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Exxon Valdez Oil Spill Trustee Council

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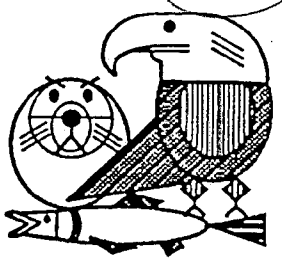

TO: Trustee Council

DATE: February 8, 1993

FROM: Dave Gibbons
Interim Executive Director

TELE: 278-8012
FAX: 276-7178

SUBJECT: Summary of Injury and Alternatives

This packet presents draft tables summarizing injury and alternatives for the draft restoration plan. The information is preliminary, and we expect that some of the details, format, and wording will change. However, assuming concurrence from the Trustee Council, the basic content and organization is unlikely to change.

The information, along with a significant amount of explanatory text, will be used for the "Alternatives Information Packet" scheduled for publication in March. It will also be used for public meetings in April.

The tables presented here have been prepared by the Restoration Planning Working Group and reviewed by the Restoration Team. The summary of injury to resources has been reviewed by the Chief Scientist.

Resources: Summary of Results of Injury Assessment Studies

The next few pages summarize the results of the injury assessment studies for resources completed after the *Exxon Valdez* oil spill. The table has been reviewed by the Restoration Team and the Chief Scientist.

The "Description of Injury," columns focus on injury that took place during 1989. The table shows whether there was initial mortality caused by the spill, whether the spill caused a population-level injury, and whether there is evidence of sublethal or chronic effects on the resource. For some resources, an estimate is available for the total number of animals initially killed by the spill. When available, that estimate is shown in parentheses under the initial mortality column. For many resources, the total number killed will never be known.

The "Status of Recovery" columns show the best estimate of recovery using information current through 1992. These columns show resources' progress toward recovery to the population levels that scientists estimate would have occurred in the absence of the spill. The "Current Population Status" column shows a resource's progress from any "Decline in Population after the Spill." Similarly, the column labeled "Evidence of Continuing Sublethal or Chronic Effects" shows whether a initial chronic or sublethal injury is continuing.

The "Geographic Extent of Injury" column shows whether the injury occurred in the geographic areas shown in Figure X. (Injury may have been more extensive in some regions than others.)

TABLE X Natural Resources: Summary of Results of Injury Assessment Studies Done After the *Exxon Valdez* Oil Spill

Resource	Description of Oil Spill Injury			Status of Recovery in December, 1992		Geographic Extent of Injury (a)				Comments/Discussion
	Initial Oil Spill Mortality (total mortality estimate)(b)	Measured Decline in Population after the spill	Evidence of Sublethal or Chronic Effects (c)	Current Population Status	Evidence of Continuing Sublethal or Chronic Effects	PWS	Kenai	Kodiak	Alaska Penin.	
MARINE MAMMALS										
Harbor Seals (d)	YES (345)	YES	YES	POSSIBLY STABLE, BUT NOT RECOVERING	NO	YES	YES (e)	UNKNOWN	UNKNOWN	Many seals were directly oiled . There was a measurable difference in populations between oile and unoiled areas in PWS in 1989 and 1990. Population was declining prior to the spill and r recovery evident in 1992. Oil residues found in seal bile were 5 to 6 times higher in oiled areas than unoiled areas in 1990.
Humpback Whales	NO	NO	NO	(f)	(f)	(f)	(f)	(f)	(f)	Other than fewer animals being observed in Knight Island Passage in summer 1989, which did not persist in 1990, the oil spill did not have a measurable impact on humpback whales.
Killer Whales	POSSIBLY (g)	POSSIBLY (g)	POSSIBLY (g)	RECOVERING	UNKNOWN	YES	UNKNOWN	UNKNOWN	UNKNOWN	13 whales of the 36 in AB pod are missing and presumed dead. Circumstantial evidence links wha disappearance to oiling. Several adult males hav collapsed dorsal fins. Social disruption of fami units has been observed. In AB pod, no new birth were recorded in 1989 or 1990; one birth was recorded in 1991; and two births were recorded ir 1992.

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(g) "Possibly" was used if there was disagreement over the conclusions to be drawn from the results of the damage assessment studies.

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Sea Lions (d)	UNKNOWN	UNKNOWN	NO	CONTINUING DECLINE	(f)	(f)	(f)	(f)	(f)	Several sea lions were observed with oiled pelts and oil residues were found in some tissues in 1989. It was not possible to determine populatio effects or cause of death of carcasses recovered in 1989. Sea lion populations were declining pri to the oil spill.
Sea Otters	YES (3,500 TO 5,000)	YES	YES	STABLE, BUT NOT RECOVERING	YES	YES	YES	YES (e)	YES (e)	Post-spill surveys showed measurable difference i populations and survival between oiled and unoile areas in 1989, 1990 and 1991. Survey data have n established a significant recovery. Carcasses of prime-age animals were found on beaches in 1989, 1990 and 1991. Proportions of prime-age carcasse found on beaches in 1992 is not significantly different from pre- or post-spill data. Sea otte feed in the lower intertidal and subtidal areas a may still be exposed to hydrocarbons in the environment.

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TERRESTRIAL MAMMALS										
Black Bear	NO	UNKNOWN	UNKNOWN	(f)	(f)	(f)	(f)	(f)	(f)	No field studies were completed.
Brown Bear	NO	NO	NO	(f)	(f)	(f)	(f)	(f)	(f)	Hydrocarbon exposure was documented on Alaska Peninsula in 1989 including high hydrocarbon leve in the bile of one dead yearling, although it is unknown if this was the cause of death. Brown be feed in the intertidal zone and may still be exposed to hydrocarbons in the environment.
River Otters	YES (NUMBER UNKNOWN)	UNKNOWN	YES	UNKNOWN	YES	YES	UNKNOWN	UNKNOWN	UNKNOWN	Exposure to hydrocarbons and sub-lethal effects were determined, but no effects were established population. Sub-lethal indicators of possible oi exposure remained in 1991. River otters feed in the intertidal and shallow subtidal areas and may be still be exposed to hydrocarbons in the environment.
Sitka Black-tailed Deer	NO	NO	NO	(f)	(f)	(f)	(f)	(f)	(f)	Elevated hydrocarbons were found in tissues in so deer in 1989 in PWS.

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BIRDS										
Bald Eagles	YES (more than 200 to 300)	POSSIBLY	YES	RECOVERED OR RECOVERING	UNKNOWN	YES	YES	YES (e)	YES(e)	Productivity in PWS was disrupted in 1989, but returned to normal in 1990. Exposure to hydrocarbons and some sub-lethal effects were fou in 1989 and 1990, but no continuing effects were observed on populations. In 1989, 151 carcasses were recovered from beaches.
Black-legged Kittiwakes	YES (ESTIMATE UNKNOWN)	NO	NO	NO CHANGE	NO	YES	YES (e)	YES (e)	YES (e)	Total reproductive success in oiled and unoiled areas of PWS has declined since 1989. Hydrocarbc contaminated tissues were detected in 1989. Hydrocarbon contaminated stomach contents were detected in 1989 and 1990. This species is knowr for great natural variation and reproductive failure may be unrelated to the oil spill. In 1989, 1225 carcasses were recovered from beaches.
Black Oyster-catchers	YES (ESTIMATE UNKNOWN)	YES	YES	RECOVERING	YES	YES	YES (e)	YES (e)	YES (e)	Differences in egg size between oiled and unoilec areas were found in 1989. Exposure to hydrocarbc and some sublethal effects were determined. Populations declined more in oiled areas than unoiled areas in post-spill surveys in 1989, 199(and 1991. Black oystercatchers feed in the intertidal areas and may be still be exposed to hydrocarbons in the environment. In 1989, nine carcasses were recovered from beaches.

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Common Murres	YES (175,000 to 300,000)	YES	YES	DEGREE OF RECOVERY VARIES BY COLONY	YES	NO	YES	YES	YES	Measurable impacts on populations were recorded 1989, 1990 and 1991. Breeding was still inhibit in some colonies in the Gulf of Alaska in 1992. 1989, 10,428 carcasses were recovered from beach
Glaucous-winged gulls	YES (ESTIMATE UNKNOWN)	NOT DETECTED	NO	NO CHANGE	NO	YES (e)	YES (e)	YES (e)	YES (e)	While 555 dead birds were recovered in 1989, the is no evidence of a population level impact when compared to historic (1972, 1973) population levels.
Harlequin Ducks	YES (423)	YES	YES	STABLE OR CONTINUING DECLINE	YES	YES	YES (e)	YES (e)	YES (e)	Post-spill samples showed hydrocarbon contaminat and poor body conditions in 1989 and 1990. Surv in 1990-1992 indicated population declines and r total reproductive failure. Harlequin ducks fee in the intertidal and shallow subtidal areas anc may still be exposed to hydrocarbons in the environment. In 1989, 213 carcasses were recove from beaches.
Marbled Murrelets (d)	YES (8,000 TO 12,000)	YES	UNKNOWN	STABLE OR CONTINUING DECLINE	UNKNOWN	YES	YES (e)	YES (e)	YES (e)	Measurable population effects were recorded in 1989, 1990 and 1991. Marbled murrelet populatic were declining prior to the spill. In 1989, hydrocarbon contamination was found in livers of adult birds. In 1989, 612 carcasses were recove from beaches.

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Peale's Peregrine Falcons	UNKNOWN	UNKNOWN	NO	(f)	(f)	(f)	(f)	(f)	(f)	When compared to 1985 surveys a reduction in population and lower than expected productivity measured in 1989 in the PWS. Cause of these changes are unknown. In 1989, two carcasses were recovered from beaches.
Pigeon Guillemots (d)	YES (1,500 TO 3,000)	YES	NO	STABLE OR CONTINUING DECLINE	UNKNOWN	YES	YES (e)	YES (e)	YES (e)	Pigeon guillemot populations were declining prio to the spill. In 1989, hydrocarbon contaminatio was found in birds and, externally, on eggs. In 1989, 614 carcasses were recovered from beaches.
Storm Petrels	YES (ESTIMATE UNKNOWN)	NO	UNKNOWN	NO CHANGE	UNKNOWN	YES (e)	YES (e)	YES (e)	YES (e)	Although 363 carcasses were recovered in 1989 an petrels ingested oil and transferred oil to thei eggs, reproduction was normal in 1989.
Other Seabirds	YES (ESTIMATE UNKNOWN)	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	YES (e)	YES (e)	YES (e)	YES (e)	Seabird recovery has not been studied. Species collected dead in 1989 include 216 common, 87 yellow-billed, 18 pacific, 5 red-throated loon; red-necked and 277 horned grebe; 426 northern fulmar; 360 sooty and 2,460 short-tailed shearwater; 38 double-crested, 418 pelagic, and red-faced cormorant; 8 herring and 33 mew gull; arctic and 1 Aleutian tern; 67 Kittlitz's and 31 ancient murrelet; 48 Cassin's, 5 least, 31 parakeet, and 141 rhinoceros auklet; and 139 ho and 361 tufted puffin.

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Other Sea Ducks	YES (ESTIMATE UNKNOWN)	NO	UNKNOWN	UNKNOWN	UNKNOWN	YES	YES (e)	YES (e)	YES (e)	Species collected dead in 1989 include 4 Stellar' 9 king and 17 common eider; 342 white-winged, 17! surf and 132 black scoter; 185 oldsquaw; 21 bufflehead; 6 common and 33 Barrow's goldeneye; a 2 common and 33 red-breasted merganser. Sea duck tend to feed in the intertidal and shallow subtic areas which were most heavily impacted by oil.
Other Shorebirds	YES (ESTIMATE UNKNOWN)	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	YES	YES (e)	YES (e)	YES (e)	Species collected dead in 1989 include 1 golden plover; 2 lesser yellowlegs; 1 semipalmated, 5 western, 4 least and 1 Baird's sandpiper; 3 surfbird; 1 short-billed dowitcher; 1 common snip 2 red and 7 red-necked phalarope.
Other Birds	YES (ESTIMATE UNKNOWN)	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	YES (e)	YES (e)	YES (e)	YES (e)	Species collected dead in 1989 include 2 emperor and 1 Canada goose; 3 brant; 11 mallard; 4 northe pintail; 5 green-winged teal; 27 greater and 2 lesser scaup; 1 ruddy duck; 1 great blue heron; long-tailed jaeger; 1 willow ptarmigan; 3 great-horned owl; 1 Steller's jay; 7 magpie; 18 common raven; 34 northwestern crow; 2 robin; 1 varied a 1 hermit thrush; 3 yellow warbler; 1 pine grosbe 1 savannah and 4 golden-crowned sparrow; 8 white-winged crossbill.

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FISH										
Cutthroat Trout	YES	POSSIBLY (g)	YES	UNKNOWN	UNKNOWN	YES	UNKNOWN	UNKNOWN	UNKNOWN	Differences in survival and growth between anadromous adult populations in the oiled and unoiled areas persisted from 1989 to 1991 despite decrease in exposure indicators. This could be c to continuing injury to the food base.
Dolly Varden	YES	POSSIBLY (g)	YES	UNKNOWN	UNKNOWN	YES	UNKNOWN	UNKNOWN	UNKNOWN	Differences in survival between anadromous adult populations in the oiled and unoiled areas persisted from 1989 to 1991 despite a decrease ir exposure indicators. This could be due to continuing injury to the food base.
Pacific Herring	YES, TO EGGS AND LARVAE	UNKNOWN	YES	UNKNOWN	NO	YES	UNKNOWN	UNKNOWN	UNKNOWN	Measurable difference in egg counts between oile and unoiled areas were found in 1989 and 1990. Lethal and sublethal effects on eggs and larvae were evident in 1989 and to a lesser extent in 1990; in 1991 there were no differences between oiled and unoiled areas. It is possible that th 1989 year class was injured and could result in reduced recruitment to the adult population.

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Pink Salmon (Wild) (d)	YES, TO EGGS	POSSIBLY (g)	YES	UNKNOWN	YES	YES	UNKNOWN	UNKNOWN	UNKNOWN	There was initial egg mortality in 1989. Egg mortality continued to be high in 1990 and 1991. Abnormal fry were observed in 1989. Reduced gro of juveniles was found in the marine environment 1989 and 1991, which correlates with reduced survival.
Rockfish	YES (ESTIMATE UNKNOWN)	UNKNOWN	YES	UNKNOWN	UNKNOWN	YES	YES	UNKNOWN	UNKNOWN	Twenty dead fish were found in 1989, but only a were in condition to be analyzed. Exposure to hydrocarbons with some sub-lethal effects was determined in those fish, but the effects on the population was unknown. Closures to salmon fisheries increased fishing pressures on rockfis which may be impacting population.
Sockeye Salmon	UNKNOWN	YES	YES	SEE COMMENTS	YES	UNKNOWN	YES	YES	NO	Smolt survival continues to be poor in the Red L and Kenai River systems due to overescapements i Red Lake in 1989, and in the Kenai River in 1987 1988, 1989. As a result, adult returns are expected to be low in 1994 and successive years. Trophic structures of Kenai and Skilak Lakes hav been altered by overescapement.

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SHELLFISH										
Clam	YES (ESTIMATE UNKNOWN)	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	YES	YES	YES	YES	Native littleneck and butter clams were impacted both oiling and clean-up, particularly high pressure, hot water washing. Additional data ar still being evaluated.
Crab (Dungeness)	UNKNOWN	UNKNOWN	UNKNOWN	(f)	(f)	(f)	(f)	(f)	(f)	Insufficient data to determine injury.
Oyster	UNKNOWN	UNKNOWN	UNKNOWN	(f)	(f)	(f)	(f)	(f)	(f)	Although studies were initiated in 1989, they we not completed because they were determined to be limited value.
Sea Urchin	UNKNOWN	UNKNOWN	UNKNOWN	(f)	(f)	(f)	(f)	(f)	(f)	Studies limited to laboratory toxicity studies.
Shrimp	UNKNOWN	UNKNOWN	NO	(f)	(f)	(f)	(f)	(f)	(f)	No conclusive evidence presented for injury link to oil spill.

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INTERTIDAL/SUBTIDAL COMMUNITIES										
Intertidal Organisms/ Communities	YES	YES	YES	VARIABLE BY SPECIES	YES	YES	YES	YES	YES	Measurable impacts on populations of plants and animals were determined 1989 to 1992. The lower intertidal and, to some extent, the mid intertid is recovering. Some species (e.g. Fucus) in the upper intertidal zone have not recovered, and oi persists in and under mussel beds. Intertidal organisms were impacted by both oiling and clear up, particularly high pressure, hot water washir
Subtidal Communities	YES	YES	YES	VARIABLE BY SPECIES	YES	YES	UNKNOWN	UNKNOWN	UNKNOWN	Measurable impacts on population of plants and animals were determined in 1989. Eel grass and some species of algae appear to be recovering. Amphipods in eel grass beds recovered to pre-spi densities in 1991. Leather stars and helmet cr show little sign of recovery through 1991.

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TABLE XXX Other Natural Resources and Archaeology: Summary of Results of Injury Assessment Studies Done After the *Exxon Valdez* Oil Spill (b)

RPWG draft 2/8/93

Resource	Description of Injury	Status of Recovery in December, 1992	Geographic Extent of Injury (a)				Comments/Discussion
			PWS	Kenai	Kodiak	Alaska Penin.	
Air	Air quality standards for aromatic hydrocarbons were exceeded at the spill site. Health and safety standards for permissible exposure levels were exceeded up to 400 times.	Recovered	YES	UNKNOWN	UNKNOWN	UNKNOWN	Impacts diminished as oil weathered and lighter factions evaporated.
Sediments	Oil coated beaches and became buried in beach sediments. Oil laden sediments were transported off beaches and deposited on subtidal marine sediments.	Oil remains intertidally on rocks and beaches and buried beneath the surface at other beach locations. Oil concentrations have increased in subtidal marine sediments and have spread to greater depths (to ~~720~~ 25 meters) over time.	YES	YES	YES	YES	Unweathered buried oil will persist for many years in protected low-energy sites in Prince William Sound.
Water	State of Alaska water quality standards were not exceeded in open sea conditions. In small bays and near shore, hydrocarbon concentrations may have exceeded the 10 micrograms per liter standard immediately after the spill. Federal oil discharge standards of no visible sheen were exceeded.	Recovered	YES	UNKNOWN	UNKNOWN	UNKNOWN	Impacts were patchy and transient during the early stages of the spill. Impacts diminished as oil weathered and lighter factions evaporated.
Archaeologic sites/artifacts	Currently, 24 sites are known to have been adversely affected by oiling, clean-up activities, or looting and vandalism linked to the oil spill. 113 sites are estimated to have been similarly affected. Injuries attributed to looting and vandalism (linked to the oil spill) are still occurring.	Archaeological sites and artifacts cannot recover, they are finite non-renewable resources.	YES	YES	YES	YES	* Injury studies are not yet complete (January 1993).

(a) There may have been an unequal distribution of injury within each region, see map for location of regions;
(b) This page has not yet been reviewed by the Chief Scientist;

Services: Summary of Results of Injury Assessment Studies

The next few pages summarizes information concerning services damaged by the spill. The information in this table has not yet been peer reviewed and is subject to change.

Much of the damage to services, and the information about those damages, is not quantitative. The table reflects the qualitative content of the information. The "Description of Injury" column recounts the situation for each service in the year following the spill. The "Status of Recovery in 1992" shows the 1992 situation for that service.

The information used for this table is taken from injury assessment studies, information from agency managers, and, for recreation, a Key Informant Interview study conducted the Restoration Planning Working Group in December 1992.

TABLE XX Services: Summary of Results of Injury Assessment Studies Done After the *Exxon Valdez* Oil Spill

RPWG draft 2/8/93

WORKING DRAFT - NOT FOR PUBLIC RELEASE

Service	Description of Injury	Status of Recovery in December, 1992	Geographic Extent of Injury				Comments/Discussion
			PWS	Kenai	Kodiak	Alaska Penin.	
Passive Use ~~Values (Option, existence and non-use values)~~	In 1991, over 90% of those surveyed (nation-wide) said they were aware of the Exxon Valdez oil spill. Over 50% believed that the spill was the largest environmental accident caused by humans anywhere in the world. The median household willingness to pay for future prevention was $31. Multiplying thus by the number of U.S. household results in a damage estimate of $2.8 billion.	Data is not available to determine the status of recovery.	~~N/A~~ Y	~~N/A~~ Y	~~N/A~~ Y	~~N/A~~ Y	The study, A Contingency Valuation Study of Lost Passive Use Values Resulting From the Exxon Valdez Oil Spill, was developed between July 1989 and January 1991, at which time it was put into the field. Respondents were comprised of people in the lower 48 states.
Recreation ~~and Tourism~~	The nature and extent of injury varied by user group and by area. About a quarter of key informants interviewed reported no change in their recreation experience, but others reported avoidance of the spill area, reduced wildlife sightings, residual oil, and more people. They also reported changes in their perception of recreation opportunity in terms of increased vulnerability to future oil spills, erosion of wilderness, a sense of permanent change, concern about long-term ecological effects, and, in some, a sense of optimism. Overall, recreation, tourism and sport fishing declined significantly in 1989 and improved markedly in 1990 although there were residual effects. ~~Sport~~ hunting of harlequin duck was affected by restrictions imposed in 1991 in response to damage assessment studies.	Declines in recreation activities reported in 1989 appear to have reversed, although there is no data to support or deny this perception. Harlequin duck harvest restrictions are expected to continue through 1993. All sport fishing	YES	YES	YES	YES	
COMM. TOURISM							

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TABLE XX Services: Summary of Results of Injury Assessment Studies Done After the *Exxon Valdez* Oil Spill

Service	Description of Injury	Status of Recovery in December, 1992	Geographic Extent of Injury				Comments/Discussion
			PWS	Kenai	Kodiak	Alaska Penin.	
Sport and Commercial Fishing	During 1989, emergency commercial fishery closures were ordered in PWS, Cook Inlet, Kodiak and the Alaska Peninsula. This affected salmon, herring, crab, shrimp, rockfish and sablefish. The 1989 closures resulted in sockeye over-escapement in the Kenai River and in the Red Lake system (Kodiak Island). In 1990 a portion of PWS was closed to shrimp fishing. Between 1989 and 1990 a decline in sport fishing (number of anglers, fishing trips and fishing day) were recorded for PWS, Cook Inlet and the Kenai Peninsula. In 1992 an emergency order restricting cutthroat trout fishing was issued for western PWS due to low adult returns.	Currently there are no oil spill-related commercial closures in effect. The 1992 sport fishing closure for cutthroat trout is expected to continue at least through 1993. EVOS related sockeye over-escapement in the Kenai River and Red Lake system is anticipated to result in low adult returns in 1994 and 1995. These over-escapements may result in closure or harvest restrictions during these and perhaps in subsequent years.	YES	YES	YES	YES	Injury in the Alaska Peninsula is for Commercial fishing only. Injuries and recovery status of rockfish, PINK SALMON shellfish and herring are uncertain. Therefore, future impacts on these fisheries is unknown.

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TABLE XX Services: Summary of Results of Injury Assessment Studies Done After the *Exxon Valdez* Oil Spill

Service	Description of Injury	Status of Recovery in December, 1992	Geographic Extent of Injury				Comments/Discussion
			PWS	Kenai	Kodiak	Alaska Penin.	
Subsistence	Subsistence harvests of fish and wildlife in 9 of 15 villages surveyed declined from 4 - 78% in 1989 when compared to pre-spill averages. Approximately 7 of the 15 villages show continued declines in use in the period 1990-1991; this decline is particularly noticeable in the Prince William Sound villages of Chenega and Tatitlek. In 1989, chemical analysis indicated that most resources tested, including fish, marine mammals, deer, and ducks, were safe to eat, but that shellfish from oiled beaches should not be used. In addition, village residents believe that subsistence species continue to decline or have not recovered from the oil spill.	Many subsistence users believe that continued contamination to subsistence food sources is dangerous to their health.	YES	YES	YES	NO	For detailed information on village subsistence use see table _, page__.
Wilderness Values	There is a perception of lost values to designated federal and state wilderness areas in parks, refuges and forests. People report that their feeling about the spill area has changed. There is wide-spread feeling that something has been lost. Approximately _,___ miles of wilderness coastline were affected by oil. Some oil remains embedded in the sediments of these areas.	Some people's feelings of lost values are diminishing (recovery). To others the values remain injured (lack of recovery). Oil has degraded substantially in many areas but remains in others. Until oil is completely removed or degrades naturally, injury to wilderness values will continue.	YES	YES	YES	YES	

Draft Alternatives

These pages summarize the alternatives proposed for the draft restoration plan. Some of the details are likely to change, tables may be reformatted during publication, and much explanatory text will accompany the tables. But the tables contain the basic information proposed for the alternatives. With Trustee concurrence, these alternatives are intended for the draft restoration plan, and the "Alternative Information Package" scheduled for March publication.

Five tables are presented for each alternative.

1. Summary of the theme and policy variables that apply to that alternative.
2. The Resources and Services addressed in that alternative. Alternatives two, four, and five address all resources. Alternative three addresses only resources that show a population-level injury. All alternatives (except alternative #1, the "no-action alternative) address all services.
3. Restoration Options applicable to that alternative.
4. Geographic Distribution of Restoration Options
5. Cost Allocation
6. Option by Option Cost Summary

A Note About Costs. All costs are in thousands of 1993 dollars. The inflation-adjusted value of the remainder of the settlement is approximately $522 million in 1993 dollars (after deducting an estimate of reimbursements to governements). Inflation adjustments use the projection from mid-range scenario of the Alaska Department of Revenue's Fall 1993 revenue forecast.

Costs for each alternative are summarized into the broad categories described below.

1. **Administration and Information.** Includes costs for administration and public information.
2. **Monitoring**
3. **Habitat Protection**
4. **Other Restoration.** This category includes all restoration except habitat protection.
5. **Other Restoration Reserve.** The "other restoration" category includes the projected cost of all restoration options known today that fit into the policy variables of each alternative. Other effective options may be suggested. This reserve provides a source of funds for effective options that are not known today.

	Alternative 1 Natural Recovery	Alternative 2 Habitat Protection	Alternative 3 Limited Restoration	Alternative 4 Moderate Restoration	Alternative 5 Comprehensive Restoration
THEME	No action other than monitoring and normal agency management.	Protect injured resources and services from further degradation or disturbance.	Take highly effective actions to protect and restore injured services and resources whose population has declined. Maintain the existing character of the affected area.	Take highly effective actions to protect and restore all injured resources and services. Increase, to a limited extent, opportunities for human use in the affected area.	Take all effective actions to protect, restore, and enhance all injured resources and services. Increase opportunities for human use in the affected area.
VARIABLES					
Injuries Addressed	N/A	All injured resources and services.	Injured services and resources whose populations declined.	All injured resources and services.	All injured resources and services.
Status of Resource Recovery	N/A	Resources not recovered and resources recovered.	Resources not recovered.	Resources not recovered.	Resources not recovered and resources recovered.
Effectiveness of Restoration Actions	N/A	All effective habitat protection actions.	Only highly effective actions.	Only highly effective actions.	All effective actions.
Strategies for Public Use	N/A	Protect or increase existing use through habitat protection.	Protect existing use.	Protect or increase existing use.	Protect or increase existing use or encourage appropriate new use.

Monitoring and information programs are included in all alternatives.
Restoration actions may be undertaken for injured resources, services, or their equivalents in all alternatives.

Table ____. Summary of Draft Restoration Plan Alternatives

Table V-__ shows which resources showed a population decline, and which showed chronic or sublethal injury without a detectable change in population. The table shows the injuries that occurred as of 1989, the spill year and does not take into account recovery.

Table V-__. Degree of Injury

Resources whose populations declined because of the spill.	**Sublethal or Chronic Effects. No Detectable spill-related population decline**
Harbor seals	River otters
Sea otters	Bald eagles*
Common murres	Killer Whales*
Marbled murrelet	Pink salmon*
Pigeon Guillemots	Pacific herring
Harlequin ducks	Rockfish
Black oystercatchers	Dolly Varden*
Sockeye salmon smolts	Cutthroat Trout*
Intertidal organisms	
Subtidal organisms	

* For these species, the Trustees' scientists have considerable disagreement over the conclusions to be drawn from the results of the damage assessment studies.

Alternative 1 - Natural Recovery

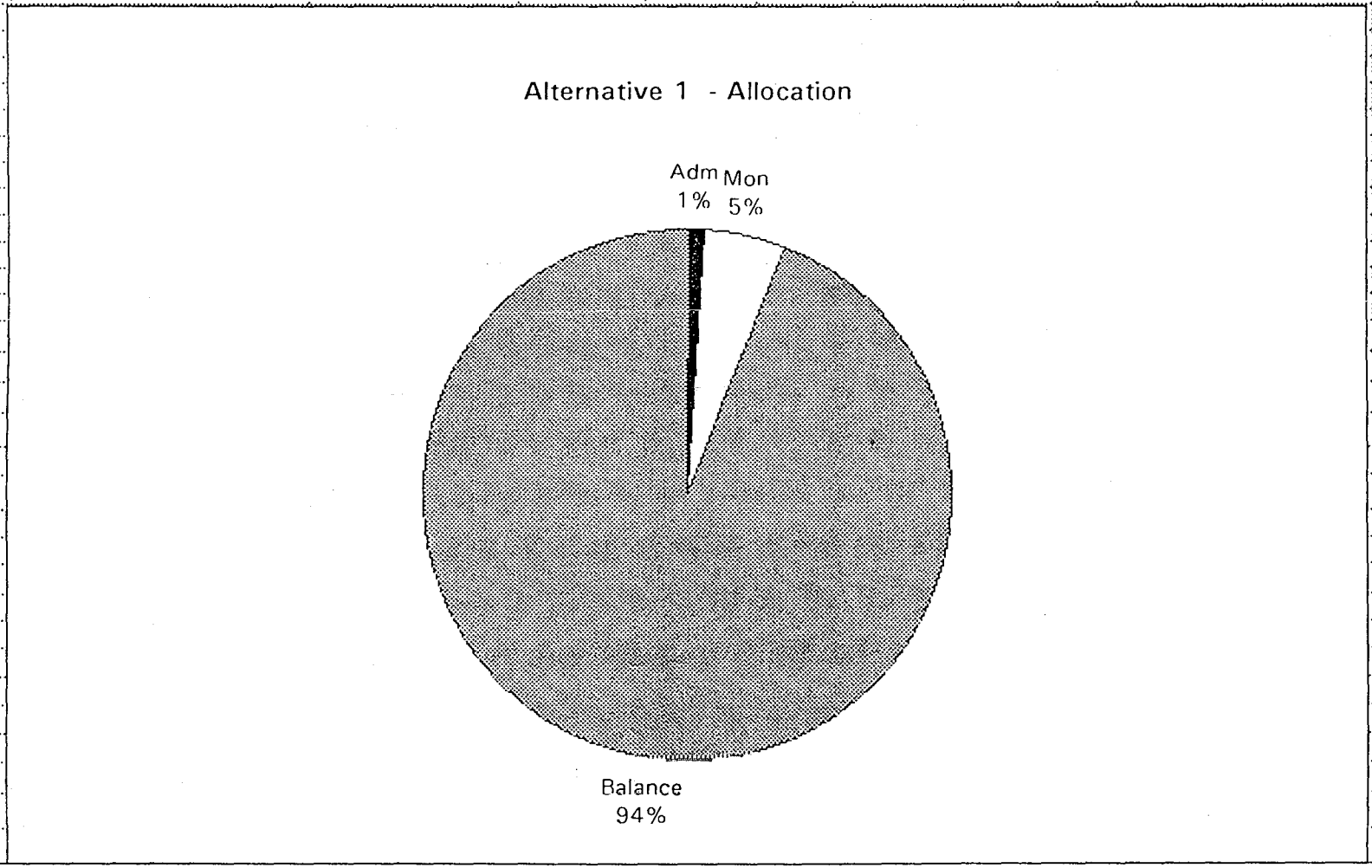
THEME	No action other than monitoring and normal agency management.
VARIABLES	
Injuries Addressed	N/A
Status of Resource Recovery	N/A
Effectiveness of Restoration Actions	N/A
Strategies for Public Use	N/A

Monitoring and information programs are included in all alternatives.
Restoration actions may be undertaken for injured resources, services, or their equivalents in all alternatives.

What would happen to resources and services within the Exxon Valdez oil spill area if no restoration options were implemented? Normal agency management continues, current trends in human use of the affected area continue, and planned development of private lands continue. These trends influence the environment that injured resources face in order to recover. Ideally, the exact injury would be known, and enough would be known about each resource to develop a population model. Unfortunately, such detailed information is not available for most resources; therefore, estimates are based on discussions with agency experts and peer reviewers, and from experience with similar species in different areas (Note: the literature synthesis information is not yet incorporated into this DRAFT!). Similarly, there is limited information on the injury to services.

The objectives of this alternative are to describe the potential rate and degree of recovery for the injured resources with only normal agency management; identify the missing information that make the recovery estimates uncertain; describe the recovery of services; and to describe the monitoring and public information program that would be funded through the Trustee Council.

Allocation of Remainder of Settlement Funds	Total $	%
Adm	5200.0	1%
Mon	25250.0	5%
Balance	491550.0	94%



NB: All costs are expressed in units of $1,000 (1993 $). The inflation-adjusted value of the remainder of the settlement is about $522 million.

Alternative 1 - Natural Recovery														
				ANNUAL COST			DURATION					TOTAL COST		
								Years				10-Year Maximum		
Opt	DESCRIPTION	ResSvc	UNIT	Exp	Low	High	Type	E	L	H		Expected	Lower	Higher
P1.00	Administration	Multiple resources										5200.0	5200.0	36500.0
P2.00	Monitoring	Multiple resources										25250.0	25250.0	52500.0

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NB: All costs are expressed in units of $1,000 (1993 $). The inflation-adjusted value of the remainder of the settlement is about $522 million.

Alternative 2 - Habitat Protection

THEME	Protect injured resources and services from further degradation or disturbance.
VARIABLES	
Injuries Addressed	All injured resources and services.
Status of Resource Recovery	Resources not recovered and resources recovered.
Effectiveness of Restoration Actions	All effective habitat protection actions.
Strategies for Public Use	Protect or increase existing use through habitat protection.

Monitoring and information programs are included in all alternatives.
Restoration actions may be undertaken for injured resources, services, or their equivalents in all alternatives.

The goal of this alternative is for the spill-affected area to return to prespill conditions on its own without further disturbance. This alternative addresses all injured resources and services whether or not they have recovered. Table _____ lists the resources and services addressed in this alternative. As these resources and services recover, protective actions would continue so that they are not subject to additional stress.

RESOURCES			SERVICES
Population Decline	Sublethal/Chronic	Other	
Black oystercatcher *Common murre Harbor seal Harlequin duck *Intertidal organisms Marbled murrelet *Pigeon guillemot *Sea otter Sockeye salmon *Subtidal organisms	Bald eagle Cutthroat trout Dolly Varden *Killer whale *Pacific herring Pink salmon *River otter *Rockfish	*Archaeology	*Commercial fishing Recreation *Sport fishing *Subsistence Wilderness

* Resources and services for which no restoration action(s) are included in this alternative.

Table _____. Resources and Services Addressed in Alternative 2

DRAFT 2/8/93 **Restoration Options for Alternative 2****

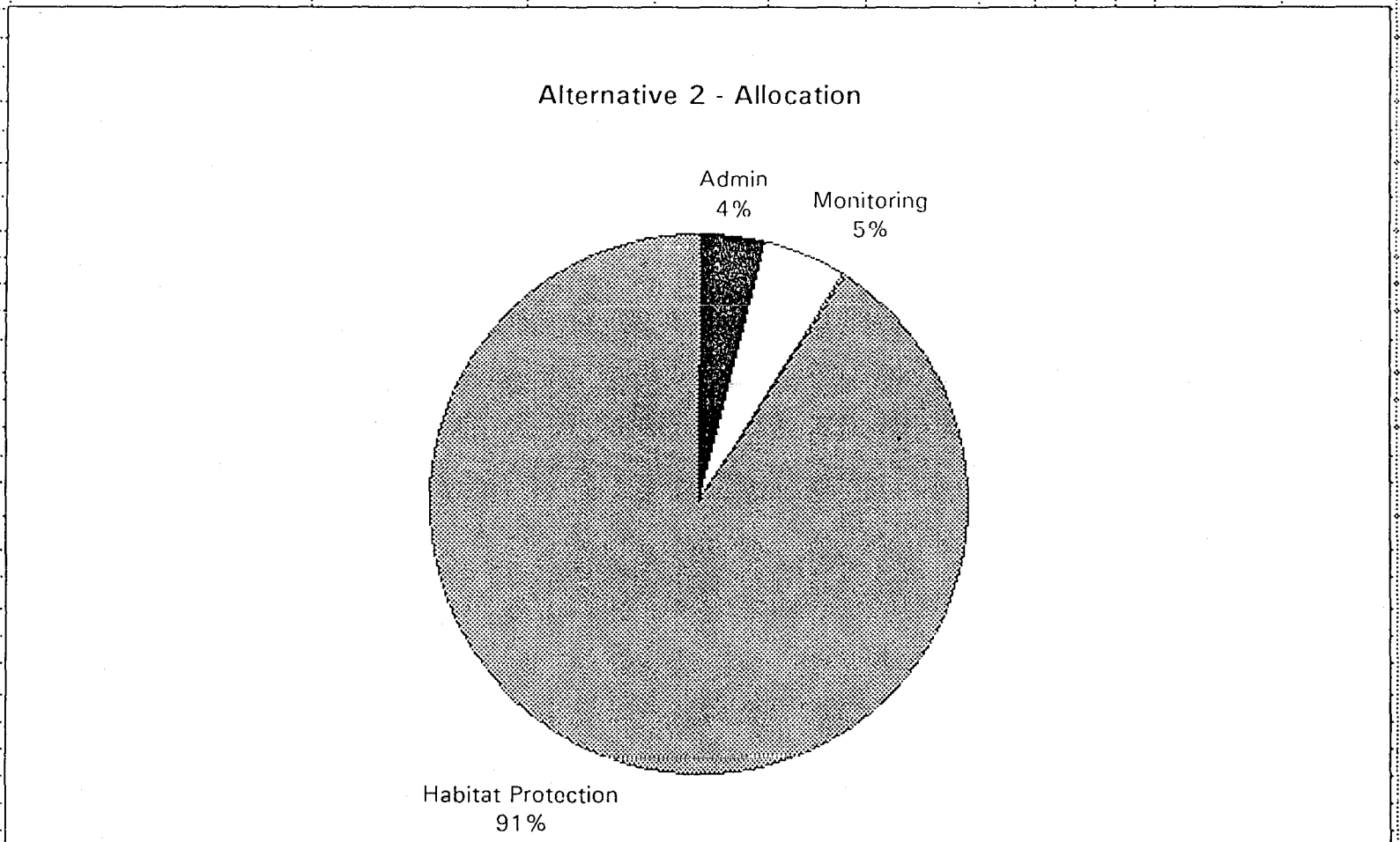
RESOURCE/SERVICE	RESTORATION OPTION
Black oystercatcher	40.0 Land and water management actions
Common murre	None identified
Harbor seal	37.0 Habitat protection and acquisition
Harlequin duck	37.0 Habitat protection and acquisition
Intertidal organisms	None identified
Marbled murrelet	37.0 Habitat protection and acquisition 40.0 Land and water management actions
Pigeon guillemot	None identified
Sea otter	None identified
Sockeye salmon	37.0 Habitat protection and acquisition
Subtidal organisms	None identified
Bald eagle	37.0 Habitat protection and acquisition
Cutthroat trout	37.0 Habitat protection and acquisition
Dolly Varden	37.0 Habitat protection and acquisition
Killer whale	None identified
Pacific herring	None identified
Pink salmon	37.0 Habitat protection and acquisition 40.0 Land and water management actions
River otter	None identified
Rockfish	None identified
Archaeology	None identified
Commercial fishing	None identified
Recreation	37.0 Habitat protection and acquisition 40.0 Land and water management actions
Sport fishing	None identified
Subsistence	None identified
Wilderness and non-use values	37.0 Habitat protection and acquisition 40.0 Land and water management actions

** Options 37 and 40 can potentially benefit <u>all</u> injured resources and services. The table above reflects those resources and services which are the <u>primary</u> targets of the proposed options.

ALTERNATIVE 2: GEOGRAPHIC DISTRIBUTION

RESOURCE OR SERVICE	OPTION NUMBER	OPTION NAME	Prince William Sound			Kenai/Cook Inlet			Alaska Penin.	Kodiak/Afognak		Outside EVOS
			North	East	West	Outer Kenai	Lower Cook In	Central Cook In		Afogn. Shuyak	Kodiak	
MULTI-SPECIES	37.0	Habitat protection and acquisition		x	x	x	x	x	x	x	x	
MULTI-SPECIES	40.0	Land and water management actions	x	x	x	x	x	x	x	x	x	

Allocation of Remainder of Settlement Funds	Total $	%
Admin	21000.0	4%
Monitoring	26000.0	5%
Habitat Protection	475000.0	91%



NB: All costs are expressed in units of $1,000 (1993 $). The inflation-adjusted value of the remainder of the settlement is about $522 million.

Alternative 2 - Protection													
				ANNUAL COST			DURATION				TOTAL COST		
								Years			10-Year Maximum		
Opt	DESCRIPTION	ResSvc	UNIT	Exp	Low	High	Type	E	L	H	Expected	Lower	Higher
37.00	Habitat protection/acquisition	Multiple resources									475000.0	234900.0	475000.0
40.00	Land and water mgmt actions	Multiple resources											
P1.00	Administration	Multiple resources									21000.0	5200.0	36500.0
P2.00	Monitoring	Multiple resources									26000.0	25250.0	52500.0

NB: All costs are expressed in units of $1,000 (1993 $). The inflation-adjusted value of the remainder of the settlement is about $522 million.

Alternative 3 - Limited Restoration

THEME	Take highly effective actions to protect and restore injured services and resources whose population has declined. Maintain the existing character of the affected area.
VARIABLES	
Injuries Addressed	Injured services and resources whose populations declined.
Status of Resource Recovery	Resources not recovered.
Effectiveness of Restoration Actions	Only highly effective actions.
Strategies for Public Use	Protect existing use.

Monitoring and information programs are included in all alternatives.
Restoration actions may be undertaken for injured resources, services, or their equivalents in all alternatives.

The goal of this alternative is for the worst-injured resources and services to return to prespill conditions as efficiently as possible. This is the only alternative that limits its scope to resources whose populations declined after the spill. Table _____ lists the resources and services addressed in this alternative. None of the resources whose populations declined after the spill has yet recovered. However, as resources recover, settlement funds would no longer be allocated to protecting or restoring them. This alternative includes only the most effective actions for protecting injured resources and restoring them to prespill conditions. It also includes only those actions that protect existing human uses that were injured and the resource base on which they depend. For example, a boat ramp in an area already used to launch boats would protect the beach that supports this type of recreational use.

RESOURCES		SERVICES
Population Decline	Other	
*Black oystercatcher Common murre Harbor seal Harlequin duck Intertidal organisms Marbled murrelet Pigeon guillemot Sea otter Sockeye salmon *Subtidal organisms	Archaeology	Commercial fishing Recreation Sport fishing Subsistence Wilderness

* Resources and services for which no restoration action(s) are included in this alternative.

Table _____. Resources and Services Addressed in Alternative 3

DRAFT 2/8/93 **Restoration Options for Alternative 3**

RESOURCE/SERVICE	RESTORATION OPTION
Black oystercatchers	None identified
Common murres	16.1 Study: Increase productivity with social stimuli 17.2 Temporary predator control
Harbor seals	46.0 Cooperative program with commercial fishermen 47.0 Cooperative program with subsistence users
Harlequin duck	13.1 Study: eliminate oil from mussel beds
	37.0 Habitat protection and acquisition
Intertidal organisms	14.0 Accelerate recovery of upper intertidal zone
Marbled murrelet	9.0 Minimize incidental take
	37.0 Habitat protection and acquisition 40.0 Land and water management actions
Pigeon guillemots	17.2 Temporary predator control
Sea otters	4.2 Study: Reduce disturbance at marine mammal haul-outs 13.2 Study: eliminate oil from mussel beds 47.0 Cooperative program with subsistence users
Sockeye salmon	2.5 Intensify sockeye management to protect injured stocks 48.0 Improve survival of salmon eggs and fry
Subtidal organisms	None identified
Archaeology	1.1 Site stewardship program 1.2 Site patrol and monitoring 10.0 Preserve archaeological sites and artifacts
Commercial fishing	18.0 Replace salmon harvest opportunities
Recreation	12.1 New backcountry public recreation facilities
	37.0 Habitat protection and acquisition 40.0 Land and water management actions
Sport fishing	18.0 Replace salmon harvest opportunities

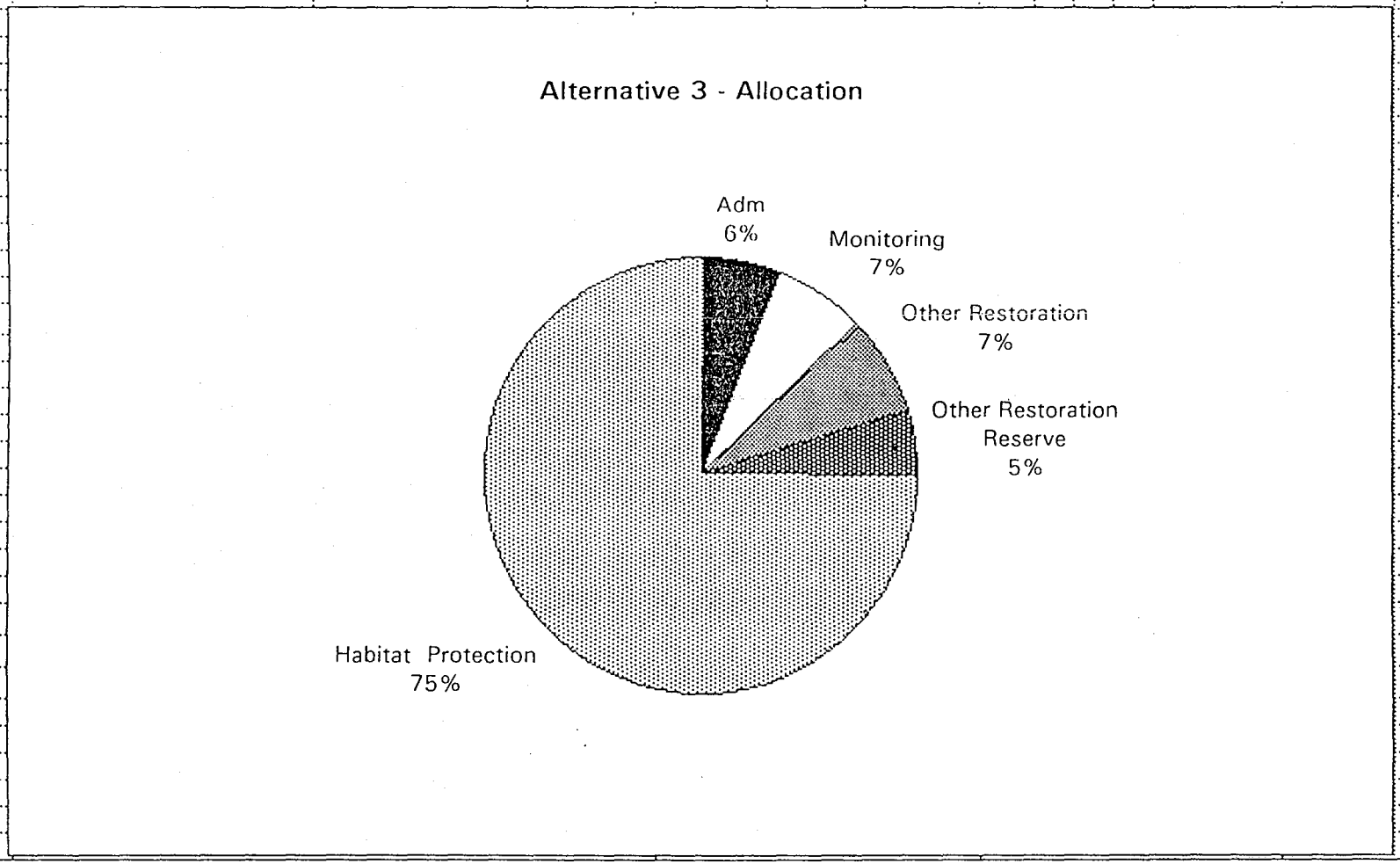
Subsistence	30.0 Test subsistence foods for hydrocarbon contamination 49.0 Provide access to traditional subsistence foods
Wilderness and non-use values	37.0 Habitat protection and acquisition 40.0 Land and water management actions
	Included in Alternative 2

ALTERNATIVE 3: GEOGRAPHIC DISTRIBUTION

RESOURCE OR SERVICE	OPT. No.	OPTION NAME	Prince William Sound			Kenai Cook/Inlet			Alaska Penin.	Kodiak/Afognak		Outside EVOS
			North	East	West	Outer Kenai	Lower Ck In	Central Ck In		Afg. Shuyak	Kodiak	
Archaeology	1.0	Archaeological site stewardship program	X	X	X	X	X	X	X	X	X	
Sockeye salmon	2.5	Intensify sockeye management to protect injured stocks						X				
Harbor seal	4.2	Reduce disturbance at marine mammal haul-outs	X	X	X	X	X	X				
Sea otter	4.2	Reduce disturbance at marine mammal haul-outs	X	X	X							
Marbled murrelet	9.0	Minimize incidental take by commercial fisheries	X	X	X	X	X	X	X	X	X	
Archaeology	10.0	Preserve archaeological sites and artifacts	X	X	X	X	X	X	X	X	X	
Sockeye salmon	11.2	Fertilize lakes to improve sockeye rearing success	X									
Recreation	12.1	Construct new backcountry public facilities	X	X	X	X	X	X	X	X	X	
Harlequin duck	13.1	Study: eliminate oil from mussel beds			X	X	X	X	X	X	X	
Sea otter	13.2	Study: eliminate oil from mussel beds			X							
MULTI-SPECIES	14.0	Accelerate recovery of upper intertidal zone			X	X	X	X	X	X	X	
Common murre	16.1	Increase murre productivity through enhanced social stimuli				X			X			
Pigeon guillemot/Common murre (replacement)	17.1	Removal of introduced species in the Aleutians										X
Common murre	17.2	Temporary predator control				X	X	X	X	X	X	
Pigeon guillemot	17.2	Temporary predator control	X	X	X	X	X	X	X	X	X	
Subsistence	30.0	Test subsistence foods for hydrocarbon contamination		X	X		X				X	
MULTI-SPECIES	37.0	Habitat protection and acquisition		X	X	X	X	X	X	X	X	
MULTI-SPECIES	40.0	Land and water management actions	X	X	X	X	X	X	X	X	X	
Killer Whale - AB pod	45.0	Study: Facilitate changes in black cod fishery gear	X	X	X	X						
Harbor Seal	46.0	Cooperative program w. comm. fishermen to reduce seal bycatch	X	X	X		X			X	X	
Harbor Seal & Sea otter	47.0	Cooperative program with subsistence users to assess harvest levels		X	X		X				X	
Sockeye Salmon	48.0	Improve survival of salmon eggs and fry						X			X	

RESOURCE OR SERVICE	OPT. No.	OPTION NAME	Prince William Sound			Kenai Cook/Inlet			Alaska Penin.	Kodiak/Afognak		Outside EVOS
			North	East	West	Outer Kenai	Lower Ck In	Central Ck In		Afg. Shuyak	Kodiak	
Subsistence	49.0	Provide subsistence users access to traditional subsistence foods			X							
Pink salmon	51.0	Relocate existing hatchery runs	X	X	X							

Allocation of Remainder of Settlement Funds	Total $	%
Adm	31500.0	6%
Monitoring	36500.0	7%
Other Restoration	38362.0	7%
Other Restoration Reserve	24138.0	5%
Habitat Protection	391500.0	75%



NB: All costs are expressed in units of $1,000 (1993 $). The inflation-adjusted value of the remainder of the settlement is about $522 million.

Alternative 3 - Limited Restoration

Opt	DESCRIPTION	ResSvc	UNIT	ANNUAL COST			DURATION				TOTAL COST 10-Year Maximum		
				Exp	Low	High	Type	E	L	H	Expected	Lower	Higher
1.10	Site stewardship program	Archaeology	Per 3 areas	195.0	195.0	195.0	Ltd	10	10	10	1950.0	1950.0	1950.0
1.20	Site patrol and monitoring	Archaeology		300.0	300.0	300.0	Ltd	4	3	5	1200.0	900.0	1500.0
2.50	Intensify management	Sockeye salmon		3000.0	2000.0	5000.0	Ltd	5	2	5	15000.0	4000.0	25000.0
4.30	Feas Study: Reduce disturb	Sea otter					Ltd				120.0	80.0	640.0
9.00	Minimize incidental take	Marbled murrelet									1625.0	1100.0	2000.0
10.00	Archaeol Res Protection	Archaeology									4072.0	3250.0	7000.0
12.10	New backcountry rec facilities	Recreation									1620.0	480.0	3256.0
13.01	Eliminate oil from mussel beds	Harlequin duck		491.0	340.0	641.0	Ltd	5	4	7	2455.0	1360.0	4487.0
13.02	Study: Elim oil fr mussel beds	Sea otter											
14.01	Accelerate recovery of UIT	Intertidal organisms		150.0	100.0	200.0	UR	5	4	7	750.0	400.0	1400.0
16.10	Feas Study: Social stimuli	Common murre					Ltd				850.0	800.0	5500.0
17.21	Temporary predator control	Common murres		350.0	300.0	400.0	Ltd	5	5	10	1750.0	1500.0	4000.0
17.22	Temporary predator control	Pigeon guillemot		200.0	150.0	250.0	Ltd	4	4	6	800.0	600.0	1500.0
18.01	Replace harvest opportunities	Comm fishing	5 projects	750.0	500.0	1000.0	Ltd	2	1	5	1500.0	500.0	5000.0
18.02	Replace harvest opportunities	Sport fishing	5 projects	750.0	250.0	1000.0	Ltd	2	1	5	1500.0	250.0	5000.0
30.00	Test subsistence foods	Subsistence		330.0	300.0	350.0	Ltd	3	2	5	990.0	600.0	1750.0
37.00	Habitat protection/acquisition	Multiple resources									391500.0	234900.0	475000.0
40.00	Land and water mgmt actions	Multiple resources											
46.00	Coop prgm-fishermen	Harbor seal		50.0	30.0	100.0	Ltd	3	1	5	150.0	30.0	500.0
47.01	Coop prgm-subsistence users	Harbor seal		30.0	30.0	30.0	UR	10	10	10	300.0	300.0	300.0
47.02	Coop prgm-subsistence users	Sea otter					UR						
48.02	Improve survival rates	Sockeye salmon	4 projects	400.0	200.0	600.0	Ltd	3	1	5	1200.0	200.0	3000.0
49.00	Access to traditional foods	Subsistence	Per village	53.0	50.0	60.0	UR	10	5	10	530.0	250.0	600.0
P1.00	Administration	Multiple resources									31500.0	5200.0	36500.0
P2.00	Monitoring	Multiple resources									36500.0	25250.0	52500.0

NB: All costs are expressed in units of $1,000 (1993 $). The inflation-adjusted value of the remainder of the settlement is about $522 million.

Alternative 4 - Moderate Restoration

THEME	Take the most effective actions to protect and restore all injured resources and services. Increase, to a limited extent, opportunities for human use in the affected area.
VARIABLES	
Injuries Addressed	All injured resources and services.
Status of Resource Recovery	Resources not recovered.
Effectiveness of Restoration Actions	Only highly effective actions.
Strategies for Public Use	Protect or increase existing use.

Monitoring and information programs are included in all alternatives.
Restoration actions may be undertaken for injured resources, services, or their equivalents in all alternatives.

The goal of this alternative is for all injured resources and services to return to prespill conditions as efficiently as possible. Table _____ lists the resources and services addressed in this alternative. None of the resources whose populations declined after the spill has yet recovered. However, as resources recover, settlement funds would no longer be allocated to protecting or restoring them. This alternative includes actions that protect existing human uses that were injured and the resource base on which they depend and also those actions that would increase existing use. An example of the latter is a new hatchery run that may increase opportunities in an existing fishery.

RESOURCES			SERVICES
Population Decline	Sublethal/Chronic	Other	
*Black oystercatcher Common murre Harbor seal Harlequin duck Intertidal organisms Marbled murrelet Pigeon guillemot Sea otter Sockeye salmon *Subtidal organisms	Bald eagle Cutthroat trout Dolly Varden Killer whale Pacific herring Pink salmon *River otter Rockfish	Archaeology	Commercial fishing Recreation Sport fishing Subsistence Wilderness

* Resources and services for which no restoration action(s) are included in this alternative.

Table _____. Resources and Services Addressed in Alternative 4.

DRAFT 2/8/93 **Restoration Options for Alternative 4**

RESOURCE/SERVICE	RESTORATION OPTION
Black oystercatcher	None identified
Common murre	16.1 Study: Increase productivity with enhanced social stimuli
	17.1 Removal of introduced species in the Aleutians
	17.2 Temporary predator control
Harbor seal	46.0 Cooperative program with fishermen 47.0 Cooperative program with subsistence users
Harlequin duck	13.1 Study: eliminate oil from mussel beds 37.0 Habitat protection and acquisition
Intertidal organisms	14.0 Accelerate recovery of upper intertidal zone
Marbled murrelet	9.0 Minimize incidental take 37.0 Habitat protection and acquisition 40.0 Land and water management actions
Pigeon guillemot	17.1 Removal of introduced species in the Aleutians 17.2 Temporary predator control
Sea otter	4.2 Study: Reduce disturbance at marine mammal haul-outs 13.2 Study: Eliminate oil from mussel beds 47.0 Cooperative program with subsistence users
Sockeye salmon	2.5 Intensify sockeye management to protect injured stocks
	11.2 Fertilize lakes to improve sockeye rearing success
	48.0 Improve survival of salmon eggs and fry
Subtidal organisms	None identified
Bald eagle	37.0 Habitat protection and acquisition
Cutthroat trout	2.1 Intensify management to protect injured stocks 37.0 Habitat protection and acquisition

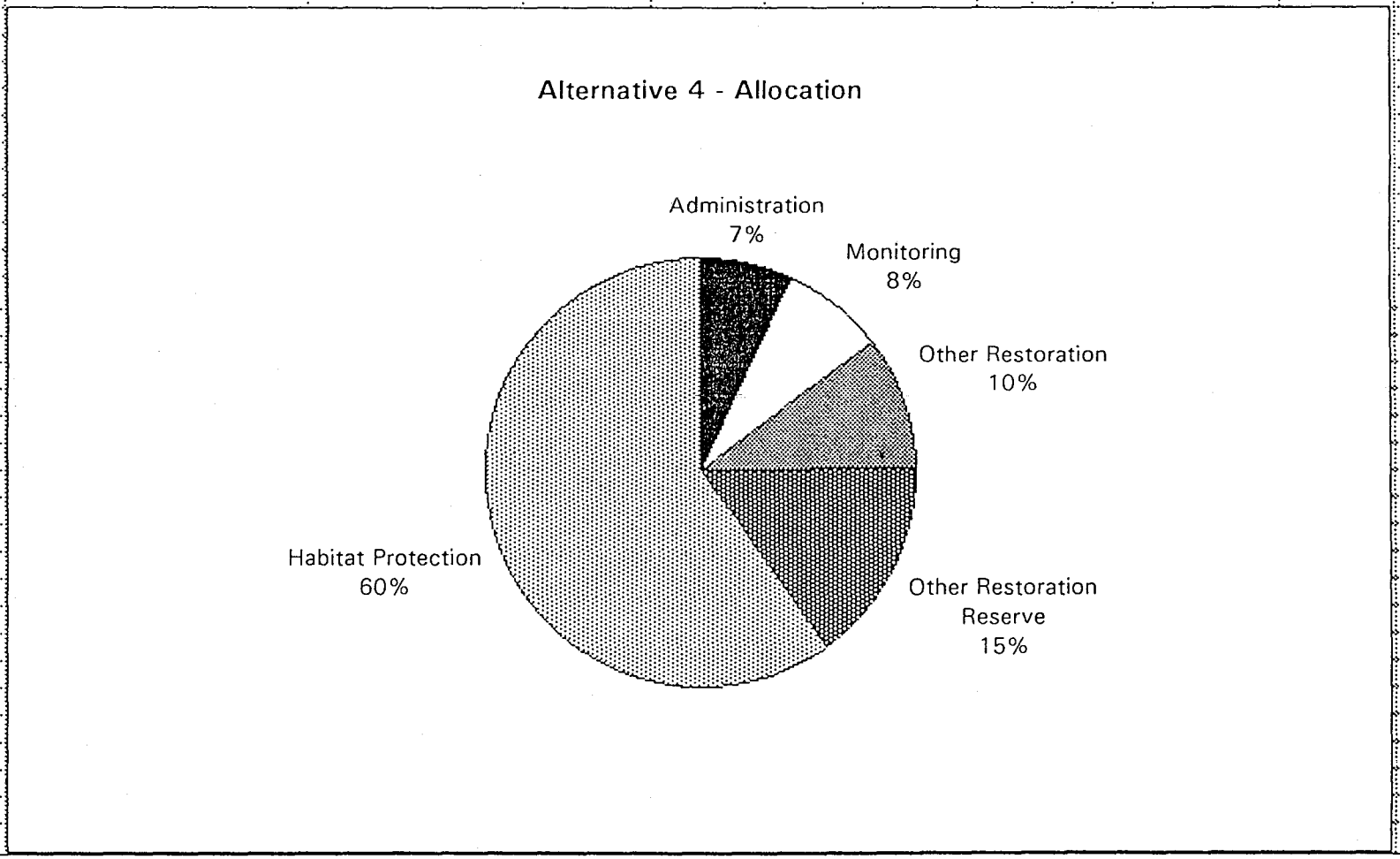
Dolly Varden	2.1 Intensify management to protect injured stocks 37.0 Habitat protection and acquisition
Killer whale	45.0 Study: Changes in black cod fishery gear
Pacific herring	2.2 Intensify herring management to protect injured stocks
Pink salmon	2.3 Intensify salmon management to protect injured stocks 51.0 Relocate existing hatchery runs
River otter	None identified
Rockfish	2.4 Intensify rockfish management to protect injured stocks
Archaeology	1.1 Site stewardship program 1.2 Site patrol and monitoring 10.0 Preserve archaeological sites and artifacts
	35.0 Acquire replacements for artifacts from the spill area
Commercial fishing	18.0 Replace salmon harvest opportunities
Recreation	12.1 New backcountry public recreation facilities 37.0 Habitat protection and acquisition 40.0 Land and water management actions
Sport fishing	18.0 Replace salmon harvest opportunities
Subsistence	30.0 Test subsistence foods for hydrocarbon contamination 49.0 Provide access to traditional subsistence foods
Wilderness and non-use values	37.0 Habitat protection and acquisition 40.0 Land and water management actions
	Included in Alternatives 2 or 3

ALTERNATIVE 4: GEOGRAPHIC DISTRIBUTION

RESOURCE OR SERVICE	OPT. No.	OPTION NAME	Prince William Sound			Kenai/Cook Inlet			Alaska Penin.	Kodiak/Afognak		Outside EVOS
			North	East	West	Outer Kenai	Lower Ck In	Central Ck In		Afg. Shuyak	Kodiak	
Archaeology	1.0	Archaeological site stewardship program	X	X	X	X	X	X	X	X	X	
Cutthroat trout/ Dolly Varden	2.1	Intensify managment to protect injured stocks	X	X	X							
Herring	2.2	Intensify herring management to protect injured stocks	X	X	X							
Pink salmon	2.3	Intensify pink salmon management to protect injured stocks	X	X	X							
Rockfish	2.4	Intensify rockfish management to protect injured stocks	X	X	X	X	X					
Sockeye salmon	2.5	Intensify sockeye management to protect injured stocks						X				
Harbor seal	4.2	Reduce disturbance at marine mammal haul-outs	X	X	X	X	X	X				
Sea otter	4.2	Reduce disturbance at marine mammal haul-outs	X	X	X							
Marbled murrelet	9.0	Minimize incidental take by commercial fisheries	X	X	X	X	X	X	X	X	X	
Archaeology	10.0	Preserve archaeological sites and artifacts	X	X	X	X	X	X	X	X	X	
Sockeye salmon	11.2	Fertilize lakes to improve sockeye rearing success	X									
Sockeye salmon	11.3	Improve access to salmon spawning areas with fish passes, etc.									X	
Recreation	12.1	Construct new backcountry public facilities	X	X	X	X	X	X	X	X	X	
Harlequin duck	13.1	Study: eliminate oil from mussel beds			X	X	X	X	X	X	X	
Sea otter	13.2	Study: eliminate oil from mussel beds			X							
MULTI-SPECIES	14.0	Accelerate recovery of upper intertidal zone			X	X	X	X	X	X	X	
Common murre	16.1	Increase murre productivity through enhanced social stimuli				X			X			
Pigeon guillemot/Common murre (replacement)	17.1	Removal of introduced species in the Aleutians										X
Common murre	17.2	Temporary predator control				X	X	X	X	X	X	
Pigeon guillemot	17.2	Temporary predator control	X	X	X	X	X	X	X	X	X	

RESOURCE OR SERVICE	OPT. No.	OPTION NAME	Prince William Sound			Kenai/Cook Inlet			Alaska Penin.	Kodiak/Afognak		Outside EVOS
			North	East	West	Outer Kenai	Lower Ck In	Central Ck In		Afg. Shuyak	Kodiak	
Commercial Fishing	18.0	Replace fisheries harvest opportunities by creating new salmon runs	X	X	X		X	X		X	X	
Sport Fishing	18.0	Replace fisheries harvest opportunities by creating new salmon runs	X	X	X		X	X		X	X	
Subsistence	30.0	Test subsistence foods for hydrocarbon contamination		X	X		X				X	
Archaeology	35.0	Negotiate with museums to acquire replacements for looted artifacts	X	X	X	X	X	X	X	X	X	X
MULTI-SPECIES	37.0	Habitat protection and acquisition		X	X	X	X	X	X	X	X	
MULTI-SPECIES	40.0	Land and water management actions	X	X	X	X	X	X	X	X	X	
Killer Whale - AB pod	45.0	Study: Facilitate changes in black cod fishery gear	X	X	X	X						
Harbor Seal	46.0	Cooperative program with commercial fishermen	X	X	X		X			X	X	
Harbor Seal and Sea Otter	47.0	Cooperative program with subsistence users		X	X		X				X	
Sockeye Salmon	48.0	Improve survival of salmon eggs and fry						X			X	
Subsistence	49.0	Provide subsistence users access to traditional subsistence foods			X							
Pink salmon	51.0	Relocate existing hatchery runs	X	X	X							

Allocation of Remainder of Settlement Funds	Total $	%
Administration	36500.0	7%
Monitoring	41750.0	8%
Other Restoration	51204.0	10%
Other Restoration Reserve	79346.0	15%
Habitat Protection	313200.0	60%



NB: All costs are expressed in units of $1,000 (1993 $). The inflation-adjusted value of the remainder of the settlement is about $522 million.

Alternative 4 - Moderate Restoration														
				ANNUAL COST			DURATION				TOTAL COST		
								Years			10-Year Maximum		
Opt	DESCRIPTION	ResSvc	UNIT	Exp	Low	High	Type	E	L	H	Expected	Lower	Higher
1.10	Site stewardship program	Archaeology	Per 3 areas	195.0	195.0	195.0	Ltd	10	10	10	1950.0	1950.0	1950.0
1.20	Site patrol and monitoring	Archaeology		300.0	300.0	300.0	Ltd	4	3	5	1200.0	900.0	1500.0
2.10	Intensify management	Cutthroat/Dolly		255.0	200.0	300.0	Ltd	2	2	2	510.0	400.0	600.0
2.20	Intensify management	Pacific herring		457.0	440.0	500.0	Ltd	3	2	4	1371.0	880.0	2000.0
2.30	Intensify management	Pink salmon		3000.0	2000.0	5000.0	Ltd	2	2	4	6000.0	4000.0	20000.0
2.40	Intensify management	Rockfish		593.0	550.0	700.0	Ltd	2	1	4	1186.0	550.0	2800.0
2.50	Intensify management	Sockeye salmon		3000.0	2000.0	5000.0	Ltd	5	2	5	15000.0	4000.0	25000.0
4.30	Feas Study: Reduce disturb	Sea otter					Ltd				120.0	80.0	640.0
9.00	Minimize incidental take	Marbled murrelet									1625.0	1100.0	2000.0
10.00	Archaeol Res Protection	Archaeology									4072.0	3250.0	7000.0
11.20	Fertilize lakes	Sockeye salmon	Per lake	190.0	150.0	220.0	Ltd	3	1	5	570.0	150.0	1100.0
12.10	New backcountry rec facilities	Recreation									1620.0	480.0	3256.0
13.01	Eliminate oil from mussel beds	Harlequin duck		491.0	340.0	641.0	Ltd	5	4	7	2455.0	1360.0	4487.0
13.02	Study: Elim oil fr mussel beds	Sea otter											
14.01	Accelerate recovery of UIT	Intertidal organisms		150.0	100.0	200.0	UR	5	4	7	750.0	400.0	1400.0
16.10	Feas Study: Social stimuli	Common murre					Ltd				850.0	800.0	5500.0
17.10	Remove introduced species	Common murre					UR				2500.0	1500.0	3500.0
17.21	Temporary predator control	Common murres		350.0	300.0	400.0	Ltd	5	5	10	1750.0	1500.0	4000.0
17.22	Temporary predator control	Pigeon guillemot		200.0	150.0	250.0	Ltd	4	4	6	800.0	600.0	1500.0
18.01	Replace harvest opportunities	Comm fishing	5 projects	750.0	500.0	1000.0	Ltd	2	1	5	1500.0	500.0	5000.0
18.02	Replace harvest opportunities	Sport fishing	5 projects	750.0	250.0	1000.0	Ltd	2	1	5	1500.0	250.0	5000.0
30.00	Test subsistence foods	Subsistence		330.0	300.0	350.0	Ltd	3	2	5	990.0	600.0	1750.0
35.00	Aquire archaeol. artifacts	Archaeology		225.0	150.0	300.0	Ltd	3	3	3	675.0	450.0	900.0
37.00	Habitat protection/acquisition	Multiple resources									313200.0	234900.0	475000.0
40.00	Land and water mgmt actions	Multiple resources											
45.00	Feas Study: Black cod gear	Killer whale		30.0	30.0	30.0	Ltd	1	1	1	30.0	30.0	30.0
46.00	Coop prgm-fishermen	Harbor seal		50.0	30.0	100.0	Ltd	3	1	5	150.0	30.0	500.0
47.01	Coop prgm-subsistence users	Harbor seal		30.0	30.0	30.0	UR	10	10	10	300.0	300.0	300.0
47.02	Coop prgm-subsistence users	Sea otter					UR						
48.02	Improve survival rates	Sockeye salmon	4 projects	400.0	200.0	600.0	Ltd	3	1	5	1200.0	200.0	3000.0
49.00	Access to traditional foods	Subsistence	Per village	53.0	50.0	60.0	UR	10	5	10	530.0	250.0	600.0
51.00	Relocate existing hatchery runs	Pink salmon	Per project				Ltd						
P1.00	Administration	Multiple resources									36500.0	5200.0	36500.0
P2.00	Monitoring	Multiple resources									41750.0	25250.0	52500.0

NB: All costs are expressed in units of $1,000 (1993 $). The inflation-adjusted value of the remainder of the settlement is about $522 million.

Alternative 5 - Comprehensive Restoration

THEME	Take all effective actions to protect, restore and enhance all injured resources and services. Increase opportunities for human use in the affected area.
VARIABLES	
Injuries Addressed	All injured resources and services.
Status of Resource Recovery	Resources not recovered and resources recovered.
Effectiveness of Restoration Actions	All effective actions.
Strategies for Public Use	Protect or increase existing use; or encourage appropriate new use.

Monitoring and information programs are included in all alternatives.
Restoration actions may be undertaken for injured resources, services, or their equivalents in all alternatives.

The goal of this alternative is for all injured resources and services to return or exceed prespill levels. Table _____ lists the resources and services addressed in this alternative; they are identical to those addressed in Alternatives 2 and 4. This alternative includes actions that protect existing human uses that were injured and the resource base on which they depend and also those actions that would increase existing use or create new uses. An example of the last item is a new commercial facility on public land that attracts different types of uses than had previously existed there.

RESOURCES			SERVICES
Population Decline	Sublethal/Chronic	Other	
Black oystercatcher Common murre Harbor seal Harlequin duck Intertidal organisms Marbled murrelet Pigeon guillemot Sea otter Sockeye salmon *Subtidal organisms	Bald eagle Cutthroat trout Dolly Varden Killer whale Pacific herring Pink salmon River otter Rockfish	Archaeology	Commercial fishing Recreation Sport fishing Subsistence Wilderness

* Resources and services for which no restoration action(s) are included in this alternative.

Table _____. Resources and Services Addressed in Alternative 5.

DRAFT 2/8/93 **Restoration Options for Alternative 5**

RESOURCE/SERVICE	RESTORATION OPTION
Black oystercatcher	14.0 Accelerate recovery of upper intertidal zone
	37.0 Habitat protection and acquisition 40.0 Land and water management actions
Common murre	4.1 Reduce disturbance at marine bird colonies
	16.1 Study: Increase productivity with enhanced social stimuli
	16.2 Study: Improve physical characteristics of nest sites
	17.1 Removal of introduced species in Aleutians 17.2 Temporary predator control
Harbor seal	4.2 Reduce disturbance at marine mammal haul-out areas
	46.0 Cooperative program with commercial fishermen 47.0 Cooperative program with subsistence users
Harlequin duck	8.1 Develop sport harvest guidelines
	13.1 Study: Eliminate oil from mussel beds 37.0 Habitat protection and acquisition
Intertidal organisms	14.0 Accelerate recovery of upper intertidal zone
Marbled murrelet	9.0 Minimize incidental take 37.0 Habitat protection and acquisition 40.0 Land and water management actions
Pigeon guillemot	17.1 Removal of introduced species in the Aleutians 17.2 Temporary predator control
Sea otter	4.2 Study: Reduce disturbance at marine mammal haul-outs 13.2 Study: eliminate oil from mussel beds 47.0 Cooperative program with subsistence users

Sockeye salmon	2.5 Intensify sockeye management to protect injured stocks 11.2 Fertilize lakes to improve sockeye rearing success
	11.3 Improve access to spawning areas with fish passes, etc.
	37.0 Habitat protection and acquisition 48.0 Improve survival of salmon eggs and fry
Subtidal organisms	None identified
Bald eagle	37.0 Habitat protection and acquisition
Cutthroat trout	2.1 Intensify management to protect injured stocks
	19.0 Anadromous stream catalogue
	37.0 Habitat protection and acquisition
Dolly Varden	2.1 Intensify management to protect injured stocks 37.0 Habitat protection and acquisition
Killer whale	45.0 Study: Changes in black cod fishery gear
Pacific herring	2.2 Intensify herring management tc protect injured stocks
Pink salmon	2.3 Intensify salmon management to protect injured stocks
	11.1 Construct spawning channels and instream improvements 11.3 Improve access to spawning areas with fish passes, etc. 19.0 Anadromous streams catalogue
	37.0 Habitat protection and acquisition 40.0 Land and water management actions
	48.0 Improve survival of salmon eggs and fry
	51.0 Relocate existing hatchery runs
River otter	8.2 Develop trapping harvest guidelines
Rockfish	2.4 Intensify rockfish management to protect injured stocks

Archaeology	1.1 Site stewardship program 1.2 Site patrol and monitoring 10.0 Preserve archaeological sites and artifacts 35.0 Acquire replacements for artifacts from the spill area
Commercial fishing	18.0 Replace salmon harvest opportunities
Recreation	12.1 New backcountry public recreation facilities
	12.2 Plan and market public land for commercial recreational facilities 33.0 Visitor centers 34.0 Marine environmental institute
	37.0 Habitat protection and acquisition 40.0 Land and water management actions
Sport fishing	18.0 Replace salmon harvest opportunities
Subsistence	18.0 Replace salmon harvest opportunities
	30.0 Test subsistence foods for hydrocarbon contamination 49.0 Provide access to traditional subsistence foods
	50.1 Develop subsistence mariculture sites 50.2 Develop bivalve shellfish hatchery and research center
Wilderness and non-use values	37.0 Habitat protection and acquisition 40.0 Land and water management actions
	Included in Alternatives 2, 3 or 4

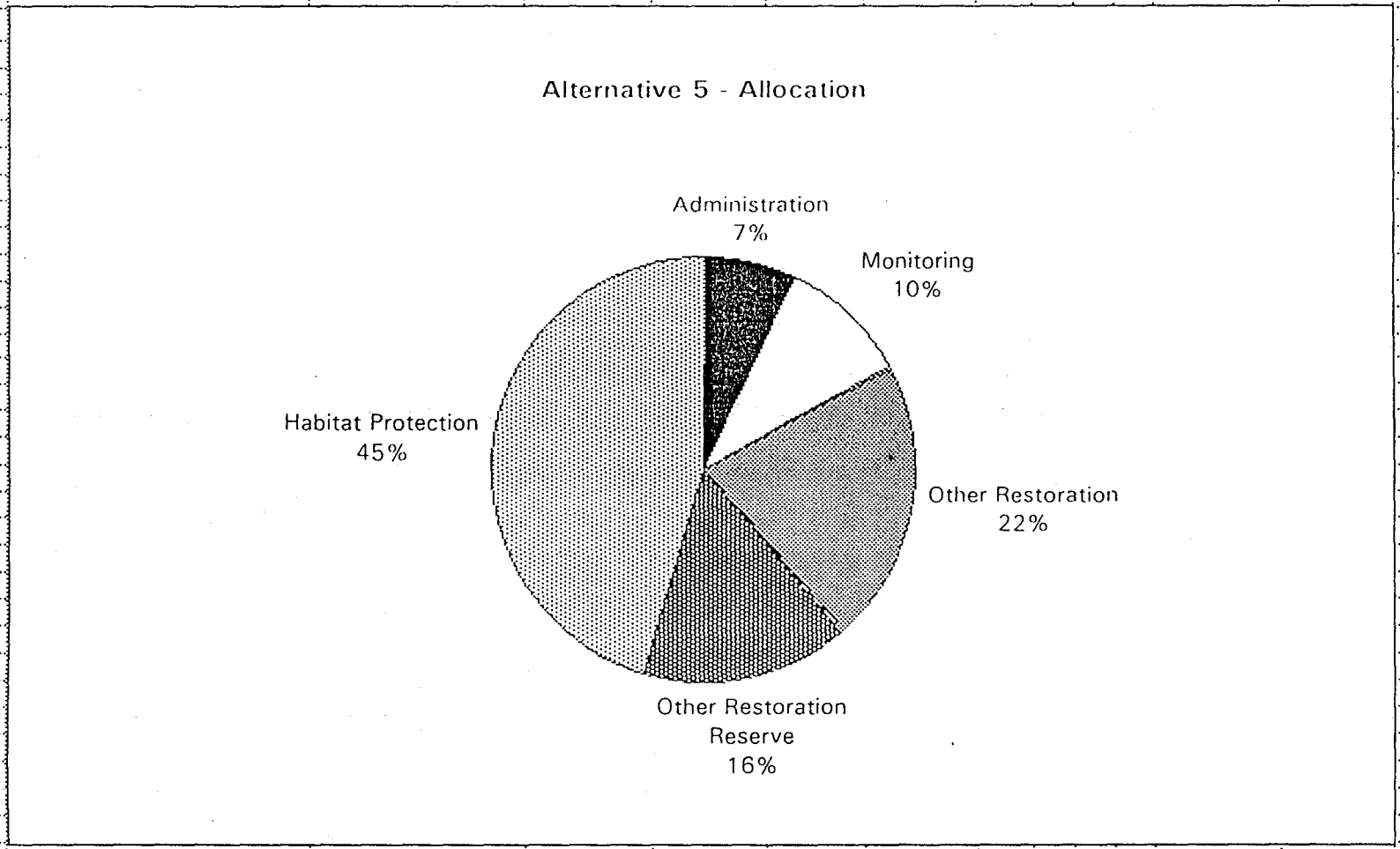
ALTERNATIVE 5: GEOGRAPHIC DISTRIBUTION

RESOURCE OR SERVICE	OPT. No.	OPTION NAME	Prince William Sound			Kenai/Cook Inlet			Alaska Penin.	Kodiak/Afognak		Outside EVOS
			North	East	West	Outer Kenai	Lower Ck In	Central Ck In		Afg. Shuyak	Kodiak	
Archaeology	1.0	Archaeological site stewardship program	X	X	X	X	X	X	X	X	X	
Cutthroat trout/ Dolly Varden	2.1	Intensify managment to protect injured stocks	X	X	X							
Herring	2.2	Intensify herring management to protect injured stocks	X	X	X							
Pink salmon	2.3	Intensify pink salmon management to protect injured stocks	X	X	X							
Rockfish	2.4	Intensify rockfish management to protect injured stocks	X	X	X	X	X					
Sockeye salmon	2.5	Intensify sockeye management to protect injured stocks						X				
Common murre	4.1	Reduce disturbance at marine bird colonies				X	X	X	X			
Harbor seal	4.2	Reduce disturbance at marine mammal haul-outs	X	X	X	X	X	X				
Sea otter	4.2	Reduce disturbance at marine mammal haul-outs	X	X	X							
Harlequin duck	8.1	Develop sport harvest guidelines for injured species	X	X	X	X						
River otter	8.2	Develop trapping guidelines for injured species	X	X	X							
Marbled murrelet	9.0	Minimize incidental take by commercial fisheries	X	X	X	X	X	X	X	X	X	
Archaeology	10.0	Preserve archaeological sites and artifacts	X	X	X	X	X	X	X	X	X	
Pink salmon	11.1	Construct salmon spawning channels and instream improvements	X	X	X							
Sockeye salmon	11.2	Fertilize lakes to improve sockeye rearing success	X									
Pink salmon	11.3	Improve access to salmon spawning areas with fish passes, etc.	X	X	X							
Sockeye salmon	11.3	Improve access to salmon spawning areas with fish passes, etc.									X	
Recreation	12.1	Construct new backcountry public facilities	X	X	X	X	X	X	X	X	X	
Recreation	12.2	Plan and market new public facilities on public land	X	X	X	X	X	X	X	X	X	

RESOURCE OR SERVICE	OPT. No.	OPTION NAME	Prince William Sound			Kenai/Cook Inlet			Alaska Penin.	Kodiak/Afognak		Outside EVOS
			North	East	West	Outer Kenai	Lower Ck In	Central Ck In		Afg. Shuyak	Kodiak	
Harlequin duck	13.1	Study: eliminate oil from mussel beds			X	X	X	X	X	X	X	
Sea otter	13.2	Study: eliminate oil from mussel beds			X							
MULTI-SPECIES	14.0	Accelerate recovery of upper intertidal zone			X	X	X	X	X	X	X	
Common murre	16.1	Increase murre productivity through enhanced social stimuli				X			X			
Common murre	16.2	Improve physical characteristics of murre nest sites				X			X			
Pigeon guillemot/Common murre (replacement)	17.1	Removal of introduced species in the Aleutians										X
Common murre	17.2	Temporary predator control				X	X	X	X	X	X	
Pigeon guillemot	17.2	Temporary predator control	X	X	X	X	X	X	X	X	X	
Commercial Fishing	18.0	Replace fisheries harvest opportunities by creating new salmon runs	X	X	X		X	X		X	X	
Sport Fishing	18.0	Replace fisheries harvest opportunities by creating new salmon runs	X	X	X		X	X		X	X	
Subsistence	18.0	Replace fisheries harvest opportunities by creating new salmon runs		X	X		X				X	
Cutthroat Trout	19.0	Anadromous stream catalogue	X	X	X							
Pink salmon	19.0	Anadromous stream catalogue	X	X	X					X	X	
Subsistence	30.0	Test subsistence foods for hydrocarbon contamination		X	X		X				X	
Recreation	33.0	Visitor centers	X	X	X	X	X	X	X		X	
Recreation	34.0	Marine environmental institute	X	X	X	X	X	X	X	X		
Archaeology	35.0	Negotiate with museums to acquire replacements for looted artifacts	X	X	X	X	X	X	X	X	X	X
MULTI-SPECIES	37.0	Habitat protection and acquisition		X	X	X	X	X	X	X	X	
MULTI-SPECIES	40.0	Land and water management actions	X	X	X	X	X	X	X	X	X	
Killer Whale - AB pod	45.0	Study: Facilitate changes in black cod fishery gear	X	X	X	X						
Harbor Seal	46.0	Cooperative program with commercial fishermen	X	X	X		X			X	X	
Harbor Seal and Sea Otter	47.0	Cooperative program with subsistence users		X	X		X				X	
Pink Salmon	48.0	Improve survival of salmon eggs and fry	X	X	X							

RESOURCE OR SERVICE	OPT. No.	OPTION NAME	Prince William Sound			Kenai/Cook Inlet			Alaska Penin.	Kodiak/Afognak		Outside EVOS
			North	East	West	Outer Kenai	Lower Ck In	Central Ck In		Afg. Shuyak	Kodiak	
Sockeye Salmon	48.0	Improve survival of salmon eggs and fry						X			X	
Subsistence	49.0	Provide subsistence users access to traditional subsistence foods			X							
Subsistence	50.1	Develop subsistence mariculture sites		X	X		X				X	
Subsistence	50.2	Develop bivalve shellfish hatchery and research center				X						
Pink salmon	51.0	Relocate existing hatchery runs	X	X	X							

Allocation of Remainder of Settlement Funds	Total $	%
Administration	36500.0	7%
Monitoring	52250.0	10%
Other Restoration	114678.0	22%
Other Restoration Reserve	83672.0	16%
Habitat Protection	234900.0	45%



NB: All costs are expressed in units of $1,000 (1993 $). The inflation-adjusted value of the remainder of the settlement is about $522 million.

Alternative 5 - Comprehensive Restoration														
				ANNUAL COST			DURATION				TOTAL COST		
								Years			10-Year Maximum		
Opt	DESCRIPTION	ResSvc	UNIT	Exp	Low	High	Type	E	L	H	Expected	Lower	Higher
1.10	Site stewardship program	Archaeology	Per 3 areas	195.0	195.0	195.0	Ltd	10	10	10	1950.0	1950.0	1950.0
1.20	Site patrol and monitoring	Archaeology		300.0	300.0	300.0	Ltd	4	3	5	1200.0	900.0	1500.0
2.10	Intensify management	Cutthroat/Dolly		255.0	200.0	300.0	Ltd	2	2	2	510.0	400.0	600.0
2.20	Intensify management	Pacific herring		457.0	440.0	500.0	Ltd	3	2	4	1371.0	880.0	2000.0
2.30	Intensify management	Pink salmon		3000.0	2000.0	5000.0	Ltd	2	2	4	6000.0	4000.0	20000.0
2.40	Intensify management	Rockfish		593.0	550.0	700.0	Ltd	2	1	4	1186.0	550.0	2800.0
2.50	Intensify management	Sockeye salmon		3000.0	2000.0	5000.0	Ltd	5	2	5	15000.0	4000.0	25000.0
4.10	Reduce disturbance	Common murre					Ltd				330.0	185.0	640.0
4.20	Reduce disturbance	Harbor seal					Ltd				330.0	185.0	640.0
4.30	Feas Study: Reduce disturb	Sea otter					Ltd				120.0	80.0	640.0
4.40	Reduce disturb public info	Multiple resources		40.0	30.0	50.0	Ltd	1	1	1	40.0	30.0	50.0
4.50	Reduce disturb field presence	Multiple resources		438.0	390.0	486.0	Ltd	10	10	10	4380.0	3900.0	4860.0
8.10	Sport/trap harvest guidelines	Harlequin duck		15.0	10.0	30.0	UR	2	1	2	30.0	10.0	60.0
8.20	Sport/trap harvest guidelines	River otter		15.0	10.0	30.0	UR	2	1	2	30.0	10.0	60.0
9.00	Minimize incidental take	Marbled murrelet									1625.0	1100.0	2000.0
10.00	Archaeol Res Protection	Archaeology									4072.0	3250.0	7000.0
11.10	Salmon spawn channels etc	Pink salmon	9 total	579.0	579.0	579.0	Ltd	6	6	6	3474.0	3474.0	3474.0
11.20	Fertilize lakes	Sockeye salmon	Per lake	190.0	150.0	220.0	Ltd	3	1	5	570.0	150.0	1100.0
11.31	Fish passes and access	Pink salmon	5 passes	250.0	64.0	1900.0	Ltd	6	6	10	1500.0	384.0	19000.0
11.32	Fish passes and access	Sockeye salmon	2 passes	100.0	25.0	800.0	Ltd	6	6	10	600.0	150.0	8000.0
12.10	New backcountry rec facilities	Recreation									1620.0	480.0	3256.0
12.20	Pln/mkt comm rec facilities	Recreation		275.0	200.0	350.0	Ltd	1	1	1	275.0	200.0	350.0
13.01	Eliminate oil from mussel beds	Harlequin duck		491.0	340.0	641.0	Ltd	5	4	7	2455.0	1360.0	4487.0
13.02	Study: Elim oil fr mussel beds	Sea otter											
14.01	Accelerate recovery of UIT	Intertidal organisms		150.0	100.0	200.0	UR	5	4	7	750.0	400.0	1400.0
14.02	Accelerate recovery of UIT	Black oystercatchers											
16.10	Feas Study: Social stimuli	Common murre					Ltd				850.0	800.0	5500.0
16.20	Feas Study: Impr nest sites	Common murre					Ltd				850.0	800.0	5500.0
17.10	Remove introduced species	Common murre					UR				2500.0	1500.0	3500.0
17.21	Temporary predator control	Common murres		350.0	300.0	400.0	Ltd	5	5	10	1750.0	1500.0	4000.0
17.22	Temporary predator control	Pigeon guillemot		200.0	150.0	250.0	Ltd	4	4	6	800.0	600.0	1500.0
18.01	Replace harvest opportunities	Comm fishing	5 projects	750.0	500.0	1000.0	Ltd	2	1	5	1500.0	500.0	5000.0
18.02	Replace harvest opportunities	Sport fishing	5 projects	750.0	250.0	1000.0	Ltd	2	1	5	1500.0	250.0	5000.0
18.03	Replace harvest opportunities	Subsistence	5 projects	750.0	250.0	1000.0	Ltd	4	1	10	3000.0	250.0	10000.0

NB: All costs are expressed in units of $1,000 (1993 $). The inflation-adjusted value of the remainder of the settlement is about $522 million.

Opt	DESCRIPTION	ResSvc	UNIT	ANNUAL COST			DURATION				TOTAL COST 10-Year Maximum		
								Years					
				Exp	Low	High	Type	E	L	H	Expected	Lower	Higher
19.01	Anad Stream Catalogue	Cutthroat trout	PWS	335.0	300.0	400.0	Ltd	1	1	1	335.0	300.0	400.0
19.02	Anad Stream Catalogue	Pink salmon	PWS/Afog	650.0	600.0	800.0	Ltd	1	1	1	650.0	600.0	800.0
30.00	Test subsistence foods	Subsistence		330.0	300.0	350.0	Ltd	3	2	5	990.0	600.0	1750.0
33.00	Visitor center	Recreation	Per 5000 sf				Ltd				1000.0	750.0	1750.0
34.00	Marine environmental institute	Recreation					Ltd				42000.0	42000.0	42000.0
35.00	Aquire archaeol. artifacts	Archaeology		225.0	150.0	300.0	Ltd	3	3	3	675.0	450.0	900.0
37.00	Habitat protection/acquisition	Multiple resources									234900.0	234900.0	475000.0
40.00	Land and water mgmt actions	Multiple resources											
45.00	Feas Study: Black cod gear	Killer whale		30.0	30.0	30.0	Ltd	1	1	1	30.0	30.0	30.0
46.00	Coop prgm-fishermen	Harbor seal		50.0	30.0	100.0	Ltd	3	1	5	150.0	30.0	500.0
47.01	Coop prgm-subsistence users	Harbor seal		30.0	30.0	30.0	UR	10	10	10	300.0	300.0	300.0
47.02	Coop prgm-subsistence users	Sea otter					UR						
48.01	Improve survival rates	Pink salmon	4 projects	400.0	200.0	600.0	Ltd	3	1	5			
48.02	Improve survival rates	Sockeye salmon	4 projects	400.0	200.0	600.0	Ltd	3	1	5	1200.0	200.0	3000.0
49.00	Access to traditional foods	Subsistence	Per village	53.0	50.0	60.0	UR	10	5	10	530.0	250.0	600.0
50.10	Subsistence mariculture sites	Subsistence		550.0	180.0	600.0	Ltd	3	2	4	1650.0	360.0	2400.0
50.20	Bivalve shellfish hatchery etc	Subsistence		1000.0	1300.0	2500.0	Ltd	3	2	4	3000.0	2600.0	10000.0
51.00	Relocate existing hatchery runs	Pink salmon	Per project				Ltd						
P1.00	Administration	Multiple resources									36500.0	5200.0	36500.0
P2.00	Monitoring	Multiple resources									52250.0	25250.0	52500.0

NB: All costs are expressed in units of $1,000 (1993 $). The inflation-adjusted value of the remainder of the settlement is about $522 million.

COMPARISON OF ALTERNATIVES

Alternatives:	1	2	3	4	5
Administration	1%	4%	6%	7%	7%
Monitoring	5%	5%	7%	8%	10%
Other Restoration	--	--	7%	10%	22%
Other Restoration Reserve	--	--	5%	15%	16%
Habitat Protection	--	91%	75%	60%	45%
Uncommitted Balance	94%	--	--	--	--

Table ____. Comparison of Alternatives by Allocation of Cost