumption and tradeoffs may be taken too lightly in the context of ultimate recovery.

# D. Mechanism for Public Disclosure of Findings

The August 1989 State/Federal Draft Natural Resources Damage Assessment Plan for the Exxon Valdez Oil Spill is open for public review prior to the completion of the Final Plan. The deadline for comments has been extended from September 30 until October 31, 1989. Resource agencies, locals and interested parties are all welcome to send comments on the Draft Plan to the Trustee Council. Although public input has been incorporated into the <u>restoration plan outline</u>, there is no concrete information regarding the avenues for public input.

Potential responsible parties identified by the Coast Guard include the managers and representatives of Exxon Shipping Company, Exxon Corporation, and Alyeska Pipeline Service Company. Letters giving notice of intent to perform an assessment have been sent to the parties listed above. The draft assessment plan states that the list may be expanded upon further investigation. How will the <u>public be notified</u> of the expansion of the list?

# E. Appropriate Summary Discussion and Graphics

Although there is an elaborate financial summary, there is no conclusive summary discussion in the draft damage assessment plan. The plan ends rather abruptly with a summary of fiscal needs. Why isn't the big picture addressed? Graphics are, for the most part, appropriately presented. Maps are provided of (1) North Central Gulf of

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Alaska (Figure 1a); (2) Western Gulf of Alaska (Figure 1b); (3) Map of Prince William Sound (Figure 2); (4) Major Currents in the Gulf of Alaska (Figure 3); (5) Movement of the Oil from the Excon Valdez Spill, March 24-May 18, 1989 (Figure 4). Figure 5 shows the Behavior of Oil in the Alaskan Environment. Figures 6, 7 and 8 are diagrams of the planning process.

# IV. RECOMMENDATIONS

### A. Internal Consistency

Perhaps a baseline environment can be established for comparison which is similar to the status of Prince William Sound prior to the spill. Establishment of such a control environment will inevitably provide a clearer picture of the extent of the actual damage both now and in the future. Consistency between the diagrams in the document and the written report itself will allow for a more plausible final damage assessment plan. In order to provide accurate information, more information regarding sampling sites and techniques is needed. A glossary would be useful at the end of the report to further define terms certain readers may not be sure of.

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# B. Relationship to Kev Ecological Concepts

Establish a damage assessment plan which is open-ended and leave room for integration of damages as they are discovered. Integrate key ecological concepts such as complex linkages, density dependence, biological magnification, and stability boundaries. The Final Plan should address the ecosystemic impacts of the oil spill. The draft plan

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outlines the effect of the spill on the nine individual categories but the linkages between air and water and restoration, etc. as well as cumulative impacts on all categories should be addressed both systemically and programmatically. If the plan is supposed to be a comprehensive analysis of how the oil spill affected ecosystems in south central Alaska, then it should be comprehensive and as such include damage assessment studies of plankton, marine bacteria and algae. Some degree of ecosystemic forecasting is needed in order to estimate the long-term damage rather than relying entirely on data gathered from the six-month Alaskan summer.

## C. Linkage to Policy Choices

What is the short and long-term impact of the environmental crisis on the local economy and culture? Many people move to Alaska because they believe in the cultural values of Alaska and Alaskans and yet the spill has adversely affected those values. Although there is a brief mentioning of Native allotments, tourism, etc. there is no information regarding the linkages between the environment and the people who are devoted both economically, culturally and spiritually to the uniqueness of the Alaskan environment. How will the oil spill affect future generations? What are the chances of irreversibility in certain parts of the ecosystem? These questions need to be addressed in the Final Plan. A lead agency must be established in order to continue to develop the restoration process.

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# D. Mechanism for Public Disclosure of Findings

The Trustees should respond directly to the resource agencies and individuals

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submitting comments. Responses should refer to the integration of individual comments into the Final Plan. The public should have the opportunity to know as soon as possible after responsiblity is assigned to key parties. Avenues for public input into the development of a restoration strategy should be more clearly outlined in the Final Plan.

# E. Appropriate Summary Discussion and Graphics

A full summary discussion would help emphasize the main goal of the damage assessment plan. The big picture/long-term should be addressed. Graphics should be expanded to include maps of projected areas subject to damage in the long-run from the oil spill. Diagrams should also include the long-term in the planning process.



## V. CONCLUSION

A restoration plan is needed now. Although the Alyeska Pipeline Servie Company is refusing to assume responsibility for any spill beyond an initial response, someone must pay for the ongoing restoration efforts. A damage assessment plan focused on individual categories or study areas does not change the fact that Exxon is primarily responsible for the cleanup, as well as the parties that did not enforce the oil spill plan requirement. CERCLA and the CWA give the EPA the authority to make sure the environment is protected and restored to it's pre-accident state. Determination of pre-spill conditions is imperative in order to set an ultimate clean-up goal. Development of a restoration plan is urgent and the plan must be open for ecological, social and political input indefinitely. The Alaskan environment, people and wildlife must not suffer any longer.





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# Prince William Sound Science and Technology Institute

P.O. Box 705

Cordova, Alaska 99574

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(907) 424-5800 Fax (907) 424-5820

October 19, 1989

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

Gentlemen:

The Board of Directors of the Prince William Sound Science Center has directed me to advise you of two major concerns with respect to the Public Review Draft Report: State/Federal Natural Resource Assessment Plan for the Exxon Valdez Oil Spill. Aug., 1989. We regret that these comments reach you after the published deadline; unfortunately the Board did not meet for discussion of these materials until after that date.

The Board's principal concern is that the document appears preoccupied with short-term goals and tasks, rather than taking a considered long-term approach to restoration and future protection of the impacted natural resources. This is particularly perplexing in view of the introductory statement to reviewers that:

". . .the plan is focused on those studies necessary to determine injury to natural resources and to determine damages resulting from the loss of public use of those resources, and on the strategy for restoration of natural resources." (emphasis added)

Reviewers of the August draft must conclude that the projected array of studies became so focused on the first two purposes that the third, and most environmentally important purpose received scant attention--apparently limited to the single interagency general planning study outlined on p. 186.

While that study clearly is in order to assure a comprehensive and cost-effective approach to restoration in the long term, there certainly are aspects of damaged habitat restoration which should be begun at once, without waiting for the comprehensive analysis and report proposed.

It would seem also that long-term planning should give significant attention to environmental protection against future disasters.

As a further suggestion, the perceived preoccupation with shortterm tasks is heightened by the fact that most projects are described in a single-season time-frame context, even though many, particularly those addressing biological problems, will require continuity through a sequence of years to produce useful results. Projects requiring multi-year continuity should be so described, and include some projection of costs into subsequent years.

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The Board of Directors' second concern more directly addresses implementation of the planned studies. It appears that the responsible agencies continue to debate what has to be done and which entity will be funded to do it, rather than getting on promptly with the tremendous tasks which clearly need immediate attention. The Board urges earliest possible inter-agency cooperative action on studies of recognized immediate importance.

The Board recognizes that considerable progress may already have been made toward addressing this concern. However, there is no general awareness that this is so. The Board therefore further recommends that progress reports on the scope and progress of work actually underway be widely disseminated within the scientific community and to the general public. It is worth noting in this context that the Prince William Sound Science Center recently attempted to convene a regional conference for precisely that purpose, but was forced to postpone that effort when it became apparent that the "gag order" in effect would not permit any such public review and discussion.

These comments are intended to be constructive in terms of needed future action, fully recognizing the time constraints and other difficulties under which this document had to be drawn together from multiple sources, and then approved for public review by the responsible agencies. Please be assured that the Prince William Sound Science Center is intensely interested in the issues involved and in the researches contemplated to address those issues. The Center is prepared to cooperate and participate in any way contributing to the ultimate success of those endeavors.

Yours sincerely.

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John P. Harville Interim Director, Prince William Sound Science Center

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# Washington State University

Department of Anthropology, Puliman, Washington 99164-4910 509-335-3441

October 18, 1989

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

Dear Sirs:

I have read over the Public Review Draft Statement of the State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill of August 1989. Specifically I would like to comment on Economics Uses Study Numbers 6 and 9.

#### Economics Uses Study Number 6

LOSSES TO SUBSISTENCE HOUSEHOLDS

(1) Local food and raw material resources are of extreme importance to Native American and Euro-American populations on a subsistence level of economy. Not only are the food resources important in terms of calories, but they also provide a balanced nutrition. When local populations turn to processed foods they are either uninformed about a proper balance of commercially available foods or they simply cannot afford the costs of maintaining a balanced diet with these foods.

(2) The impact of the oil spill in destroying local food resources is thus more than a reduction in caloric intake, but also results in a dietary imbalance when a substitution is made.

(3) The loss of raw materials for construction, the handicraft industry and the like is in some ways less serious, but at the same time is a loss not easily replaced by purchasing a manufactured equivalent. For the handicraft industry there is no equivalent.

#### Economic Uses Study Number 9

SURVEY OF ARCHAEOLOGICAL SITES IMPACTED BY THE EXXON VALDEZ OIL SPILL.

#### (1) <u>Impacts to be considered as a result of the Exxon Valdez Oil Spill</u>

(a) Radiocarbon dating analysis

The seepage of oil into the soil and midden matrix of archeological sites will undoubtably have a profound effect on the radiocarbon dating of the sites. The oil, which contains very ancient organic carbon, at first will be a coating on materials and then as it penetrates into the more porous organics will become incorporated. The presence of the ancient carbon will skew the date of the sample submitted for dating from the site.

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#### (b) Soil Analysis

The introduction of oil to the soil structure could well disturb the soil chemistry of archeological sites. With a large amount of oil in the soil, sediments become very difficult to work with in the field as it masks color and textural characteristics. Many of the normal sediment studies such as grain size analysis, sinking rates of sediments in water columns, etc would not work until the oil is removed. The problem in soil chemistry, is that one does not know what else is removed during the process of cleansing the oil from the samples.

As oil congeals it can form bituminous-like pavements or hardpans. The effect of this cementation process on archeological sites is, likewise, an unknown impact and one that needs to be evalued.

#### (3) Artifact analysis

Artifacts are presently subjected to a variety of micro-analytic procedures which search for traces of blood residues, mineral pigments, resins for hafting and the like. Current methodology now limits the amount of handling of artifacts until such studies are completed as well as the avoidance of washing the artifacts. With a coating film of oil, I would doubt that these microanalytic procedures would be practical. We don't know what cleaning artifacts in a solvent does to amino-acids, pigment and resin residues.

#### (4) Preservation of archeological site materials

Would the presence of oil hasten biological decomposition? If the presence of the oil attracted a variety of new microorganisms then this might hasten the disintegration of organic artifacts, plant and animal remains in the site.

#### 2. <u>Site value</u>

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It is often very difficult to put a value on a site until the site is excavated to determine what information it contained. Sites also have value in terms of the scientific research problems that can be addressed using site information. Landforms and biotic resources are important criteria utilized in determining the reasons why particular sites were occupied. Site value or significance thus can be accessed in part through the study of local ecological relationships and site settings. For certain research questions, sites along an open coast might be more important than those within an embayment. In terms of other research problems, the prehistorian might be addressing the subsistence strategies of people who occupied different parts of an embayment. One has to conclude that all archeological sites are valuable as there are a multitude of research questions that can be asked of site data. Relatively modern sites thus may be as important to the investigation of a particular environmentally related archeological problem as those

Significance of sites or site information is often measured by the rule of <u>the potential for contributing new scientific data</u>. While in some ways this works, in many other ways it does not.  $\triangle$  50 year old log cabin is often regarded as less significant than a 5000 year old prehistoric site as we know about the people who lived in cabins 50 years ago. Unfortunately, written history has a way of short-changing us and we fail to record the familiar or the obvious. The 50 year old cabin ruin of today may be the vital bit of data needed by the scientists of the future. 3. Evaluation of the impact of the oil spill on archeological sites.

Not only will the number of sites, both surface and subsurface need to be determined to evaluate the impact of the oil spill, but different site types and site locations will have to be tested to determine the nature of the impact of the oil spill on archeological materials. It is important to stress that there are both surface and subsurface components in archeological sites. In coastal areas where erosion can cut into the side of an archeological site exposing the entire strata of occupation, both the surface and the subsurface components will be affected.

Yours Sincerely,

Robert I leterman

Robert E. Ackerman Director, Museum of Anthropology and Professor of Anthropology

cc. Judith E. Bittner State Historic Preservation Officer.

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EXIMI VALUEZ OR CELL 58 TRUCTER COURCEL ADMINISTRATIVE RECORD

NORTH GULF OCEANIC SOCIETY



P.O. BOX 15244 .... HOMER, ALASKA 99603 (907) 235-6590

P.O. BOX 156 CORDOVA, ALASKA 99574

To: Trustee Council P.0. Box 20792 Juneeu, Alaska 99802

16 October 1989

Re: State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill.

Since most of these studies were organized shortly after the spill occurred and were an attempt to cover all possible biological aspects of the demage, it is difficult to make constructive. comments until the first seesons results are in. This should be in January 1990.

Most of the studies revolve around individuals or agencies with prior expertise with the organisms or hebitat under study and should incorporate previously collected "baseline" information. The lack of good beseline data in some cases will underline the need for these types of studies prior to possible disturbances in the future. In the case of some animals, such as marine mammals, that have long life histories and low mortality and recruitment rates long term studies provide the only reliable basis for assessment of impacts after an event such as the Exixon Valdez spiil.

My field of expertise is with marine mammals, so I will limit my specific comments to these studies.

in regard the humpback whale study, there is probably a small chance of direct kill of these whales from ingestion of oil, since few humpbacks were present when the oil moved through the Sound and along the outer coast. Seldom are any number of humpbacks seen until late April or May. We do not know for certain (as the study plan suggests we do) that whales that feed in the Kodiek area are part of the same group that feeds in Prince William Sound. It would seen, though, that the most likely known feeding area that wheles from the Sound would move into if displaced would be the Kodiak area. I have some concern that the Kodiak area will not receive enough attention in determining oil effects on humpbacks. Also of great concern is the long term food chain effects on these whales. Effects on the whales prey or on the whales themselves may not show up immediately, but intensify as hydrocarbons work their way up the food chein. I have some concern that the small fish and exphausids that make up the prey of these whales are not receiving the study they should and that problems in the prey populations might go undetected. Finally, I have strong doubts of the value of line transect surveys using boots and aircraft in an enclosed, irregularly sheped area such as the Sound and feel that photoidentification methods of population census provide the only reliable, cost effective research tool. This is especially true in light of the previous photoidentification work that has been completed and its value as a baseline.

With the killer whale assessment work, I again feel that aerial surveys are a tool that may be used to determine areas where photocensus should occur, but has little value as a means of determining population parameters in the detail needed for determination of oil impacts. Again, It is fortunete the the photoidentification beseline exists in the Sound to examine the more subtle changes in population paramenters. To confirm changes (or lack thereof) a several year approach to study must be taken. Since interchange between killer whales from the Sound and Kodiak has been demonstrated, again, it would seem important to concentrate some effort in the Kodiak area if distributional information is important.

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In regard the harbor seal and seal iton studies, I would consider these essential in light of the declining Steller sea lion populations in western Alaska and the declining harbor seal populations in the western Sound. It is my fear that the spill will excerbate the decline of these marine mammals. Again, without a several year perspective, the effects on these long lived animals will not be clear.

The need for extended see otter work is certainly evident. The only concern is that since this research is "hands on" type work involving the insertion of radio transmitters, that no more otters be radio outfitted than is absolutely necessary to obtain statistically meaningful results. Considering the disasterous effects of oil on the otters that has already been documented, it would seem disturbance of the animals should be kept to the mimimum necessary to produce grantifiable results.

It should be clear that with all these marine mammal studies, a single seeson of study will not prove or disprove to the extent a court of law would require the extent of damages (or lack of damages) to these populations. Without a 2 or preferably a 3 year study, population parameters necessary to assess oil impacts these long lived, slow reproducing animals cannot be adequately developed.

After these first year studies are reported upon it may be quite possible to reduce some of the costs by cutting segments of the studies that do not seem to yeild information directly pertinent to the question of oil related impacts on the population.

Finally, I am very concerned that the results of all these studies described in the draft plan, both long term and short term will not be centrally catalogued and available to other workers as well as the public. Is there some system for catalogueing and making evailable the final reports by all the various research groups and contractors?

Sincerely, Jay EMAther Craig O. Matkin, Director

cc: Rita Hendrickson, Prince William Sound Users Association Michelle Straube, National Wildlife Federation









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IN TRI-STATE BIRD RESCUE & RESEARCH, INC.

P.O. BOX 299, WILMINGTON, DEL AWARE 19899 October 15, 1989

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

Dear Hope,

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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 has, 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 delaterious 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.

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Hope Babcock Letter

# ASSESSEMENT GUILDEINES RE: CERCIA / 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 <u>only</u> 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 <u>alwavs</u> 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 Flan 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 affective.

Good luck. I look forward to hearing from you.

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Sincerely,

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Lyne Frink Lynne Frink President

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COMMENTS ON THE

NATURAL RESOURCE DAMAGE ASSESSMENT PLAN EXXON VALDE2 OIL SPILL

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OVERVIEW

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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. 18/24/39 84:35

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# 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 spacies 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.

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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 affect 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-documentad. 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 Grude oils, has been similarly well-documented. These chemicals have been assessed for significant risk as carcinogens, reproductive 10/ 24/69 04:36 DU PONT EXP. STA. 5126-225 PHE225 025

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and developmental hazards and direct toxicity (cf CRC Handbook of Laboratory Safety and EPA deteriminations of hazards). Quantitative determinations of toxicity (in the form of LD50 measurments) have been documented in laboratory animals and this research has been directly extrapolated to other animals (most notably humans) in medicine and industrial hygiense. 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).

3

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 barast 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

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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.

<sup>1</sup> 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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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.

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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 domesticate 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.TopicIssueSug.Sort4318502

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mass spectral and infared 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 be 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.)

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# Ouestions 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 Palcons? 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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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.

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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 aconomic 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.

# <u>Conclusions</u>

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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 <u>because</u> of the magnitude of the event, <u>because</u> 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.

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These proposals represent poorly designed, invasive and disruptive projects requiring vast sums of monoy 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 mothods.

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 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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ROBERT G. TORRICELLI

COMMITTEES FOREIGH AFFAIRS SCIENCE, SPACE, AND TECHNOLOGY



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Mouse of Representatives Washington, DC 20515

Congress of the United States

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

Dear Trustee Council Members:

This is in reference to the draft Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill made available on August 18, 1989. I commend the Trustee Council for preparing the draft for public review; however, I would like to take this opportunity submit as comments my serious concerns about the plan.

I am concerned that the damage assessment plan would limit all studies to one year. The study itself admits the oil will continue to have serious environmental impact for years to come. Many of these biological and ecological impacts will take years to become apparent. For example, it may take several years before the extent of damage done to the salmon population will be known. While the plan does provide for the possibility of future studies, decisions to extend studies would depend on impacts found in the first year, thereby ignoring damages that may emerge after one year.

Also, I am concerned that the trustees may let Exxon participate. in the assessment. It is my understanding that Exxon will be doing its own studies, the results of which may be used in the assessment. Even with oversight from the Interior Department, we can not expect Exxon to provide objective information considering their direct interest in the results.

Perhaps of greatest significance is the plan's lack of focus on restoration, replacement, or acquisition of the equivalent of the injured resources. The D.C. Circuit Court of Appeals rejected several of the Interior Department's damage assessment regulations. It held that restoration or replacement of natural resources should be the basic measure of damages. However, the draft states that the rejected regulations are still being considered as an option when considering how to compensate for damage. It is essential that a restoration plan and damage assessment plan be developed that are consistent with the court's decision. Use value alone must not determine the extent of damages.

Finally, I am concerned about the vagueness of the study. Many details about the study were left out. For instance, I recently learned that the Trustee Council, to save costs, will only allow each research team to analyze ten samples (e.g. carcasses) for each study.

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Gon. Tople Tissue 4 3 0102 × 2 Trustee Council Page 2 October 12, 1989

Such a limit will make it unlikely that damage assessment will be accurate considering that 29,541 birds, 922 sea otters, and several hundred seals already have been found dead. These are only fractions of the total numbers of animals killed by the spill. The Interior Department must provide more details on the study so that intelligent public comment will be possible on the plan's specifics.

Thank you for your consideration of these matters. Please contact me if you have any questions or concerns.

Sincerel G TOR Member of Congress

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ENNON VALUER ON SCILL TRUSTEE COUNCIL ADMINISTRATIVE RECORD

# society for american archaeology

808 17TH STREET NW #200 WASHINGTON DC 20006 TELEPHONE 202/223-9774

MSU MUSEUM Michigan State University East Lansing, Michigan 48824-1045

October 11, 1989

CERCIA Trustee Council P.O. Box 20792 Juneau, Alaska 99602

Dear CERCIA Trustees:

The Society for American Archaeology, the largest organization representing the archaeological community in the United States, has had the opportunity to review the Public Review Draft of the Assessment Plan for the Eccon Valdez oil spill. Given the precedent setting nature of this initial CERCIA process, and the fact that significant archaeological resources are present in the assessment area, we feel it is imperative that archaeological resources be properly addressed in the Assessment Plan. We would, therefore, like to bring to your attention several areas of the Public Review Draft which we feel warrant modification to better accompate the impact on archaeological resources.

Economic Use Study Number 9 has a section referring to archaeological resources. The proposed activities in this section must be more clearly specified, for purposes of proper research design formulation, as well as for purposes of accountability and project evaluation. It should also be noted that this section has no dollar values associated with the work to be accomplished. This differs from other sections of the plan where dollar values are specified. Clearly these are linked problems. The work plans need to be more specific so that appropriate funding can be allocated.

Economic Use Study Number 9 also does not address what has been a major issue for the Society for American Archaeology in recent years; looting and vandalism. As sites hitherto unknown to the general public become more visible, and as their locations become known, there undoubtedly will be an increase in the already high rates of looting that occurs at these locales. The SAA strongly feels that funding for assessment of looting impacts, and the regular monitoring of these sites to apprehend vandals, should be included in the Final Assessment Plan. Prosecution under the Archaeological Resource Protection Act may help to curb such activities.

As Economic Use Study Number 9 indicates, the deadline for completion of the archaeological component of this assessment is February 28, 1990. Archaeological work at this latitude requires a summer field season, which means that the time frame for completion should be modified accordingly. At a minimum the deadline should be extended through September of 1990 if not longer.

The Society for American Archaeology appreciates this opportunity to comment on the Public Review Draft of the Assessment Plan, and we hope that the Final Plan can be properly modified to accomodate the several concerns we



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CERCIA Trustees page 2

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have expressed. We believe that more in depth consideration of the archaeological resources in the assessment area is critical to evaluating the long term effects they will undergo from the oil spill event. I thank you for your attention. If I may be of further assistance feel free to contact me at 517/355-3485.

Sincerely, لد

William A. Lovis Chair, Government Affairs Committee Ourstor and Professor of Anthropology

cc: J. Sabloff, President P. Rice, Vice President CEHP, Inc.



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# STATE LANDS COMMISSION

LEO T. McCARTHY, Lieutenent Governor GRAY DAVIS, Controller JESSE R. HUFF, Director of Finance

EXECUTIVE OFFICE 1807 - 13th Street Sacramento, California 95814 CLAIRE T. DEDRICK **Executive Officer** 

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September 28, 1989

Trustee Council c/o Deputy Director U. S. Fish and Wildlife Service 18th and C Streets, NW, Room 3340 Washington, DC 20240

Gentlemen:

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The staff of the California State Lands Commission has reviewed the Public Review Draft State/Federal Natural Resources Damage Assessment Plan (Plan) for the Exxon Valdez Oil Spill as dated August, 1989. We appreciate this opportunity and submit these comments for your consideration.

The document indicates that Exxon has provided \$15 million for assessment studies; however, the total budget indicated in the plan is \$35 million. The means for covering the apparent shortfall is not clearly explained in the text. If participating agencies are not going to provide the missing support, the final plan should: 1) indicate the source of all monies necessary to implement the Plan; or 2) describe how the stated available monies will be allocated among a prioritized listing of the described studies.

The Plan is designed to measure effects of the spill through the end of February 1990 only. While recovery of damages which can be identified within the stated time frame should not be delayed by additional studies, some damages may not be evident during the first year. The final Plan should contain a reasoned, focused program of studies which could be necessary over a total evaluation period of five years.





# TRUSTEE COUNCIL, USFWS

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# SEPTEMBER 28, 1989

We also have some concerns as to the definition of "economic value" of resources as stated in the Plan. Such value is to be based "...on the goods and services they provide humans." This concept should be better defined. For example, under the present definition, how will resources with no "accepted" commercial value (sea otters, raptors, etc.) be evaluated along with those of accepted commercial value (Salmon, etc.)? In addition, how will the pre-spill level of the affected resources be determined?

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Thank you. We look forward to the publication of the final Plan.

Sincerely,

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DWIGHT E. SANDERS, Chief Division of Research and Planning

DES:maa cc: Claire T. Dedrick, Executive Officer





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UNIVERSITY OF ALASKA FAIRBANKS

Department of Anthropology Fairbanks, Alaska 99775

October 9, 1989

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

Dear Sir:

I am writing to provide comment on the follow-up plan to study the potential damage of the Excon-Valdez oil spill on archaeological sites. In terms of my own involvement, I worked on contract for the National Park Service for one week in April and for five weeks for Excon from mid-June to late July. My primary motive was, and is, to protect and preserve the record of Native culture history of the region since this has been my central research area for the past decade.

I did not see oil lying directly upon upland sites or washing upon eroding midden fronts this summer. Moreover, I received no reports from colleagues on contract to Excon or archaeologists from State and Federal agencies to the effect that they observed oil on sites or on erosion fronts. There is no doubt that eroded artifacts were covered with oil from time to time, but these artifacts are less important than in situ material. This is not to state unequivocally that oil did not contaminate some sites given the constipated information flow among colleagues throughout the summer. Yet, direct contamination of sites by oil seems to be less serious than other factors.

My view is that the most serious threat to sites is <u>not</u> directly attributable to oil contamination but to the documented and future damage resulting from site vandalism and marine erosion, factors which have been aggravated by the spill activity. If the professional archaeological community is serious about protecting and preserving archaeolgoical sites, vandalism and erosion, mutually reinforcing secondary impacts, must also be addressed.

Thank you for the opportunity to express my views to the Trustee Council.

Sincerely. SHETTLe

Richard H. Jordan Professor of Anthropology and Chairman

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

Dear Council,

October 9, 1989

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I have just reviewed a portion of the public review draft of the State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill. As an archaeologist who conducted survey work in the spill area this summer, I find myself very dissappointed in the design of "Economic Uses Study Number 9: Survey of Archaelogical Sites Impacted by the Exxon Valdez Spill."

-The most conspicuous omission in the plan is the lack of attention to vandalism and theft. The oil spill and months of clean-up activity brought literally thousands of people into remote areas of Prince William Sound, Kodiak Island, etc. Many of these people were first introduced to archaeology during the clean-up. Despite Exxon's efforts at education, many of these people learned how to recognize artifacts, but not that it is illegal to remove them from State and Federal lands. There is increasing demand for illegal antiquities, and the oil spill may stimulate an increased level of theft from these archaeological sites. I strongly believe that sufficient resources (i.e., funds and skilled archaeologists and law enforcement personnel) should be directed toward monitoring known sites to document this illegal activity. Effort should be directed to apprehend some of these looters under the authority of the Archaeological Resource Protection Act. The USDA Forest Service (Southwest and Northwest Regions) have successfully brought such cases to trial, and could be consulted in the planning of such efforts. Sufficient publicity should be generated to serve as a warning to other would-be site vandals.

Vandalism was already a widespread and large scale problem in places like Kodiak, but as a consequence of the oil spill, hundreds of people have learned about the location and contents of archaeological sites. Over the next few years, we may see a dramatic increase in archaeological site raiding and vandalism. Because this theft of archaeological material can damage and even destroy such a large number of sites, I believe increased vandalism may be the most significant adverse impact of the spill. Any study of impacted archaeological sites must take this into account.

The State and Federal Government employ many skilled professional archaeologists, many of whom worked on spill-related activities this summer. I hope you will employ the expertise of these people in your revision of "Economic Uses Study Number 9." In addition, the next phase of the study should be accompanied by a budget that can realistically address the issue of vandalism.

Madonna L. Moss, Ph.D. Assistant Professor of Anthropology



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DEPARTMENT OF RURAL SOCIOLOGY

1430 LINDEN DR., 350 AG. HALL

UNIVERSITY OF WISCONSIN

MADISON, WISCONSIN 53706

(608) 263-4893

American Association for the Advancement of Science

> SECTION ON SOCIAL, ECONOMIC. AND POLITICAL SCIENCES-K WILLIAM R. FREUDENBURG, Secretary

September 30, 1989

Don W. Collinsworth, et al. Trustee Council P.O. Box 20792 Juneau, AK 99802

RE: State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill

Dear Mr. Collinsworth:

I am writing to you in my position as the Chair of the Socioeconomic Subcommittee of the Scientific Advisory Committee, U.S. Minerals Management Service. I am not an employee of the Department of Interior or the Minerals Management Service, nor do these views represent official policy of the U.S. Minerals Management Service; on the basis of my discussions with other members of the Scientific Committee, however, I am confident these views would generally be shared by my scientific colleagues on the Committee.

While it is clear that a good deal of work has gone into preparing the study plan, and while my observations on the plan's omissions should in no way be taken as implying criticism of the great deal of work already done, at least one area of omissions is so obvious, and so striking, that it simply cannot be allowed to pass without comment. I refer here to the impacts of the spill and clean-up on the human environment and on the interrelationships of human beings with other components of the biophysical environment.

At the risk of stressing the obvious, it is now widely understood in scientific circles that the species <u>homo sapiens</u> is as much a part of the environment as any other -- if not indeed more so. Human beings depend on the environment both in a way that is relatively direct and physical, as in the influence of pollutants on obvious bodily functioning, and also through an additional set of interrelationships that are symbolic, emotional, intellectual, psychological, social, and cultural. While the two sets of interrelationships are often separated for intellectual purposes, moreover, they are difficult if not impossible to separate in practice; psychological health, for example, is a vital and unavoidable component of physical health more broadly. Despite these well-known facts, however, the study plan calls for only one study that deals in any way with the physical health impacts of the spill on human beings -this being an extremely narrowly conceived study, at that -- while inexplicably but completely ignoring the much broader range of other impacts on the human environment that are, in all likelihood, far more significant.

It is my general policy in letters of review such as this one to provide as much specific detail as possible; I sincerely regret to report, however, that in the present case, the lack of attention to the human environment is so complete that there's almost literally no content on which to offer commentary. For both legal and logical reasons, the impacts of the spill and Com.TopicIssueSug.Sort1401132

clean-up on the human environment simply must be given adequate treatment in the final version of the damage assessment plan and in the studies that are actually done. If you would find it helpful, I would offer my services, at no charge, in helping you to identify more fully the studies that need to be done and/or to identify other persons who might be helpful to you in that process. The current version of the plan, however, unfortunately cannot be taken as even an approximation of adequate treatment of the impacts on the human environment.

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I thank you for your attention to this input, and I reiterate my offer to help you in whatever way you might find to be most useful.

Respectfully submitted

William R. Freidenburg

Chair, Socioeconomic Subcommittee MMS Scientific Committee and Secretary, Section K - American Association for the Advancement of Science

WRF / dmv

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# F/V PRIVATEER

DAVE SCHEER & JEFF TRUHN PO BOX 511 262-1358 KASILOF, ALASKA 99610

Thustes Council Aŭ Bok 20752 Juneau, Alaska 99602

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Sept. 30, 1989

Dean Jouncil. I have reviewed the craft, Natural Resource Damage HESESSMENT Plan and Restonation Strategy for the Exxon Valcez Gilspill.

I agree 100% with all the studies presented and feel they are very important. I also agree that time is the important, and these studies must happen now on very soon !

I would note that the Trustee Douncil would recommend <u>niming Alaskans</u> whenever possible during this study. I think this is very important, to utilize Alaska's workforce, especially those who are most affected by the oil spill.

Thank you.

Davic Scheer

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INCLUSE ON EFILL TRUSTEE COUNCIL 41 ADMINISTRATIVE RECORD

P. O. Box 1988

September 30, 1989

Dear Trustee Council,

I appreciate the time and effort which you how the time of the damage assessment document. Not only is it important for all to take a good strong look at this spill, but to know what can happen if and when another spill occurs.

Homer, AK 99603

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(907) 235-5352

I would like to express a strong feeling about the Marine Mammai Study \*6 involving the sea otter. Of all the studies which you are proposing to do on animals this is the only one which is going to handle the animal by capturing and "intimately" studying by letting blood, putting in transmitters, etc. This animal has gone through an incredible amount of stress from the oil spill. Many were oiled, caught, and rehabilitated. Many were oiled, never caught, and are still living in the wilds. Others have just plain been dodging boats, aircraft, people, etc. for the whole summer. I find it inhumane to do any further study on this very vulnerable animal. None of the other birds and animals in your plan are going to be handled.

Pups and their mothers should not be touched. One cannot capture an otter without disturbing it and the others around. Capturing the otter means taking it away from its bonding group and its habitat. This, too, is inhumane at any time of the year, but particularly at this time of the year with winter around the corner.

I realize that my points are totally moot, as I am aware that the US Fish and Wildlife Service has had their permit approved to handle up to 650 otters! This agency is not capable of handling animals in a humane manner based on what went on this summer in the various centers in the state.

I hope that you will understand that this I strongly object to your otter proposal. Thank you for your attention to the above matter. Kathy Hill.

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MARINE MAMMAL COMMISSION 1825 EYE STREET, N.W. WASHINGTON, DC 20006

29 September 1989

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

Dear Sirs:

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the August 1989 Public Review Draft of the State/Federal Natural Resource Damage Assessment Plan for the <u>Exxon Valdez</u> Oil Spill. We offer the following comments on those parts of the Plan bearing upon the assessment and mitigation of the impacts of the oil spill on marine mammals.

# General Comments

The Draft Plan provides a comprehensive overview of the studies required to assess natural resource damage from the <u>Exxon</u> <u>Valdez</u> oil spill. With regard to marine mammals, it incorporates, at least in general, the elements of the oil spill response requirements identified and made known by the Commission shortly after the spill occurred (copy attached).

The Plan does not, however, contain sufficient information to judge the likelihood that the component studies will in fact provide a reliable assessment of natural resource damage, or whether the cost estimates are reasonable. For example, none of the study descriptions indicate precisely when, where, or how the planned studies will be done. Likewise, they do not identify or indicate the qualifications of the individuals who will be conducting the studies, or how the cost estimates were calculated.

To ensure development of the best possible Damage Assessment Plan, the Marine Mammal Commission recommends that, if it has not already done so, the Trustee Council: require development of comprehensive project descriptions, including detailed descriptions and justifications of study designs, sample sizes and cost estimates; have the detailed project descriptions reviewed by groups of knowledgeable experts not associated with the damage assessment program; and revise the Plan, as appropriate, to take account of the expert review. In addition, if it has not already done so, the Commission recommends that the Council make arrangements for periodic meetings of the principal investigators of the various studies to facilitate information transfer and cooperative analyses of study results as well as cooperative planning.

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With respect to program planning, it is our understanding that some beaches in areas affected by the spill remain substantially oiled, that oil in beach sediments may leach into adjacent marine areas, and that there likely will be a continuation of clean-up efforts in the spring and summer of 1990. Leaching of oil into marine areas and related containment and clean-up operations may further impact marine mammals, both directly and through food chain effects. They also could provide an opportunity to verify hypotheses concerning such things as the ability of sea otters, seals, and whales to detect and avoid oil, and the effects of noise from containment and clean-up operations on the behavior, movements and habitat-use patterns of sea otters, seals, and whales. Therefore, if it has not already done so, the Council should direct that possible future oiling and containment/clean-up operations be considered and factored into the design of ongoing and planned studies to assess the impacts of the Exxon Valdez oil spill on marine mammals and other components of the ecosystems affected by the spill.

# Specific Comments

<u>Page 1, par. 5</u>: This paragraph indicates that the Damage Assessment Plan has three major components--(1) determination and quantification of injury; (2) determination of damages; and (3) development of a restoration strategy. Efforts to document and to minimize and mitigate the impacts of the <u>Exxon Valdez</u> oil spill also should be assessed to determine steps that usefully might be taken to improve avoidance, assessment, and mitigation of impacts of future oil spills. Therefore, the Marine Mammal Commission recommends that, if it is not already doing so, the Trustee Council take steps to expand the Damage Assessment Plan or to develop a companion plan to indicate steps being taken to assess the response to the <u>Exxon Valdez</u> oil spill with the view to determining how response to future oil spills might be improved.

Pages 22-23 (Criteria for Study Evaluation): Use of the criteria listed in this section to select studies for inclusion in the Damage Assessment Plan likely will result in a Plan which will underestimate the impacts of the Exxon Valdez oil spill and related contaminant/clean-up operations on natural resources. That is, criteria 1 and 2, as we read them, would require that selected studies provide <u>conclusive</u> evidence of natural resource damage and that the damage be both detectable and <u>quantifiable</u>. Many damages may be subtle, difficult to verify, and impossible to quantify due to insufficient background data (<u>1.e.</u>, pre-spill data), or without expenditure of more time and money than reasonably can be justified. Therefore, it should be recognized and noted that the Damage Assessment Plan will provide a conservative estimate of damages or, alternatively, the criteria and the Plan itself should be revised to provide for acquisition of data that may suggest, as well as conclusively document and quantify, natural resource damage.







Pages 30-33 (Comprehensive Assessment of Injury to Coastal Habitats): Oiling and subsequent clean-up operations may have affected coastal areas that are important haul-out and pupping sites for Steller sea lions and harbor seals. If they have not already done so, the persons responsible for planning and conducting this study should consult the persons responsible for planning and conducting marine mammal studies 4 and 5 to insure that important harbor seal and Steller sea lion haul-out sites and habitat requirements have been identified and factored into the study design.

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Pages 37-38 (Geographic Extent and Temporal Persistence of Floating Oil): This project description does not indicate how frequently surveys will be done to monitor the geographic extent and temporal persistence of floating oil from the Exxon Valdez. Available information indicates that the distribution and movements of sea otters, Steller sea lions, harbor seals, and other marine mammals may be quite variable depending upon the time of year, weather conditions, and other factors. Thus, the utility of the information generated by this study with respect to assessing both the immediate and long-term effects of the Exxon Valdez oil spill on marine mammals will depend, in part, upon the frequency of data collection. Therefore, if they have not already done so, the persons responsible for planning and conducting this study should consult the persons responsible for planning and conducting marine mammal studies to insure that temporal variation in the distribution and movements of marine mammals has been considered and, as appropriate, factored into the study design.

Pages 39-41 (Petroleum Hydrocarbon-induced Injury to Subtidal Marine Sediment Resources): This study and Air/Water studies number 1, 3, and 4 are critically important for determining the possible indirect (food chain) effects of the <u>Exxon Valdez</u> oil spill on marine mammals. If they have not already done so, the persons responsible for designing and conducting these studies should consult the persons responsible for designing and conducting marine mammal studies to insure that the studies collectively will provide all information needed to reasonably assess and measure or quantify the second order effects of the oil spill on marine mammals.

Pages 42-43 (Geographic and Temporal Distribution of Dissolved and Particulate Petroleum Hydrocarbons in the Water Column): Dissolved and particulate hydrocarbon compounds in the Water column could affect the distribution, abundance, and productivity of vertebrate and invertebrate species that are important components of the diets of seals and whales that occur in areas affected by the Exxon Valdez oil spill. In addition, particulates may foul the filtering plates of baleen whales and/or be ingested during feeding. These possibilities should be noted in the project description. Also, if they have not already done so, the persons responsible for planning and conducting this study should consult the persons responsible for planning and conducting marine mammal studies to insure that related study needs have been identified clearly and will be met to the maximum extent possible.

Pages 74-78 (Injury to Prince William Sound, Kodiak, and Alaska Peninsula Herring): Herring likely is an important component of the diets of humpback whales and other marine mammals that inhabit Prince William Sound and adjacent areas seasonally as well as throughout the year. Thus, alteration of the size and/or productivity of the herring stocks in Prince William Sound, Kodiak, etc. may impact marine mammals as well as commercial fisheries. If they have not already done so, the persons responsible for designing and conducting this study should consult the persons designing and conducting marine mammal studies to insure that related information needs have been identified clearly and factored into this study design.

Pages 79-81 (Injury to Prince William Sound Clams): As noted in the first section of this project description, bivalve molusks are an important component of the food chain in Prince William Sound. Among other things, for example, they are important components in the diet of sea otters.

The objectives of this study, as presented in the project description, give the impression that the effects of the Exxon Valdez oil spill on bivalves can be determined by a one-time sample of bivalves at selected beach sites with no oiling, moderate oiling, and heavy oiling. The Methods and Analyses Section indicates, however, that one heavily oiled beach will be monitored biweekly from May through September. Thus, it would be appropriate to redraft the objectives to indicate that the level of hydrocarbons in bivalves at at least one beach site will be monitored to determine how hydrocarbon contaminant levels change over time and that the monitoring design may be altered if there are sudden changes in the proportion of dead clams or cockles being found on the selected indicator beach. In addition, the project description should be expanded to indicate what will be done if detectable/significant levels of hydrocarbons are still being found in bivalves and/or the survival and productivity rates of bivalves have not returned to pre-spill levels by the end of the sampling period--e.g., the study should and presumably will be continued until detectable or potentially harmful levels of hydrocarbons no longer are present in bivalves. Also, either this project description or the description of marine mannal study number 6 should be expanded to indicate how the possible effects of prey contamination on sea otters will be detected and measured or quantified.

Pages 96-97 (Undersea Observations): Sea otters are bottom feeders and could come into contact with, and be affected by, bottom deposits of oil and oil by-products. This possibility should be factored into the design of this study. That is, if they have not already done so, the persons responsible for designing and conducting this study should consult the persons









responsible for designing and conducting marine mammal study number 6 to determine how undersea observations may contribute to assessing the magnitude, extent, and duration of oil spill impacts on Alaska sea otter populations.

Pages 112-113 (Marine Mammals Injury Assessment): This section does not, but should, note that a large proportion of the North Pacific fur seal populations that pup and breed on the Pribilof Islands may pass through areas affected by the spill during their annual spring and fall migrations. In addition, it does not, but should, reference studies that will be undertaken to determine the possible long-term food chain effects of the oil spill on marine mammals, and how noise and disturbance caused by containment and clean-up activities may have affected and still could affect the survival and productivity of marine mammals by increasing stress and/or causing animals to abandon or avoid traditional breeding areas, feeding areas; or other areas of similar biological importance.

Pages 114-115 (Effects of the Exxon Valdez Oil Spill on the Distribution and Abundance of Humpback Whales...): If this study is conducted as described in the project description, it will provide information on the numbers, distribution, and identity of individual humpback whales and their movements in Prince William Sound during and after the Exxon Valdez oil spill. It also may identify individually recognizable whales that moved from the Sound to southeast Alaska. It seems unlikely to meet Objective C -- to "quantify the extent of injury to the humpback whale population resulting from the oil spill." That is, the study, as described, should detect whether humpback whales left and remained outside of Prince William Sound following the oil spill. By itself, however, it will not provide information necessary to determine or judge why the whales left or, if they returned, why they returned. In this regard, the study, as described, will provide no information on changes in behavior, activity patterns, survival, or reproduction that may have been caused by exposure to oil, by consumption of oil contaminated prey, or by disturbance caused by containment and clean-up operations.

Humpback whales may have left and remained outside the Sound for some time to avoid contact with oil, to avoid noise from boats and aircraft involved in containment and clean-up operations, because of decreases in and/or contamination of food supplies, or other reasons. Therefore, if they have not already done so, the persons responsible for designing and conducting this study should consult and coordinate their efforts with persons responsible for designing and conducting Air/Water Studies 1 and 3, and Fish/Shellfish Studies 11, 12, and 19. Also, if further clean-up activities are expected to be conducted in the spring and summer of 1990, the possible value of measuring the underwater noise generated by such activities and conducting observations to determine how humpback whales and other marine mammals respond to such noise should be considered. Com. Topic Issue Sug. Sort 13 3 1680 X 2

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Pages 116-117 (Assessment of Injuries to Killer Whales...): As described, this study, like the previous study concerning humpback whales, will provide distribution, abundance, and photoidentification data which may indicate changes, compared to past data, in the distribution, abundance and/or structure and size of killer whale pods in Prince William Sound and adjacent areas. It seems unlikely, however, that the study, as described, will provide information necessary to determine or judge the probable or possible causes of any observed changes. Therefore, if they have not already done so, the persons responsible for designing and conducting this study should consult the persons responsible for designing and conducting related habitat studies to assist in determining the possible cause-effect relationships. Also, the possible value of conducting additional observations in the spring and summer of 1990, in and near areas where further clean-up operations are being conducted, should be considered.

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Pages 118-119 (Cetacean Necropsies): Among other things, this project summary indicates that: "[a]s a control, dead cetaceans observed southeast of the oil spill area will be sampled and tested for hydrocarbons." A number of laboratories may have frozen tissues from whales found dead before the spill occurred. It should be noted that these tissues could augument the proposed control, or provide an additional source of tissues for comparative purposes.

Pages 120-121 (Assess the Oil Spill's Impact on Steller Sea Lions...): The first section of this project description indicates that the impacts of the Exxon Valdez oil spill on Steller sea lions could include loss or reduction of prey. The section entitled "Relationships With Other Studies" indicates that: "[i]nformation on abundance and contamination of sea lion prey organisms will be provided by a combination of several Fish/Shellfish studies." These points are not, but should be, reflected in the study objectives. That is, something like the following should added to the list of objectives--

. determine if observed changes in distribution, abundance, behavior, or productivity were [may have been] caused by spill-related changes in the availability of preferred prey species.

In addition, it would be useful to specify the Fish/Shellfish studies expected to provide information on the effects of the spill and related containment/clean-up operations on sea lion prey species.

Pages 122-124 (Assess the Injury to Harbor Seals...): This project description, like the project description concerning assessment of the effects of the Exxon Valdez oil spill on Steller sea lions, indicates that the effects could include loss or reduction of important prey species and that data on the abundance and contamination of prey species will be provided by other









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studies. It does not, but should, (1) indicate that one of the study objectives is to determine whether observed changes in the distribution, abundance, or productivity of harbor seals may have been due to spill-related changes in food availability, and (2) specify the studies expected to provide required information on the effects of the oil spill and related containment and clean-up operations on harbor seal prey species.

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Pages 125-128 (Marine Mammal Studies 6 and 7): Information obtained from these studies can and should be used to evaluate and improve oil spill contingency plans designed to minimize the effects of possible oil spills on the threatened sea otter population in California. This should be noted in the study descriptions and the study design should be modified or expanded accordingly. In addition, it should be recognized that oiling and rehabilitation efforts may affect the subsequent productivity as well as the survival, movement, and behavior of oiled sea otters that were captured, cleaned, and released back into Prince William Sound. That is, the word "productivity" should be inserted after the word "survival" in the second line of objective A of study number 7 and the study design should be modified as necessary to ensure acquisition of information necessary to determine effects on productivity as well as on survival, movements and behavior.

# Summary and Recommendations

In summary, the Commission believes that the draft Damage Assessment Plan provides a good general description of the studies that are being and should be done to assess the immediate and near term effects of the <u>Exxon Valdez</u> oil spill on marine mammals. However, the Plan does not describe the design and rationale of the component studies in sufficient detail to judge whether the program objectives are likely to be met or whether the cost estimates are reasonable. In addition, the program design does not appear to consider and take into account the possibility that some effects may be difficult to detect and to quantify and that some effects may not be evident for many years. For example, decreases in age-specific survival and reproductive rates, caused by decreased food supplies and/or exposure to low levels of petroleum hydrocarbons in food supplies, may not be evident for many years.

To ensure that the Damage Assessment Plan is as well conceived and as cost-effective as possible, the Commission recommends that, if it has not already done so, the Trustee Council require development of detailed study plans and make arrangements to have the plans reviewed by independent groups of experts not associated with the damage assessment program. The Commission also recommends that, if it has not already done so, the Council make arrangements for information transfer and program coordination meetings, and take steps to expand the Damage Assessment Plan or to develop a companion plan to indicate, based upon experience gained from the <u>Exxon Valdez</u> spill, steps that are



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being or should be taken to be better prepared to respond to future oil spills.

If the Council or its staff has any questions about the Commission's comments or recommendations, please let me know.

Sincerely, Robert J. Hofman, Ph.D. Scientific Program Director

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Enclosure

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EFTCH VALUE OIL SPILL TRUSTEE COUNCIL ADMINISTRATIVE RECORD

North Pacific Fishery Management Council

n W. Collinsworth Chairman Clarence G. Pautzke, Executive Director



Mailing Address: P.O. Box 103136 Anchorage, Alaska 99510

> Telephone: (907) 271-2809 FAX (907) 271-2817

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September 29, 1989

605 West 4th Avenue Anchorage, Alaska 99501

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

Dear Sirs:

On September 26, the North Pacific Fishery Management Council's Habitat Committee met to review the draft State/Federal Resource Damage Assessment Plan for the Exxon Valdez Oil Spill dated August 1989. The Committee had the following technical comments:

- A simple illustration or flow diagram is needed in the Introduction section that shows how 1. all the studies interrelate with one another and with the major management questions being studied. The Committee could not readily see the linkage between the studies and the overall objectives, and thus found it difficult to judge the merits of the individual studies. The Committee believes that a flow diagram would be especially useful to the Trustees during their winter review of the technical, policy and legal aspects of the plan's study components as they evaluate each study for continual funding.
- 2. The plan includes a study of larval fish within Prince William Sound (Study #19) but does not contain a similar study in the Gulf of Alaska. Specifically the Committee is concerned that the oil that moved through Shelikof Strait and other areas of the Central Gulf may have seriously impacted pollock eggs and larval fish which are found in concentrated numbers in those areas. A larval study in this area should be included in the plan.
- з. The Committee views the planned studies as critical to our knowledge on the effects of the oil spill on fishery resources and recommended that the planned studies move forward on schedule. It was stressed that the Trustee Council obtain an early commitment for funding in support of this research program through all phases to completion.

The Council Habitat Committee appreciates this opportunity to comment.

Sincerely.

Henry Mitchell Habitat Committee, Chairman

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This review, because of the short time provided for public comment, represents the opinions of the Pacific Seabird Group (PSG) Chairman only, completed after limited informal discussions with several members of the PSG. The views here do not represent a formal poll of the PSG membership.

My expertise is in the area of avian physiology/toxicology with an emphasis in seabirds. This review and comment will be confined to studies relating to birds and residue analysis. I will address all my specific comments to Bird Studies 1-14, and Technical Services Studies 1 and 2. I additionally have some general comments on the overall Plan.

General Comments: II.

This document is outlined in a comprehensive way to individually address each component of the ecosystem which has been potentially impacted by the Exxon Valdez oil spill. The structure of the plan, with assessment of each component separately, but with coordination between studies and agencies, appears to be well designed and adequate for the task of environmental assessment. The Technical Services Studies are organized so as to demonstrate that the analytical components of the assessment plan are separate from, but coordinated with, the other aspects of the study.

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1) The time frame of the Damage Assessment Plan is unrealistically short. It will be impossible to make a complete, or even an adequate, assessment of the damage within the time frame proposed. The designated time frame would require most field assessments to have been completed prior to November, when the weather will become quite inclement and preclude any further studies. For many organisms, especially birds, it will not be possible to monitor the extent of mortality until 1990. February 1990 is too early in the year to be able to make any assessment of the returning/rebounding populations.

The policy with regard to field studies should be changed so that all studies should be conducted at least through August 1990, unless there is complete and sufficient data for any individual study to justify earlier termination. Therefore, I disagree fundamentally with the position stated on Page i of the Executive Summary that: "no studies will be conducted after February 28, 1990 unless specifically approved by the Trustees...". I strongly feel that the position should be reversed; that is to say, all studies will continue unless individually terminated by the Trustees.

2) All of the studies in this report are currently in progress at the time of public review. No information was supplied to reviewers to indicate whether each study was initiated as planned, whether the data planned for collection has been acquired, or whether the study can be completed within the time frame allotted. Much informal information has been "leaked" to this reviewer indicating that many of the studies were begun months after their planned initiation, and data was not collected for many parts of several studies. If this is the case, review of this plan cannot be realistic. Why was data of this nature specifically been withheld from independent reviewers?

Damage Assessment Studies which exist, in part, only on paper parallel exactly the scenario of the Oil Spill Contingency Plan of Alyeska Pipeline Company. That plan was apparently constructed only to obtain Use Permits, and was not implemented in order to clean up oil. If segments of this Assessment Plan exist primarily on paper, but the studies are not fully conducted, the Trustees will be guilty of the same behavior as the Oil Industry. The time allocated for studies must be extended to allow for adequate completion.

3) 1989 may have been an atypical, cold water, year in the Gulf of Alaska. If this is the case, an additional year should be studied to be able to make even a "first guess" at the true impact of the oil spill in the context of an atypical year. If the drastically reduced number of seabirds breeding on the Barren Islands, for example, was confounded by a bad year as well as by spilled oil, an accurate assessment should be made.

4) The budgets for analytical chemistry of hydrocarbon residues appear to be inadequate for complete assessment of damage. Gas chromatography/mass spectroscopy (GC-MS) of aliphatic and









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aromatic samples may cost as much as \$800-1000 per sample to identify the hydrocarbon profile fingerprint of North Slope crude. Granted that many samples could be analyzed by GC-FID (flame ionization detector) and quantified at somewhat lower cost, but it may be important for purposes of litigation to be able to state the origin of the hydrocarbons in any given sample.

The number of samples to be analyzed for birds tissues alone is in excess of 300. A cursory review of the other studies indicates that several thousand samples must be analyzed for a reasonable damage assessment. \$2,300,000 is the total combined budget for both NOAA and USFWS, including travel and equipment. The total budget should probably be increased by 50% to be adequate.

5) Economics Uses Study 7: Study of Loss of Intrinsic Values:

The wording in this study plan is very general, but the public is most concerned that the Trustees take seriously the Federal Appeals Court decision of July 13, 1989 on NRDA and the will of Congress with respect to environmental pollution. This is probably the most critical part of the Damage Assessment Plan for the credibility of the Trustees. The logic and calculations forming the basis of any monetary loss derived from seabirds and sea otters must be completely and publicly delineated. Public review and comment should be required and sought prior to any agreement with the responsible party concerning monetary evaluation of environmental damage.

III. SPECIFIC COMMENTS ON BIRD STUDIES:

STUDY 1: BEACHED BIRD SURVEYS:

This is a very important part of the total evaluation of oil impact to seabirds populations. The study appears well planned, although more beach surveys are required to adequately assess the number of beached birds. Part E cannot be completed from data of 1989.

A thorough examination of beaches was conducted by capture boats employed by the Otter and Birds centers. Although these boats were employed by Exxon for recovery of birds and otters, is that data being integrated with Agency data? To what extent is Exxon derived data proprietary? Did the USFWS make adequate surveys on its own?

How will the Trustees estimate the proportion of carcasses to be found on beaches in Part C? Carter and Page (Point Reyes Bird Observatory) have some data, A. Burger in British Columbia has some, but no exhaustive studies have been conducted to evaluate floating times of many of the important species impacted in this spill.

Part D. I question how well the data of man-search-hours



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can be integrated into data of former years relative to the intensive searches done in 1989.

This study is critical, and was begun early in the spill cleanup, so that data-could be very good, but only if data from Exxon capture boats is included.

# BIRD STUDY 2: MIGRATORY BIRD SURVEYS:

Part A must have already been done. Was it done adequately? The timing of aerial surveys is critical for estimates of migratory birds.

Part C cannot be determined without a 1990 census. Furthermore, reduced hatching or fledging success of breeding species will not be able to be evaluated until the 1989 age class returns to breeding colonies, or, for some species, can be evaluated in winter or spring surveys. Age at first breeding is delayed for many species of seabirds, confounding the estimates. Additionally, if a large proportion of adult birds were lost in 1989, the age at first breeding of returning juveniles will be lower than normal, further confounding the data.

# BIRD STUDY 3: SEABIRD COLONY STUDIES:

Part A cannot be completed without at least a 1990 survey. The aberrant nature of the 1989 breeding year is important. Was the year equally atypical throughout the oiled and unoiled areas? Did unoiled areas serve as adequate controls? Answers to both of these questions cannot in themselves be made without a 1990 census.

Using data from Study 14 to predict sensitivity of birds to oil is not realistic. The experimental portion of Study 14 is not a good study.

The methods and analyses of this study would be adequate if a second year were included in the plan.

# BIRD STUDY 4: BALD EAGLES:

This is designed as a complete, well organized study, capable of providing sound data to assess oil spill effects. If executed it will be the best study of the group.

Part A plans to determine a RATE of change of the population and to determine the effect of the oil spill on that rate. If a rate is not already known from historical data independent of the oil spill, the effect of oil on the population change cannot be made. 
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Part B could have been done with some accuracy. Was it? Was Exxon Eagle Team data integrated with USFWS data? Is Exxon data available?

Part F was conducted by Exxon Eagle Teams in Prince William Sound and coordinated by USFWS. Is the Exxon data available?

Were 30 adult and 30 fledgling eagles fitted with transmitters? If not, a 1990 survey will have to be conducted to provide alternate data on winter survival.

# BIRD STUDY 5: PEREGRINE ASSESSMENTS:

This is also a well planned study, but preliminary data would seem to indicate that very few Peregrines were present in PWS in 1989, preventing completion of parts of this study. Part A could have been done, but Parts B and C could-not have been completed, because no Peregrines occupied breeding sites in PWS in 1989.

A survey will have to be done in 1990 to determine whether more than two Peregrines still exist in PWS.

# BIRD STUDY 6: MARBLED MURRELETS:

Marbled Murrelets are a good choice for assessment. Juveniles can be counted on the water after fledging, and potentially present a good index of local conditions with respect to alcid breeding and survival. The species may not be indicative of other alcid species, but is important in its own right. Are Kittlitz's Murrelets included in this study?

Part A: The patchiness of the Marbled Murrelet population is important to factor into this study. Does good pre-spill data exist for western PWS?

Collection of breeding Marbled Murrelets for contaminant analysis could provide useful data, although most oiled Murrelets would die. Many did this year. Externally oiled murrelets probably would not have bred in 1989. I think it would have been unlikely that birds could have been eating contaminated prey without becoming externally oiled, but data would be useful.

#### BIRD STUDY 7: FORK-TAILED STORM PETRELS:

The study is well planned and designed. Storm-petrels are a good indicator species, because they can be caught in their burrows and stomach contents sampled without injuring the adults or chicks (if chicks are hand fed to compensate for the loss of food taken from adults). However, according to my informal sources, this study was not conducted as presented. No visits to

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the island were made during early incubation.

If 1989 was an aberrant year, this study could not provide conclusive data on oil impacts on the population. The population must be assessed in 1990 against control sites.

Pristane is incorrectly spelled to make it a much cleaner - compound.

# BIRD STUDY 8: BLACK-LEGGED KITTIWAKES:

The study is well designed, and would provide much data on the effects of oil on these birds. The number of censuses are probably adequate to provide good data. Visual examination of birds is possible because they are white. Only their feet and beaks could not be assessed. The program is ambitious; was it conducted as presented?

# BIRD STUDY 9: PIGEON GUILLEMOTS:

Guillemots are a good study species, because they are burrow nesters and accessible during the breeding season. They do not panic from cliffs as murres and cormorants do. Birds observed from a distance, however, will be very difficult to assess for small amounts of external oil, because their plumage is black. Rates of chick feeding can be assessed, and prey type can be identified in many colonies, because the adults like to show off their catches.

Guillemots would be good indicators of other alcid genera, but only to the extent that other species are breeding in the same areas. Puffins and Murres breed in dense colonies in other areas, and could not be "studied by proxy" by guillemots at these colonies.

In general, I believe guillemots are a good species to monitor for evidence of local oil conditions.

### BIRD STUDY 10: GLAUCOUS-WINGED GULLS:

This study will probably not provide a good assessment of the impact of oil on Glaucous-winged Gulls. I believe Egg island is too far from the major impacts of oil to provide a good study. The few adult gulls which venture to Green I., Knight, or the Naked Island Group to forage will probably not be a representative proportion of the breeding population. Most breeding gulls would stay nearer to the colony than western PWS. Breeding gulls during the breeding season also do not scavenge to the same extent as during the rest of the year. Immature gulls, however, do not remain in the vicinity of the colony during the breeding season, and they do scavenge. Therefore, most of the







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gulls at risk would be immature birds not assessed in this study. I would predict that when the data of oiled gulls is examined, it will be found-that most oiled gulls were immature.

# BIRD STUDY 11: SEA DUCKS:

This study, because it concerns wintering birds, is one of the few with good potential to be concluded successfully this year. The study is well designed, and apparently can rely somewhat on samples already collected for its initial data base (food habits from stored stomach content samples). If field work can be conducted throughout the winter, time is ample for collections to be made for subsequent analysis. Hydrocarbon analysis, however, will require more time than the February deadline for completion. This study might be completed by April or May. Analysis of duck tissue samples this winter will provide good data on risk of contaminants to hunters, and will provide data on mollusks, especially mussels. The budget might be adequate.

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# BIRD STUDY 12: SHOREBIRDS:

This is a well designed study with good potential for providing data on the effects of oil on shorebirds.

I doubt that an adequate number of surveys were conducted in PWS and other staging areas during the spring of 1989 to be able to have good data for Parts A, B, and C. Part D probably could have been completed. Parts F, and G could have been done.

# BIRD STUDY 13: PASSERINES:

This study would also have provided much information, but informed sources indicate that it was not conducted, or at best was conducted incidental to other work being done in affected areas.

If samples were collected, they will provide valuable data on secondary contamination by oil, both from histopathology and residue analysis.

# BIRD STUDY 14: OIL EFFECTS, EXPERIMENTAL:

This study will be useful from the review of literature only. It is completely unrealistic to conduct experimental studies on oiling of raptors, waterfowl or seabirds for the budget proposed. This study is undesigned, not appropriate, and should not be conducted.

The \$10,000 budgeted for this study should be put into a literature review and synthesis, although the budget is too low for an adequate literature review.

# TECHNICAL SERVICES:

### STUDY 1: HYDROCARBON ANALYTICAL SUPPORT:

This study plan appears adequate and sufficient for the task, with the probable difficulty that the budget is too low for the ambitious amount of work proposed. I feel the design, QA/QC procedures, and coordination are quite good. The analytical chemistry and identified compounds to be searched are adequate to identify oil and its toxicity, but probably not adequate to distinguish North Slope crude from natural seeps in the Gulf of Alaska or Cook inlet oil spilled from platforms.

# STUDY 2: HISTOPATHOLOGY:

This is a straight-forward study of the effects of oil on ... exposed animals with very good potential for excellent results. I hope the USFWS staff at the Wildlife Health Laboratory will examine frozen tissues of oiled birds collected early in the spill when no Agency personnel were collecting samples. The budget should be adequate for a good overview of the problem.

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" P19/735 6009/07L AUMINISTRATIVE RECORD

September 28, 1989

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Trustee Council Box 20792 Juneau, AK 99802 Dear Council:

Cook Inlet Seiners Association (CISA) has reviewed the Natural Resource Damage Assessment Plan and has the following comments in respect to studies in our area.

CISA is a fishermens organization that represents 75% of the salmon permit holders in Lower Cook Inlet. Our permit area includes the waters East of Resurrection Bay at Cape Fairfield to Cape Douglas at the Northern end of Shelikof Straits.

Our comments are specifically related to the following studies; Studies number 7, 8, 9, and 10, all dealing with oil impact on various salmon species as eggs, pre-emergent fry, juvenile and adults.

CISA is very supportive of the studies. Our concern is with the lack of details on the location of the studies and the specific streams selected for each study. Only through contact with the Homer Department of Fish and Game were we able to obtain a detailed description of some of these projects. 7+8

The streams to be studied; Island Creek, Port Dick, Windy Left, Windy Right, Port Graham, Seldovia, Tutka, and Humpy were selected because of their history of pre-emergent sampling. CISA Fecommends that streams in other areas of Lower Cook Inlet also be assessed for damage. Additional areas in the Outer District would be Port Dick Hiddle, South Nuka, Delight and Desire. 7+8

No locations have been selected in either the Eastern or Kamashak districts for analysis. In the Eastern District Aialik and one or two streams in Resurrection Bay would be appropriate. In the Kamashak district little assessent has been done on oil impact and there has been only minor cleanup of oiled areas. CISA feels it is very important to determine any damage in this area due to its economic value. A minimum of two locations should be assesed, Sunday Creek and another in Southern Kamashak might be appropriate.

The lack of historic pre-emergent studies for these streams should not eliminate them as candidates for these studies. Checking these areas for hydrocarbon contamination using mussel analysis or another method would help document the presence or absence of Exxon Valdez crude oil. Furthermore this may be the start of a long period of study on the affect of oil

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contamination and it is important these areas be included in any future studies.

 In study number 10 we were unable to determine the location of any streams selected for the Dolly Varden, Sockeye salmon study.
 We feel Delight, Desire, and English Bay are potential locations for this study in Lower Cook Inlet.

We are aware of the problems of acquiring materials, short time frame and lack of data for some of these locations. The economic importance makes it critical that these areas be assessed for oil damage. Cook Inlet Seiners Association appreciates this opportunity to comment and hope we have been helpful.

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Sincerely yours,

Chris Hoss Evaluation Committee Cook Inlet Seiners Association Box 4311 Homer Alaska 99603

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EXACT VALUEZ CH. SPILL TRUSTEE COUNCIL ADMINISTRATIVE RECORD

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1359 Smuggler's Cove Friday Harbor. WA 98250 USA (206) 378-5835

ounding Directors Prentice Bloedel, II Friday Harbor, WA Kenneth C, Balcomb, III Friday Harbor, WA Dr, George Nichols Manchester, MA Dr, Michelle Balcomb Glenwood Springs, CO Ellen Bloedel Salt Lake City, UT



Prentice Bioedel. Il President Kenneth C, Balcomb. Ill Vice President. Secretary-Treasurer

OCT 5 1989

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

Dear Trustees:

Thank you for the opportunity to review the "State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill, August 1989 Public Review Draft". Recognizing that the studies proposed are necessary for an immediate determination of the extent and magnitude of injury to natural resources of Prince William Sound and the adjacent Gulf of Alaska as a result of the Oil Spill, I would like to offer the following comments on the Marine Mammal Studies Numbered 1 to 3 which fall within my area of expertise, and suggest several additional studies which might assist in your assessment.

Concerning Marine Mammals Study Number 1 on the effects of the Oil Spill on the distribution and abundance of humpback whales, the objectives A and B which deal with numbers and distribution of individual humpback whales identified in Prince William Sound and adjacent feeding areas are quite feasible given current techniques and knowledge concerning this endangered species in the North Pacific Ocean, and they should be encouraged and extended. However, objective C which would quantify the extent of injury to the Humpback Whale population, and objective D which would identify methods and strategies for restoration of lost use, populations, etc. leave me wondering a bit. I can see that with several years of the proposed surveys and photo-identification studies one could roughly calculate how

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CENTER FOR WHALE RESEARCH, INC. a 501 (c)(3) non-profit organization

28 September 1989

many whales don't appear again in the oil affected habitats; but, that is a far cry from quantifying the extent of the injury, it seems to me. For analogy, one might study the effects of tarring and feathering people in a community and determining whether they return to that community or go elsewhere; but, the effects of tarring may go deeper than those that are immediate and superficially observable, especially if the tarring included items consistently found in the victims' diet. Humpback whales feed upon great quantities of organisms (shrimp, herring, etc.) at lower levels of the food chain which are very likely to be affected or at least contaminated by oil in the habitat and in the water column. You should be very concerned about possible second order (food chain) effects of oil contamination on marine mammals in general and humpback whales in particular, but I don't see any application of state of the art studies in that respect (biopsy, analysis for environmental toxicants, DNA biomarking, etc.). The U.S. Marine Mammal Commission can probably advise you on current techniques to employ for best results insofar as direct and indirect sampling can offer. I urge you to consider such sampling studies to monitor and evaluate second order effects in humpback and other baleen whales in the oil affected areas and in adjacent areas. I further urge you to extend non-invasive studies (surveys, photo-identification) of humpback whales in Prince William Sound, Southeast Alaska, and the Kodiak Archipelago for at least five years to ascertain nuances of effects beyond the writs of CERCLA and CWA, but well within the Findings, Purposes, and Policies of both MMPA (Marine Mammal Protection Act) and ESA (Endangered Species Act). There is no question that a very important whale feeding habitat is at risk (approximately one hundred humpback whales make most of their annual living in oil affected areas) - you may not be able to do anything to "restore" it in a timeframe meaningful to the survival of some individuals, but it is prudent that someone learn as much as possible about the spill's effects (or non-effects) on the survivors so that the true impacts of a major spill on a pristine ecosystem can be evaluated.

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Concerning Marine Mammals Study Number 2, the assessment of injuries to killer whales in Prince William Sound, the Kodiak Archipelago, and Southeast Alaska, I think objectives 1 and 2 are feasible in a quick-look such as you have proposed and funded through NOAA, but objectives C and D are simply not feasible without long-term studies AND sampling studies such as I've urged for humpback whales (biopsy, analysis for environmental toxicants, etc.). Killer whales, in particular, are very well known individually and demographically in the Pacific Northwest and Alaska. Approximately two hundred killer whales depend upon the food resources of Prince William Sound and environs for their livelihood. They are a priceless environmental treasure that cannot be replaced. They feed at higher levels of the food chain than do humpback whales, therefore there are more steps in the food chain which may go awry. They are very long-lived (50-80+ years), and much of their prey also lives in long cycles (eg. salmon which return to Prince William Sound this year and contribute to their diet were spawned two or more years ago and have spent most of the intervening time at sea). It is likely that any effects of introduced hydrocarbons in their habitat and diet may take years to manifest themselves in either their tissues or their demographic vigor; but, they are nonetheless worth looking for as quantifiable indicators in assessing damage from the Exxon Valdez Oil Spill. These whales are at the very top of any marine ecosystem and are excellent indicators of its accumulative health.

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With respect to Marine Mammals Study Number 3, cetacean necropsies to determine injury from the Exxon Valdez Oil Spill, the objectives and methods sound precise, but in practice Cetacean necropsies on remote beaches are extremely difficult, especially if the specimens are large and/or are not fresh. I think you are underbudgeted. On top of that, it seems that the enforcement overtones of the study severely limit what will actually be accomplished. course, necropsies should be done to learn about causes of death, etc. for as many animals as possible in the wake of the spill for the next several years. The difficulty I have is with having them performed only by "qualified veterinary pathologists", requiring evidential procedures, etc. which I suspect will render most of the potentially available material ineligible for this study or any study. I recommend that you be less concerned with assessment of legally recoverable natural resource damages (ie. fines which are insignificant in terms of damage done), and much more concerned with the unprecedented learning experience of the spill. The earth is going to have hydrocarbons and habitats in conflict for the forseeable future, and it is simply not reasonable to have to ask the same questions every time a spill occurs, particularly if the questions are rote or artificially constrained by ad hoc legalisms. When faced with issues of such magnitude as assessing the damage to an ecosystem and evaluating steps toward its recovery, it is totally unreasonable to permit our thinking to be confined by law, press releases, and anthropocentric economies which are notoriously short-sighted. I think you should get out ahead of this one - get as competent and complete a series of necropsies as possible from any and all stranded and floating dead marine mammals (and other creatures) in the areas affected by the spill and outside of the spill for several years to objectively evaluate the effects of hydrocarbons in the system. This should be done for many species in conjunction with biopsy studies to ascertain the contaminant levels in the survivors.

I think that you should at least mention gray whales as a species of particular importance in Study Number AW2 (and AW1), because many of these whales feed upon the benthic infauna of intertidal and subtidal habitats which are likely affected by the Oil Spill. It would probably be useful to expand these studies to evaluate the degree of contamination and the percentage of gray whale feeding area affected, as well as conduct biopy studies of individuals migrating through or "residing" in these areas. This is entirely possible with current techniques, and it should be of concern considering the significant number of post-spill mortalities known for this species in the area. Gray whales are very important to lots of people, and they figure prominently in significant whale-watching commerce further south in their migrations.

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My final comment is that amongst all of the hype, hysteria, propoganda and publicity surrounding the Exxon Valdez Oil Spill from all quarters, I am left with an altogether uneasy feeling that our nation's elected officials and the bureaucratic custodians of our public natural resources are not properly doing their job with respect to careful and thoughtful consideration of our society's short term energy needs and its long term environmental needs. I think that the Trustee Council has an excellent opportunity to aggressively pursue a Damage Assessment Plan and Restoration Strategy for the Exxon Valdez Oil Spill that may start to reverse such feelings, but a meager 35 million dollar projected budget (especially compared to a billion dollar cosmetic cleanup budget), with no further studies to be conducted after February 28 1990, is ridiculously inadequate and short-sighted. Accepting that, I am left with the uneasy feeling and a sense of mourning for all of the creatures that have died and will die from neglect. I think you have to go to the administration and to Exxon and multiply the budget by ten or twenty and the time frame by five to ten to have anyone think you are serious about this massive problem of assessing the damage of the Exxon Valdez Oil Spill on the Prince William Sound and adjacent habitats.

Yours Sincerely, Daliont Ken Balcomb Research Biologist

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**Founding Directors** Prentice Bloedel, II Friday Harbor, WA Kenneth C. Balcomb. III Friday Harbor, WA Dr. George Nichols Manchester, MA Dr. Michelle Balcomb Ellen Bloedel

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EXECUTIVALEEZ ON SPILL TRUSTEE COUNCIL ADMINISTRATIVE RECORD

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Trustee Council P.O. Box 20792

Juneau, Alaska 99802

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The State/Federal Damage Assessment Plan for the Exxon Valdez Oil Spill has been forwarded to me for review by the U.S. Department of Interior, Hineral Hanagement Service. I serve on the OCS Advisory Board Scientific Committee.

I commend the committee that took on the task of assembling this report. It was a tremendous effort over a very brief time. Hy comments are kept within my area of experience, physical oceanography. First, in several places (in the letter to the reviewers and page 1 of the text) it is acknowledged that long term research will be necessary to determine the complete effects of the oil spill but that these studies will not address the long term needs. I don't understand who will if this study doesn't undertake this work now. This is a very serious fault with the plan. The study, as it stands, will only address the short term effects of the spill and the idea of completing the work by 28 February 1990 is unachievable. I also have some qualms about the lack of information on the ocean circulation in the determination of the impacted regions. For example, how far are the study regions going to extend along the Alaska Peninsula? On what basis were the regions east of Prince William Sound eliminated from consideration? -Some specific comments follow.

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	2	26 ·	The indication that the glaciers send icebergs floating out to sea is erroneous. While they do contribute ice to the waters of Prince William Sound, I have never seen reports of them in the open North Pacific.	rt   -
	6	7	Actually this could be increased to 320" of rain. ] Com. Topic Issue Sug. Sort 4 3 0/00 1	
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27 September 1989

transport of the oil along the Alaska Peninsula.

- 14-15 Once again the long term effects are mentioned.
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8-9 It is concluded that certain areas are fouled by oil before the study has been carried out. Why?

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- 30+ The pathway through which pollutants reach the resources of concern in included in the Type B regulations, however I don't see any circulation studies or even summaries included in this plan. For example, what shores are or will be impacted? Remember that the oil is still being transported even today. What will be the maximum extent of the oiled shores? What are the durations of oiling? The Alaska Coastal Current has a reverse flow (eastward) offshore of the westward flow and this could bring the oil back to the sound to re-enter at a later date. What is the distribution of currents with depth? Oil now found at aid-depth could have a different pathway than that oil that remains on the surface or that that sinks to the bottom. What is the residence time of circulation in Prince William Sound, Alaskan shelf, and North Pacific? These questions will help assess where and when damage might occur; they are being ignored in this plan.
- 4-5 How is one going to prove injury by the spill if there are no long term studies? We also have evidence of long term ocean temperature changes of about 1.5 C in this region that will affect the biota. This temperature effect needs to be monitored and eliminated as a possible cause of the observed changes of the biota.
- 18-20 Once again, the distribution, transport and persistence of the spilled oil is sentioned without any strategy to assess it.
  - 26-27 Again the distribution of spilled oil in space and time is emphasized.
- 4 Ongoing natural fluctuations in the physical environment need to be considered.

84 Fortunately, there is a lot of physical \_\_\_\_\_\_ oceanographic data available for Prince William Sound, but unfortunately it is in raw form and n analyzed since it was "bootlegged" on other programs. \_\_\_\_\_\_

18+ It might be mentioned here that UAF has done sampling in the sound and some samples were taken within a day or so of the oil reaching the shore.

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de de	termined? It sounds like the extent is already
30 Wh sh pr ru fr	at consideration is being given to reciling of the ores? Also, the freshwater influx in fall might otect a lot of the shore against reciling. High noff through porous beaches might also flush cil on within the cobble/sand.
35 4-5 I a th st ac	agree that the geographical and temporal extent of e oil spill is an important aspect of these udies but I question whether the methods are equate (see below).
35 14-15 Wh th ha: Ho pa	ile aerial surveys were SOMETIMES adequate during e initial phases of the spill, satellite imagery s proven to be almost worthless for oil tracking. W are the less concentrated and subsurface oil tches going to be tracked?
35 24-25 On Wi th	ce again, why are only the regions west of Prince Com. Topic Issue Sug. Sort lliam Sound being considered? (I realize that $206/202$
37 27-30 I c ca th ci . ci mi	don't know of any oil spill models that presently n accurately determine the extent and volume of e spilled oil here. They also will need rculation DATA as input. Also, all beaches that ght be impacted cannot be sampled.
43 2−3 Wha ne be bi	at is the rationale for selection of 1,3,5 and 9 ter depths? These sampling depths should have en determined from physical (pycnocline depths) or 22 2 2 2 2 2 2 plogical (euphotic) factors.
44 The dev sut	e benthic study participants need knowledge of the Com. Topic Issue Sug. Sort p water circulation, that is, where the DSurface spilled oil is going.
48 Onx Is thu	ce again, why are the studies limited to Unimak Com. Topic Issue Sug. Sort land to the west and why are no habitats east of 24 2 300
55 Hoo war thu as;	will physical factors such as circulation and ter mass anomalies be considered as they influence Com. Topic Issue Sug. Sort a fisheries? Both studies 3 and 4 suffer in this 25 0 1330 2 bect.
Time does not permit a plan but I would like to a departures from normal might and other blots. The disc below normal and influences	nore detailed comments on the remainder of the dd that the freshwater discharge and its that a significant influence on the fisheries harge immediately after the spill was very much d the spread of the oil and could have had an Com. Topic Issue Sug. Sort $Com. 3 000 2$

adverse influence on the salmon streams. The bottom line is that the physical conditions must be put into the context as to whether they are normal for this region.

Thomas C. Royer Professor of Marine Science University of Alaska Fairbanks, Alaska 99775 (907) 474-7835/ Electronic Mail-Omnet/T.ROYER

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EMMON VALDEZ ON SPILL TRUSTER COUNCIL ADMINISTRATIVE RECORD

Arndt

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Box 81369 Fairbanks, Ak 99708 27 September 1989

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

Dear Sirs:

Thank you for the opportunity to review your draft "State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdaz Oil Spill, August 1989." The two proposed studies in which I have a particular interest are Economic Uses Study No. 6 (Losses to Subsistence Households) and Economic Uses Study No. 9 (Survey of Archaeological Sites Impacted by the <u>Exxon Valdez</u> Oil Spill).

I was very glad to see these important topics included in the draft plan. Both the proposed studies appear to be reasonably well conceived and practicable. Lacking specific budget information similar to that provided for other of the assessment studies, however, it is impossible to judge whether the costs of these efforts have been estimated in a realistic manner. In the final version of your plan I would like to see separate budget estimates for each of the economic uses studies.

With regard to Economic Uses Study No. 9 (Survey of Archaeological Sites Impacted...), I have two additional comments. First, the study as now described seems biased toward the assessment of effects upon prehistoric and/or buried cultural resources. I hope that damages to historic-age surface remains and structures will not be overlooked in the final assessment. Second, I would recommend deletion of the last two words on page 201: "or replacement." While some degree of restoration or mitigation of effects may be possible, it makes no sense to speak of replacing a nonrenewable, irreplaceable resource.







Sincerely,

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Kathaine L. and

Katherine L. Arndt

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Thank you for the opportunity to review and comment on Economic Use studies Numbers 6 (Subsistence) and No. 9 (archeological impacts) of your Natural Resource Damage Assessment Plan. Since I am a professional archaeologist, I will confine my comments primarily to the latter document, although I have reviewed both.

With regard to the subsistence document (pp.196-197) I will only note that the objectives appear to be very ambitious and that the work plan lacks the specificity found in other plans in the document. Absence of a budget projection is also puzzling. What, specifically, is the anticipated investment of effort to be? Will all named communities be dealt with (a Herculean task). be? or will a sample be drawn? Objective A (literature review) is crucial, because this study must build on previous work by the ADF&G Subsistence Division if meaningful results are to be obtained in the time available. In Objective C the phrase "changes in subsistence use through time" is undesirably imprecise. Are we speaking of before and after the spill, or is a longer baseline intended. The question of budget and level of effort must be forthrightly addressed, otherwise this necessary project is likely to get only the scraps from the table, a clearly unacceptable outcome given the human needs and costs associated with this particular topic.

Many of the above comments also apply to the archaeological impact document (P.200-201). While the need for such evaluative work is very real, the plan again lacks specificity and there is no indication of the level of effort anticipated and, unlike other plans, no specific estimated budget appended. The probable outcome of this situation is drearily clear to me. If the subsistence studies receive the scraps from the table, the archeological impact studies will receive the crumbs from the scraps and not be funded at a level making achievement of the necessary ends possible.

The objectives stated , while very broad, are reasonable and necessary. Much of the methods and analysis section is undesirably vague however. The use of the term "model" in the first paragraph seems inappropriate to me. In my estimation a more precise term for what is needed would be <u>inventory</u>. To say that a "representative sample" (how drawn? how large?) will "be researched" (meaning, specifically, what?) and "archaeological tests [of what kind?] will be conducted" is too vague to provide a basis for planning.

The second paragraph is considerably better, although one wonders how artifact loss over time is going to be monitored in

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Com. Topic Issue Sug. Sort 8 4 2790 2 the brief time available for this study. Baseline (in this case, pre-oil) data are badly needed, indicating that any sites for which such data is available (if there are any!) should be included in "the sample." I lack optimism that many "specialized data recovery techniques" can be developed in a crash program of this kind, although I would be happy to be proved wrong on this point.

A final factor that badly needs consideration and monitoring is the impact (if any) of oil cleanup activities on sites. If any sites are located on "cleaned" beaches, they too should certainly be included in the sample. The task of placing a cash value on damage done to archeological sites will be an interesting one, breaking new and controversial ground at a most inauspicious time.

Finally I must repeat my projection that lack of specification of the intensity of effort (and associated expense) anticipated for this project and lack of a budget projection virtually guarantee that funding (hence effort) will be truly minimal.

Thank you again for a chance to say my piece. In the interest of getting these comments in while they will still perhaps do some good (I received the document yesterday) I have prepared them in haste and bypassed the customary retyping on institutional letterhead. They represent the best and most helpful comments I can give under the circumstances.

Respectfully submitted

Mim B. Withman

William Workman Professor of Anthropology University of Alaska Anchorage





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EMNON VALUES ON SPILL TRUSTEE COUPON ADMINISTRATIVE RECORD Department of Law

OCT 2 1989

UNIVERSITY OF OREGON

September 27, 1989

Alaska Attorney General's Office 1031 West 4th Avenue, Suite 200 Anchorage, Alaska 99501 Attn: Barbara Hyder

Dear Barbara Hyder:

I write with reference to the State/Federal Natural Resource Damage Assessment Plan for the Oil Spill, dated August 1989. I focus on the lack of attention to possible damage to archaeological sites located in the lowlying coastal areas affected by the spill.

Although I recognize that damage to resources of archaeological value are not susceptible to correction in the same way that damage to fish and wildlife habitat may be, it is necessary to recognize that (a) deeply penetrating hydrocarbons may affect not only some artifactual material that is potentially recoverable through excavation, but more seriously (b) may contaminate organic materials to the place where it becomes absolutely impossible to conduct analyses of chemical attributes that permit estimates of food values of resources and of past diets, or to accurately measure ages by the radiocarbon method or by some other isotopic means. Such losses would be permanent and absolutely irreplaceable.

It is therefore imperative that studies of a sample of sites be initiated in order to assess the degree of this danger. Should oil seepage into the sediments be a problem that continues over even the near term, this must be determined within the test period in order to prepare for later mitigation of damage by speedy excavation of at least some threatened sites.

Yours sincerel: . 1.

Don E. Dumond Professor and Director, Oregon State Museum of Anthropology

OCT 5 1989

DEPARTMENT OF ANTHROPOLOGY • COLLEGE OF ARTS AND SCIENCES • EUGENE, OR 97403-1218 • (503) 686-5102 An Equal Opportunity. Affirmments: Affirmments

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Mark Reed 723 Broad Rock Road Peace Dale, RI 02879 October 2, 1989

Trustee Council		
P.O. Box 20792		5 1989
Juncau, AK 99802	OU I	•

Dear Sir/Ms:

I have just received and reviewed in some detail the State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill.

Although these comments will arrive a few days after September 30, I trust they may be taken into consideration.

In brief, the plan relies on a series of measurement programs to assess the damages. The published literature (examples enclosed) clearly shows that measurement programs without a unifying modeling framework cannot demonstrate losses within any acceptable statistical confidence. This is not simply my opinion, but a scientific fact arising as a direct result of magnitude of natural variability in space and time.

I strongly urge the Trustee Council to reconsider the scientific basis of the proposed plan. As proposed, the results of the studies will not stand up in or out of court, and the public will have received a second major disservice as a result of this oil spill, this time from the trustees of their own natural resources.

It is my understanding that a polluter, in this case Exxon, does not have to reimburse the trustees for unreasonable damage assessment costs. The vase majority of the studies in the proposed plan can clearly be shown to fall into this category.

Sincerely yours,

Mark Reed, Ph.D. J.

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ENNEL VALUEZ ON SPILL TRUSTEE COURCH ADMINISTRATIVE RECORD

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UNIVERSITY OF ALASKA, FAIRBANKS Fairbanks, Alaska 9978 99775-016

Institute of Arctic Biology September 27, 1989

CERCLA Trustee Council P.D. Box 20792 Juneau, AK 99802

Dear Trustees:

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... I have been reviewing the Public Review Draft of the Assessment Plan the Council has issued. I am deeply concerned about several aspects of the Plan. Since my areas of expertise are anthropology and archaelogy, I will focus my comments on the related sections of the draft. However, I feel other segments of related sections of the draft. However, i feel other segurities the plan may have similar problems, and I urge you in the strongest possible terms to reexamine and rethink your plan.

rection devoted to archaeological sites. This section is much too wague to be reviewable. I have considerable experience in it cultural resource management contracting, and no reputable contractor could or would perform research on the basis of this document in its current form. The proposed activities need to be specified much more clearly and carefully. For adequate accountability, both the contractor and the contractee must be able to tell when the work has been completed. There must also be: a reasonable basis for evaluation built into the project statement. 

Antime Secondly, this section suffers because, unlike the studies proposed marlier in the plan, there are no specific costs attached to the work to be done. Here again, the vagueness of the study proposal is at fault. Without more specific proposals, The impossible to attach realistic dollar figures.

Together these two factors give the distinct impression that the area's cultural resources are not very important and are receiving second, maybe even third class, consideration by the Trustees. I feel relegating these resources to a lower status would be a grave mistake on your part. There are some very important archaeological sites in this area, resources with significance locally, statewide, nationally and even internationally, as evidenced by the recent major international Smithsonian exhibit, Crossroads of the Continents, for example. They deserve more serious consideration on your part than this plan demonstrates. 12 .

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# UNIVERSITY OF ALASKA-FAIRBANKS

CERCLA Trustees September 27, 1989

There are two very important additional problems as well. Economic Uses Study Number 8 fails completely to address what will probably be one of the biggest, if not the biggest source of damage to archaeological sites as a result of the oil spill: vandalism. Many of the sites in this region have been protected for a long time by their relative obscurity. Now many more people are familiar with these areas and their cultural resources. Archaeologists working in the region, particularly on Kodiak, are already concerned about the level of vandalism/theft to archaeological resources. The increased familiarity brought about by clean-up activities is accelerating the vandalism

Economic Uses Study Number 9 must include research to investigate the amount of vandalism that has gone on, project the increased vandalism expected as a result of increased public knowledge of the sites, estimate costs for periodic monitoring of key sites and determine funding levels needed for future investigations and prosecutions under the Archaeological Resources Protection Act (ARPA). Although it is sad to say, it may take some successful prosecutions under ARPA to curb this illegal activity. On a more positive note, the assessment study should also work out a plan, including costs, for an effective public education program to discourage vandalism of the region's archaeological heritage. All of these costs are legitimate costs to the public resulting from the oil spill and must be assessed. The state and the federal agencies on whose lands these cultural resources occur have a mandate to protect them, and without adequate funds, they cannot carry out this mandate.

Finally, the deadline of February 28, 1990 is totally impractical. To be conducted adequately, the archaeological studies will require a summer field season. To maintain such a deadline for archaeological studies, and i suspect many other studies as well, is to say in effect, "Doing it right is not important." I don't think this message is what the Trustees should be communicating.

Let me now turn to Economic Uses Study Number 6, the proposals for subsistence studies. Many of the comments 1 have already made about the vagueness of the proposals and the lack of dollar figures also apply to these studies as well. Additionally, the subsistance studies should include another objective and that is to work with local people to determine what, in the absence of subsistence activities, is needed to support local values fostered and reinforced by subsistence.

Looking at subsistence losses, wage/labor patterns, income levels, inflation rates, effects of clean-up work, outside agency demands, industry demands and so on is all very important. But

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# UNIVERSITY OF ALASKA - FAIRBANKS

CERCLA Trustees September 27, 1989

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there are other very important issues that are harder to measure by numbers and statistics that also must be examined. Subsistence activities are extremely important in maintaining important local values. Although these values may be expressed in different cultural terms in different communities, they seem to come down to a set of basics: economic independence, protection of the land and environment, a sense of self-identity and control over one's own life, meaningful work, the ability to live meaningful lifestyles, and a sense of community and personal worth.

Assessing the spill's impact on these values will almost certainly require some skilled ethnographic research. Some literature review might be helpful as well to examine successful ways in which other northern communities have worked to preserve these values when other sources of income have supplanted subsistence. Devising alternatives and assessing their cost will require careful interaction with local communities. Local people often have good ideas and need to take charge of their own lives. What kinds of appropriate assistance with skills and resources can often allow them to solve their own problems, maintain their values? How much will they cost? If you want to get at the real impact of this accident on people's lives, over the long run, examining how these basic values can be preserved is one of the most important factors to be considered.

Finally, and very importantly, the subsistence research proposals should include some specific statements about local involvement in the research process. These studies should not be carried out on local communities but with local communities if they are to be most effective, and if the resulting damage awards are to have a positive impact.

I appreciate this opportunity to comment on the Review Draft. If you have specific questions or I can provide further input, please do not hesistate to contact me. My phone number is (907) 474-7039.

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Sincerely,

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Wendy H. Asundale

Wendy H. Arundale Research Associate



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UNIVERSITY OF ALASKA FAIRBANKS

INSTITUTE OF ARCTIC BIOLOGY Fairbanks, Alaska 99775-0180 U.S.A.

October 24, 1989 CERCLA Trustee Council P.O. Box 20792 Juneau. AK 99602

Dear CERCLA Trustees:

in <u>late September I wrote to the Council with a series of</u> <u>comments</u> on the <u>Public Review brait of the Assessment Plan for</u> the Exxon Valdez oil spill. One concern I expressed in my comments was that the plan contained no indications of <u>how local</u> <u>people would be involved in the assessment research effort</u>. In my brief letter, it was difficult to make any specific suggestions for how this problem might be remedied. A colleague, however, has suggested the enclosed report, though aimed primarily at northern and northwestern Alaska, might have some information useful to the Council on this issue. I recommend section 3 on Local Involvement.

(907) 474-7640

see study

The enclosed report is a draft. There were some clerical problems in its production that will be conjected in the rinks version. Therefore, I must ask you to overlook the obvious clerical errors, and focus on the ideas the report presents.

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If I can provide any additional information, please do not hesitate to contact me.

Sincerely,

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Wendy H. Arundale Research Associate

Enclosure

15.2.1

ENNOU VALUEZ CUL SPILL THUSTER COUNCIL 21 AGMINISTRATIVE RECORD -

P.O. Box 658 Homer, Alaski 99603 September 27, 1989

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

Dear Council:

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Brown

I am a citizen of Homer, Alaska, and comment herein on your Public Review Draft of the "State/Federal Natural Resource Damage Assessment Plan for the Ermon Valdez Oil Spill" of August, 1989. Nore specifically, I address Marine Mammals Study Mumber 6 (pgs 125-129) with regard to Impact on the Sea Otter.

- During April-August, 1989, I was hired by Exmon to monitor daily otters brought into the Valdez Rehabilitation Center (April- une) and akalof Bay Rehabilitation Center ( uly-August). The rehabilitation process was grueling at stressful to the otter, and was used more for ... research than healing an oiled otter. Of the 2-1/2 months I was in Valdez, only one-out of many gave birth to a live pup, all others being still-born. This says a lot about human intervention with sea otters. It has been proven in records through necropsy/autopsy reports that stress to the otter causes ulcers, mouth lesions, and in many cases death. The rehabilitation process had its pros and cons, and still I cannot say with conviction that it was the best thing for the otter, especially for those rehabilitated otters who have had surgically implanted radio transmitters. These otters! life will never again be normal or "in the wild". I have watched and listened with anguished heart the process of capture, drugging, holes punched for flipper tags, extraction of molar, implant surgery for transmitters, with the simultaneous screams of desp ir and fear of mother for her pup and the cries of otters reaching out to thir mate or bonding partner. These mammals do have intense feeling as a human would have if their young were to have a same process inflicted. When the research boats of Fish and Wildlife go out in pursuit of the otter for research, it will inflict stress and harm to the species in the name of research. This research will not benefit the otter as much as the "scientist".

Specifically, I oppose the intented research for the following reasons:

1. The method of capture is by tangle net, which requires a long and hard chase by motor power. It is extremely exhausting and durressful to the animal. When in the net, they will struggle with extreme stress.

 Drugging can cause allergic or reactive effects, and in previous cases ofters havedrowned when put back into the water after the reversal drug wore off.

3. Chances of abandorment by mother is extreme where her pup is captured, taken from her, and she is unable to retrieve her pup in a short periodof time. The pups will not be weaned, are still Dependent, and would have extreme difficulty and danger, if not impossibility, surviving on its own.

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Trustee Council September 27, 1989 Page Two

4. Surgically implanted transmitters and transponder chips will adversely affect the otter for the rest of its existence, and is invasive.

.....

### 5. The number of capture otters is excessive.

There is a discrepancy in the number of otters being used for ths research. In the Assessment, it is stated that up to 100 mature females in oiled, 100 mature females in unoiled, 50 dependent pups in oiled and 25 dependent pups in non-oiled areas will be instrumented with radio transmitters to document survival and dispersal. Fish d Wildlifehas been granted a Permit to research 650 Wild Otters. This fact was ommitted "from your Assessment." Such ommission seems to cover up or minimize the full and broad intentions of Fish d Wildlife and the extent to which research will be performed. Research on 650 Wild Otters is exfessive. Additionally, despite requests for public hearing on this matter before the Permit was issued, this Permit was approved without apprisal of all pertinent facts, data and information, and should be null and void.

Here we are, spending so much money on research and neglecting the real cause of concern. We should better be using this money to find alternative methods of energy so that we are not so dependent on oil, or to instigate oil tanker legislation so that our waterways are more protected, and how we can improve oil spill clean-up technology in the event this should happen again.

There is no money value one can put on a living animal in the wild; its intrinsicvalue is priceless. We can best help the otter by keeping its environment clean by not fouling its water with oil and trash/waste than by cutting them open to learn more about them. Its a value system more in line with caring rather than destroying.

With hope, Naney Brown

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The attached Petition was circulated for 1 week in Homer, to get an idea of how many people were aligned with my comments above. I give them to you for review.

cc: The Hon. Ted Stevens The Hon. Frank Murkowski The Hon. Don Young U.S. Fish andWildlife, Washington, DC



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EXXON VALCEZ OIL SPILE TRUSTEE COUNCIL ADMINISTRATIVE RECORD

VANGUARD RESEARCH, Cultural Resource Consultants Post Office Box 635 • Douglas, Alaska 99824 • (907) 780-6287 15

September 25, 1989

Re: State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill

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

Dear Sirs:

1 .

I would like to comment on Economic Uses Study Number 9 of the Damage Assessment Plan titled "Survey of Archaeological Sites Impacted by the Exxon Valdez oil spill".

From May to August 1989 I was an archaeological consultant to Exxon assigned to a Shoreline Cleanup Advisory Team (SCAT) and worked in both Prince William Sound and the Kodiak area.

My concern is with the potential for continuing human impact on highly visible and critically sensitive historic and prehistoric archaeological sites especially in the form of relic collecting and intentional vandalism by individuals who have had increased awareness of, and access to archaeological sites in the oil spill area.

Perhaps the most visible and sensitive archaeological sites with the greatest potential for adverse impact are burial caves and rockshelters containing human remains. Even with intermittent archaeological monitoring one of these caves in the western part of Prince William Sound vas vandalized during the 1989 cleanup even though the immediate site vicinity had been placed off limits to cleanup activity due to the sensitivity of the cultural resource in the area

The State/Federal Damage Assessment Plan should specifically address the problem of educating oil spill workers and the public of the value, both cultural and scientific, of the archaeological sites in the impact area, and of the need for continued monitoring of the most visible and sensitive sites to evaluate the extent of human impact beyond the immediate cleanup phase of the oil spill.









VANGUARD RESEARCH, Cultural Resource Consultants Post Office Box 635 • Douglas, Alaska 99824 • (907) 780-6287

The following are some of the actions that should be continued through 1990 to mitigate or help minimize human impact to cultural resources in the aftermath of the oil spill cleanup.

- Education of all beach workers and supervisors of the nature and sensitivity of cultural resources during employment orientation. Less than one minute of discussion of cultural resources in the 1989 Veco orientation program was not adequate. A short 15 minute video tape was made by the Exxon Archaeology Office but this tape was not used in the Veco orientation where it would have done the most good. At a minimum this tape or a similar presentation should be made part of the orientation program should cleanup activities continue into 1990.
- 2. Baseline pre or post-cleanup assessment of all known archaeological sites in the vicinity of oiled beaches. This should include video taping of the site condition, surface features and artifacts susceptible to disturbance. Vandalism which appears to have occurred prior to the oil spill should be carefully documented. A sample of known sites was documented and video taped during the post assessment phase in 1989 but lack of time did not allow adequate base line data to be obtained at all impacted sites.

Placing of signs notifying the public of the presence of a sensitive cultural resource and the legal penalties for vandalism of archaeological sites. This should be considered only for highly visible sites where the sign will not, in itself, increase the risk of vandalism.

Periodic archaeological monitoring of known-sites through the summer of 1990. This would be done to detect evidence of vandalism and to evaluate the necessity for continued monitoring and/or other measures to minimize human impact to cultural resources on a site specific basis.



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5. **Emergency collection and curation of surface** artifacts in immediate danger of loss through relic collection or natural erosion. Artifact collection at highly visible archaeology sites should be used only as a last resort to avoid loss of diagnostic artifacts or significance cultural information.

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Please consider including some or all of the above actions within the overall scope of Economic Uses, Study #9. Thank you very much.

Sincerely

Robert C. Sette

Robert C. Betts, Archaeologist Vanguard Research

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EXXGD VALUE OF SFILL TRUSTER OCUMENT ADMINISTRATIVE RECORD

see mext p.

Steve Kuchnicki Kitoi Bay Hatchery 99697

Kodiak, Alaska 99615

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The Trustee Council 7.0. Box 20792 Juneau, Alaska 99802

Dear Sirs:

Them an employee of the Alaska Dept. of Fish and Game's F.R.E.D. Division (fish hatcheries), also a longtime resident of Alaska, and am greatly concerned and disturbed by the proposed "scientific research" slated to be done on 650 Alaskan sea otters in the near future. This project, if indeed allowed to go ahead as outlined in permit PRT \$740502) will involve disturbing at least as many of these animals as have already died as a result of the Exxon Valdez oil fiasco; quite a number of actual rural Alaskan residents, myself included, who come into contact with the area's otters and other marine fauna, realize that there is something definitely smelly going on here.

Could this possibly be another idea, not to say the word "scam", to get a few more easy bucks out of Exxon, for blood or conscience money, when the only ones to be harmed will be several hundred more of our state's natural inhabitants? An initial measly \$800,000 will be needed for this supposed necessary research. I have been sickened throughout this summer by the dishonesty and greed shown by a lot of my fellow Alaskans in the wake of this ecological nightmare, and say no way should this program be allowed to begin, at least at the present time. These animals, and all others of the Alaskan seacoast habitat, have already been impacted, threatened, fortured through ignorance and killed in great enough numbers this year. Let's let them get back to a normal existence now without endangering them further.

I found out about this project barely in time to get this let ter in the mail; if other Alaska bush residents HAD KNOWN ABOUT this proposed research, I am sure negative response to this and other unnecessary, harmful, pseudo-scientific information gatheringinvolving our state's wildlife would have been much greater. As it stands, I suspect that once again the rural residents of this state, people who are in daily contact with our natural resources and genuinely care about them, are about to be treated to a dose of Anchorage bureaueracy in action. Something as important as the welfare of a large group of the wild inhabitants of Alaska should be at least open to public discussion, and not shoved down our throats by some Anchorage "Acting Director" of this or that. This permit PRT #740502 should definitely be denied until further facts have been uncovered in this matter, and public discussions held; this could avoid more serious mistakes being made, and the risk of more negative future impact upon some of our most important, visible and sensitive Alaskan wild creatures.

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"Thanks very much for your time and consideration.

Sincerely,

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Steve Kuchnicki Kitoi Bay 9-24-89

Sec. of Interior Luhan Congressman Don Young Senator Ted Stevens Senator Frank Murkowski

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# FRIENDS OF THE SEA OTTER

P.O. BOX 221220, CARMEL, CALIFORNIA 93922

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

September 21, 1989

Dear Trustee Council,

We have reviewed the Public Review Draft of the "State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill, August 1989", and our comments on this document follow. We are a non-profit organization representing over 5000 members concerned about the plight of the sea otter and its habitat.

Of greatest concern to us is the Plan's deadline of February 28, 1990. The Note between p. 28 and p. 29 indicates that funding for all field work and analysis activities through Feb. 28, 1990 is included in the Plan. The implication is that all field work and analysis will cease as of that date unless the Trustees have specifically approved continuation of some studies. Since the oil spill occurred on March 24, 1989, even studies that began as early as the day of the spill would not be "one-year" studies, as the Note suggests they would be. Many, if not most, of the studies described in the Damage Assessment Plan began long after the date of the spill, and some studies have still not been started (e.g. the radio tracking portion of Marine Mammals Study #6). How will studies which continue beyond Feb. 28, 1990 be funded? To achieve the goal of "determin[ing] injury to natural resources" as a result of the spill, studies must continue for years. For instance, if hydrocarbons accumulate in tissues of clams which are ingested by sea otters, there may be a slow accumulation of hydrocarbons in sea otter tissues which may eventually affect reproduction and The Damage Assessment Plan as presented may be survival. sufficient to identify initial, direct damages but it certainly does not address long-term chronic damages, given the time frame allotted. We would like to see a clarification of how vital longterm studies will be handled, for Exxon ultimately should be responsible for these studies, as well. Additionally, please responsible for these studies, as well. Additionally, please provide us with a list of those studies which you have decided should be funded beyond the Feb. 1990 deadline.

On p. 18 of the Plan, you say that the Trustees are considering having the "responsible parties" participate in the damage assessment. We feel that it is completely inappropriate for the responsible parties to play a role in determining the degree of damage they have caused. Clearly, the responsible parties are biased and predisposed to find as little damage as possible. Damage assessment should be conducted only by independent parties.

Our review of the Plan has focused on all studies that relate







# FRIENDS OF THE SEA OTTER

P.O. BOX 221220, CARMEL, CALIFORNIA 93922

directly or indirectly to sea otters. First, the estimate of the number of otters affected by the oil spill does not agree with the population estimates given in the permit application (PRT-740507) submitted by Dr. Tony DeGange of the U.S. Fish & Wildlife Service (USFWS) for studying otters affected by the spill. Dr. DeGange states that there are 7-8000 otters inhabiting Prince William Sound, more than 3000 along the Kenai Peninsula and over 4000 at Kodiak Island. Although Dr. DeGange does not specify how many otters in each population may have been affected by the oil spill, it seems likely that the total affected exceeds the number indicated on p. 14 of the Plan (5000 is implied in the Plan). The fact that 1010 dead otters had been retrieved by mid-Sept. 1989 alone suggests that many thousands of otters probably were influenced by the spill.

We have been supportive of the research on sea otters proposed in Marine Mammals Studies #6 and #7. We are aware of the objectives and methods of these studies, but we have not seen formal proposals for either of them. We, hereby, request copies of the proposals for these two studies.

Marine Mammals Study #6 has as its first objective to "determine the magnitude of injury to sea otter populations". How is injury defined? Injury should include mortality (both direct and indirect), behavioral disruption and decreased reproductive success. In addition to injuries caused by the oil, injuries caused by the cleanup effort also should be considered. Marine Mammals Study #6 is associated with Economic Uses Studies #5 and #7; if subsistence use of sea otters was affected by the spill, Economic Uses Study #6 also should be considered. The numbers of free-ranging otters to be implanted with radio transmitters in Marine Mammals Study #6 is not consistent with the number indicated in the permit application (PRT-740507) submitted by Dr. Tony DeGange of the U.S. Fish & Wildlife Service (USFWS) for this work. Two critical aspects of this important research- monitoring food habits of otters in oiled and unoiled areas and determining the cause of death for otters that die- can only be answered if there is very frequent monitoring of otters from a boat or from land. As we have indicated in letters and phone calls to the USFWS, the level of monitoring of implanted otters needs to be increased to 2-3 times per week instead of the once per two weeks currently established.

We have supported Marine Mammals Study #7 and urge that, as with Study #6, the goal of visual contact with each instrumented otter be increased substantially. The validity of both of these studies rests heavily on the quality of the monitoring of otters tracked over the long-term. The numbers of rehabilitated otters








P.O. BOX 221220, CARMEL, CALIFORNIA 93922

fitted with flipper transmitters and surgically implanted (p. 127) is incorrect in the Plan: the correct numbers are seven and 45, respectively.

The two sea otter studies (Marine Mammals #6 and #7) should be listed as related studies under the following other studies, which investigate sea otter prey: Fish/Shellfish Studies #13, #14, #21, #22, and #26. USFWS should be included as a cooperating agency on all of these studies, as well. The effect of the oil spill on otter prey is crucial to determining the long-term effects of the spill on otters themselves. Results of all of these studies must be shared by the researchers involved to insure a complete ecosystem analysis of the spill's effects on otters and their prey.

The USFWS should be included as a cooperating agency in Restoration Study #1. For natural resources which cannot be restored (e.g. dead sea otters), an alternative recompense should be funding of long-term research to gain as much knowledge as possible about the injuries suffered by otter populations and about their natural recovery process. Based on other major oil spills in which oil has lingered in the environment for a decade or longer, research funds should be committed for a minimum of ten years to study the effects of the oil spill on Alaska sea otterpopulations. Studying the impact of the spill over the long-term on non-restorable resources must be treated equally in terms of funding with restoration of restorable resources.

The economic valuation of damages is a highly significant aspect of the Plan, and we find the information provided about the Economic Uses Studies insufficient for us to judge the validity of your approach. Economic Uses Studies #5 and #7 and possibly #6 all relate to sea otters, and we request copies of the proposals describing these studies. We would like to have the opportunity to comment on the specifics of these studies. We applaud the apparent intent behind the "Study of Loss of Intrinsic Values due to the Exxon\_Valdez Oil Spill" (Economic Uses Study #7). The worldwide outpouring of anger and sadness over the oil spill was certainly based on the intrinsic value which people give to pristine wilderness areas replete with wildlife. It is imperative that surveys of intrinsic value be distributed to people throughout the entire United States (and perhaps in foreign countries, as well), because many of us "outsiders", as those who live outside Alaska are known, put a very high value on simply knowing that untouched wilderness areas and wild animal populations exist.

We would like to receive a copy of the draft restoration plan once it is released for public review. We look forward to the chance to comment on the restoration plan.













-P.O. BOX 221220, CARMEL, CALIFORNIA 93922

In summary, our major points of concern are: 1) the inadequacy of the study period described in the Plan; 2) the level of monitoring of sea otters fitted with radio transmitters in the two sea otter studies; 3) the need for cooperative analysis of data gathered in the sea otter studies and in the studies of sea otter prey items; 4) the lack of details on specific methods for attributing economic value to natural resources lost or damaged by the spill (specifically, how will you determine how much is each sea otter worth?); 5) the lack of information on how recompense will be made for non-restorable resources that were lost as a result of the spill.

In this letter we have requested copies of: 1) the proposals describing the two sea otter studies; 2) the proposals describing Economic Uses Studies #5, #6 and #7; 3) the draft restoration plan; 4) a list of studies approved by the Trustees to continue beyond Feb. 1990. In addition, we request a clarification of your plans for long-term damage assessment (beyond Feb. 28, 1990).

We appreciate the opportunity to comment on the Damage Assessment Plan, and we look forward to hearing from you on the above matters.

Sincerely,

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Susan H. Shane, Ph.D. Scientific Director

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EXAGN VALUEZ ON SPILL TRUSTED COUNCIL ADMINISTRATIVE RECORD 11.

Southern Illinois University at Carbondale Carbondale, Illinois 62901-6504

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Cooperative Wildlife Research Laboratory 618-536-7766

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September 20, 1989

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

Dear Trustee:

I am writing to offer my comments on the draft "Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill." I am an avian physiological ecologist with expertise in the reproductive biology and energetics of high latitude plankton-feeding seabirds. I have extensive field research experience in both the arctic and antarctic, including Alaska.

The most glaring inadequacy of the Plan is the lack of a commitment to continue studies past February 1990. The cover letter that introduces the\_\_\_\_\_\_ Plan states that "while related long-term research may be desirable . . . it falls outside the scope and intent of the plan." Damage assessment studies that encompass more than one breeding season post-spill can hardly be considered long-term. The deadline for completion of the assessment renders it essentially impossible to achieve most of the stated objectives of the planned studies. It will not be feasible to determine even the acute impact of the spill on many of the monitored species and species groups without at least one additional field season. For example, it has been documented, at least in the case of the <u>Amoco Gadiz</u> catastrophe, that high density aromatic hydrocarbons, a toxic component of crude oil, were present for at least a year after the spill.

Bird Study No. 7 entitled "Assessment of the Effects of Petroleum Hydrocarbons on Reproductive Success of the Fork-tailed Storm Petrel" is a plagiarized version of a proposal that I was invited to submit to the Alaska Fish and Wildlife Research Center of the U.S. Fish and Wildlife Service back in April 1989. (In fact, the second paragraph of the "Concern/

Justification" section, objectives B and D, and the last four sentences of the "Methods and Analyses" section are verbatim from my proposal). Consequently, I will review this study in some depth. Because Region 7 of the Fish and Wildlife Service had not originally intended on addressing objectives B and D, I am concerned that they will not be realized. I see no methods for measuring adult foraging efficiency or chick physiological condition (objective B). In fact, it appears that the proposed schedule of field work precludes these measurements.





Trustee Council Page 2 September 20, 1989

The intent of the Fish and Wildlife Service for the 1989 field season was to spend only 2-3 weeks during the incubation period to find active nests and 2-3 weeks late in the nestling period to check "reproductive success." This schedule for field work will not yield information on the percentage of eggs that fail to hatch and why (i.e., were the eggs infertile, abandoned, addled, contaminated?), the percentage of hatchlings that fail to fledge and why (i.e., were nestlings abandoned, not fed sufficient food, fed contaminated food, covered with oil?), or fledging weights. Storm-petrel chicks generally carry large fat reserves when they leave the nest. Stored energy appears to be a critical factor in post-fledging survival. Chicks that have not attained large fat reserves prior to normal fledging age may either remain in the nest until the parents abandon them and/or die shortly after fledging. The proposal makes no mention of either measuring chicks (to estimate age) or weighing chicks (to estimate fat reserves) in the field. It would be desirable to determine growth rates of known-age chicks and measure their body fat content repeatedly (and nondestructively) using a TOBEC analyzer. The frequency and quantity of meals delivered to chicks by adults must be monitored in order to measure adult foraging efficiency (objective B), yet there seems to be no provision for collecting these data.

Because failure of the food supply and the resultant nesting failure are naturally occurring phenomena for most seabird species, it is not sufficient to just ascertain the percentage of nesting attempts that fail. It is necessary to document the cause of the failure and determine whether there is a link with petroleum pollution. The word from seabird biologists currently working in Alaska is that 1989 was a poor year for seabird reproduction throughout the Gulf of Alaska, and perhaps the Bering Sea as well. If so, the petroleum industry will quickly take advantage of any lack of documentation of oil-related impact to claim that all seabird reproductive failure in 1989 was a natural phenomenon. This underlines the importance of establishing the causal link between oil pollution and . reproductive failure, should one exist.

This brings me to objective D which is extremely important and one of the primary reasons for focusing on storm-petrels as an indicator species. In order to determine the extent and persistence of petroleum hydrocarbon pollution in the marine environment, it is critical to continue collecting storm-petrel stomach oil samples from several locations until contamination reaches background (pre-spill) levels. Storm-petrels breed from Prince William Sound west to the Aleutian Islands and could be used to monitor petroleum residues throughout the affected area. Yet Bird Study No. 7 proposes collecting stomach oil samples from only one site (East Amutili Island) for one breeding season (1989). Why not monitor storm-petrels than breed on the Wooded Islands next to Montague Island in Prince William Sound or along the southern coast of the Kenai and Alaska peninsulas, areas that were hard hit by the spill? Also, there is no indication that the levels of petroleum hydrocarbons found in stomach oils of storm petrels from East Amatuli will be related back to sublethal (or even lethal) impacts on reproduction, as objective D states.

Bird Studies 2 and 3 essentially rely on surveys before and after the spill to quantify the impact on seabirds. Yet it is clear that complex oceanographic factors may be responsible for relatively low numbers of



Trustee Council Page 3 September 20, 1989

pelagic seabirds recorded during both offshore surveys and surveys at the breeding colonies in 1989. Relevant controls from unaffected areas may be difficult or impossible to obtain. Again, this emphasizes the critical nature of establishing cause and effect. Surveys can not do this; studies that incorporate chromatographic verification of petroleum contamination. gross pathology, histopathology, and enzyme assays can. It may be too late to obtain most of these data, but my guess is that, considering the sums of money involved, Exxon and Alyeska will contest the damages that are assessed as a consequence of the spill. If the Trustee Council intends to support the damage assessment so that it will stand up in court, the case needs to be adequately documented. Are blood smears being taken from seemingly healthy birds to ascertain whether red blood cells exhibit lesions characteristic of hemolytic anemai caused by oil ingestion? Are liver samples being collected from sick and/or moribund birds and immediately placed in liquid nitrogen for laboratory assays of aryl hydrocarbon hydrogenase (AHH) activity and other mixed-function oxygenase (MFO) enzymes? In short, judging from the draft Plan, I seriously question whether Region 7 of the Fish and Wildlife Service has the expertise, manpower, or inclination to perform an adequately documented damage assessment for migratory birds potentially impacted by the Exxon Valdez disaster.

I hope these comments assist you in preparing the final version of the Plan. Please let me know if I can be of any further assistance.

Best regards Nam Ŵ Daniel D. Roby Assistant Professo

DDR:mlm

cc: Walter O. Stieglitz, Regional Director, Region 7 John D. Buffington, Deputy Assistant Director, Research

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EXNO:: VALDEZ CH. EPILL TRUSTEE COUNCIL ADMINISTRATIVE RECORD



September 20, 1989

Ms. Susan M. Lawrence, Acting Chief Branch of Permits Office of Management Authority U.S. Fish and Wildlife Service P.O. Box 3507 Arlington, VA 22203-3507

HAND DELIVERY

14

Re: Sea Otter (Enhydra lutris) Capture Permit Application, PRT-740507

#### Dear Ms. Lawrence:

Defenders of Wildlife (Defenders) is pleased to comment on a permit application to capture up to 650 sea otters from Alaska's Prince William Sound and adjacent waters. In my conversation with you and Sandra Bruce two weeks ago, you advised me that the comment period for this application was extended for two weeks. However, I was recently advised that your new Fish and Wildlife Service (FWS) Deputy Director and former Head of Research, Dick Smith, has supposedly gone ahead and prematurely issued this permit even before closure of the public comment period. I tried to verify this situation today, but my intern was unable to get a response from your office. If this is indeed the case, we find this at the very least a highly irregular and questionable practice. We would certainly hope that the FWS has not prematurely granted a permit for a program of this magnitude and expense.

There is no question that we need to conduct long-term studies on sea otters, and other wildlife for that matter, in those areas impacted by Exxon's oil from the Exxon Valdez to determine the overall effects of oil, oil spill by-products, and other contaminants on wildlife. However, as it presently stands, Defenders has some serious reservations and grave concerns about this permit application for sea otter capture, handling, and radio-tracking. From a short-term standpoint as of this writing, the in-hand body count of sea otters remains at around 1,000 animals from Prince William Sound (PWS), the Alaska Peninsula, Cook Inlet, and Kodiak Island. During my month's investigation in April and July in south-central Alaska, I certainly saw my share of otter mortality, stress, mishandling, improper feeding and care, and other problems related to otter rehabilitation and restoration. In addition, numerous Defenders' members, activists, and concerned citizens have related to me additional problems with otters and other wildlife. Stress in the form of human contact and oil contamination to those surviving animals continued all summer, and existing contamination will continue to kill otters this winter and beyond. As recently as three weeks ago, most of western PWS was covered with an oily sheen, and two weeks ago, major bays around Kodiak and Afognak islands were oiled with a sheen, and new bays previously unoiled were reported

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with 4-5 inches of new mousse. The fact of the matter: these animals have been and will continue to be subjected to tremendous stress. Some of that stress has already shown up in the form of intestinal ulcers, inflamed mouth lesions, and shock. Pneumonia, exhausted adrenal glands, and death may result.

Having had considerable experience in immobilizing, handling, and radio-collaring various species of wildlife -- e.g., M.Sc. and Ph.D. research immobilizing and handling over 100 black (Ursus americanus) and several grizzly bears (U. arctos horribilis), and the radio-collaring and tracking of 35 black bears -- I am especially cognizant of problems related to drug overdose, allergic reaction to immobilizing agents, and stress. From a standpoint of stress alone, not to mention the need for a statistically significant sample size, the capture, immobilization, tagging, blood sampling, aging (premolar tooth sectioning), and transponder chip implantation of up to 650 sea otters seems extreme and far in excess of the necessary sample size. Knowing the personal difficulties in tracking 25 radiotagged black bears at one time -- including with the use of aircraft -- and the present difficulties that the FWS has had in tracking the few otters it radio-implanted this summer, how does the Service plan to conduct realistic tracking operations for 275 otters? This is unrealistic, probably unworkable (given otter daily movements of up to 60 or more statute miles), and perhaps logistically impossible.

Stress to the otters must further be factored into the research equation by the inclusion of the impacts of capture, later recapture(s), invasive surgery (transmitter and transponder chip implants), visceral fat biopsy, tooth extraction, tagging, handling, drug sensitivity, and oil spill impacts already affecting the animals prior to capture (e.g., emphysema, destruction of livers and kidneys, breakdown of immune systems, aplastic anemia, bone marrow toxicity, central nervous system damage, blindness, and other problems).

Stress, too, may result in the rejection or later abandonment of pups by their mothers. This is not satisfactorily addressed on p. 8 of the permit application. Capture can and has resulted in the drowning of pups with females, and this is nowhere addressed in this application (p. 9). I know of at least one drug-related otter mortality this summer, and nowhere is this addressed on pp. 9-10. No explanation is given why Cedar Creek Bioelectronic Labs were chosen to supply radio transmitters (e.g., Telonics is considered the best radio transmitter company for terrestrial wildlife collars; reference p. 10). No mention is made of the range of these radio transmitters, nor their known impacts on the body movements, behavior, breeding and feeding habits, and predator avoidance capabilities of these implanted mammals (p. 11). Is the capture, immobilization, implantation, and re-release of otters immediately following surgery the best and most advisable technique (as opposed to allowing surgical im-

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plant recovery prior to release; p. 11)? It is unclear if all instrumented otters will be recaptured, nor now many times they will be recaptured, resulting in further stress (p. 12).

The explanation of impacts of the transmitters on otters is insufficient, given the unique nature of this study and the contaminated habitat in which it is being conducted. Although we are told that, "to date there has been a conspicuous absence of problems associated with the transmitter package and surgical procedures to implant those transmitters," (p. 12) no literature is cited (nor citations given elsewhere, for that matter) to verify this statement.

Regarding the actual research intent of this study (pp. 14-15), no mention is made of the importance of research gathered from non-radio telemetry studies which also need to be conducted in a detailed, systematic, replicated and careful way. These include population survey work, additional body counts and collections (with subsequent necropsies), behavioral studies of unimplanted animals, observations of pupping areas and breeding success, pup survivorship, etc. From my experience, "frequent monitoring" means far more than "at least weekly" observations (p. 13). How, too, will "detailed behavioral observations of marked individuals" be conducted, and why is it necessary to recapture individuals "in order to evaluate the effects of marking"? (p. 13) - a seemingly unnecessary additional stress. So what if you recapture an otter only to find that it has lost its tag. You already stated that otter "temple tag" loss is high, and that coded transponder chips and radio transmitters are permanent (pp. 10, 11). The question -- of whatever significance it plays in this study -- is already answered.

Why is harassment (p. 13) listed as "not applicable"? It certainly would appear to be a problem, given some of the above concerns. This definitely needs to be addressed.

No budget was included in this application. Although Exxon may ultimately pay for this research, immediate funds will likely come from the American taxpayer. Budget information should be an intrinsic part of the application.

In conclusion, although this may be a well-intentioned study, it is overly ambitious, unnecessarily large, untenable, and likely will result in far more harm than good. Given the aforementioned concerns, if a study of this type is to be conducted at all, we recommend one of a much smaller scale, which still would provide statistically significant results with far less stress on the animals. Such a study should at most be no more than one-fifth the size recommended here (<u>total capture of</u> <u>130 otters, total transmitter implant of 55 animals</u>). If this request is unacceptable, we ask for a public hearing on this issue to justify the need for such a large capture of sea otters,





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a verification that there will be no duplication of effort from other work on otters ongoing, that harassment will not occur, and that stress will be minimal.

Sincerely yours,

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Albert M. Manville, II, Ph.D. Senior Staff Wildlife Biologist Defenders of Wildlife

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cc: John Turner Bob Smith Walt Stieglitz Tony DeGange

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Mr. Richard D. Dederick P. B. Box 308 Kasilot, Alaska 99610 Sept. 20, 1989

Trustee Council P.O. Box 20892 Juneau, Alaska 99702

Dear Sir. I am writing in regards to the scientific research on 650 Sea Otters: Marine Mammal Study 6, to be captured, drugged, tagged, blood sampled and injected with subcutaneous transponder chips. Up to 275 may be surgically implanted with radio transmitters and a biopsy of visceral fat

will be taken for toxicity analysis. (permit # 740502). The ultimate objective, up here in Alaska after this

devastating oil spill, is the restoration of the ecology of the effected areas, and to assure no more oil is spilled.

I can see no justification of this kind of study to only furthur impact the already ailing Sea Otters in the affected areas, and impact the fortunate ones who were not affected at #11.

To injure an animal to make the assessment of injury to the animal shows incompetence and ignorance. This type of conduct has been the norm during this disaster for most all Federal and State agencies, and I am very disappointed and embarrassed at what I have seen.

. . To further this type of activity only adds insult to injury. What has happened to human dignity. What has happened to bona fide research, where humans retain their dignity at the same time gaining astounding information.

This type of invasive research and harassment will only gain us limited knowledge to questions which are right before our eyes. Which the Sea Otters showed Magnificiently when they gouged their own eyes, and chewed off the ends of their fingers.

Please stop this hormon of data collection. But that Money towards research of containerized oil transport, or restocking Sea Otter habitat.

The Fish and Wildlife Service has got to prove that they are the protectors of our wilclife. This reseach permit proves otherwise. It proves the love of money.

We request that you deny this study and if you need more information to base your decision we request a public hearing to be held in affected areas of Alaska and Washington D.C. Thank-you for your consideration.

Sincerely,

Richard O. Dederich

CC: Congressmar Don Young Senator Frank Murkowski Senator Ted Stevens 👘 President George Bush 

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#### PETITION

9/19/89

ALASKA FISH and WILDLIFE RESEARCH has applied for a Permit to conduct scientific studies on 650 WILD SEA OTTERS, and are asking permission to CAPTURE BY TANGLE NET, DRUG WITH FENTANYL CITRATE, AZAPERONE and VALIUM, TAG FLIPPERS by PUNCTURE HOLES, SAMPLE BLOOD, BIOPSY VISCERAL FAT, EXTRACT A MOLAR, INJECT SUBCUTANEOUS TRANSPONDER CHIPS, and SURGICALLY IMPLANT RADIO TRANSMITTERS in 300 Dependent PUPS, 300 Independent FEMALES, and 50 Independent Males for purposes of gaining damage assessment value to the harm caused by the Oil Spill on Alaska's Wildlife in pursuit of the State of Alaska's lawsuit against Exxon.

We, the undersigned, oppose such INVASIVE Research which harms the animal, causes extreme duress, and lays open very probable abandonments by Mother Sea Otter in having her Pup captured, and other various reasons and request by this Petition a Public Hearing be granted to the People of this State so that all facts and data can be reviewed before such Permit can be legally and humanely considered and/or approved:

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Sandria Thomas, M.D. **Jakolof Otter Center** Red Mountain via Homer, AK. 99603-

9-15-89

Trustee Council Box 20792 Juneau Alaska 99802

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'Dear Sir or Madam,

I think that abdominal implants of radio transmitters into the sea otters who were victims of the Exxon Valdex Oil Spill and who have been rehabilitated and are currently healthy enough to be released should stop. These wild animals are being transformed from victims to research specimens for Fish and Wildlife Service of Alaska.

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Surgical implants are deleterious to them physically because of intitial risks including infection and long-term nisks including inadequate physical assessment follow-up and possible fetal death if pregnant females are inadvertantly implanted.

The implants are delerious mentally/emotionally because of increased stress from added handling, pain, and post-surgical recovery, and because of maintenance of long-term human/otter interaction by proposed monitoring for two years from planes and boats.

Ethically, to pluck a wild animal out of it's habitat in the name of rescue with the goal of rehabilitating it back to the wild in the shortest possible time frame and then to change that goat mid-stream to make that animal a research subject and delay it's re-entry into the wild is to revictimize that animal. This is morally dishonest.

Scientifically, these rehabilitated sea otters are not representative of typical wild sea otters and any correlations between behaviorial research on these animals and the general population of otters can not be made. The risk of surgical implantation of radio transmitters in these sea otters clearly outweighs the possible benefit of this research. This is not scientifically sound.

Thank you for your active participation in the prevention of unethical treatment of these Alaskan Sea Otters.

Sincerely a Thomas, M.D.

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EMNOR VALCEZ OU. PPHL TEURITE COUNCIL ADIMNISTRATIVE RECORD

1565 Sunrise Drive Anchorage, AK 99508 September 14, 1989

no substantive comments Sort Con. Topic Issue Sug.

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

Dear Madam or Sir:

I would like to offer one brief comment on the "State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdex Oil Spill, August 1989, Public Review Draft."

The cover artwork grossly distorts the reality of the oil spill. At no time was the spilled oil contained by booms as depicted in the drawing. The oil spread far beyond the small slick which is depicted in the immediate area of the tanker in the drawing.

Visual communication is a powerful and important means of conveying information and feelings. The cover drawing you have selected suggests that the events of March 24 are somehow containable, separate, and not threatening to the surrounding environment. Part of the assessment plan should be an accurate depiction of the damage of the spill through the choice of realistic art work.

If you choose more symbolic or abstract art, carefully consider the images and their meaning. The cover art will be the first information which readers of the report will see and will likely be the most visible part of the reports as they sit on numerous desks and shelves. Because of the prominent position it has, the cover art will likely be the most memorable part of the report and deserves more careful consideration.

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Sincerely,

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Eric Larson

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# KENAI PENINSULA BOROUGH

144 N. BINKLEY • SOLDOTNA, ALASKA 99669 PHONE (907) 262-4441

> DON GILMAN MAYOR

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September 13, 1989

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

Dear Sirs,

The Kenai Peninsula Borough has reviewed the State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill, August 1989, Public Review Draft. Our comments are outlined below.

# Comments Regarding the Introduction of the Assessment Plan

One year is not sufficient to fully assess the damage to natural resources since impacts to fish and other resources will not be evident for three or more years. For example, the plan states that the damage to Pacific herring in Prince William Sound will not be known for at least three years.

The responsible party's involvement in the assessment should be limited to providing financial assistance to the Trustee to assure the objectivity of the assessment.

The chronology of the spill (page 6 to 11) is oriented toward Prince William Sound which lessens the importance of events that occurred in the Gulf of Alaska and Cook Inlet. More emphasis should be placed on the events in the Gulf and Cook Inlet such as the closure of much of the fishing season.

Figure 4 should be updated in the final assessment plan to accurately represent the full extent of the movement of oil. Studies should include all areas impacted by the spill.

The transport and fate of the oil in Cook Inlet is not discussed. There are indications that debris from the spill will accumulate on the west side of Cook Inlet. This should be addressed.

The discussion of impacts to sea mammals and birds impacted in the Gulf of Alaska and Cook Inlet should be discussed in more detail.

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# Comments Regarding the Injury Determination/Quantification Studies

The areas encompassed by the three geographic regions established for the Coastal Habitat Injury Assessment, (PWS, Cook Inlet and the Kenai Peninsula, and Kodiak and the Alaska Peninsula), are unclear. It is uncertain which of these areas include the west side of Cook Inlet. A figure showing the regions would be helpful.

It is unclear if the Coastal Habitat Injury Assessment will include Upper Cook Inlet or the west side of Cook Inlet. Both of these areas were impacted by the Valdez Exxon oil spill and should be included in the assessment.

The Petroleum Hydrocarbon-Induced Injury to Subtidal Marine Sediment Resources Study (Air/Water Study Number 2) should include sites within Cook Inlet especially the west side of Cook Inlet.

Comments regarding the Fish/Shellfish Assessment are listed in the table below.

<u>Study No.</u> 6	This study should include Upper and Lower [] 11 3 1360 [
7	This study should include Upper Cook Inlet 12 3 1370
8	The areas to be studied are unclear.
9	Cook Inlet and the west side of Cook Inlet 13 3 1380 / should be included in this study.
12	Kamishak Bay and the lower Kenai Peninsula contain herring fisheries that may have been impacted by the oil spill. These areas should be included in the study
21	Clams are present in Kachemak Bay and the west side of Cook Inlet. These areas should be included in the study.
23	This study should include the Kenai Peninsula and Cook Inlet 17 3 1530 1

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Generally, this assessment is oriented to Prince William Sound (PWS). Although the PWS was severally impacted, the Gulf of Alaska and Cook Inlet are equally important to the State of Alaska and were also impacted by the spill. These areas should be given equal attention during the assessment process.

This assessment plan was written prior to the full impact of the oil spill. The west side of Cook Inlet and Upper Cook Inlet are largely ignored by the assessment plan. The Trustees should reevaluate the areas to be assessed by the proposed studies with consideration to the entire area affected by the oil spill.

The Kenai Peninsula Borough would like to be informed on the progress and results of all studies taking place within the Gulf of Alaska and Cook Inlet.

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Sincerely,

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Alice Bullington Environmental Technician

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# P.O. BOX 221220, CARMEL, CALIFORNIA 93922

directly or indirectly to sea otters. First, the estimate of the number of otters affected by the oil spill does not agree with the population estimates given in the permit application (PRT-740507) submitted by Dr. Tony DeGange of the U.S. Fish & Wildlife Service (USFWS) for studying otters affected by the spill. Dr. DeGange states that there are 7-8000 otters inhabiting Prince William Sound, more than 3000 along the Kenai Peninsula and over 4000 at Kodiak Island. Although Dr. DeGange does not specify how many otters in each population may have been affected by the oil spill, it seems likely that the total affected exceeds the number indicated on p. 14 of the Plan (5000 is implied in the Plan). The fact that 1010 dead otters had been retrieved by mid-Sept. 1989 alone suggests that many thousands of otters probably were influenced by the spill.

We have been supportive of the research on sea otters proposed in Marine Mammals Studies #6 and #7. We are aware of the objectives and methods of these studies, but we have not seen formal proposals for either of them. We, hereby, request copies of the proposals for these two studies.

Marine Mammals Study #6 has as its first objective to "determine the magnitude of injury to sea ctter populations". How is injury defined? Injury should include mortality (both direct and indirect), behavioral disruption and decreased reproductive success. In addition to injuries caused by the oil, injuries caused by the cleanup effort also should be considered. Marine Mammals Study #6 is associated with Economic Uses Studies #5 and #7; if subsistence use of sea otters was affected by the spill, ( Economic Uses Study #6 also should be considered. The numbers of free-ranging otters to be implanted with radio transmitters in Marine Mammals Study #6 is not consistent with the number indicated in the permit application (PRT-740507) submitted by Dr. Tony DeGange of the U.S. Fish & Wildlife Service (USFWS) for this work. Two critical aspects of this important research- monitoring food habits of otters in oiled and unoiled areas and determining the cause of death for otters that die- can only be answered if there is very frequent monitoring of otters from a boat or from land. As we have indicated in letters and phone calls to the USFWS, the level of monitoring of implanted otters needs to be increased to 2-3 times per week instead of the once per two weeks currently established.

We have supported Marine Mammals Study #7 and urge that, as with Study #6, the goal of visual contact with each instrumented otter be increased substantially. The validity of both of these studies rests heavily on the quality of the monitoring of otters tracked over the long-term. The numbers of rehabilitated otters Com. Topic Issue Sug. Sort









# P.O. BOX 221220, CARMEL, CALIFORNIA 93922

fitted with flipper transmitters and surgically implanted (p. 127) is incorrect in the Plan: the correct numbers are seven and 45, respectively.

The two sea otter studies (Marine Mammals #6 and #7) should be listed as related studies under the following other studies, which investigate sea otter prey: Fish/Shellfish Studies #13, #14, #21, #22, and #26. USFWS should be included as a cooperating agency on all of these studies, as well. The effect of the oil spill on otter prey is crucial to determining the long-term effects of the spill on otters themselves. Results of all of these studies must be shared by the researchers involved to insure a complete ecosystem analysis of the spill's effects on otters and their prey.

The USFWS should be included as a cooperating agency in Restoration Study #1. For natural resources which cannot be restored (e.g. dead sea otters), an alternative recompense should be funding of long-term research to gain as much knowledge as possible about the injuries suffered by otter populations and about their natural recovery process. Based on other major oil spills in which oil has lingered in the environment for a decade or longer, research funds should be committed for a minimum of ten years to study the effects of the oil spill on Alaska sea otter populations. Studying the impact of the spill over the long-term on non-restorable resources must be treated equally in terms of funding with restoration of restorable resources.

The economic valuation of damages is a highly significant aspect of the Plan, and we find the information provided about the Economic Uses Studies insufficient for us to judge the validity ofyour approach. Economic Uses Studies =5 and #7 and possibly #6 allrelate to sea otters, and we request copies of the proposals describing these studies. We would like to have the opportunity to comment on the specifics of these studies. We applaud the apparent intent behind the "Study of Loss of Intrinsic Values due to the Exxon Valdez Oil Spill" (Economic Uses Study #7). The worldwide outpouring of anger and sadness over the oil spill was certainly based on the intrinsic value which people give to pristine wilderness areas replete with wildlife. It is imperative that surveys of intrinsic value be distributed to people throughout the entire United States (and perhaps in foreign countries, as well), because many of us "outsiders", as those who live outside Alaska are known, put a very high value on simply knowing that untouched wilderness areas and wild animal populations exist.\_

We would like to receive a copy of the draft restoration plan once it is released for public review. We look forward to the chance to comment on the restoration plan.

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# P.O. BOX 221220, CARMEL. CALIFORNIA 93922

In summary, our major points of concern are: 1) the inadequacy of the study period described in the Plan; 2) the level of monitoring of sea otters fitted with radio transmitters in the two sea otter studies; 3) the need for cooperative analysis of data gathered in the sea otter studies and in the studies of sea otter prey items; 4) the lack of details on specific methods for attributing economic value to natural resources lost or damaged by the spill (specifically, how will you determine how much is each sea otter worth?); 5) the lack of information on how recompense will be made for non-restorable resources that were lost as a result of the spill.

In this letter we have requested copies of: 1) the proposals describing the two sea otter studies; 2) the proposals describing Economic Uses Studies #5, #6 and #7; 3) the draft restoration plan; 4) a list of studies approved by the Trustees to continue beyond Feb. 1990. In addition, we request a clarification of your plans for long-term damage assessment (beyond Feb. 28, 1990).

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We appreciate the opportunity to comment on the Damage Assessment Plan, and we look forward to hearing from you on the above matters.

Sincerely,

Shisan H. Stirne

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Susan H. Shane, Ph.D. Scientific Director

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DEDICATED TO THE STUDY AND CONSERVATION OF PACIFIC SEABIRDS AND THEIR ENVIRONMENT

#### **REVIEW OF:**

STATE/FEDERAL NATURAL RESOURCE DAMAGE ASSESSMENT PLAN FOR THE EXXON VALDEZ OIL SPILL

> D. MICHAEL FRY CHAIRMAN, PACIFIC SEABIRD GROUP

DEPARTMENT OF AVIAN SCIENCES UNIVERSITY OF CALIFORNIA DAVIS, CA 95616 (916) 752-1201

## I. Introduction:

This review, because of the short time provided for public comment, represents the opinions of the Pacific Seabird Group (PSG) Chairman only, completed after limited informal discussions with several members of the PSG. The views here do not represent a formal poll of the PSG membership.

My expertise is in the area of avian physiology/toxicology with an emphasis in seabirds. This review and comment will be confined to studies relating to birds and residue analysis. I will address all my specific comments to Bird Studies 1-14, and Technical Services Studies 1 and 2. I additionally have some general comments on the overall Plan.

II. General Comments:

This document is outlined in a comprehensive way to individually address each component of the ecosystem which has been potentially impacted by the Exxon Valdez oil spill. The structure of the plan, with assessment of each component separately, but with coordination between studies and agencies, appears to be well designed and adequate for the task of environmental assessment. The Technical Services Studies are organized so as to demonstrate that the analytical components of the assessment plan are separate from, but coordinated with, the other aspects of the study.

1) The time frame of the Damage Assessment Plan is unrealistically short. It will be impossible to make a complete, or even an adequate, assessment of the damage within the time frame proposed. The designated time frame would require most field assessments to have been completed prior to November, when the weather will become quite inclement and preclude any further studies. For many organisms, especially birds, it will not be possible to monitor the extent of mortality until 1990. February 1990 is too early in the year to be able to make any assessment of the returning/rebounding populations.

The policy with regard to field studies should be changed so that all studies should be conducted at least through August 1990, unless there is complete and sufficient data for any individual study to justify earlier termination. Therefore, I disagree fundamentally with the position stated on Page i of the Executive Summary that: "no studies will be conducted after February 28, 1990 unless specifically approved by the Trustees...". I strongly feel that the position should be reversed; that is to say, all studies will continue unless individually terminated by the Trustees.

2) All of the studies in this report are currently in progress at the time of public review. No information was supplied to reviewers to indicate whether each study was initiated as planned, whether the data planned for collection has been acquired, or whether the study can be completed within the time frame allotted. Much informal information has been "leaked" to this reviewer indicating that many of the studies were begun months after their planned initiation, and data was not collected for many parts of several studies. If this is the case, review of this plan cannot be realistic. Why was data of this nature specifically been withheld from independent reviewers?

Damage Assessment Studies which exist, in part, only on paper parallel exactly the scenario of the Oil Spill Contingency Plan of Alyeska Pipeline Company. That plan was apparently constructed only to obtain Use Permits, and was not implemented in order to clean up oil. If segments of this Assessment Plan exist primarily on paper, but the studies are not fully conducted, the Trustees will be guilty of the same behavior as the Oil Industry. The time allocated for studies must be extended to allow for adequate completion.

3) 1989 may have been an atypical, cold water, year in the Gulf of Alaska. If this is the case, an additional year should be studied to be able to make even a "first guess" at the true impact of the oil spill in the context of an atypical year. If the drastically reduced number of seabirds breeding on the Barren Islands, for example, was confounded by a bad year as well as by spilled oil, an accurate assessment should be made.

4) The budgets for analytical chemistry of hydrocarbon residues appear to be inadequate for complete assessment of damage. Gas chromatography/mass spectroscopy (GC-MS) of aliphatic and Com. Topic Issue Sug. Sort

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aromatic samples may cost as much as \$800-1000 per sample to identify the hydrocarbon profile fingerprint of North Slope crude. Granted that many samples could be analyzed by GC-FID (flame ionization detector) and quantified at somewhat lower cost, but it may be important for purposes of litigation to be able to state the origin of the hydrocarbons in any given sample.

The number of samples to be analyzed for birds tissues alone is in excess of 300. A cursory review of the other studies indicates that several thousand samples must be analyzed for a reasonable damage assessment. \$2,300,000 is the total combined budget for both NOAA and USFWS, including travel and equipment. The total budget should probably be increased by 50% to be adequate.

#### 5) Economics Uses Study 7: Study of Loss of Intrinsic Values:

The wording in this study plan is very general, but the public is most concerned that the Trustees take seriously the Federal Appeals Court decision of July 13, 1989 on NRDA and the will of Congress with respect to environmental pollution. This is probably the most critical part of the Damage Assessment Plan for the credibility of the Trustees. The logic and calculations forming the basis of any monetary loss derived from seabirds and sea otters must be completely and publicly delineated. Public review and comment should be required and sought prior to any agreement with the responsible party concerning monetary evaluation of environmental damage.

# III. SPECIFIC COMMENTS ON BIRD STUDIES:

## STUDY 1: BEACHED BIRD SURVEYS:

This is a very important part of the total evaluation of oil impact to seabirds populations. The study appears well planned, although more beach surveys are required to adequately assess the number of beached birds. Part E cannot be completed from data of 1989.

A thorough examination of beaches was conducted by capture boats employed by the Otter and Birds centers. Although these boats were employed by Exxon for recovery of birds and otters, is that data being integrated with Agency data? To what extent is Exxon derived data proprietary? Did the USFWS make adequate surveys on its own?

How will the Trustees estimate the proportion of carcasses to be found on beaches in Part C? Carter and Page (Point Reyes Bird Observatory) have some data, A. Burger in British Columbia has some, but no exhaustive studies have been conducted to evaluate floating times of many of the important species impacted in this spill.

Part D. I question how well the data of man-search-hours

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can be integrated into data of former years relative to the intensive searches done in 1989.

This study is critical, and was begun early in the spill cleanup, so that data could be very good, but only if data from Exxon capture boats is included.

#### BIRD STUDY 2: MIGRATORY BIRD SURVEYS:

Part A must have already been done. Was it done adequately? The timing of aerial surveys is critical for estimates of migratory birds.

Part C cannot be determined without a 1990 census. Furthermore, reduced hatching or fledging success of breeding species will not be able to be evaluated until the 1989 age class returns to breeding colonies, or, for some species, can be evaluated in winter or spring surveys. Age at first breeding is delayed for many species of seabirds, confounding the estimates. Additionally, if a large proportion of adult birds were lost in 1989, the age at first breeding of returning juveniles will be lower than normal, further confounding the data.

# BIRD STUDY 3: SEABIRD COLONY STUDIES:

Part A cannot be completed without at least a 1990 survey. The aberrant nature of the 1989 breeding year is important. Was the year equally atypical throughout the oiled and unoiled areas? Did unoiled areas serve as adequate controls? Answers to both of these questions cannot in themselves be made without a 1990 census.

Using data from Study 14 to predict sensitivity of birds to oil is not realistic. The experimental portion of Study 14 is not a good study.

The methods and analyses of this study would be adequate if a second year were included in the plan.

#### BIRD STUDY 4: BALD EAGLES:

This is designed as a complete, well organized study, capable of providing sound data to assess oil spill effects. If executed it will be the best study of the group.

Part A plans to determine a RATE of change of the population and to determine the effect of the oil spill on that rate. If a rate is not already known from historical data independent of the oil spill, the effect of oil on the population change cannot be made.





Part B could have been done with some accuracy. Was it? Was Exxon Eagle Team data integrated with USFWS data? Is Exxon data available?

Part F was conducted by Exxon Eagle Teams in Prince William Sound and coordinated by USFWS. Is the Exxon data available?

Were 30 adult and 30 fledgling eagles fitted with transmitters? If not, a 1990 survey will have to be conducted to provide alternate data on winter survival.

BIRD STUDY 5: PEREGRINE ASSESSMENTS:

This is also a well planned study, but preliminary data would seem to indicate that very few Peregrines were present in PWS in 1989, preventing completion of parts of this study. Part A could have been done, but Parts B and C could not have been completed, because no Peregrines occupied breeding sites in PWS in 1989.

A survey will have to be done in 1990 to determine whether more than two Peregrines still exist in PWS.

### BIRD STUDY 6: MARBLED MURRELETS:

Marbled Murrelets are a good choice for assessment. Juveniles can be counted on the water after fledging, and potentially present a good index of local conditions with respect to alcid breeding and survival. The species may not be indicative of other alcid species, but is important in its own right. Are Kittlitz's Murrelets included in this study?

Part A: The patchiness of the Marbled Murrelet population is important to factor into this study. Does good pre-spill data exist for western PWS?

Collection of breeding Marbled Murrelets for contaminant analysis could provide useful data, although most oiled Murrelets would die. Many did this year. Externally oiled murrelets probably would not have bred in 1989. I think it would have been unlikely that birds could have been eating contaminated prey without becoming externally oiled, but data would be useful.

# BIRD STUDY 7: FORK-TAILED STORM PETRELS:

The study is well planned and designed. Storm-petrels are a good indicator species, because they can be caught in their burrows and stomach contents sampled without injuring the adults or chicks (if chicks are hand fed to compensate for the loss of food taken from adults). However, according to my informal sources, this study was not conducted as presented. No visits to

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the island were made during early incubation.

If 1989 was an aberrant year, this study could not provide conclusive data on oil impacts on the population. The population must be assessed in 1990 against control sites.

Pristane is incorrectly spelled to make it a much cleaner compound.

# BIRD STUDY 8: BLACK-LEGGED KITTIWAKES:

The study is well designed, and would provide much data on the effects of oil on these birds. The number of censuses are probably adequate to provide good data. Visual examination of birds is possible because they are white. Only their feet and beaks could not be assessed. The program is ambitious; was it conducted as presented?

#### BIRD STUDY 9: PIGEON GUILLEMOTS:

Guillemots are a good study species, because they are burrow nesters and accessible during the breeding season. They do not panic from cliffs as murres and cormorants do. Birds observed from a distance, however, will be very difficult to assess for small amounts of external oil, because their plumage is black. Rates of chick feeding can be assessed, and prey type can be identified in many colonies, because the adults like to show off their catches.

Guillemots would be good indicators of other alcid genera, but only to the extent that other species are breeding in the same areas. Puffins and Murres breed in dense colonies in other areas, and could not be "studied by proxy" by guillemots at these colonies.

In general, I believe guillemots are a good species to monitor for evidence of local oil conditions.

### BIRD STUDY 10: GLAUCOUS-WINGED GULLS:

This study will probably not provide a good assessment of the impact of oil on Glaucous-winged Gulls. I believe Egg island is too far from the major impacts of oil to provide a good study. The few adult gulls which venture to Green I., Knight, or the Naked Island Group to forage will probably not be a representative proportion of the breeding population. Most breeding gulls would stay nearer to the colony than western PWS. Breeding gulls during the breeding season also do not scavenge to the same extent as during the rest of the year. Immature gulls, however, do not remain in the vicinity of the colony during the breeding season, and they do scavenge. Therefore, most of the



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gulls at risk would be immature birds not assessed in this study. I would predict that when the data of oiled gulls is examined, it will be found that most oiled gulls were immature.

### BIRD STUDY 11: SEA DUCKS:

This study, because it concerns wintering birds, is one of the few with good potential to be concluded successfully this year. The study is well designed, and apparently can rely somewhat on samples already collected for its initial data base (food habits from stored stomach content samples). If field work can be conducted throughout the winter, time is ample for collections to be made for subsequent analysis. Hydrocarbon analysis, however, will require more time than the February deadline for completion. This study might be completed by April or May. Analysis of duck tissue samples this winter will provide good data on risk of contaminants to hunters, and will provide data on mollusks, especially mussels. The budget might be adequate.

## BIRD STUDY 12: SHOREBIRDS:

This is a well designed study with good potential for providing data on the effects of oil on shorebirds.

I doubt that an adequate number of surveys were conducted in PWS and other staging areas during the spring of 1989 to be able to have good data for Parts A, B, and C. Part D probably could have been completed. Parts F, and G could have been done.

#### BIRD STUDY 13: PASSERINES:

This study would also have provided much information, but informed sources indicate that it was not conducted, or at best was conducted incidental to other work being done in affected areas.

If samples were collected, they will provide valuable data on secondary contamination by oil, both from histopathology and residue analysis.

# BIRD STUDY 14: OIL EFFECTS, EXPERIMENTAL:

This study will be useful from the review of literature only. It is completely unrealistic to conduct experimental studies on oiling of raptors, waterfowl or seabirds for the budget proposed. This study is undesigned, not appropriate, and should not be conducted.

The \$10,000 budgeted for this study should be put into a literature review and synthesis, although the budget is too low for an adequate literature review.









## TECHNICAL SERVICES:

#### STUDY 1: HYDROCARBON ANALYTICAL SUPPORT:

This study plan appears adequate and sufficient for the task, with the probable difficulty that the budget is too low for the ambitious amount of work proposed. I feel the design, QA/QC procedures, and coordination are quite good. The analytical chemistry and identified compounds to be searched are adequate to identify oil and its toxicity, but probably not adequate to distinguish North Slope crude from natural seeps in the Gulf of Alaska or Cook inlet oil spilled from platforms.

## STUDY 2: HISTOPATHOLOGY:

This is a straight-forward study of the effects of oil on exposed animals with very good potential for excellent results. I hope the USFWS staff at the Wildlife Health Laboratory will examine frozen tissues of oiled birds collected early in the spill when no Agency personnel were collecting samples. The budget should be adequate for a good overview of the problem.

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October 30, 1989

Trustee Council P.O. Box 20792 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 kavahing, 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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assessment in order to determine injury and assess damages. Therefore, the plan risks greatly underestimating the actual injuries and damages.

# B. <u>Absence of Any Damage Assessment based on</u> <u>Restoration</u>

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.

In <u>Ohio v. Department of the Interior</u>, 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. <u>Ohio</u> at 45. The court specifically rejected Interior's regulation requiring that damages be the "lesser of" restoration costs or lost use values. <u>Ohio</u>, 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 <u>Ohio</u> 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.

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. Com. 10020 11 2 3 0151

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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.

D. <u>Exxon should not participate in the damage</u> 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.

E. <u>A regulatory discount rate appears inappropriate in</u> <u>this instance</u>.

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 <u>Ohio</u>, at 69, in its discussion of the authority, 43 C.F.R. 11.84, of the trustees to adjust for uncertainty in assumptions.

F. General Absence of Laboratory Modeling



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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.

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# G. <u>Inconsistency in the methods used to model amounts</u> 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.

# H. <u>Absence of Assessment of Damage to Recreation</u> <u>Industry and other businesses outside of the commercial</u> <u>fishing industry.</u>

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.

#### 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

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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 if 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.

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# II. SPECIFIC COMMENTS

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# 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.

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.

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.

#### B. Fish Studies

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









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.

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D. <u>Terrestrial Mammals</u>

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

E. <u>Bird Studies</u>

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

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.

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.

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.

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







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recreational user or not a recreational user -- i.e., is a 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,

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ADLER, JAMESON & CLARAVAL By: Geoffrey Y. Parker

See pg 2 for Comment 18 See p H For 19 p 7 For 20 p 7 For 21