AN OILSPILL RISK ANALYSIS FOR THE NORTON SOUND, ALASKA, (PROPOSED SALE 57) OUTER CONTINENTAL SHELF LEASE AREA

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Abstract

An oilspill risk analysis was conducted to determine the relative environmental hazards of developing oil in different regions of the Norton Sound, Alaska, (Proposed Sale 57) Outer Continental Shelf (OCS) lease area. The probability of spill occurrences, likely movement of oil slicks, and locations of resources vulnerable to spilled oil were analyzed. The times between spill occurrence and contact with various resources were also estimated. The combined results yielded estimates of the overall risks associated with development of the proposed lease area. Assuming that oil exists in the lease area (a 14-percent chance) and depending upon the routes chosen to transport oil from OCS platforms to the shore, the leasing of the tracts proposed for OCS Sale 57 will result in an expected 2.8 oilspills (of 1,000 barrels or larger). The estimated probability that land will be contacted by one or more oilspills (of 1,000 barrels or larger) that have been at sea less than 30 days is 0.51 to 0.53, depending on the proposed transportation method chosen.

Introduction

The Federal Government has proposed to offer Outer Continental Shelf (OCS) lands off the Norton Sound, Alaska, coast for oil and gas leasing. The conditional mean estimate of oil resources for the proposed 429 tracts is 480 million barrels of crude oil. The probability that oil occurs in commercial quantities in the sale area is 14 percent. The chance that oil will not be found in economically recoverable quantities is 86 percent. This report examines what could happen if oil is found. Contingent upon actual discovery of oil, production is expected to span a period of 25 years.

Oilspills are a major problem associated with offshore oil production. An important fact that stands out when one attempts to evaluate the significance of accidental oilspills is that the problem is fundamentally probabilistic. Uncertainty exists about the amount of oil that will be produced from the leases and the number and size of spills that might occur during the life of production, as well as the wind and current conditions that would exist at the time of a spill occurrence and give direction to the oil slick. Although some of the uncertainty reflects incomplete and imperfect data, considerable uncertainty is simply inherent in the problem of describing future events over which complete control cannot be exercised. Since it can not be predicted with certainty that a probabilistic event such as an oilspill will occur, only the likelihood of occurrence can be quantified. The range of possible effects that may accompany a decision on oil and gas production must be considered. In attempting to maintain perspective on the problem, each potential effect must be associated with a quantitative estimate of its probability of occurrence.

This report summarizes results of an oilspill risk analysis conducted for the proposed Norton Sound OCS Lease Sale 57. The study had the objective of determining relative risks associated with oil and gas production in different regions of the proposed lease area. The study was undertaken for consideration in the draft environmental impact statement (EIS), which is prepared for the area by the Bureau of Land Management (BLM), and to aid in the final selection of tracts to be offered for sale. A description of the oilspill trajectory analysis model used in this analysis can be found in previous papers (Lanfear and others, 1979; Smith and others, 1980; Lanfear and Samuels, 1981). The analysis was conducted in three parts corresponding to different aspects of the overall problem. The first part dealt with the probability of oilspill occurrence, and the second with the trajectories of oilspills from potential launch points to various targets. Results of the first two parts of the analysis were then combined to give estimates of the overall oilspill risk associated with oil and gas production in the lease area.

Decisionmaking Under Risk and Uncertainty

Oilspill impacts result primarily from two events that are probabilistic in nature: oilspill occurrence caused by accidents, and oilspill movement directed by random winds and currents. Although a probabilistic event (such as an oilspill) cannot be predicted with certainty, the likelihood of occurrence can be quantified. The likelihood that oilspills will result from an OCS leasing decision can be estimated, but whether they will actually occur can only be known after the area is explored and the oil, if any, is produced. This situation is in contrast to a deterministic situation where a particular action can be depended upon to produce a specific result.

In making decisions under risk and uncertainty, investigators must understand that a choice can have a range of possible outcomes. Generally, a desire to maximize the likelihood of the most favorable outcomes must be tempered by the need to minimize the probability of highly unfavorable outcomes. The U.S. Geological Survey (USGS) Oilspill Trajectory Analysis (OSTA) Model was designed to reflect the range of possible outcomes of leasing decisions by estimating the probability of occurrence for each discrete outcome; specifically, it estimates the likelihood that a particular target will be contacted by 0, 1, 2, ..., N oilspills during the production life of an OCS lease area.

The probability that, if an oilspill occurs at a given launch point, it will contact a particular target is termed a conditional probability. Such conditional probabilities can be very useful in identifying those launch points at which an oilspill, if it occurs, will pose the highest risks to various targets. Tables of conditional probabilities can help the analyst to select alternatives that will reduce overall risk. However, conditional probabilities do not include the probability of oilspill occurrence. It is assumed that a tract that contains little or no oil is a small risk because, no matter how high the conditional probability of contacting a target may be, the small amount of oil makes it unlikely that an oilspill will occur. Also, conditional probabilities for spills originating at the production platforms do not necessarily reflect the risks of spills during transportation. For these reasons, analysts are cautioned against basing judgments solely upon conditional probabilities.

Summary of the Proposed Action and the Major Alternatives

The proposed action is to lease 429 tracts on the Outer Continental Shelf off the Norton Sound coast. The study area for this analysis includes all of these tracts and extends from latitude 62 degrees N to 66 degrees 5 minutes N, and from longitude 159 degrees 24 minutes W to 169 degrees 7 minutes W.

The study area and the proposed tracts are shown on a Mercator projection in figure 1. The subdivisions of the proposed tracts are shown in figure 2. The launch points, which represent platform locations, pipeline routes, and tanker routes, are shown in figure 3. Two oil transportation scenarios were analyzed for the proposed action and each of three tract deletion alternatives. In the first scenario (referred to as "onshore"), all the oil from the lease area would be piped to a terminal onshore (P8) near Nome, Alaska. From there, the oil would be transported south by tankers out of the study area. In the second scenario, (referred to as "offshore") all the oil would be piped to an offshore terminal (P11) near the center of the lease area. From there the oil would be tankered south out of the study area. The three tract deletion alternatives are as follows:

1. northern tracts deleted (tract groups A and B)
2. southern tracts deleted (tract groups E, F, and G)
3. eastern tracts deleted (tract groups B, D, and G)

For the offshore transportation scenario of the east deletion alternative, the oil from the remaining tracts is piped to a terminal near the southeast edge of the lease area (P2) and tankered south from there.

Environmental Resources

The locations of 19 categories of biological resources (or targets, as they are designated in this paper) were digitized in the same coordinate system, or base map, as that used in trajectory simulations. Targets were selected by BLM analysts. Maps showing the digitized targets are shown in appendix A, figures A-1 to A-19. The monthly sensitivity of these targets was also recorded so that, for example, a target such as migrating birds could be contacted by simulated oilspills only when the birds would be in the area. Mid-boundary and seabird foraging areas 1 through 5 were given two sets of seasonal vulnerabilities (summer and winter). In this analysis, the winter season includes the months December to May, and the summer season includes the months June to November. The targets are listed below:

Average shorefast ice zone 1 (winter)
Average shorefast ice zone 2 (winter)
Average shorefast ice zone 3 (winter)
Average shorefast ice zone 4 (winter)

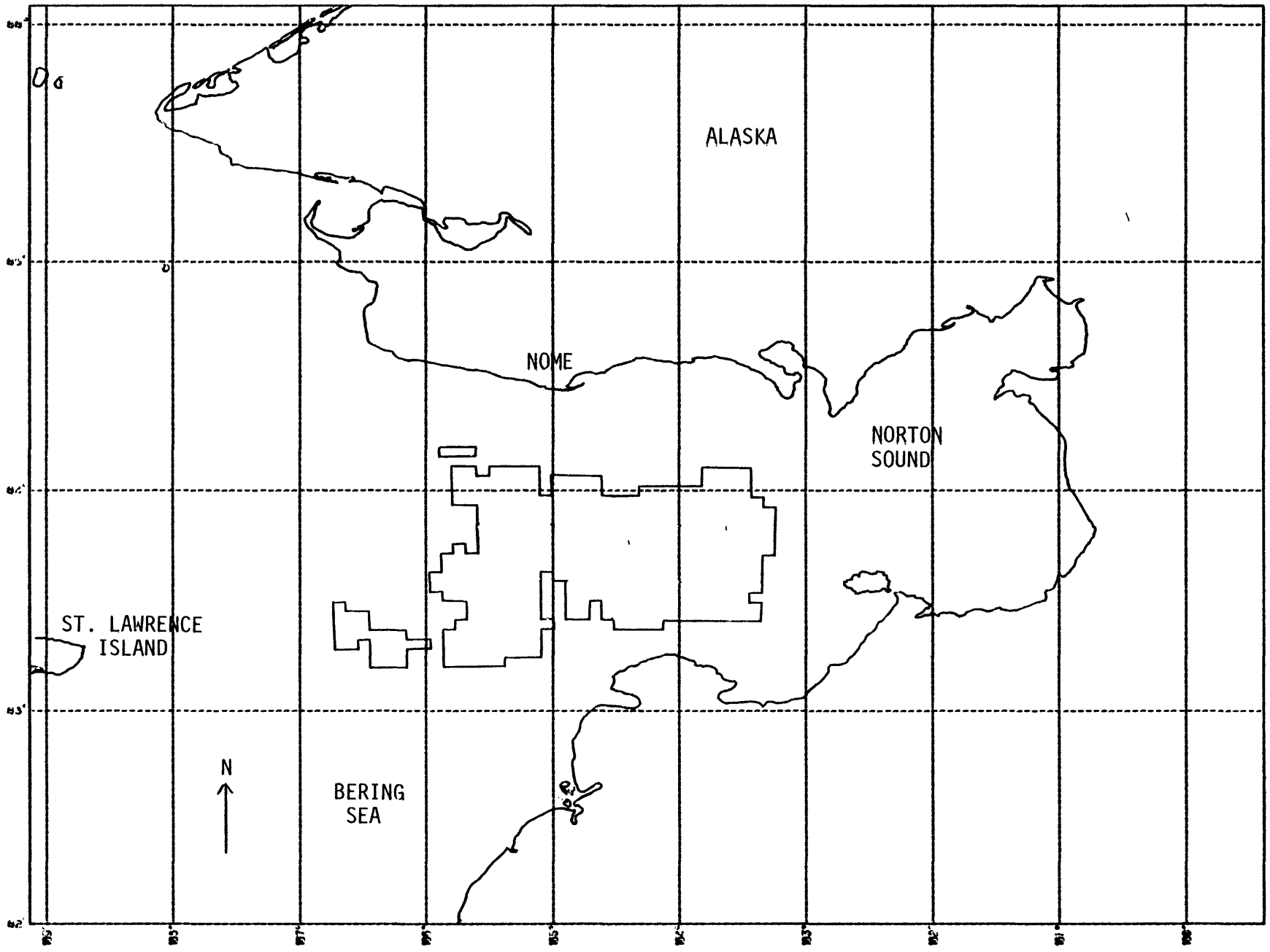

Figure 1.--Map showing the Norton Sound OCS Lease Sale 57 study area and the proposed lease tracts.

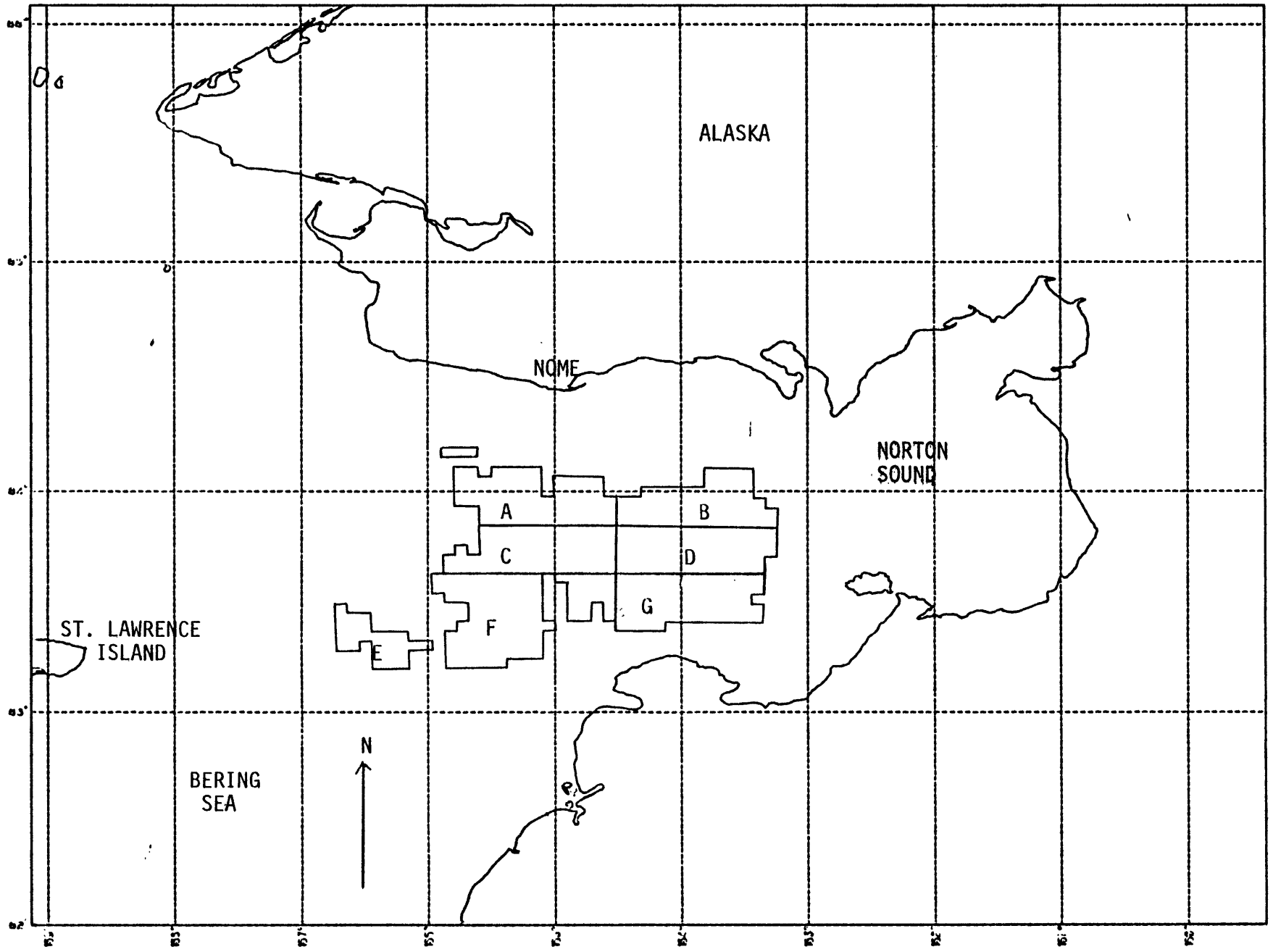

Figure 2.--Map showing the subdivisions of the proposed lease tracts for Norton Sound OCS Lease Sale 57.

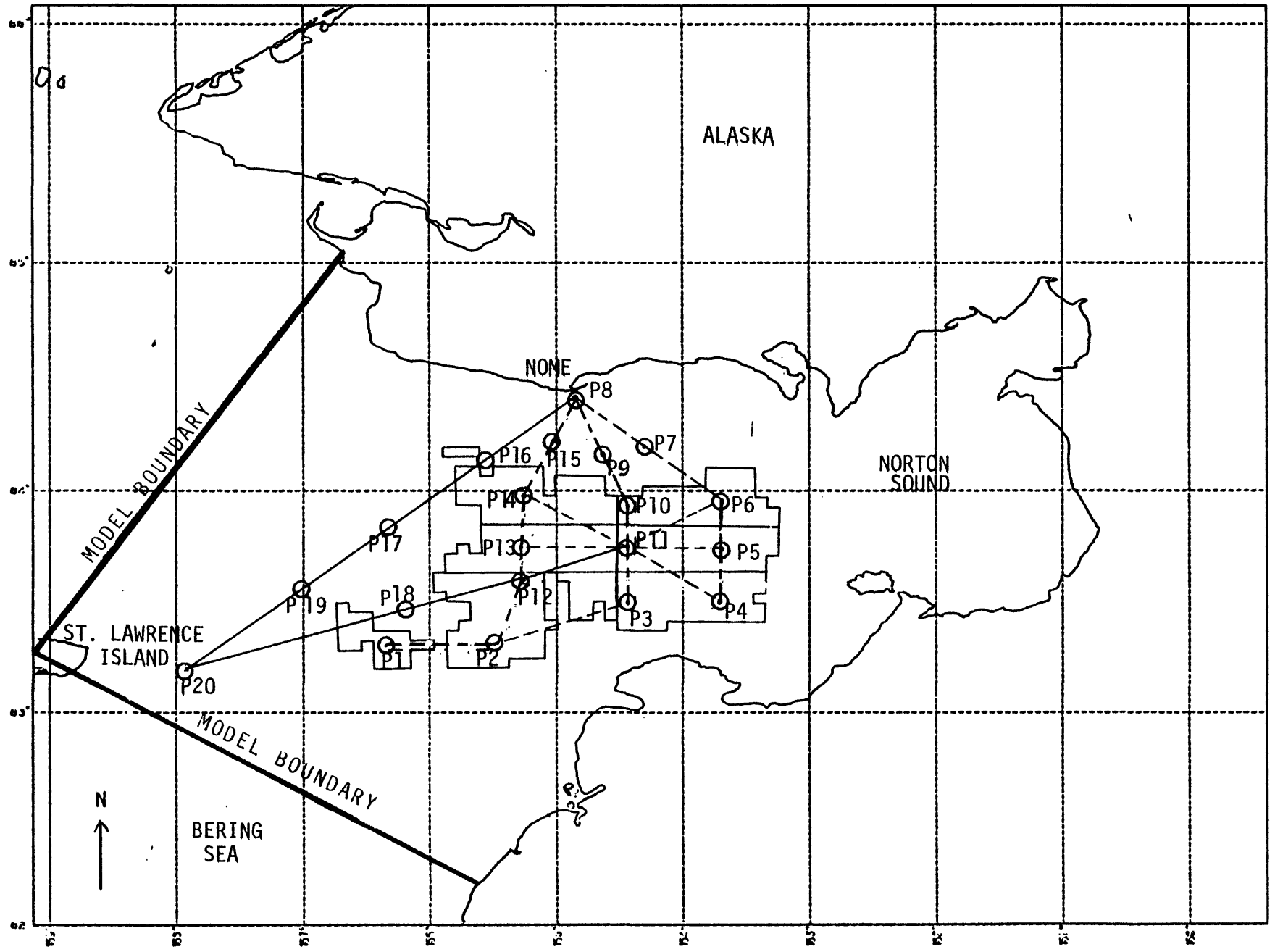

Figure 3.--Map showing the launch points which represent platform locations and pipelines (dashed lines) and tanker routes (solid lines). Polygons represent proposed lease tracts.

Average shorefast ice zone 5 (winter)
Average shorefast ice zone 6 (winter)
Mid-boundary area 1 (summer)
Mid-boundary area 2 (summer)
Mid-boundary area 3 (summer)
Mid-boundary area 4 (summer)
Mid-boundary area 5 (summer)
Mid-boundary area 1 (winter)
Mid-boundary area 2 (winter)
Mid-boundary area 3 (winter)
Mid-boundary area 4 (winter)
Mid-boundary area 5 (winter)
Seabird foraging area 1 (summer)
Seabird foraging area 2 (summer)
Seabird foraging area 3 (summer)
Seabird foraging area 4 (summer)
Seabird foraging area 5 (summer)
Seabird foraging area 1 (winter)
Seabird foraging area 2 (winter)
Seabird foraging area 3 (winter)
Seabird foraging area 4 (winter)
Seabird foraging area 5 (winter)
King crab fishery area (summer)
Yukon Delta entrainment area (summer)
Gray whale feeding area and hypothetical Bowhead whale migration corridor (summer and winter)

Because the trajectory model simulates an oilspill as a point, most targets have been given an areal extent slightly greater than they actually occupy. For example, some shoreline targets extend a short distance offshore; this allows the model to simulate a spill that approaches land, makes partial contact, withdraws, and continues on its way.

To provide a more detailed analysis for land or land-based targets, the model includes a feature that allows subdividing the coastline into land segments. Figure 4 shows the coastline divided into 24 segments of approximately equal length. The open sea boundaries were also divided into 10 segments of approximately equal length.

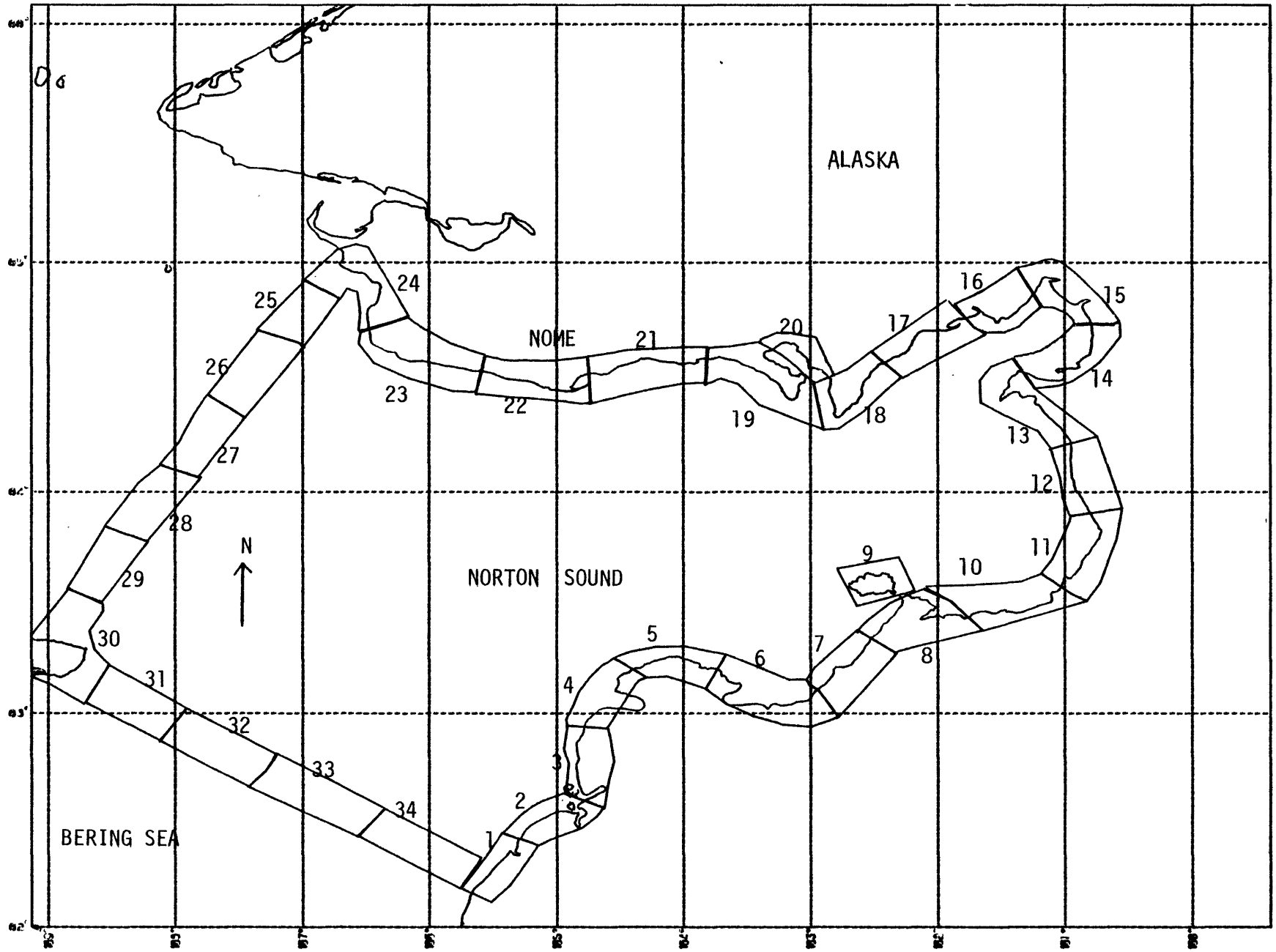

Figure 4.--Map showing the division of the Norton Sound open sea boundary and coastline into 34 segments of approximately equal length.

Estimated Quantity of Oil Resources

Considerable uncertainty exists in estimating the volume of oil that will be discovered and produced as a result of an OCS lease sale. A question exists as to whether oilspill risk calculations should be based upon a single estimate of volume, or should consider volume as a random variable and include some probability distribution for volume in computing oilspill occurrence probabilities. The choice may depend upon how the results are to be incorporated into the benefit/risk analysis.

Benefits and risks (as well as many environmental impacts), are functions of the volume of oil, and are not independent of each other. Greater risks are associated with greater volumes of oil and greater economic benefits. If benefits are evaluated by assuming production of a specific amount of oil, then the corresponding risks should be stated in a conditional form such as, "the risks are ..., given that the volume is ..." If benefits are evaluated for a number of discrete volumes, then risks should likewise be calculated for the same volumes. Any statements about the likelihood of the presence of a particular volume of oil apply equally well to the likelihood of the corresponding benefits and risks.

The estimated oil resources used for oilspill risk calculations in this report correspond to those used by BLM in preparing the draft EIS for the lease sale. These estimates are based on those derived by the Conservation Division, USGS for the draft EIS in August 1980. A 14 percent chance exists that oil is present in economically recoverable quantities in the sale area. If oil is present, then an estimated conditional mean value of 480 million barrels, distributed among the various subareas, may occur. For the deletion alternatives, the probability of commercial oil being present was assumed to remain the same (14 percent), but the quantities remaining were 260, 480, and 98 million barrels for the north, south, and east deletion alternatives, respectively. These conditional mean estimates are also based on those derived by the Conservation Division, USGS for the draft EIS in August 1980. Note that if the south deletion alternative is chosen, the remaining tracts have a resource estimate equal to the amount predicted for the entire sale area. These southern tracts are believed to be gas prone instead of oil bearing. We cannot overemphasize that these estimates are based on the assumption that oil is present; if it is not present (an 86 percent probability), then, obviously, no oilspill risks exist. The remainder of this analysis is designed to answer the question, "What are the risks if oil is found?"

Probability of Oilspills Occurring

The probability of oilspill occurrence (given that oil is present) is based on the fundamental assumption that realistic estimates of future spill frequencies can be based on past OCS experience. This analysis is based on the assumption that spills occur independently of each other as a Poisson process and that the spill rate is dependent upon the volume of oil produced or transported. This last assumption - that spill rate is a function of the volume of oil handled - might be modified on the basis of size, extent, frequency, or duration of the handling. In the case of tanker transport, for example, the number of port calls and the number of tanker-years have been contemplated (Stewart, 1976, and Stewart and Kennedy, 1978). This analysis is based on volume of oil handled, since all other estimates must ultimately be derived from this quantity.

This analysis includes all types of spills resulting from OCS leasing. It considers not only well blowouts, but also other accidents on platforms, transportation of the oil to shore, and, in some cases, further transportation from an intermediate terminus to refineries. Including all of these risks allows the risks of the proposed OCS leasing to be compared to those of other alternatives, such as importing oil. Previous USGS data on OCS accidents, (Dannenberger, 1976; 1980) are included in the data base, but comprise only a part of the data.

In past model runs, only spills larger than 1,000 barrels (bbl) were considered. This report examines, when the data permit, spills in two size ranges: 10,000 barrels or greater, and 1,000 barrels or greater (which is included in the first category). To place these sizes in a rough perspective, spills in the largest category are usually associated with catastrophies such as large blowouts or shipwrecks. Accidents in the second category typically include those and other serious events, such as structural failures and tanker collisions. The choice of size range to be used depends upon the analysis being performed. If, for example, a particular impact could occur only from a massive oil slick, then only large spills would be examined.

Accident rates for platforms on the U.S. OCS were derived from USGS accident files (USGS, 1979a and b), and from USGS production records (USGS, 1980). For spills of 1,000 barrels or larger, the period from 1964 to 1979 was used. Between 1964 and 1979, four spills of 10,000 barrels or larger occurred, and nine spills (including the four) of 1,000 barrels or larger occurred. During this period, U.S. OCS oil production was 4,386 million barrels.

USGS accident files are also a major source of data for pipeline accidents. As with platforms, the period from 1964 to 1979 was used for spills of 1,000 barrels or larger. USGS files (1979a and b) include two spills of over 10,000 barrels and seven spills (including the two) of over 1,000 barrels. Devanney and Stewart (1976) report six additional pipeline spills, but all except one (1,020 barrels) occurred in coastal channels. Adding this one spill to the USGS data gives a total of eight spills of 1,000 barrels or larger. Since nearly all U.S. OCS production has been transported to shore by pipelines, the same production statistics used for platforms can be applied to the pipeline accident data.

Accident data and oil transportation data for tankers is not maintained by the USGS, so tanker accident rates must be derived from published literature. The tanker accident rate for spills of 1,000 barrels or larger, used in recent OSTA models, is from Stewart (1976): 178 spills in 45,941 million barrels of oil transported. No detailed listing of these spills exists in the published literature. However, Devanney and Stewart (1974) examined tanker spills on major trade routes, and reported 99 spills greater than 42,000 gallons (1,000 barrels), 87 spills greater than 100,000 gallons, and 32 spills greater than 1,000,000 gallons. Interpolation of this data gives about 53 spills greater than 10,000 barrels, or about 54 percent of the 1,000-barrel spill rate. This estimate can be partially confirmed by listings of spills in Oilspill Intelligence Report (1979 and 1980) where, out of 22 spills of crude oil from bulk carriers reported for 1978 and 1979, and known or estimated to be larger than 1,000 barrels, 15, or 68 percent, were larger than 10,000 barrels. Therefore, a ratio of 60 percent of the 1,000-barrel rate appears reasonable, giving an estimated spill rate for 10,000 barrel and larger spills of 107 per 45,941 million barrels.

In summary, the spill rates used in this report are:

	Spills per billion barrels	
	1,000+ bbl	10,000+ bbl
Platforms	2.05	0.91
Pipelines	1.82	0.46
Tankers	3.87	2.32

Are these rates applicable to Alaska, since most of the existing data are from more temperate climates? About 400 million barrels of petroleum have been produced from platforms in Cook Inlet, piped to shore, and transported south by tankers; no spills of 1,000 barrels or greater have occurred. Applying the spill rates used in this analysis, we find a 10-percent chance of no spills in producing and

transporting 400 million barrels in this manner. Thus, the data base for Alaska (400 million barrels) is still too small to say, with a high degree of confidence, that the Alaskan spill rate differs from the rate for the rest of the U.S. OCS. This conclusion, however, will need to be reviewed if the commendable safety record of Alaskan operations continues for a longer period.

Spill frequency estimates were calculated for production and transportation of oil from Sale 57. Table 1 shows the expected number of spills and the most likely number of spills that will occur during the expected production life of the lease area. Figure 5 shows the probability that 0, 1, 2, ..., N spills will occur.

Oilspill Trajectory Simulations

Oilspill trajectories were simulated by the Rand Corporation, Santa Monica, Calif., using their three-dimensional model for estuaries and coastal seas (Liu and Nelson, 1977). The application of this model was developed as part of the BLM environmental studies program in the Bering Sea. Twenty launch points were selected representing platform locations, pipelines, and tanker routes in the study area. In this analysis, the location of the center of mass of each hypothetical oilspill was reported every 12 hours. Oilspill trajectories were simulated under three sets of environmental conditions. The first set, which included the months December to May, was termed the ice-cover condition. During this period, Norton Sound is covered by ice floes. For each launch point, 10 oilspills were simulated under different weather scenarios. The second set was an ice-free condition which included the months June to August. Because of the variability of the weather during this period, 26 hypothetical oilspills were launched from each site. The third set was also an ice-free condition including the months September to November. During this period, ten hypothetical oilspills were launched from each site. The trajectories calculated by Rand were transmitted to the U.S. Geological Survey, Reston, Va., on computer-compatible tapes. The x,y coordinates of the trajectories in the Rand grid system were converted to the USGS grid system by a linear transformation. As the simulated oilspill was moved, any contacts with targets were recorded. Spill movement continued until the spill hit land, moved off the map, or aged more than 30 days.

The trajectories simulated by the model represent only hypothetical pathways of oil slicks and do not involve any direct consideration of cleanup, dispersion, or weathering processes which could determine the quantity or quality of oil that might eventually come in contact with targets. An implicit analysis of weathering and decay can be considered by noting the age of

Table 1. -- Oilspill probability estimates for spills greater than 1,000 and 10,000 barrels resulting from OCS Lease Sale 57.

	Expected number of spills (mean).		Most likely number of spills (mode).		Probability of one or more spills	
	>1,000	>10,000	>1,000	>10,000	>1,000	>10,000
Proposed action (onshore and offshore scenarios)	2.8	1.5	2	1	0.94	0.70
North deletion (onshore and offshore scenarios)	1.5	0.62	1	0	0.78	0.48
South deletion (onshore and offshore scenarios)	2.8	1.5	2	1	0.94	0.70
East deletion (onshore and offshore scenarios)	0.56	0.23	0	0	0.43	0.22

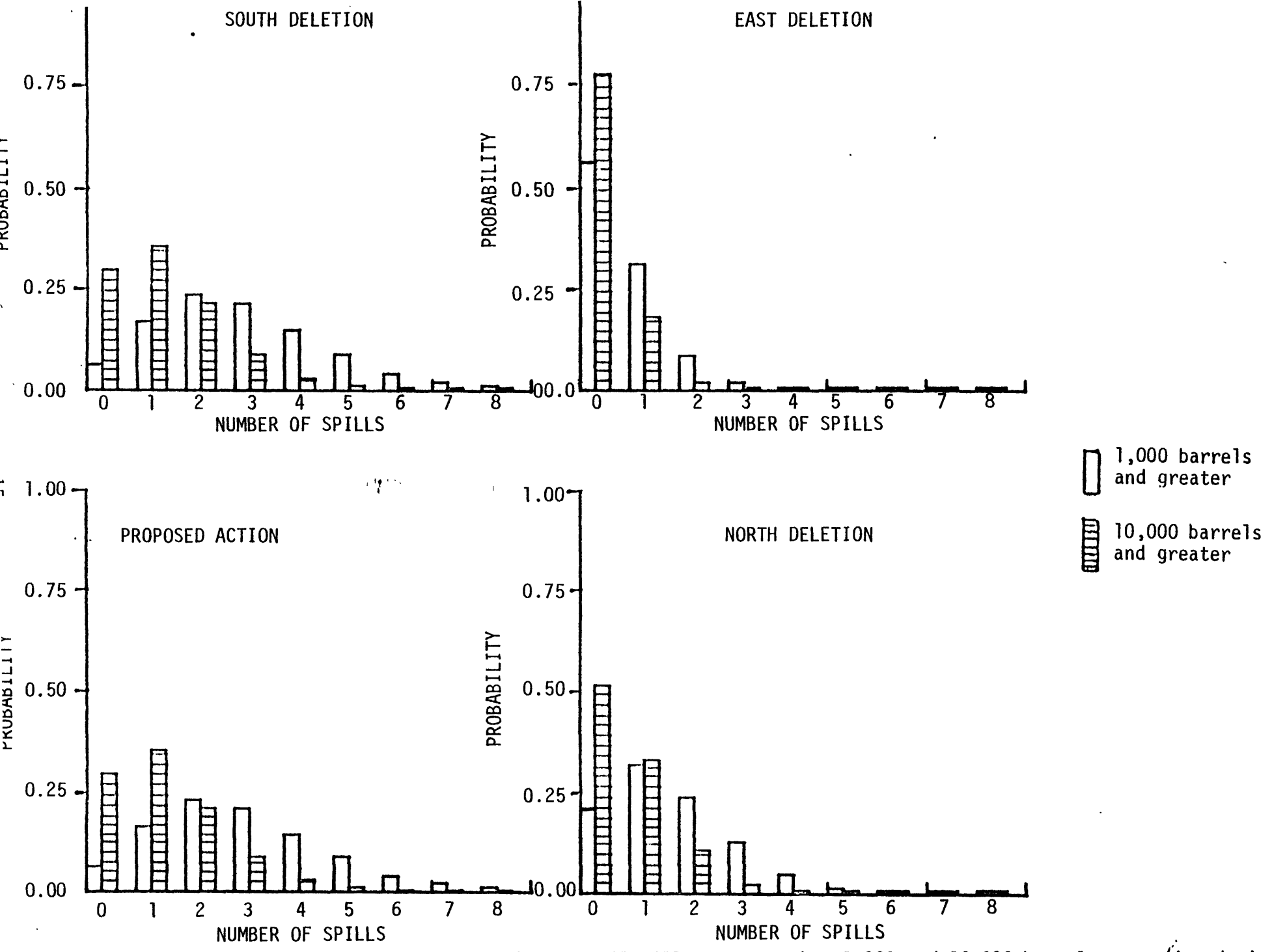

Figure 5.--Estimated frequency distribution for oilspills greater than 1,000 and 10,000 barrels occurring during the expected production life of the proposed lease tracts for Norton Sound OCS Lease Sale 57.

simulated oilspills when they contact targets. For this analysis, three time periods were selected: 3 days, to represent diminished toxicity of the spill; 10 days, to allow for deployment of cleanup equipment; and 30 days, to represent the difficulty of tracking or locating spills after this time.

When calculating probabilities from Monte Carlo trials it is desirable to estimate the error associated with this technique. The calculation of the standard deviation s, for a particular probability p is calculated as follows:

$$s = SQRT(p(1-p)/N)$$

where N = number of trials. The shape of this distribution approximates the normal curve, thus, table 2 shows, for the 90-percent confidence level of this distribution, values of s as a function of p and N. When comparing two probabilities, the investigator should also test whether the two values are significantly different from each other. Figure 6 shows the results of this significance test, based on the formula above (N = 46, 90-percent confidence level). Points lying within the shaded portion of the graph are not significantly different from each other.

Each entry in tables 3, 4, and 5 represents the probability (expressed as percent chance) that, if a spill starts from a certain launch point, it will contact a particular target within 3, 10, or 30 days, respectively. Tables 6, 7, and 8 present similar probabilities for land and sea segments. These conditional probabilities allow for the possibility that the targets may not be vulnerable to oilspills for the entire year: a target that is vulnerable for only 1 month, for example, could have a conditional probability no higher than about 1/12.

Combined Analysis of Oilspill Occurrence and Oilspill Trajectory Simulations

Data in figure 5 indicate the probabilities of different numbers of oilspills occurring. Tables 3 to 8 indicate the probabilities that targets or land or sea segments will be contacted, given that an oilspill occurs. Combining these two sets of probabilities yields estimates of the chances that oilspills will occur and contact targets or land segments.

A critical difference exists between the conditional probabilities calculated in the previous section and the overall probabilities calculated in this section. Conditional probabilities depend only on the winds and currents in the study area -- elements over which the decisionmaker has no control. Overall probabilities, on the other hand, will depend not only on

of the number of trials and the estimated probability.

	NUMBER OF TRIALS									
PROB	10	20	40	46	50	100	200	500	1000	2000
0.02	0.07	0.05	0.04	0.03	0.03	0.02	0.02	0.01	0.01	0.01
0.04	0.10	0.07	0.05	0.05	0.05	0.03	0.02	0.01	0.01	0.01
0.06	0.12	0.09	0.06	0.06	0.06	0.04	0.03	0.02	0.01	0.01
0.08	0.14	0.10	0.07	0.07	0.06	0.04	0.03	0.02	0.01	0.01
0.10	0.16	0.11	0.08	0.07	0.07	0.05	0.04	0.02	0.02	0.01
0.12	0.17	0.12	0.08	0.08	0.08	0.05	0.04	0.02	0.02	0.01
0.14	0.18	0.13	0.09	0.08	0.08	0.06	0.04	0.03	0.02	0.01
0.16	0.19	0.14	0.10	0.09	0.09	0.06	0.04	0.03	0.02	0.01
0.18	0.20	0.14	0.10	0.09	0.09	0.06	0.04	0.03	0.02	0.01
0.20	0.21	0.15	0.10	0.10	0.09	0.07	0.05	0.03	0.02	0.01
0.22	0.22	0.15	0.11	0.10	0.10	0.07	0.05	0.03	0.02	0.02
0.24	0.22	0.16	0.11	0.10	0.10	0.07	0.05	0.03	0.02	0.02
0.26	0.23	0.16	0.11	0.11	0.10	0.07	0.05	0.03	0.02	0.02
0.28	0.23	0.17	0.12	0.11	0.10	0.07	0.05	0.03	0.02	0.02
0.30	0.24	0.17	0.12	0.11	0.11	0.08	0.05	0.03	0.02	0.02
0.32	0.24	0.17	0.12	0.11	0.11	0.08	0.05	0.03	0.02	0.02
0.34	0.25	0.17	0.12	0.12	0.11	0.08	0.06	0.03	0.02	0.02
0.36	0.25	0.18	0.13	0.12	0.11	0.08	0.06	0.04	0.03	0.02
0.38	0.25	0.18	0.13	0.12	0.11	0.08	0.06	0.04	0.03	0.02
0.40	0.26	0.18	0.13	0.12	0.11	0.08	0.06	0.04	0.03	0.02
0.42	0.26	0.18	0.13	0.12	0.12	0.08	0.06	0.04	0.03	0.02
0.44	0.26	0.18	0.13	0.12	0.12	0.08	0.06	0.04	0.03	0.02
0.46	0.26	0.18	0.13	0.12	0.12	0.08	0.06	0.04	0.03	0.02
0.48	0.26	0.18	0.13	0.12	0.12	0.08	0.06	0.04	0.03	0.02
0.50	0.26	0.18	0.13	0.12	0.12	0.08	0.06	0.04	0.03	0.02

Level of significance = 90 percent

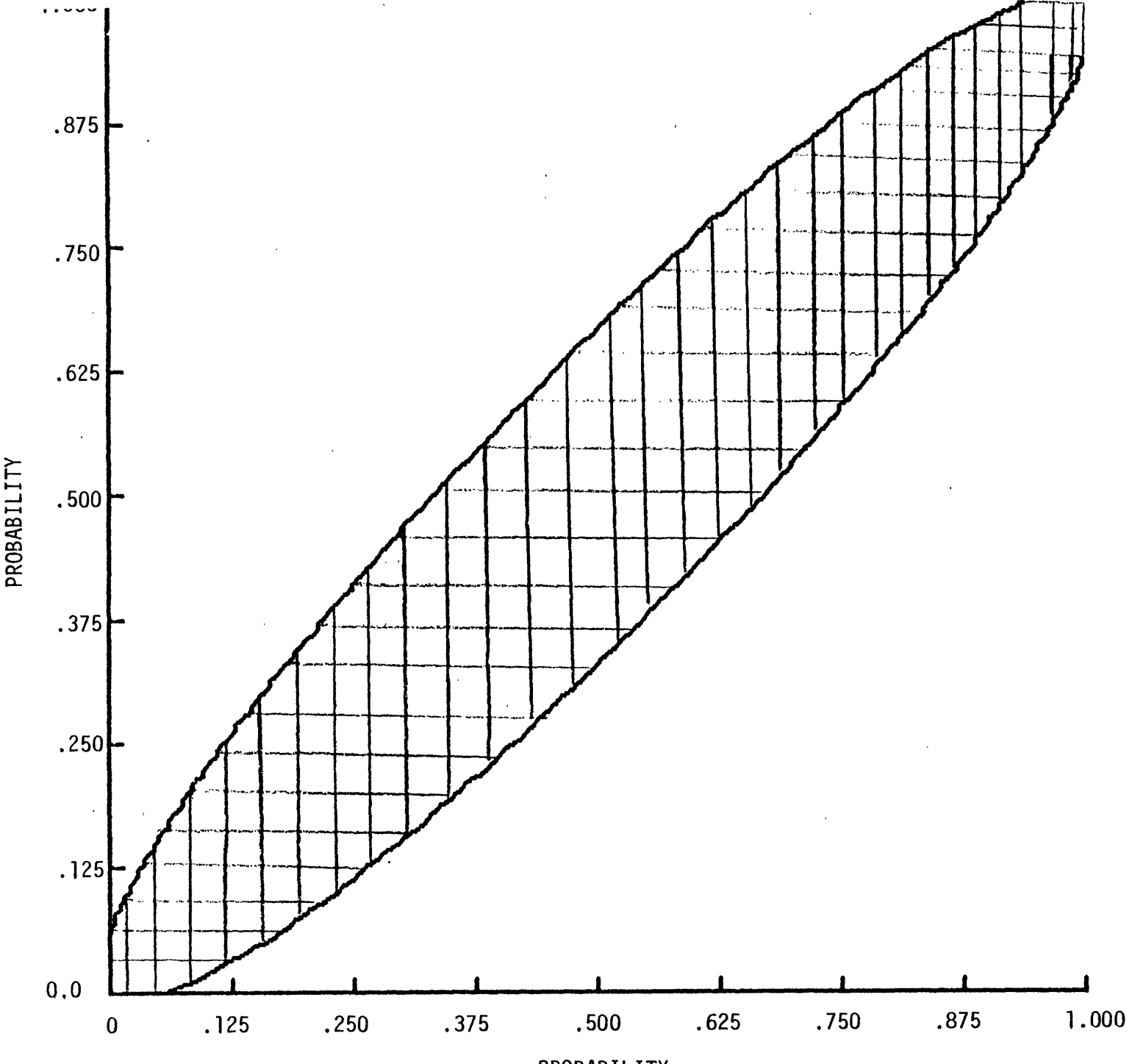

Figure 6.--Results of a significance test for any two probabilities (46 trials, 90 percent confidence level). Points lying within the shaded portion of the graph are not significantly different from each other.

Table 3. -- Probabilities (expressed as percent chance) that an oilspill starting at a particular location will contact a certain target within 3 days.

Target	Hypothetical Spill Location																			
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20
Land	n	n	n	3	n	n	6	3	n	n	n	n	n	n	3	1	n	n	n	n
Ice zone 1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Ice zone 2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Ice zone 3	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Ice zone 4	n	n	n	45	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Ice zone 5	n	n	50	40	5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Ice zone 6	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Mid. Bnd. 1 Sum.	n	n	n	n	1	8	50	22	16	6	n	1	3	12	50	17	1	n	n	n
Mid. Bnd. 2 Sum.	n	n	n	1	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Mid. Bnd. 3 Sum.	n	30	28	27	5	n	n	n	n	n	5	14	2	n	n	n	n	5	n	n
Mid. Bnd. 4 Sum.	20	2	n	n	n	n	n	n	n	n	n	2	n	n	n	n	2	15	7	5
Mid. Bnd. 5 Sum.	n	n	n	n	n	n	n	n	n	n	n	n	n	3	2	3	13	2	16	2
Mid. Bnd. 1 Wint.	n	n	n	n	5	10	50	15	5	n	n	n	n	n	50	n	n	n	n	n
Mid. Bnd. 2 Wint.	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Mid. Bnd. 3 Wint.	n	5	35	30	5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Mid. Bnd. 4 Wint.	45	25	10	5	5	n	n	n	n	n	5	5	n	n	n	n	n	20	n	n
Mid. Bnd. 5 Wint.	n	5	15	5	n	15	15	10	25	20	15	15	20	25	25	35	45	5	20	n
Sbd. For. 1 Sum.	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n
Sbd. For. 2 Sum.	n	n	n	n	n	n	n	2	2	n	n	n	n	4	3	13	9	n	1	n
Sbd. For. 3 Sum.	n	n	n	n	1	11	21	22	5	3	n	n	n	n	2	n	n	n	n	n
Sbd. For. 4 Sum.	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sbd. For. 5 Sum.	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sbd. For. 1 Wint.	n	n	n	5	n	n	n	15	5	5	5	n	n	n	10	n	n	n	n	n
Sbd. For. 2 Wint.	n	n	n	5	n	10	15	30	20	10	5	n	n	20	40	40	n	n	n	n
Sbd. For. 3 Wint.	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sbd. For. 4 Wint.	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sbd. For. 5 Wint.	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
King Crab Sum.	n	n	n	n	1	12	50	50	17	7	1	1	2	11	50	17	2	n	n	n
Yukon Delta Sum.	n	1	7	17	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Gray Whale Area	32	20	20	n	5	5	5	10	15	15	15	25	25	20	10	25	47	32	75	**

Note: ** = Greater than 99.5 percent; n = less than 0.5 percent.

Table 4. -- Probabilities (expressed as percent chance) that an oilspill starting at a particular location will contact a certain target within 10 days.

Target	Hypothetical Spill Location																			
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20
Land	7	6	13	17	14	20	21	19	10	6	9	4	4	8	13	13	4	7	4	1
Ice zone 1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Ice zone 2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Ice zone 3	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Ice zone 4	n	n	n	45	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Ice zone 5	n	n	50	40	20	5	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Ice zone 6	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Mid. Bnd. 1 Sum.	4	4	5	1	6	9	50	28	24	16	11	9	12	18	50	22	9	5	2	n
Mid. Bnd. 2 Sum.	n	1	4	16	18	15	4	n	1	4	4	1	n	1	1	n	n	n	n	n
Mid. Bnd. 3 Sum.	9	31	31	27	22	15	5	n	7	17	22	17	3	n	2	n	4	10	4	n
Mid. Bnd. 4 Sum.	25	17	5	n	n	n	n	2	10	2	n	20	22	17	13	10	13	22	7	13
Mid. Bnd. 5 Sum.	1	n	2	n	n	2	2	7	7	2	2	3	2	8	5	11	16	4	21	5
Mid. Bnd. 1 Wint.	n	n	n	n	5	10	50	20	5	n	n	n	n	n	50	n	n	n	n	n
Mid. Bnd. 2 Wint.	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Mid. Bnd. 3 Wint.	n	5	40	40	20	10	n	n	n	5	10	n	n	n	n	n	n	n	n	n
Mid. Bnd. 4 Wint.	50	45	30	30	30	15	10	5	10	15	25	30	15	5	5	5	n	30	n	n
Mid. Bnd. 5 Wint.	n	5	15	5	10	30	35	30	40	30	15	15	25	40	40	45	45	5	20	n
Sbd. For. 1 Sum.	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	3	1	3	2
Sbd. For. 2 Sum.	2	n	n	n	n	2	5	7	2	n	n	1	2	4	3	13	11	3	7	3
Sbd. For. 3 Sum.	n	1	5	2	9	13	23	25	17	15	10	2	2	9	13	6	n	n	n	n
Sbd. For. 4 Sum.	n	n	n	n	n	4	2	n	1	1	n	n	n	n	n	n	n	n	n	n
Sbd. For. 5 Sum.	n	n	1	3	3	1	n	n	n	n	1	n	n	n	n	n	n	n	n	n
Sbd. For. 1 Wint.	n	n	n	5	n	n	n	15	5	5	5	n	n	n	10	n	n	n	n	n
Sbd. For. 2 Wint.	n	n	n	5	n	10	25	45	25	10	5	n	n	20	40	40	n	n	n	n
Sbd. For. 3 Wint.	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sbd. For. 4 Wint.	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sbd. For. 5 Wint.	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
King Crab Sum.	4	6	5	3	9	14	50	50	23	17	12	11	12	18	50	22	11	6	2	n
Yukon Delta Sum.	9	6	17	22	17	7	n	n	n	5	7	n	n	n	n	n	1	5	5	2
Gray Whale Area	52	32	30	15	30	35	32	40	47	37	32	45	47	60	45	62	70	62	78	**

Note: ** = Greater than 99.5 percent; n = less than 0.5 percent.

Table 5. -- Probabilities (expressed as percent chance) that an oilspill starting at a particular location will contact a certain target within 30 days.

Target	Hypothetical Spill Location																			
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20
Land	18	22	32	37	35	37	32	25	25	27	30	23	22	22	24	22	17	20	18	11
Ice zone 1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Ice zone 2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Ice zone 3	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Ice zone 4	n	n	n	45	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Ice zone 5	n	n	50	45	20	5	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Ice zone 6	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Mid. Bnd. 1 Sum.	11	8	7	1	6	9	50	28	24	17	12	16	17	21	50	22	15	13	11	6
Mid. Bnd. 2 Sum.	6	11	12	16	18	15	5	3	6	9	11	10	8	5	5	4	5	4	2	2
Mid. Bnd. 3 Sum.	9	31	31	27	22	15	7	n	7	17	22	17	3	n	2	n	4	10	5	8
Mid. Bnd. 4 Sum.	25	17	13	5	13	5	10	7	13	15	7	22	22	17	15	13	13	22	7	13
Mid. Bnd. 5 Sum.	1	n	2	n	2	10	10	15	10	5	5	3	2	8	7	11	16	4	21	6
Mid. Bnd. 1 Wint.	n	n	n	n	5	10	50	20	5	n	n	n	n	n	50	n	n	n	n	n
Mid. Bnd. 2 Wint.	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Mid. Bnd. 3 Wint.	n	5	40	40	20	10	n	n	n	5	10	n	n	n	n	n	n	n	n	n
Mid. Bnd. 4 Wint.	50	45	35	40	35	15	10	5	10	15	25	30	15	5	5	5	n	30	n	n
Mid. Bnd. 5 Wint.	n	5	15	5	10	30	35	30	40	30	15	15	25	40	40	45	45	5	20	n
Sbd. For. 1 Sum.	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	3	1	3	3
Sbd. For. 2 Sum.	2	n	n	n	n	2	5	7	2	n	n	1	2	4	3	13	11	3	8	4
Sbd. For. 3 Sum.	5	8	8	2	9	13	23	25	17	16	13	12	13	14	13	12	8	10	9	4
Sbd. For. 4 Sum.	n	6	9	11	12	10	7	2	7	9	8	4	4	3	3	2	4	2	1	1
Sbd. For. 5 Sum.	1	2	4	5	4	4	n	n	n	3	5	1	1	n	n	1	1	1	1	1
Sbd. For. 1 Wint.	n	n	n	5	n	n	n	15	5	5	5	n	n	n	10	n	n	n	n	n
Sbd. For. 2 Wint.	n	n	n	5	n	10	25	45	25	10	5	n	n	20	40	40	n	n	n	n
Sbd. For. 3 Wint.	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sbd. For. 4 Wint.	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sbd. For. 5 Wint.	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
King Crab Sum.	12	11	8	4	9	14	50	50	23	18	17	18	20	23	50	24	16	16	13	8
Yukon Delta Sum.	9	6	17	22	20	7	2	n	n	5	7	n	n	n	n	n	2	5	6	7
Gray Whale Area	52	37	37	17	37	47	47	55	57	50	42	50	52	62	55	65	72	62	78	**

Note: ** = Greater than 99.5 percent; n = less than 0.5 percent.

Table 6. -- Probabilities (expressed as percent chance) that an oilspill starting at a particular location will contact a certain land or sea segment within 3 days.

Land or Sea Segment	Hypothetical Spill Location																			
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20
5	n	n	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
21	n	n	n	n	n	n	1	3	n	n	n	n	n	n	n	n	n	n	n	n
22	n	n	n	n	n	n	n	n	n	n	n	n	n	n	3	n	n	n	n	n
23	n	n	n	n	n	n	5	n	n	n	n	n	n	n	n	1	n	n	n	n
25	n	n	n	5	n	n	n	5	5	5	n	n	n	n	5	1	n	n	n	n
26	n	n	5	n	n	n	10	15	5	n	5	n	n	10	10	10	n	n	n	n
27	n	n	n	n	n	n	5	n	5	5	n	5	5	5	5	10	5	n	n	n
28	n	5	n	n	n	n	n	n	5	5	n	10	10	5	n	5	15	5	5	n
29	10	5	n	n	n	n	n	n	n	n	n	n	5	n	n	n	5	10	20	n
30	5	5	n	n	n	n	n	n	n	n	5	5	n	n	n	n	n	5	5	5
31	10	5	5	n	n	n	n	n	n	n	n	5	n	n	n	n	n	5	n	47
32	n	5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1

Notes: ** = Greater than 99.5 percent; n = less than 0.5 percent.
Rows with all values less than 0.5 percent are not shown.

Table 7. -- Probabilities (expressed as percent chance) that an oilspill starting at a particular location will contact a certain land or sea segment within 10 days.

Land or Sea Segment	Hypothetical Spill Location																			
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20
1	n	n	2	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
3	3	n	2	n	n	n	n	n	n	n	5	n	n	n	n	n	n	1	1	n
4	2	2	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n	3	1	1
5	1	2	2	7	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n
7	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
8	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
9	n	n	2	3	3	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
12	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n
17	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n
18	n	n	n	2	n	5	n	n	n	n	n	n	n	n	n	n	n	n	n	n
19	n	n	2	n	2	5	11	3	1	2	1	n	n	n	n	n	n	n	n	n
20	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
21	n	n	n	1	1	1	6	14	6	3	2	n	n	n	4	n	n	n	n	n
22	n	1	1	n	n	n	n	1	1	n	1	4	3	6	7	8	n	n	n	n
23	1	1	n	n	5	5	5	1	2	1	n	n	1	2	2	5	4	3	2	n
24	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n
25	2	n	n	5	n	n	n	5	5	5	n	1	1	1	5	1	3	1	3	2
26	n	n	5	n	n	n	10	17	5	n	5	n	n	10	10	10	n	n	n	1
27	n	n	n	n	n	10	5	15	5	10	n	5	5	7	17	12	5	n	n	n
28	n	5	n	2	5	5	15	5	20	5	10	12	10	15	10	20	27	5	5	n
29	10	7	5	7	n	5	5	n	n	15	n	n	10	10	n	n	10	12	27	n
30	7	5	5	5	15	5	n	n	5	n	20	10	10	n	n	5	7	10	30	15
31	27	15	15	5	5	5	n	5	10	5	n	15	5	10	10	5	5	25	7	57
32	17	12	5	15	5	n	5	n	2	10	10	10	15	2	2	2	5	7	2	7
33	7	17	10	n	5	5	n	n	n	n	5	7	2	n	n	n	n	2	n	n
34	n	2	n	n	n	n	n	n	n	2	n	2	n	n	n	n	n	n	n	n

Notes: ** = Greater than 99.5 percent; n = less than 0.5 percent.
Rows with all values less than 0.5 percent are not shown.

Table 8. -- Probabilities (expressed as percent chance) that an oilspill starting at a particular location will contact a certain land or sea segment within 30 days.

Land or Sea Segment	Hypothetical Spill Location																			
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20
1	n	n	2	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
2	n	n	n	n	n	2	2	n	n	2	n	n	n	n	n	n	n	n	n	n
3	3	n	2	n	2	n	n	n	n	n	5	n	n	n	n	n	n	1	2	1
4	2	2	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n	3	2	3
5	1	2	2	7	n	5	n	n	n	n	n	n	n	n	n	n	n	n	n	1
6	n	n	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
7	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
8	1	1	2	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	2	n
9	1	1	2	3	3	n	n	n	n	n	1	2	2	n	n	n	n	2	1	n
11	1	2	3	7	6	2	1	n	1	3	5	2	2	1	n	n	1	n	n	n
12	n	2	5	4	1	3	1	n	3	3	n	2	n	n	n	1	n	2	n	n
13	n	1	4	3	6	4	5	n	1	n	5	1	n	1	2	1	1	n	n	n
14	n	n	n	n	2	n	n	1	1	1	2	n	n	n	n	n	n	n	n	n
15	n	n	n	n	n	1	n	1	n	n	n	n	n	n	n	n	n	n	n	n
16	n	2	1	1	n	2	1	n	n	2	n	n	n	n	n	n	n	n	n	n
17	1	n	n	2	3	3	n	2	2	n	1	3	2	n	1	n	1	n	n	n
18	2	2	1	4	1	5	1	n	1	5	3	3	3	2	1	n	n	1	n	n
19	1	2	4	n	2	5	11	5	6	7	5	4	6	5	3	4	2	5	1	2
20	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
21	1	2	1	1	1	1	6	14	8	4	3	3	2	6	8	4	3	1	6	2
22	2	2	1	n	n	n	n	1	1	n	1	4	4	6	7	8	3	n	1	1
23	3	2	n	n	5	5	5	1	2	1	n	n	2	2	2	5	7	6	4	n
24	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	1
25	2	n	n	5	n	n	n	5	5	5	n	1	1	1	5	1	3	1	3	3
26	n	n	5	n	n	n	10	17	5	n	5	n	n	10	10	10	n	n	n	1
27	n	n	n	2	2	10	7	17	7	10	n	5	5	7	17	12	5	n	n	n
28	n	5	n	2	5	7	20	7	22	7	10	12	12	15	15	22	27	5	5	n
29	10	7	5	10	2	10	7	5	2	20	5	n	10	15	n	2	12	12	27	n
30	12	10	10	5	17	12	2	10	10	5	25	15	15	7	10	15	17	17	30	15
31	27	15	17	5	12	7	10	5	15	7	2	20	10	12	12	7	7	27	7	57
32	17	17	7	27	10	7	5	2	5	12	12	12	17	5	2	2	5	7	5	7
33	7	17	20	5	12	5	2	2	n	2	5	7	2	2	2	2	n	5	n	n
34	n	2	2	n	n	2	2	2	2	2	5	2	2	n	n	n	n	n	n	n

Notes: ** = Greater than 99.5 percent; n = less than 0.5 percent.
Rows with all values less than 0.5 percent are not shown.

the physical conditions, but also on the course of action chosen by the decisionmaker, that is, choosing to sell or not to sell the lease tracts.

Two oilspill sizes are considered in this analysis, those greater than 1,000 barrels and those greater than 10,000 barrels. Tables 9 and 10 show the probabilities (expressed as percent chance) of one or more oilspills (greater than 1,000 barrels and greater than 10,000 barrels) the most likely number of oilspills, and the expected number of oilspills occurring and contacting targets within periods of 3, 10, and 30 days, over the expected production life of the proposed lease tracts, for onshore and offshore transportation scenarios, respectively. Tables 11 to 16 show similar probabilities for the north, south, and east deletion alternatives (onshore and offshore transportation scenarios). Tables 17 to 24 show similar probabilities to land and sea segments for the proposed lease tracts, north, south, and east deletion alternatives (onshore and offshore transportation scenarios).

The overall probabilities are also shown graphically in appendices B and C. Figures B-1 through B-41 are histograms which show probabilities of 1, 2, ... N spills occurring and contacting specific targets within periods of 3, 10, and 30 days. Figures C-1 through C-6 indicate, through circles superimposed on maps of the coastline, the probabilities of one or more spills occurring and contacting land segments within 3, 10, and 30 days, for both scenarios.

Discussion of Results

Assuming that oil is spilled in the lease area, the probability of a spill contacting land within 3 days is minimal for each launch point. These probabilities increase as spills are tracked up to 30 days; however, the chances of oil contacting land are still no higher than 37 percent (see launch point P4, table 5). Most of the spills head in a westerly direction, contacting the segments along the open sea boundary. Even launch point P8, located very close to shore near Nome, Alaska, has only a 25-percent chance of contacting land within 30 days. Any spills that would come ashore would probably also be highly weathered. The shorefast ice zones also have little chance of being hit by an oilspill (assuming one occurs) except by spills launched from sites P3 and P4. The spill contact probabilities for ice zones 4 and 5 are in the range of 40 to 50 percent (see table 5) from these launch points for 3-day travel times.

If all the tracts are leased and oil is discovered somewhere in the lease area, the probability that one or more spills (of 1,000 barrels and larger) will occur and contact land (within a 30-day

Table 9. -- Probabilities (expressed as percent chance) of one or more spills, the most likely number of spills (mode), and the expected number of spills (mean) occurring and contacting targets over the production life of the proposed lease tracts using onshore transportation scenario.

Target	Within 3 days						Within 10 days						Within 30 days					
	≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
Land	2	0	0.0	1	0	0.0	27	0	0.3	12	0	0.1	51	0	0.7	26	0	0.3
Ice zone 1	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 2	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 3	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 4	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 5	1	0	0.0	1	0	0.0	6	0	0.1	3	0	0.0	6	0	0.1	3	0	0.0
Ice zone 6	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Mid. Bnd. 1 Sum.	25	0	0.3	10	0	0.1	35	0	0.4	16	0	0.2	39	0	0.5	18	0	0.2
Mid. Bnd. 2 Sum.	n	0	0.0	n	0	0.0	11	0	0.1	4	0	0.0	19	0	0.2	8	0	0.1
Mid. Bnd. 3 Sum.	3	0	0.0	1	0	0.0	21	0	0.2	9	0	0.1	23	0	0.3	10	0	0.1
Mid. Bnd. 4 Sum.	3	0	0.0	2	0	0.0	16	0	0.2	8	0	0.1	27	0	0.3	13	0	0.1
Mid. Bnd. 5 Sum.	7	0	0.1	4	0	0.0	16	0	0.2	8	0	0.1	23	0	0.3	11	0	0.1
Mid. Bnd. 1 Wint.	17	0	0.2	6	0	0.1	19	0	0.2	7	0	0.1	19	0	0.2	7	0	0.1
Mid. Bnd. 2 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Mid. Bnd. 3 Wint.	1	0	0.0	1	0	0.0	11	0	0.1	5	0	0.0	11	0	0.1	5	0	0.0
Mid. Bnd. 4 Wint.	3	0	0.0	1	0	0.0	26	0	0.3	11	0	0.1	27	0	0.3	12	0	0.1
Mid. Bnd. 5 Wint.	38	0	0.5	20	0	0.2	53	0	0.8	28	0	0.3	53	0	0.8	28	0	0.3
Sbd. For. 1 Sum.	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
Sbd. For. 2 Sum.	6	0	0.1	3	0	0.0	11	0	0.1	6	0	0.1	12	0	0.1	6	0	0.1
Sbd. For. 3 Sum.	15	0	0.2	6	0	0.1	26	0	0.3	11	0	0.1	32	0	0.4	15	0	0.2
Sbd. For. 4 Sum.	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	14	0	0.1	6	0	0.1
Sbd. For. 5 Sum.	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	5	0	0.0	2	0	0.0
Sbd. For. 1 Wint.	10	0	0.1	4	0	0.0	10	0	0.1	4	0	0.0	10	0	0.1	4	0	0.0
Sbd. For. 2 Wint.	30	0	0.4	14	0	0.1	36	0	0.4	16	0	0.2	36	0	0.4	16	0	0.2
Sbd. For. 3 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Sbd. For. 4 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Sbd. For. 5 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
King Crab Sum.	34	0	0.4	15	0	0.2	43	0	0.6	20	0	0.2	48	0	0.6	23	0	0.3
Yukon Delta Sum.	n	0	0.0	n	0	0.0	11	0	0.1	5	0	0.0	13	0	0.1	6	0	0.1
Gray Whale Area	50	0	0.7	31	0	0.4	75	1	1.4	47	0	0.6	80	1	1.6	52	0	0.7

Note: n = less than 0.5 percent; ** = greater than 99.5 percent.

Table 10. -- Probabilities (expressed as percent chance) of one or more spills, the most likely number of spills (mode), and the expected number of spills (mean) occurring and contacting targets over the production life of the proposed lease tracts using offshore transportation scenario.

Target	Within 3 days						Within 10 days						Within 30 days					
	≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
Land	n	0	0.0	n	0	0.0	22	0	0.2	9	0	0.1	53	0	0.8	27	0	0.3
Ice zone 1	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 2	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 3	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 4	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 5	2	0	0.0	1	0	0.0	9	0	0.1	3	0	0.0	9	0	0.1	3	0	0.0
Ice zone 6	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Mid. Bnd. 1 Sum.	6	0	0.1	2	0	0.0	22	0	0.3	10	0	0.1	28	0	0.3	13	0	0.1
Mid. Bnd. 2 Sum.	n	0	0.0	n	0	0.0	15	0	0.2	6	0	0.1	25	0	0.3	11	0	0.1
Mid. Bnd. 3 Sum.	11	0	0.1	5	0	0.1	36	0	0.4	17	0	0.2	37	0	0.5	17	0	0.2
Mid. Bnd. 4 Sum.	5	0	0.1	3	0	0.0	18	0	0.2	10	0	0.1	30	0	0.4	15	0	0.2
Mid. Bnd. 5 Sum.	1	0	0.0	1	0	0.0	8	0	0.1	4	0	0.0	13	0	0.1	6	0	0.1
Mid. Bnd. 1 Wint.	4	0	0.0	2	0	0.0	4	0	0.0	2	0	0.0	4	0	0.0	2	0	0.0
Mid. Bnd. 2 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Mid. Bnd. 3 Wint.	2	0	0.0	1	0	0.0	19	0	0.2	7	0	0.1	19	0	0.2	7	0	0.1
Mid. Bnd. 4 Wint.	11	0	0.1	6	0	0.1	44	0	0.6	22	0	0.3	46	0	0.6	23	0	0.3
Mid. Bnd. 5 Wint.	28	0	0.3	13	0	0.1	37	0	0.5	17	0	0.2	37	0	0.5	17	0	0.2
Sbd. For. 1 Sum.	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0
Sbd. For. 2 Sum.	1	0	0.0	n	0	0.0	3	0	0.0	2	0	0.0	3	0	0.0	2	0	0.0
Sbd. For. 3 Sum.	4	0	0.0	1	0	0.0	19	0	0.2	8	0	0.1	27	0	0.3	13	0	0.1
Sbd. For. 4 Sum.	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	17	0	0.2	7	0	0.1
Sbd. For. 5 Sum.	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	8	0	0.1	3	0	0.0
Sbd. For. 1 Wint.	6	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
Sbd. For. 2 Wint.	12	0	0.1	5	0	0.0	12	0	0.1	5	0	0.0	12	0	0.1	5	0	0.0
Sbd. For. 3 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Sbd. For. 4 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Sbd. For. 5 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
King Crab Sum.	8	0	0.1	3	0	0.0	26	0	0.3	12	0	0.1	35	0	0.4	17	0	0.2
Yukon Delta Sum.	n	0	0.0	n	0	0.0	17	0	0.2	7	0	0.1	19	0	0.2	8	0	0.1
Gray Whale Area	47	0	0.6	28	0	0.3	71	1	1.2	44	0	0.6	76	1	1.4	48	0	0.7

Note: n = less than 0.5 percent; ** = greater than 99.5 percent.

Table 11. -- Probabilities (expressed as percent chance) of one or more spills, the most likely number of spills (mode), and the expected number of spills (mean) occurring and contacting targets over the production life of the north deletion alternative using onshore transportation scenario.

Target	Within 3 days						Within 10 days						Within 30 days					
	≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
Land	1	0	0.0	n	0	0.0	15	0	0.2	6	0	0.1	32	0	0.4	15	0	0.2
Ice zone 1	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 2	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 3	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 4	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 5	1	0	0.0	1	0	0.0	5	0	0.1	2	0	0.0	5	0	0.1	2	0	0.0
Ice zone 6	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Mid. Bnd. 1 Sum.	12	0	0.1	5	0	0.0	19	0	0.2	8	0	0.1	22	0	0.2	10	0	0.1
Mid. Bnd. 2 Sum.	n	0	0.0	n	0	0.0	7	0	0.1	3	0	0.0	12	0	0.1	5	0	0.0
Mid. Bnd. 3 Sum.	3	0	0.0	1	0	0.0	14	0	0.2	6	0	0.1	15	0	0.2	6	0	0.1
Mid. Bnd. 4 Sum.	1	0	0.0	1	0	0.0	9	0	0.1	4	0	0.0	16	0	0.2	7	0	0.1
Mid. Bnd. 5 Sum.	4	0	0.0	2	0	0.0	9	0	0.1	4	0	0.0	12	0	0.1	6	0	0.1
Mid. Bnd. 1 Wint.	8	0	0.1	3	0	0.0	9	0	0.1	3	0	0.0	9	0	0.1	3	0	0.0
Mid. Bnd. 2 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Mid. Bnd. 3 Wint.	1	0	0.0	1	0	0.0	8	0	0.1	3	0	0.0	8	0	0.1	3	0	0.0
Mid. Bnd. 4 Wint.	3	0	0.0	1	0	0.0	18	0	0.2	8	0	0.1	20	0	0.2	8	0	0.1
Mid. Bnd. 5 Wint.	21	0	0.2	10	0	0.1	30	0	0.4	14	0	0.2	30	0	0.4	14	0	0.2
Sbd. For. 1 Sum.	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0
Sbd. For. 2 Sum.	3	0	0.0	2	0	0.0	6	0	0.1	3	0	0.0	6	0	0.1	3	0	0.0
Sbd. For. 3 Sum.	7	0	0.1	3	0	0.0	14	0	0.1	5	0	0.1	18	0	0.2	8	0	0.1
Sbd. For. 4 Sum.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	8	0	0.1	3	0	0.0
Sbd. For. 5 Sum.	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0
Sbd. For. 1 Wint.	5	0	0.1	2	0	0.0	5	0	0.1	2	0	0.0	5	0	0.1	2	0	0.0
Sbd. For. 2 Wint.	15	0	0.2	6	0	0.1	18	0	0.2	8	0	0.1	18	0	0.2	8	0	0.1
Sbd. For. 3 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Sbd. For. 4 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Sbd. For. 5 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
King Crab Sum.	17	0	0.2	7	0	0.1	24	0	0.3	10	0	0.1	28	0	0.3	13	0	0.1
Yukon Delta Sum.	n	0	0.0	n	0	0.0	8	0	0.1	3	0	0.0	9	0	0.1	4	0	0.0
Gray Whale Area	32	0	0.4	18	0	0.2	51	0	0.7	29	0	0.3	57	0	0.8	32	0	0.4

Note: n = less than 0.5 percent; ** = greater than 99.5 percent.

Table 12. -- Probabilities (expressed as percent chance) of one or more spills, the most likely number of spills (mode), and the expected number of spills (mean) occurring and contacting targets over the production life of the north deletion alternative using offshore transportation scenario.

Target	Within 3 days						Within 10 days						Within 30 days					
	> 1000 bbls.			> 10000 bbls.			> 1000 bbls.			> 10000 bbls.			> 1000 bbls.			> 10000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
Land	n	0	0.0	n	0	0.0	12	0	0.1	5	0	0.1	34	0	0.4	16	0	0.2
Ice zone 1	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 2	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 3	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 4	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 5	2	0	0.0	1	0	0.0	8	0	0.1	3	0	0.0	8	0	0.1	3	0	0.0
Ice zone 6	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Mid. Bnd. 1 Sum.	1	0	0.0	n	0	0.0	11	0	0.1	5	0	0.0	15	0	0.2	7	0	0.1
Mid. Bnd. 2 Sum.	n	0	0.0	n	0	0.0	9	0	0.1	3	0	0.0	15	0	0.2	6	0	0.1
Mid. Bnd. 3 Sum.	7	0	0.1	3	0	0.0	23	0	0.3	10	0	0.1	24	0	0.3	11	0	0.1
Mid. Bnd. 4 Sum.	3	0	0.0	2	0	0.0	10	0	0.1	5	0	0.1	18	0	0.2	9	0	0.1
Mid. Bnd. 5 Sum.	1	0	0.0	n	0	0.0	3	0	0.0	2	0	0.0	6	0	0.1	3	0	0.0
Mid. Bnd. 1 Wint.	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
Mid. Bnd. 2 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Mid. Bnd. 3 Wint.	2	0	0.0	1	0	0.0	13	0	0.1	5	0	0.1	13	0	0.1	5	0	0.1
Mid. Bnd. 4 Wint.	8	0	0.1	4	0	0.0	30	0	0.4	14	0	0.2	32	0	0.4	15	0	0.2
Mid. Bnd. 5 Wint.	13	0	0.1	6	0	0.1	17	0	0.2	8	0	0.1	17	0	0.2	8	0	0.1
Sbd. For. 1 Sum.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Sbd. For. 2 Sum.	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0
Sbd. For. 3 Sum.	n	0	0.0	n	0	0.0	9	0	0.1	4	0	0.0	15	0	0.2	7	0	0.1
Sbd. For. 4 Sum.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	10	0	0.1	4	0	0.0
Sbd. For. 5 Sum.	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	5	0	0.0	2	0	0.0
Sbd. For. 1 Wint.	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
Sbd. For. 2 Wint.	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
Sbd. For. 3 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Sbd. For. 4 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Sbd. For. 5 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
King Crab Sum.	1	0	0.0	1	0	0.0	13	0	0.1	6	0	0.1	20	0	0.2	9	0	0.1
Yukon Delta Sum.	n	0	0.0	n	0	0.0	11	0	0.1	5	0	0.0	13	0	0.1	5	0	0.1
Gray Whale Area	29	0	0.3	16	0	0.2	47	0	0.6	26	0	0.3	52	0	0.7	29	0	0.3

Note: n = less than 0.5 percent; ** = greater than 99.5 percent.

Table 13. -- Probabilities (expressed as percent chance) of one or more spills, the most likely number of spills (mode), and the expected number of spills (mean) occurring and contacting targets over the production life of the south deletion alternative using onshore transportation scenario.

Target	Within 3 days						Within 10 days						Within 30 days					
	≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
Land	2	0	0.0	1	0	0.0	27	0	0.3	12	0	0.1	51	0	0.7	26	0	0.3
Ice zone 1	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 2	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 3	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 4	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 5	1	0	0.0	1	0	0.0	6	0	0.1	3	0	0.0	6	0	0.1	3	0	0.0
Ice zone 6	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Mid. Bnd. 1 Sum.	25	0	0.3	10	0	0.1	35	0	0.4	16	0	0.2	39	0	0.5	18	0	0.2
Mid. Bnd. 2 Sum.	n	0	0.0	n	0	0.0	11	0	0.1	4	0	0.0	19	0	0.2	8	0	0.1
Mid. Bnd. 3 Sum.	3	0	0.0	1	0	0.0	21	0	0.2	9	0	0.1	23	0	0.3	10	0	0.1
Mid. Bnd. 4 Sum.	3	0	0.0	2	0	0.0	16	0	0.2	8	0	0.1	27	0	0.3	13	0	0.1
Mid. Bnd. 5 Sum.	7	0	0.1	4	0	0.0	16	0	0.2	8	0	0.1	23	0	0.3	11	0	0.1
Mid. Bnd. 1 Wint.	17	0	0.2	6	0	0.1	19	0	0.2	7	0	0.1	19	0	0.2	7	0	0.1
Mid. Bnd. 2 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Mid. Bnd. 3 Wint.	1	0	0.0	1	0	0.0	11	0	0.1	5	0	0.0	11	0	0.1	5	0	0.0
Mid. Bnd. 4 Wint.	3	0	0.0	1	0	0.0	26	0	0.3	11	0	0.1	27	0	0.3	12	0	0.1
Mid. Bnd. 5 Wint.	38	0	0.5	20	0	0.2	53	0	0.8	28	0	0.3	53	0	0.8	28	0	0.3
Sbd. For. 1 Sum.	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
Sbd. For. 2 Sum.	6	0	0.1	3	0	0.0	11	0	0.1	6	0	0.1	12	0	0.1	6	0	0.1
Sbd. For. 3 Sum.	15	0	0.2	6	0	0.1	26	0	0.3	11	0	0.1	32	0	0.4	15	0	0.2
Sbd. For. 4 Sum.	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	14	0	0.1	6	0	0.1
Sbd. For. 5 Sum.	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	5	0	0.0	2	0	0.0
Sbd. For. 1 Wint.	10	0	0.1	4	0	0.0	10	0	0.1	4	0	0.0	10	0	0.1	4	0	0.0
Sbd. For. 2 Wint.	30	0	0.4	14	0	0.1	36	0	0.4	16	0	0.2	36	0	0.4	16	0	0.2
Sbd. For. 3 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Sbd. For. 4 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Sbd. For. 5 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
King Crab Sum.	34	0	0.4	15	0	0.2	43	0	0.6	20	0	0.2	48	0	0.6	23	0	0.3
Yukon Delta Sum.	n	0	0.0	n	0	0.0	11	0	0.1	5	0	0.0	13	0	0.1	6	0	0.1
Gray Whale Area	50	0	0.7	31	0	0.4	75	1	1.4	47	0	0.6	80	1	1.6	52	0	0.7

Note: n = less than 0.5 percent; ** = greater than 99.5 percent.

Table 14. -- Probabilities (expressed as percent chance) of one or more spills, the most likely number of spills (mode), and the expected number of spills (mean) occurring and contacting targets over the production life of the south deletion alternative using offshore transportation scenario.

Target	Within 3 days						Within 10 days						Within 30 days					
	≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
Land	n	0	0.0	n	0	0.0	22	0	0.2	9	0	0.1	53	0	0.8	27	0	0.3
Ice zone 1	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 2	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 3	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 4	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 5	2	0	0.0	1	0	0.0	9	0	0.1	3	0	0.0	9	0	0.1	3	0	0.0
Ice zone 6	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Mid. Bnd. 1 Sum.	6	0	0.1	2	0	0.0	22	0	0.3	10	0	0.1	28	0	0.3	13	0	0.1
Mid. Bnd. 2 Sum.	n	0	0.0	n	0	0.0	15	0	0.2	6	0	0.1	25	0	0.3	11	0	0.1
Mid. Bnd. 3 Sum.	11	0	0.1	5	0	0.1	36	0	0.4	17	0	0.2	37	0	0.5	17	0	0.2
Mid. Bnd. 4 Sum.	5	0	0.1	3	0	0.0	18	0	0.2	10	0	0.1	30	0	0.4	15	0	0.2
Mid. Bnd. 5 Sum.	1	0	0.0	1	0	0.0	8	0	0.1	4	0	0.0	13	0	0.1	6	0	0.1
Mid. Bnd. 1 Wint.	4	0	0.0	2	0	0.0	4	0	0.0	2	0	0.0	4	0	0.0	2	0	0.0
Mid. Bnd. 2 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Mid. Bnd. 3 Wint.	2	0	0.0	1	0	0.0	19	0	0.2	7	0	0.1	19	0	0.2	7	0	0.1
Mid. Bnd. 4 Wint.	11	0	0.1	6	0	0.1	44	0	0.6	22	0	0.3	46	0	0.6	23	0	0.3
Mid. Bnd. 5 Wint.	28	0	0.3	13	0	0.1	37	0	0.5	17	0	0.2	37	0	0.5	17	0	0.2
Sbd. For. 1 Sum.	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0
Sbd. For. 2 Sum.	1	0	0.0	n	0	0.0	3	0	0.0	2	0	0.0	3	0	0.0	2	0	0.0
Sbd. For. 3 Sum.	4	0	0.0	1	0	0.0	19	0	0.2	8	0	0.1	27	0	0.3	13	0	0.1
Sbd. For. 4 Sum.	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	17	0	0.2	7	0	0.1
Sbd. For. 5 Sum.	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	8	0	0.1	3	0	0.0
Sbd. For. 1 Wint.	6	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
Sbd. For. 2 Wint.	12	0	0.1	5	0	0.0	12	0	0.1	5	0	0.0	12	0	0.1	5	0	0.0
Sbd. For. 3 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Sbd. For. 4 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Sbd. For. 5 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
King Crab Sum.	8	0	0.1	3	0	0.0	26	0	0.3	12	0	0.1	35	0	0.4	17	0	0.2
Yukon Delta Sum.	n	0	0.0	n	0	0.0	17	0	0.2	7	0	0.1	19	0	0.2	8	0	0.1
Gray Whale Area	47	0	0.6	28	0	0.3	71	1	1.2	44	0	0.6	76	1	1.4	48	0	0.7

Note: n = less than 0.5 percent; ** = greater than 99.5 percent.

Table 15. -- Probabilities (expressed as percent chance) of one or more spills, the most likely number of spills (mode), and the expected number of spills (mean) occurring and contacting targets over the production life of the east deletion alternative using onshore transportation scenario.

Target	Within 3 days						Within 10 days						Within 30 days					
	≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
Land	n	0	0.0	n	0	0.0	5	0	0.0	2	0	0.0	11	0	0.1	5	0	0.1
Ice zone 1	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 2	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 3	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 4	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 5	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 6	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Mid. Bnd. 1 Sum.	7	0	0.1	3	0	0.0	10	0	0.1	4	0	0.0	12	0	0.1	5	0	0.0
Mid. Bnd. 2 Sum.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0
Mid. Bnd. 3 Sum.	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0
Mid. Bnd. 4 Sum.	1	0	0.0	n	0	0.0	8	0	0.1	3	0	0.0	8	0	0.1	4	0	0.0
Mid. Bnd. 5 Sum.	2	0	0.0	1	0	0.0	4	0	0.0	2	0	0.0	5	0	0.1	2	0	0.0
Mid. Bnd. 1 Wint.	4	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0
Mid. Bnd. 2 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Mid. Bnd. 3 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Mid. Bnd. 4 Wint.	n	0	0.0	n	0	0.0	4	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0
Mid. Bnd. 5 Wint.	11	0	0.1	5	0	0.1	16	0	0.2	7	0	0.1	16	0	0.2	7	0	0.1
Sbd. For. 1 Sum.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Sbd. For. 2 Sum.	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
Sbd. For. 3 Sum.	2	0	0.0	1	0	0.0	4	0	0.0	2	0	0.0	8	0	0.1	3	0	0.0
Sbd. For. 4 Sum.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
Sbd. For. 5 Sum.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Sbd. For. 1 Wint.	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
Sbd. For. 2 Wint.	9	0	0.1	4	0	0.0	10	0	0.1	4	0	0.0	10	0	0.1	4	0	0.0
Sbd. For. 3 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Sbd. For. 4 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Sbd. For. 5 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
King Crab Sum.	9	0	0.1	3	0	0.0	12	0	0.1	5	0	0.0	14	0	0.2	6	0	0.1
Yukon Delta Sum.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
Gray Whale Area	16	0	0.2	8	0	0.1	28	0	0.3	14	0	0.1	30	0	0.4	15	0	0.2

Note: n = less than 0.5 percent; ** = greater than 99.5 percent.

Table 16. -- Probabilities (expressed as percent chance) of one or more spills, the most likely number of spills (mode), and the expected number of spills (mean) occurring and contacting targets over the production life of the east deletion alternative using offshore transportation scenario.

Target	Within 3 days						Within 10 days						Within 30 days					
	≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
Land	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	12	0	0.1	5	0	0.1
Ice zone 1	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 2	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 3	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 4	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 5	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Ice zone 6	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Mid. Bnd. 1 Sum.	2	0	0.0	1	0	0.0	5	0	0.1	2	0	0.0	8	0	0.1	3	0	0.0
Mid. Bnd. 2 Sum.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	5	0	0.0	2	0	0.0
Mid. Bnd. 3 Sum.	8	0	0.1	4	0	0.0	8	0	0.1	4	0	0.0	8	0	0.1	4	0	0.0
Mid. Bnd. 4 Sum.	1	0	0.0	n	0	0.0	10	0	0.1	5	0	0.0	10	0	0.1	5	0	0.0
Mid. Bnd. 5 Sum.	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
Mid. Bnd. 1 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Mid. Bnd. 2 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Mid. Bnd. 3 Wint.	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0
Mid. Bnd. 4 Wint.	6	0	0.1	3	0	0.0	14	0	0.2	7	0	0.1	14	0	0.2	7	0	0.1
Mid. Bnd. 5 Wint.	8	0	0.1	3	0	0.0	10	0	0.1	4	0	0.0	10	0	0.1	4	0	0.0
Sbd. For. 1 Sum.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Sbd. For. 2 Sum.	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
Sbd. For. 3 Sum.	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	6	0	0.1	3	0	0.0
Sbd. For. 4 Sum.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0
Sbd. For. 5 Sum.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
Sbd. For. 1 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Sbd. For. 2 Wint.	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
Sbd. For. 3 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Sbd. For. 4 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Sbd. For. 5 Wint.	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
King Crab Sum.	2	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0	9	0	0.1	4	0	0.0
Yukon Delta Sum.	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0
Gray Whale Area	12	0	0.1	5	0	0.1	22	0	0.2	10	0	0.1	24	0	0.3	11	0	0.1

Note: n = less than 0.5 percent; ** = greater than 99.5 percent.

Table 17. -- Probabilities (expressed as percent chance) of one or more spills, the most likely number of spills (mode), and the expected number of spills (mean) occurring and contacting targets over the production life of the proposed lease tracts using onshore transportation scenario.

Segment	Within 3 days						Within 10 days						Within 30 days					
	≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
1	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
2	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
3	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
4	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0
5	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
9	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0
11	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	5	0	0.0	2	0	0.0
12	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
13	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	5	0	0.0	2	0	0.0
14	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
15	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
16	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
17	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0
18	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	4	0	0.0	2	0	0.0
19	n	0	0.0	n	0	0.0	5	0	0.1	2	0	0.0	11	0	0.1	5	0	0.0
21	1	0	0.0	1	0	0.0	9	0	0.1	4	0	0.0	13	0	0.1	6	0	0.1
22	n	0	0.0	n	0	0.0	4	0	0.0	2	0	0.0	5	0	0.0	2	0	0.0
23	1	0	0.0	n	0	0.0	6	0	0.1	3	0	0.0	7	0	0.1	3	0	0.0
25	4	0	0.0	2	0	0.0	6	0	0.1	3	0	0.0	6	0	0.1	3	0	0.0
26	12	0	0.1	5	0	0.1	13	0	0.1	6	0	0.1	13	0	0.1	6	0	0.1
27	7	0	0.1	3	0	0.0	17	0	0.2	8	0	0.1	19	0	0.2	8	0	0.1
28	8	0	0.1	4	0	0.0	23	0	0.3	11	0	0.1	26	0	0.3	13	0	0.1
29	5	0	0.1	3	0	0.0	15	0	0.2	7	0	0.1	22	0	0.2	11	0	0.1
30	3	0	0.0	2	0	0.0	21	0	0.2	11	0	0.1	33	0	0.4	17	0	0.2
31	8	0	0.1	5	0	0.1	21	0	0.2	11	0	0.1	27	0	0.3	14	0	0.1
32	n	0	0.0	n	0	0.0	12	0	0.1	6	0	0.1	18	0	0.2	8	0	0.1
33	n	0	0.0	n	0	0.0	4	0	0.0	2	0	0.0	9	0	0.1	4	0	0.0
34	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	5	0	0.0	2	0	0.0

Note: n = less than 0.5 percent; ** = greater than 99.5 percent. Segments with less than a 0.5 percent probability of one or more contacts within 30 days are not shown

Table 18. -- Probabilities (expressed as percent chance) of one or more spills, the most likely number of spills (mode), and the expected number of spills (mean) occurring and contacting targets over the production life of the proposed lease tracts using offshore transportation scenario.

Segment	Within 3 days						Within 10 days						Within 30 days					
	≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
1	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
2	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
3	n	0	0.0	n	0	0.0	5	0	0.0	2	0	0.0	6	0	0.1	2	0	0.0
4	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0
5	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
9	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0
11	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	8	0	0.1	3	0	0.0
12	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0
13	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	8	0	0.1	3	0	0.0
14	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0
16	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
17	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	4	0	0.0	2	0	0.0
18	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	7	0	0.1	3	0	0.0
19	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	11	0	0.1	5	0	0.1
21	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	6	0	0.1	3	0	0.0
22	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	2	0	0.0
23	n	0	0.0	n	0	0.0	5	0	0.0	2	0	0.0	5	0	0.1	2	0	0.0
25	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
26	6	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
27	4	0	0.0	2	0	0.0	8	0	0.1	3	0	0.0	9	0	0.1	4	0	0.0
28	7	0	0.1	3	0	0.0	19	0	0.2	9	0	0.1	20	0	0.2	9	0	0.1
29	3	0	0.0	2	0	0.0	10	0	0.1	5	0	0.0	18	0	0.2	8	0	0.1
30	8	0	0.1	4	0	0.0	29	0	0.3	14	0	0.1	38	0	0.5	19	0	0.2
31	12	0	0.1	8	0	0.1	25	0	0.3	15	0	0.2	32	0	0.4	18	0	0.2
32	n	0	0.0	n	0	0.0	20	0	0.2	9	0	0.1	26	0	0.3	12	0	0.1
33	n	0	0.0	n	0	0.0	10	0	0.1	4	0	0.0	14	0	0.1	6	0	0.1
34	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	6	0	0.1	3	0	0.0

Note: n = less than 0.5 percent; ** = greater than 99.5 percent. Segments with less than a 0.5 percent probability of one or more contacts within 30 days are not shown

Table 19. -- Probabilities (expressed as percent chance) of one or more spills, the most likely number of spills (mode), and the expected number of spills (mean) occurring and contacting targets over the production life of the north deletion alternative using onshore transportation scenario.

Segment	Within 3 days						Within 10 days						Within 30 days					
	≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
1	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
3	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
9	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0
11	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0
12	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
13	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0
14	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0
17	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
18	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
19	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0
21	1	0	0.0	n	0	0.0	5	0	0.0	2	0	0.0	7	0	0.1	3	0	0.0
22	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
23	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	4	0	0.0	2	0	0.0
25	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
26	7	0	0.1	3	0	0.0	7	0	0.1	3	0	0.0	7	0	0.1	3	0	0.0
27	3	0	0.0	1	0	0.0	7	0	0.1	3	0	0.0	9	0	0.1	4	0	0.0
28	4	0	0.0	2	0	0.0	13	0	0.1	6	0	0.1	15	0	0.2	7	0	0.1
29	3	0	0.0	2	0	0.0	6	0	0.1	3	0	0.0	10	0	0.1	5	0	0.0
30	2	0	0.0	1	0	0.0	15	0	0.2	8	0	0.1	22	0	0.2	11	0	0.1
31	5	0	0.0	3	0	0.0	11	0	0.1	6	0	0.1	16	0	0.2	8	0	0.1
32	n	0	0.0	n	0	0.0	8	0	0.1	4	0	0.0	12	0	0.1	5	0	0.1
33	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0
34	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0

Note: n = less than 0.5 percent; ** = greater than 99.5 percent. Segments with less than a 0.5 percent probability of one or more contacts within 30 days are not shown

Table 20. -- Probabilities (expressed as percent chance) of one or more spills, the most likely number of spills (mode), and the expected number of spills (mean) occurring and contacting targets over the production life of the north deletion alternative using offshore transportation scenario.

Segment	Within 3 days						Within 10 days						Within 30 days					
	≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
1	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
3	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	4	0	0.0	2	0	0.0
4	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
9	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
11	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	5	0	0.1	2	0	0.0
12	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
13	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	5	0	0.1	2	0	0.0
14	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
17	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
18	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0
19	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	6	0	0.1	2	0	0.0
21	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
22	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
23	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
25	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
26	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
27	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
28	3	0	0.0	2	0	0.0	11	0	0.1	5	0	0.0	11	0	0.1	5	0	0.1
29	2	0	0.0	1	0	0.0	3	0	0.0	2	0	0.0	7	0	0.1	3	0	0.0
30	5	0	0.0	2	0	0.0	21	0	0.2	9	0	0.1	26	0	0.3	12	0	0.1
31	7	0	0.1	4	0	0.0	14	0	0.2	8	0	0.1	19	0	0.2	10	0	0.1
32	n	0	0.0	n	0	0.0	12	0	0.1	6	0	0.1	16	0	0.2	7	0	0.1
33	n	0	0.0	n	0	0.0	6	0	0.1	3	0	0.0	9	0	0.1	4	0	0.0
34	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	4	0	0.0	1	0	0.0

Note: n = less than 0.5 percent; ** = greater than 99.5 percent. Segments with less than a 0.5 percent probability of one or more contacts within 30 days are not shown

Table 21. -- Probabilities (expressed as percent chance) of one or more spills, the most likely number of spills (mode), and the expected number of spills (mean) occurring and contacting targets over the production life of the south deletion alternative using onshore transportation scenario.

Segment	Within 3 days						Within 10 days						Within 30 days					
	≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
1	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
2	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
3	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
4	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0
5	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
9	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0
11	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	5	0	0.0	2	0	0.0
12	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
13	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	5	0	0.0	2	0	0.0
14	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
15	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
16	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
17	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0
18	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	4	0	0.0	2	0	0.0
19	n	0	0.0	n	0	0.0	5	0	0.1	2	0	0.0	11	0	0.1	5	0	0.0
21	1	0	0.0	1	0	0.0	9	0	0.1	4	0	0.0	13	0	0.1	6	0	0.1
22	n	0	0.0	n	0	0.0	4	0	0.0	2	0	0.0	5	0	0.0	2	0	0.0
23	1	0	0.0	n	0	0.0	6	0	0.1	3	0	0.0	7	0	0.1	3	0	0.0
25	4	0	0.0	2	0	0.0	6	0	0.1	3	0	0.0	6	0	0.1	3	0	0.0
26	12	0	0.1	5	0	0.1	13	0	0.1	6	0	0.1	13	0	0.1	6	0	0.1
27	7	0	0.1	3	0	0.0	17	0	0.2	8	0	0.1	19	0	0.2	8	0	0.1
28	8	0	0.1	4	0	0.0	23	0	0.3	11	0	0.1	26	0	0.3	13	0	0.1
29	5	0	0.1	3	0	0.0	15	0	0.2	7	0	0.1	22	0	0.2	11	0	0.1
30	3	0	0.0	2	0	0.0	21	0	0.2	11	0	0.1	33	0	0.4	17	0	0.2
31	8	0	0.1	5	0	0.1	21	0	0.2	11	0	0.1	27	0	0.3	14	0	0.1
32	n	0	0.0	n	0	0.0	12	0	0.1	6	0	0.1	18	0	0.2	8	0	0.1
33	n	0	0.0	n	0	0.0	4	0	0.0	2	0	0.0	9	0	0.1	4	0	0.0
34	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	5	0	0.0	2	0	0.0

Note: n = less than 0.5 percent; ** = greater than 99.5 percent. Segments with less than a 0.5 percent probability of one or more contacts within 30 days are not shown

Table 22. -- Probabilities (expressed as percent chance) of one or more spills, the most likely number of spills (mode), and the expected number of spills (mean) occurring and contacting targets over the production life of the south deletion alternative using offshore transportation scenario.

Segment	Within 3 days						Within 10 days						Within 30 days					
	≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
1	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
2	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
3	n	0	0.0	n	0	0.0	5	0	0.0	2	0	0.0	6	0	0.1	2	0	0.0
4	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0
5	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
9	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0
11	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	8	0	0.1	3	0	0.0
12	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0
13	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	8	0	0.1	3	0	0.0
14	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0
16	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
17	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	4	0	0.0	2	0	0.0
18	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	7	0	0.1	3	0	0.0
19	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	11	0	0.1	5	0	0.1
21	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	6	0	0.1	3	0	0.0
22	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	2	0	0.0
23	n	0	0.0	n	0	0.0	5	0	0.0	2	0	0.0	5	0	0.1	2	0	0.0
25	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
26	6	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
27	4	0	0.0	2	0	0.0	8	0	0.1	3	0	0.0	9	0	0.1	4	0	0.0
28	7	0	0.1	3	0	0.0	19	0	0.2	9	0	0.1	20	0	0.2	9	0	0.1
29	3	0	0.0	2	0	0.0	10	0	0.1	5	0	0.0	18	0	0.2	8	0	0.1
30	8	0	0.1	4	0	0.0	29	0	0.3	14	0	0.1	38	0	0.5	19	0	0.2
31	12	0	0.1	8	0	0.1	25	0	0.3	15	0	0.2	32	0	0.4	18	0	0.2
32	n	0	0.0	n	0	0.0	20	0	0.2	9	0	0.1	26	0	0.3	12	0	0.1
33	n	0	0.0	n	0	0.0	10	0	0.1	4	0	0.0	14	0	0.1	6	0	0.1
34	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	6	0	0.1	3	0	0.0

Note: n = less than 0.5 percent; ** = greater than 99.5 percent. Segments with less than a 0.5 percent probability of one or more contacts within 30 days are not shown

Table 23. -- Probabilities (expressed as percent chance) of one or more spills, the most likely number of spills (mode), and the expected number of spills (mean) occurring and contacting targets over the production life of the east deletion alternative using onshore transportation scenario.

Segment	Within 3 days						Within 10 days						Within 30 days					
	≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
17	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
18	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
19	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
21	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
22	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
23	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0
25	1	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0
26	4	0	0.0	1	0	0.0	4	0	0.0	2	0	0.0	4	0	0.0	2	0	0.0
27	2	0	0.0	1	0	0.0	5	0	0.0	2	0	0.0	5	0	0.0	2	0	0.0
28	3	0	0.0	1	0	0.0	6	0	0.1	3	0	0.0	7	0	0.1	3	0	0.0
29	2	0	0.0	1	0	0.0	4	0	0.0	2	0	0.0	5	0	0.1	2	0	0.0
30	n	0	0.0	n	0	0.0	3	0	0.0	2	0	0.0	7	0	0.1	3	0	0.0
31	2	0	0.0	1	0	0.0	6	0	0.1	3	0	0.0	7	0	0.1	3	0	0.0
32	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	4	0	0.0	2	0	0.0
33	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
34	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0

Note: n = less than 0.5 percent; ** = greater than 99.5 percent. Segments with less than a 0.5 percent probability of one or more contacts within 30 days are not shown

Table 24. -- Probabilities (expressed as percent chance) of one or more spills, the most likely number of spills (mode), and the expected number of spills (mean) occurring and contacting targets over the production life of the east deletion alternative using offshore transportation scenario.

Segment	Within 3 days						Within 10 days						Within 30 days					
	≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.			≥ 1000 bbls.			≥ 10000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
9	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
11	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
12	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
18	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0
19	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
21	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
22	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
23	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
26	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
27	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
28	4	0	0.0	2	0	0.0	5	0	0.1	2	0	0.0	5	0	0.1	2	0	0.0
29	2	0	0.0	1	0	0.0	4	0	0.0	2	0	0.0	5	0	0.1	2	0	0.0
30	1	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0	6	0	0.1	3	0	0.0
31	1	0	0.0	1	0	0.0	6	0	0.1	3	0	0.0	7	0	0.1	3	0	0.0
32	1	0	0.0	1	0	0.0	6	0	0.1	3	0	0.0	8	0	0.1	4	0	0.0
33	n	0	0.0	n	0	0.0	5	0	0.1	2	0	0.0	5	0	0.1	3	0	0.0
34	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0

Note: n = less than 0.5 percent; ** = greater than 99.5 percent. Segments with less than a 0.5 percent probability of one or more contacts within 30 days are not shown

travel time) is 51 percent for the onshore transportation scenario and 53 percent for the offshore transportation scenario. These probabilities are reduced by about one-half if spills of 10,000 barrels and larger are considered. Land segments 19 and 21, located on the north shore of Norton Sound, are the most likely to be hit by spills. The southern and eastern shores have little chance of being contacted by an oil spill; probabilities of one or more contacts (spills of 1,000 barrels or larger) to these segments are all less than 5 percent. The most likely fate of spills is to travel out of Norton Sound. Segment 30, which contains the eastern tip of St. Lawrence Island, has a 33 to 38 percent chance of being contacted by one or more oilspills (of 1,000 barrels or larger) within 30 days travel time.

The targets most likely to be effected by oilspills are: mid-boundary area 1, summer (39 percent chance of one or more spills, 1,000 barrels or larger, 30 days travel); mid-boundary area 5, winter (53 percent); king crab fishing area, summer (48 percent); and the gray whale area (80 percent). (To see the "full" risks to these targets, these values should be multiplied by the 14-percent chance that oil will be found.) The seabird foraging areas show distinct differences in spill contact probabilities for summer and winter. For example, during the summer, seabird foraging area 3 has a 32 percent chance of being contacted by one or more spills (of 1,000 barrels or larger, 30 days travel). However, during the winter, this probability is reduced to less than 0.5 percent.

The north deletion alternative reduces the risks to land by approximately 40 percent. The south deletion alternative poses the same risks as the proposed action, since only gas, not oil, is assumed present in the deleted tracts. The east deletion alternative, which has the lowest estimate of oil, reduces risks to land by approximately 80 percent.

Conclusions

This analysis indicates that if oil exists in commercial quantities in the OCS Lease Sale 57 area, (a 14 percent chance), 2.8 oilspills of 1,000 barrels or larger are expected to occur in the Norton Sound lease area. The probability that one or more oilspills of 1,000 barrels or larger will occur is 94 percent; the probability of one or more spills occurring and contacting land within 30 days is 51 to 53 percent, depending upon the transportation method chosen. For spills 10,000 barrels or larger, these probabilities are reduced to 26 to 27 percent.

The south deletion alternative poses the same oilspill risks as the proposed action. The north deletion alternative reduces risks to land by about 40 percent, while the east deletion alternative reduces these risks by about 80 percent (both alternatives also reduce the amount of oil). Very little difference exists, as far as oilspill risks are concerned, between the onshore and offshore transportation scenarios.

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Appendix A

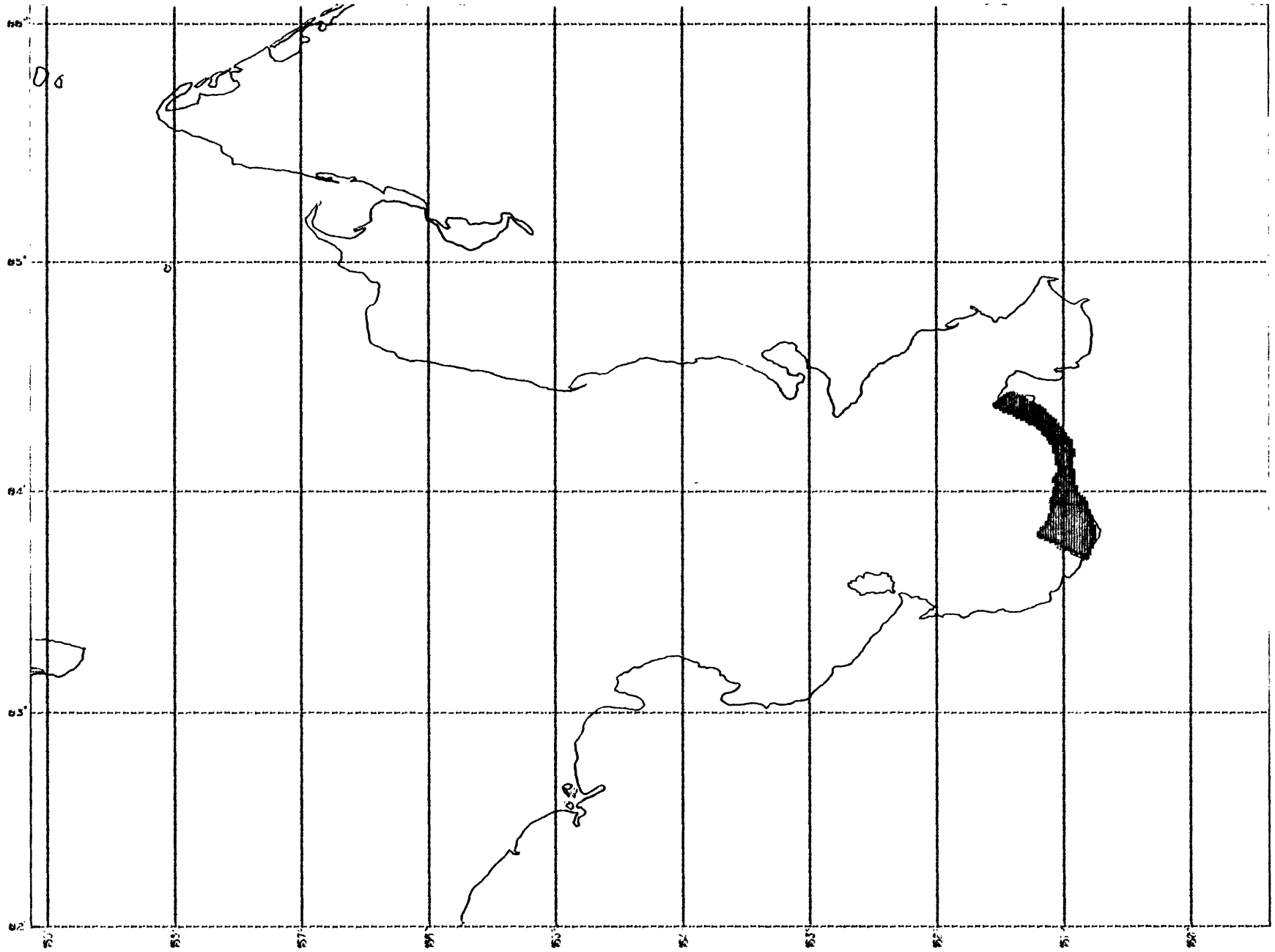

Figure A-1.--Map showing the location of shorefast ice zone 1, Norton Sound OCS Lease Sale 57: cross hatching indicates areal extent.

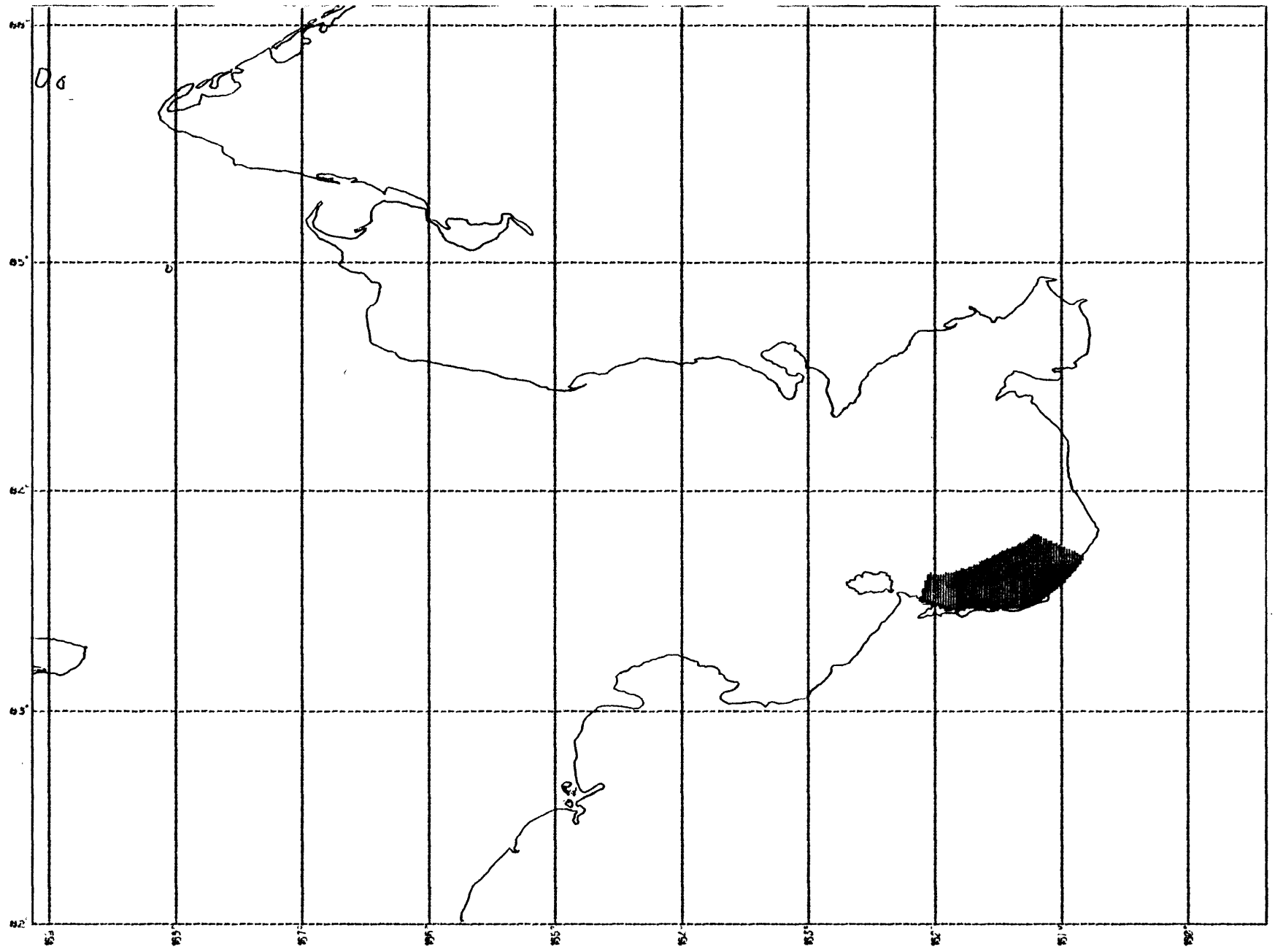

Figure A-2.--Map showing the location of shorefast ice zone 2, Norton Sound OCS Lease Sale 57: cross hatching indicates areal extent.

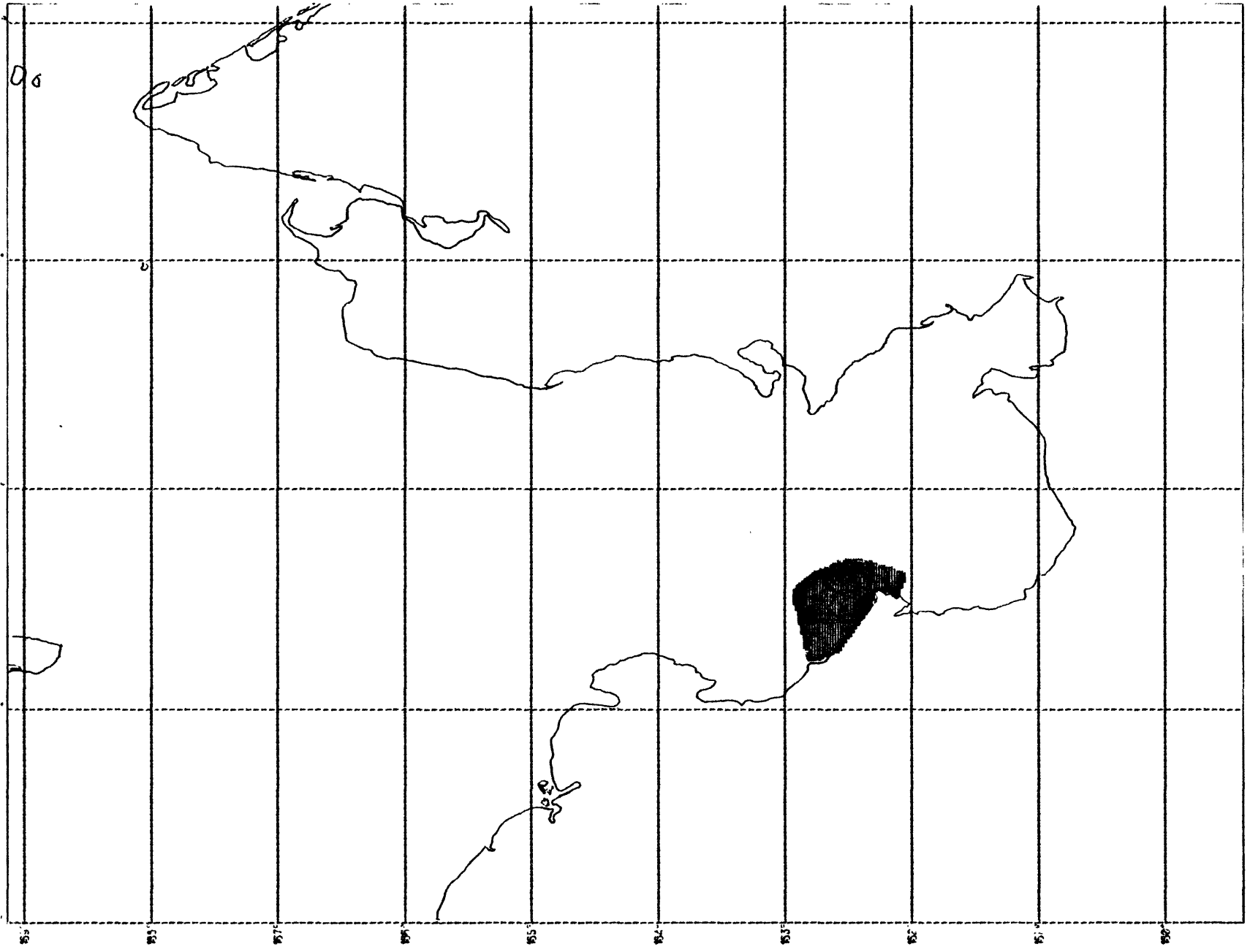

Figure A-3.--Map showing the location of shorefast ice zone 3, Norton Sound OCS Lease Sale 57: cross hatching indicates areal extent.

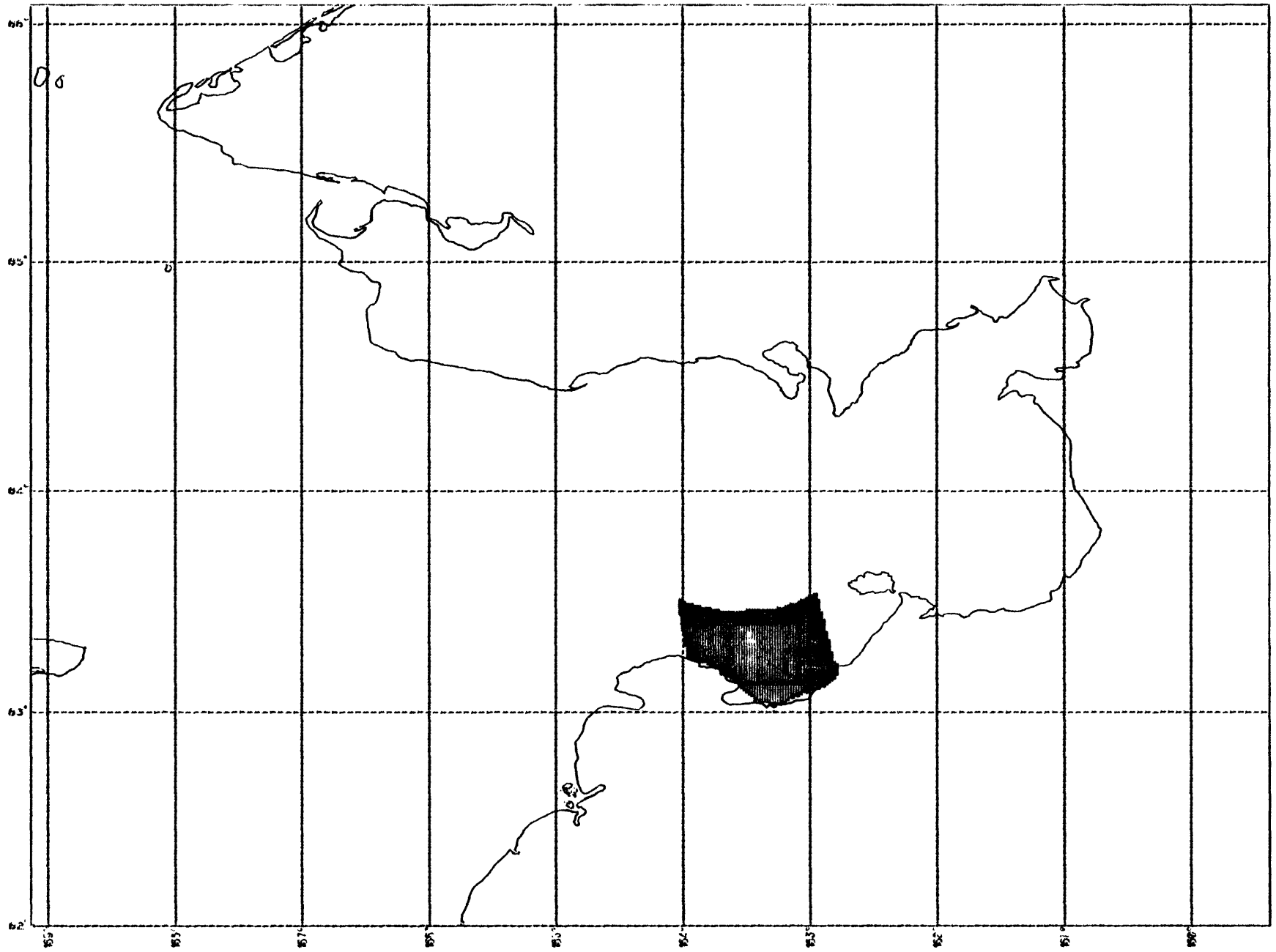

Figure A-4.--Map showing the location of shorefast ice zone 4, Norton Sound OCS Lease Sale 57: cross hatching indicates areal extent.

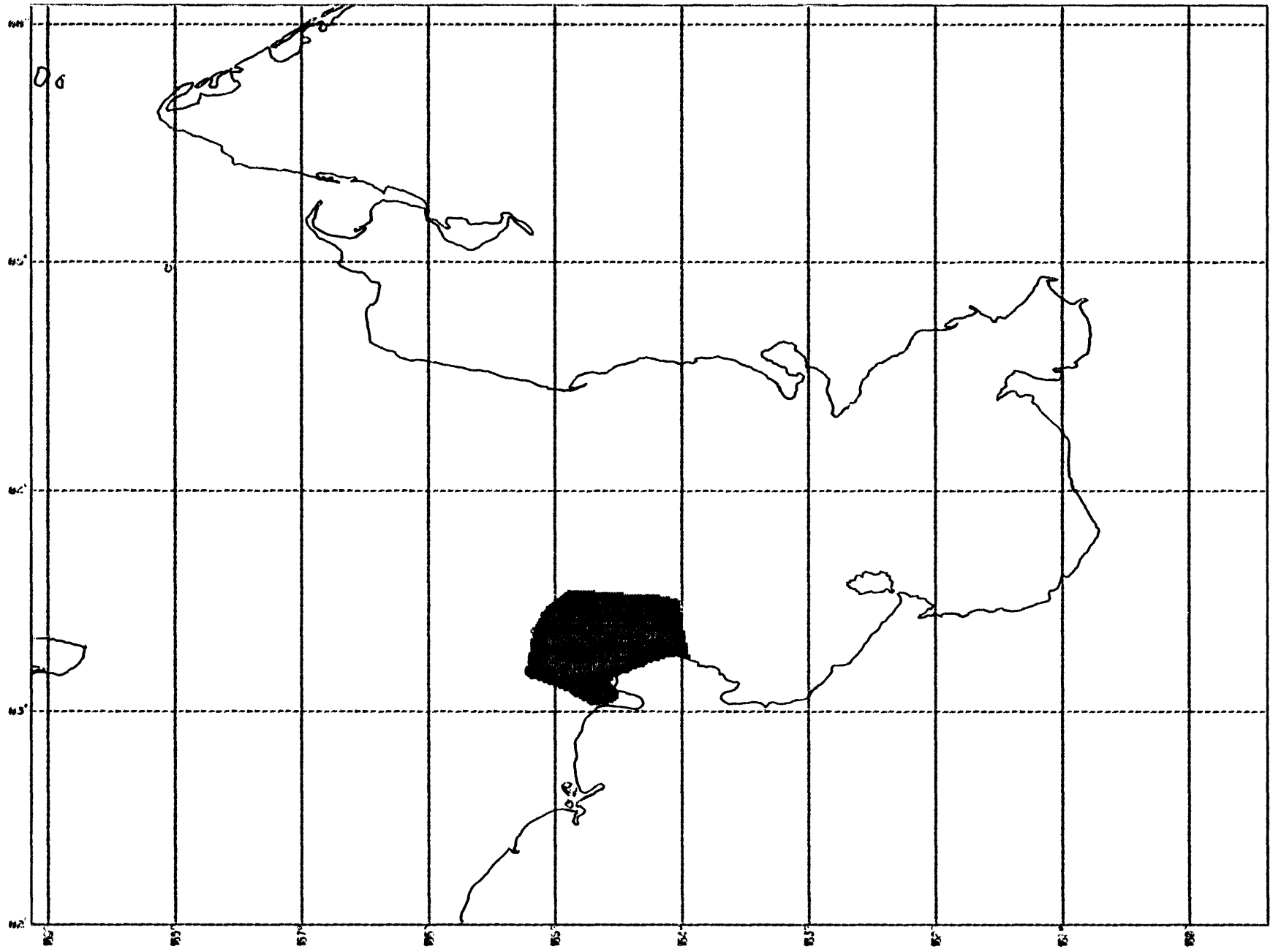

Figure A-5.--Map showing the location of shorefast ice zone 5, Norton Sound OCS Lease Sale 57: cross hatching indicates areal extent.

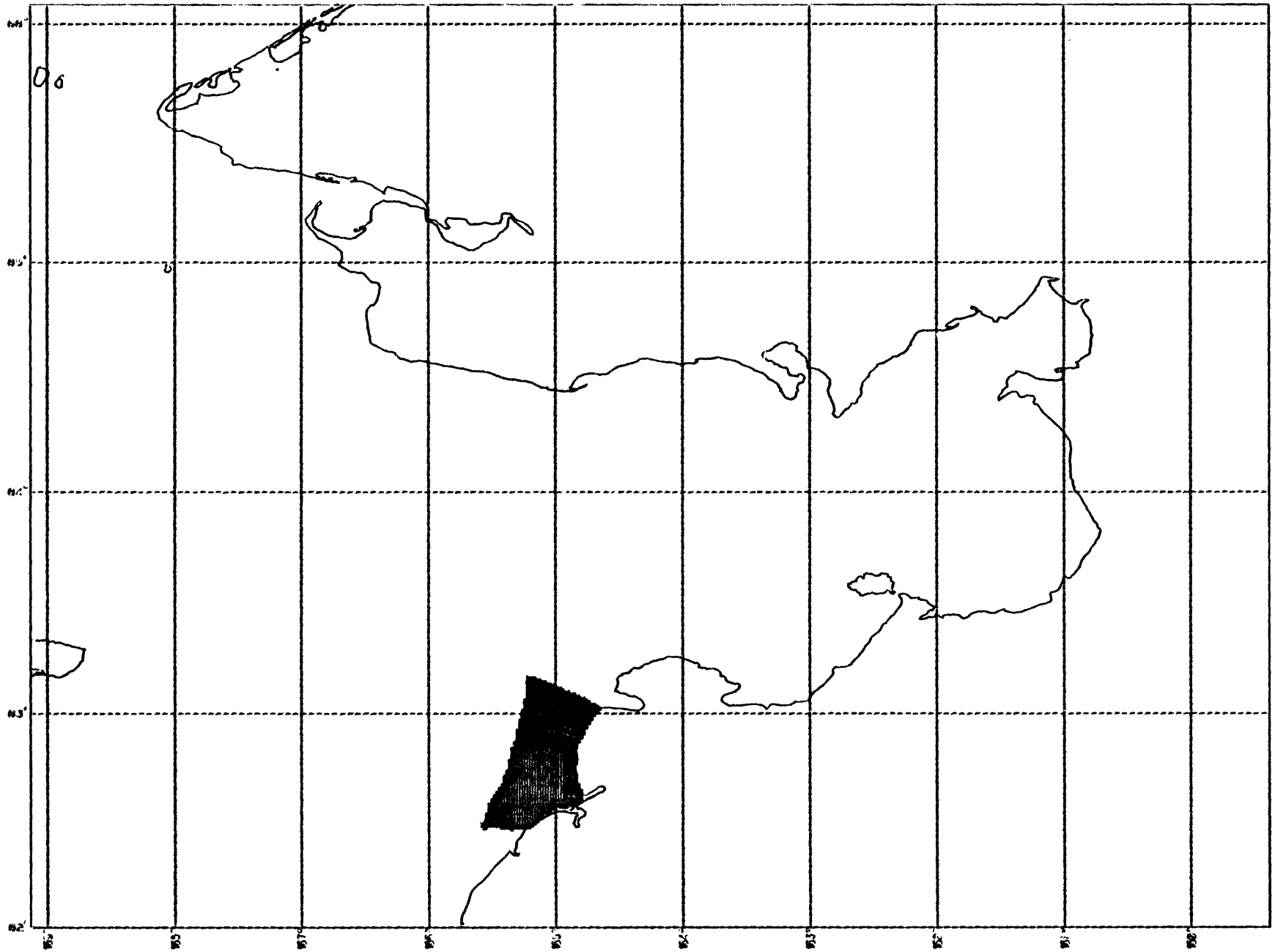

Figure A-6.--Map showing the location of shorefast ice zone 6, Norton Sound OCS Lease Sale 57: cross hatching indicates areal extent.

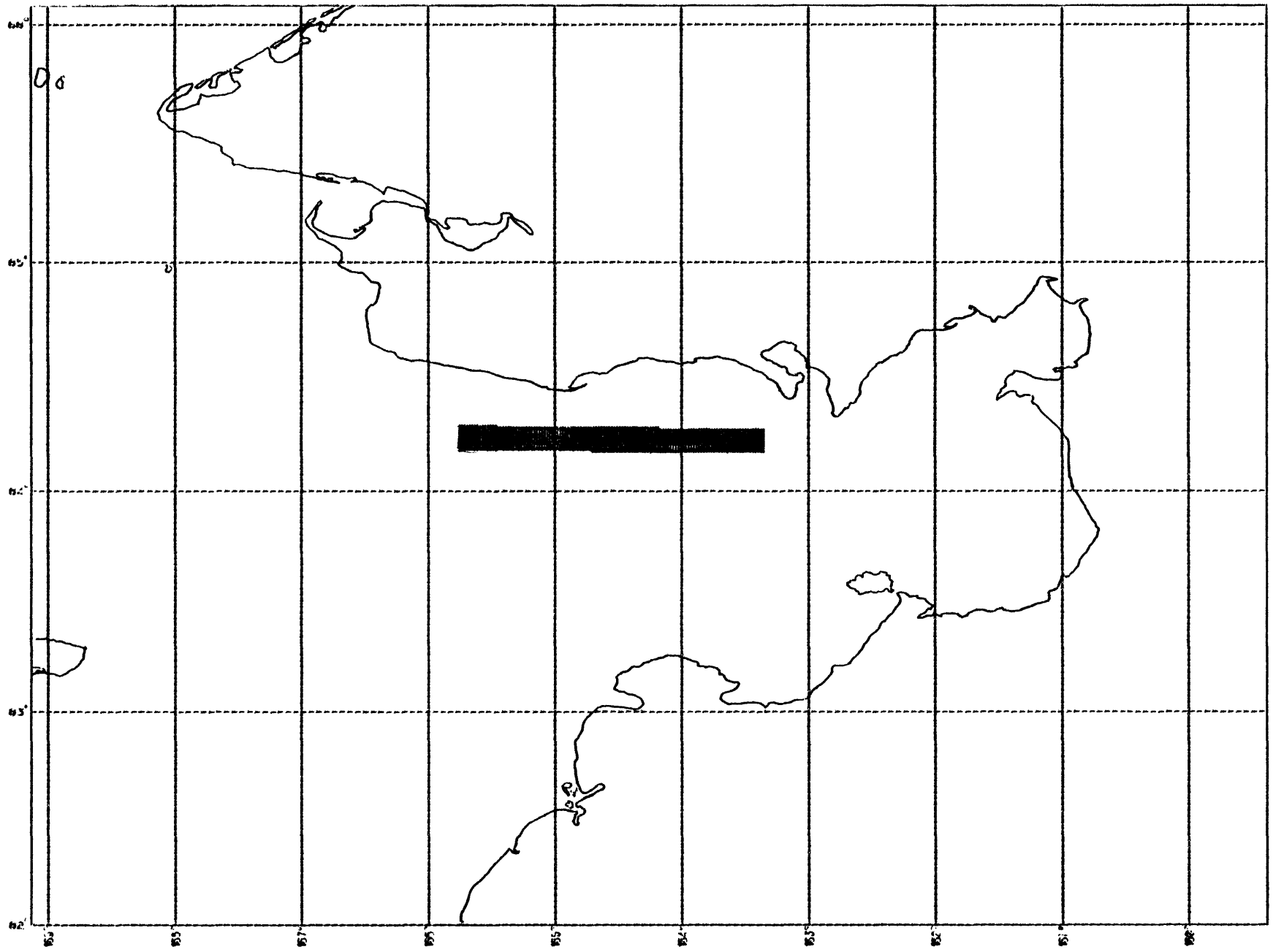

Figure A-7.--Map showing the location of Mid-boundary area 1, Norton Sound OCS Lease Sale 57: cross hatching indicates areal extent.

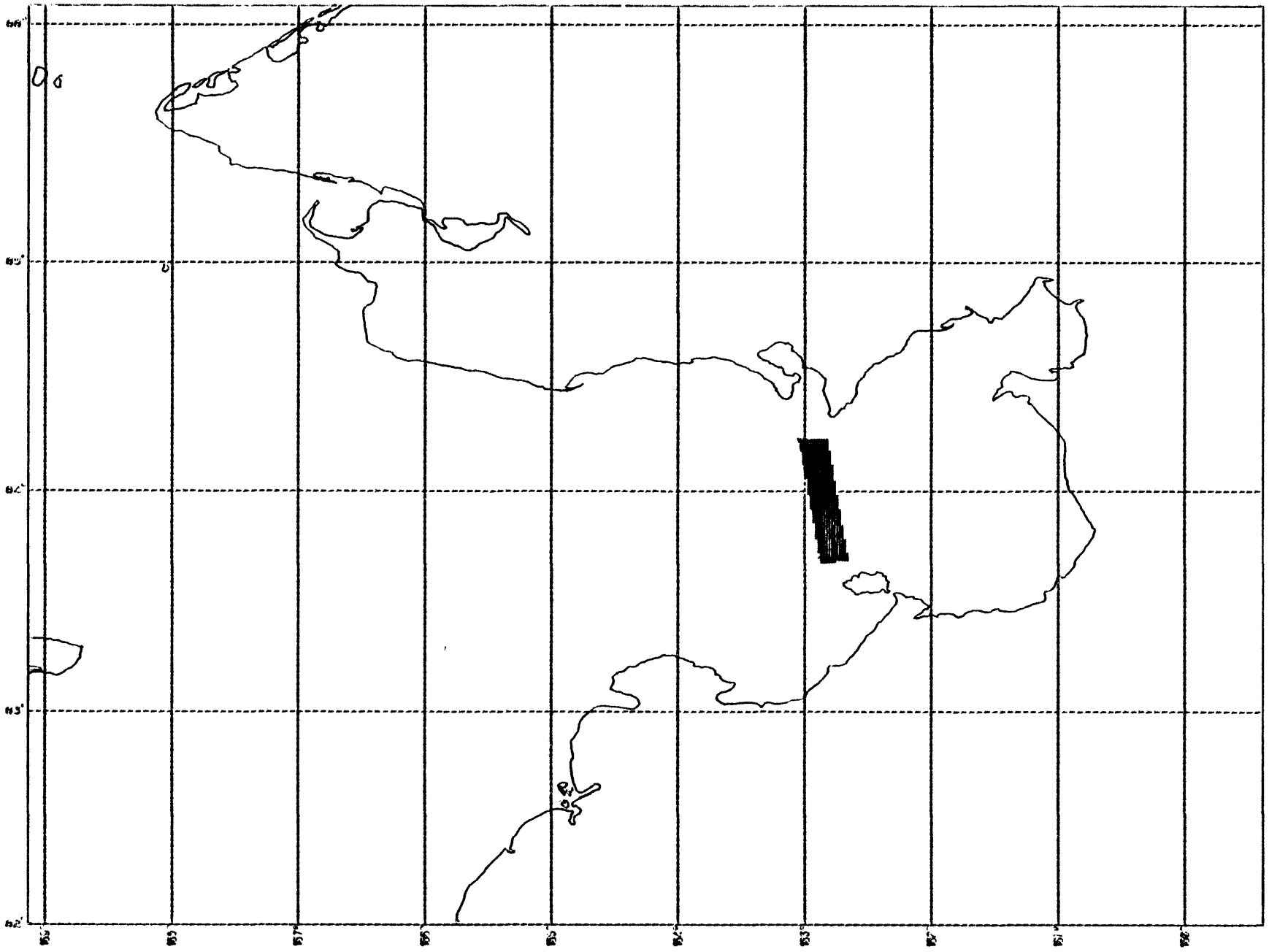

Figure A-8.--Map showing the location of Mid-boundary area 2, Norton Sound OCS Lease Sale 57; cross hatching indicates areal extent.

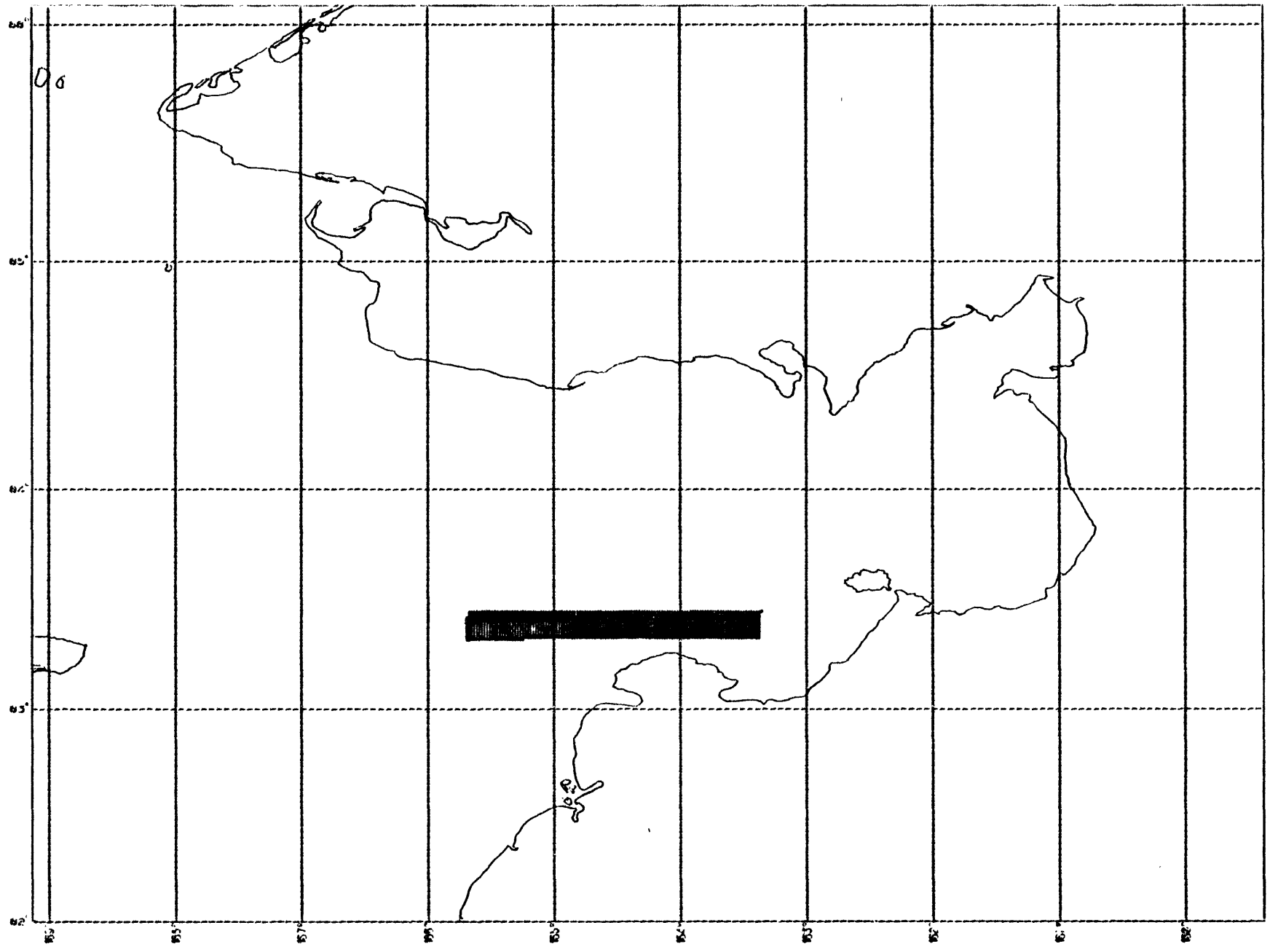

Figure A-9.--Map showing the location of Mid-boundary area 3, Norton Sound OCS Lease Sale 57: cross hatching indicates areal extent.

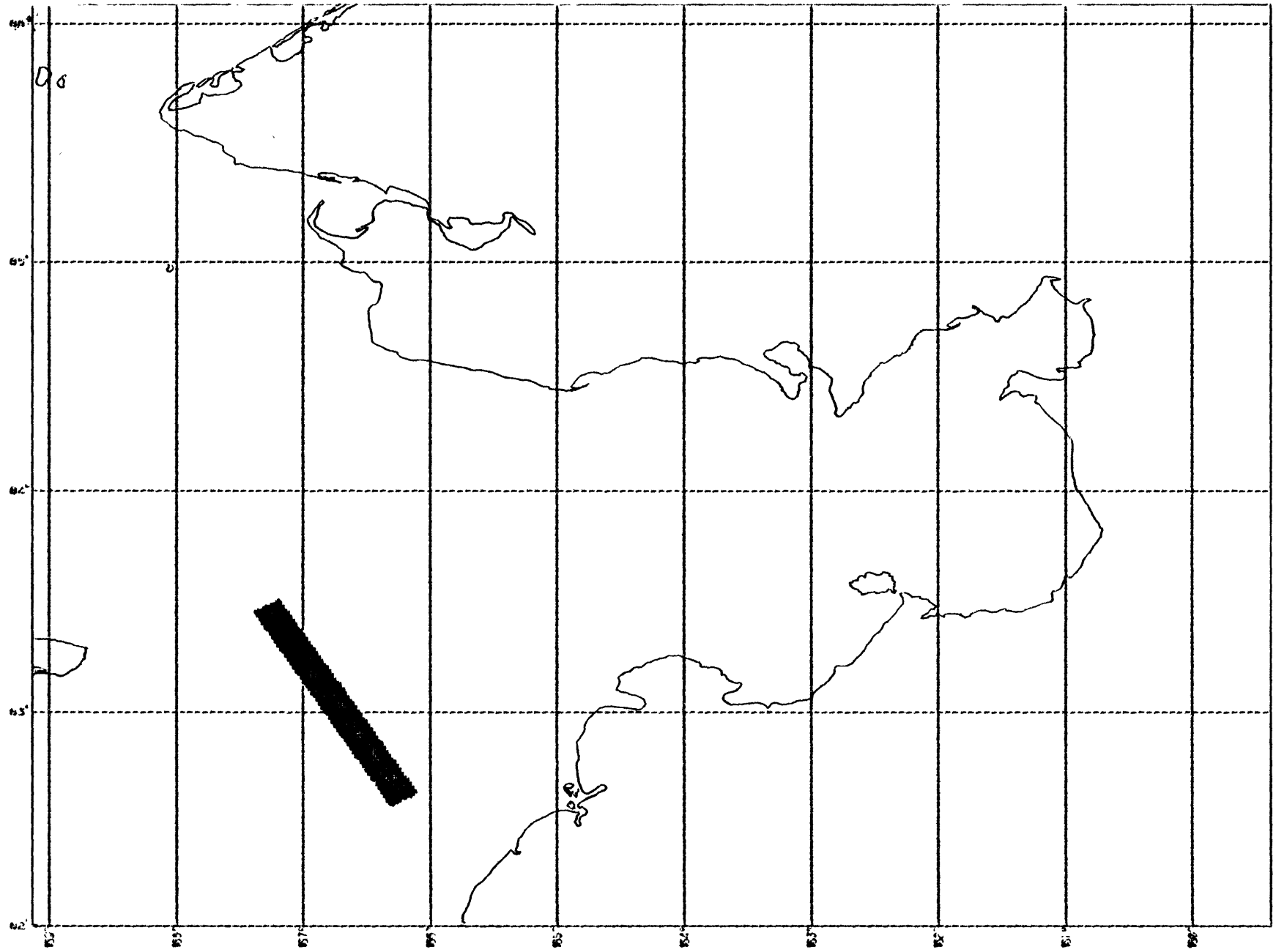

Figure A-10.--Map showing the location of Mid-boundary area 4, Norton Sound OCS Lease Sale 57: cross hatching indicates areal extent.

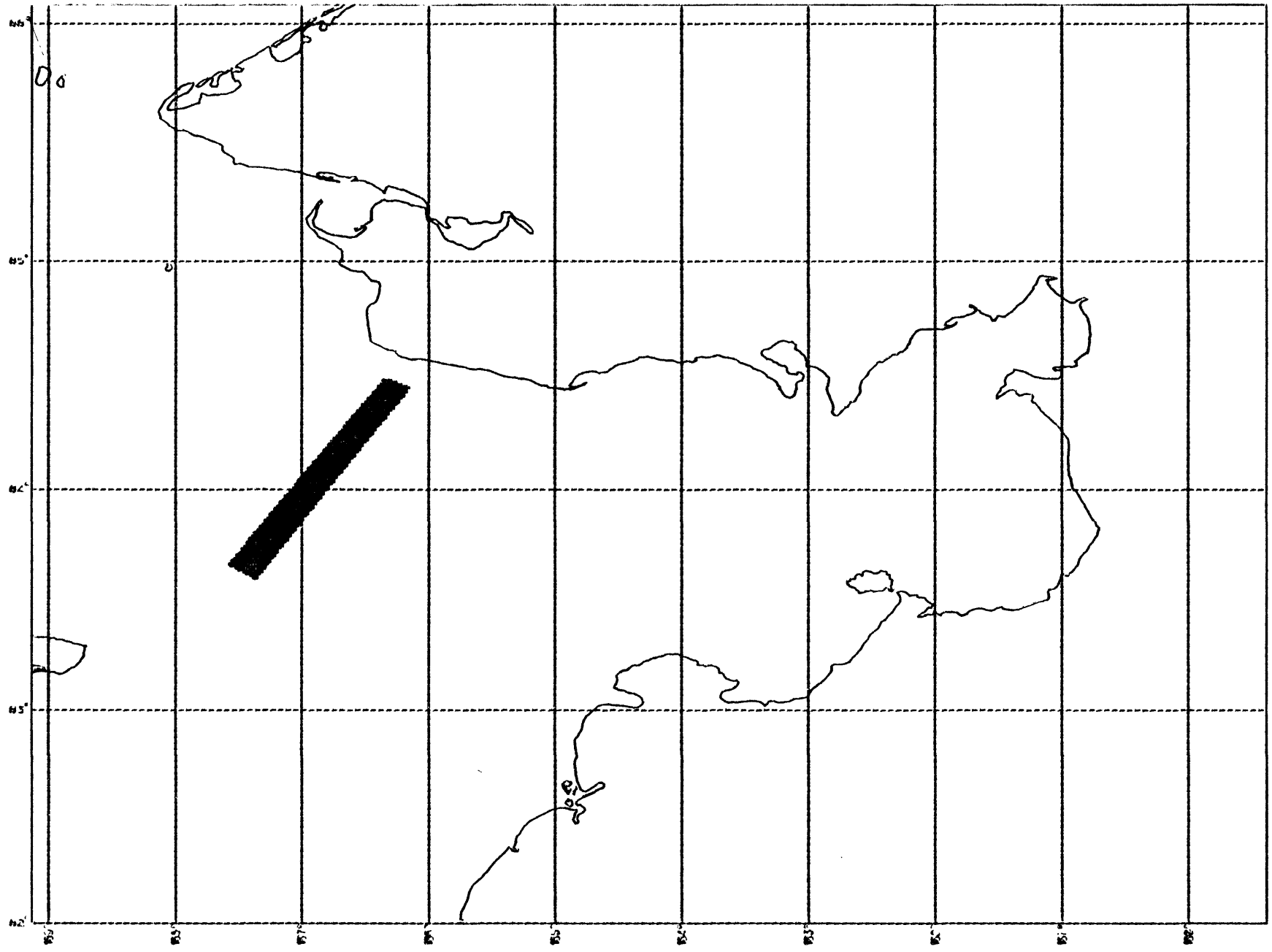

Figure A-11.--Map showing the location of Mid-boundary area 5, Norton Sound OCS Lease Sale 57: cross hatching indicates areal extent.

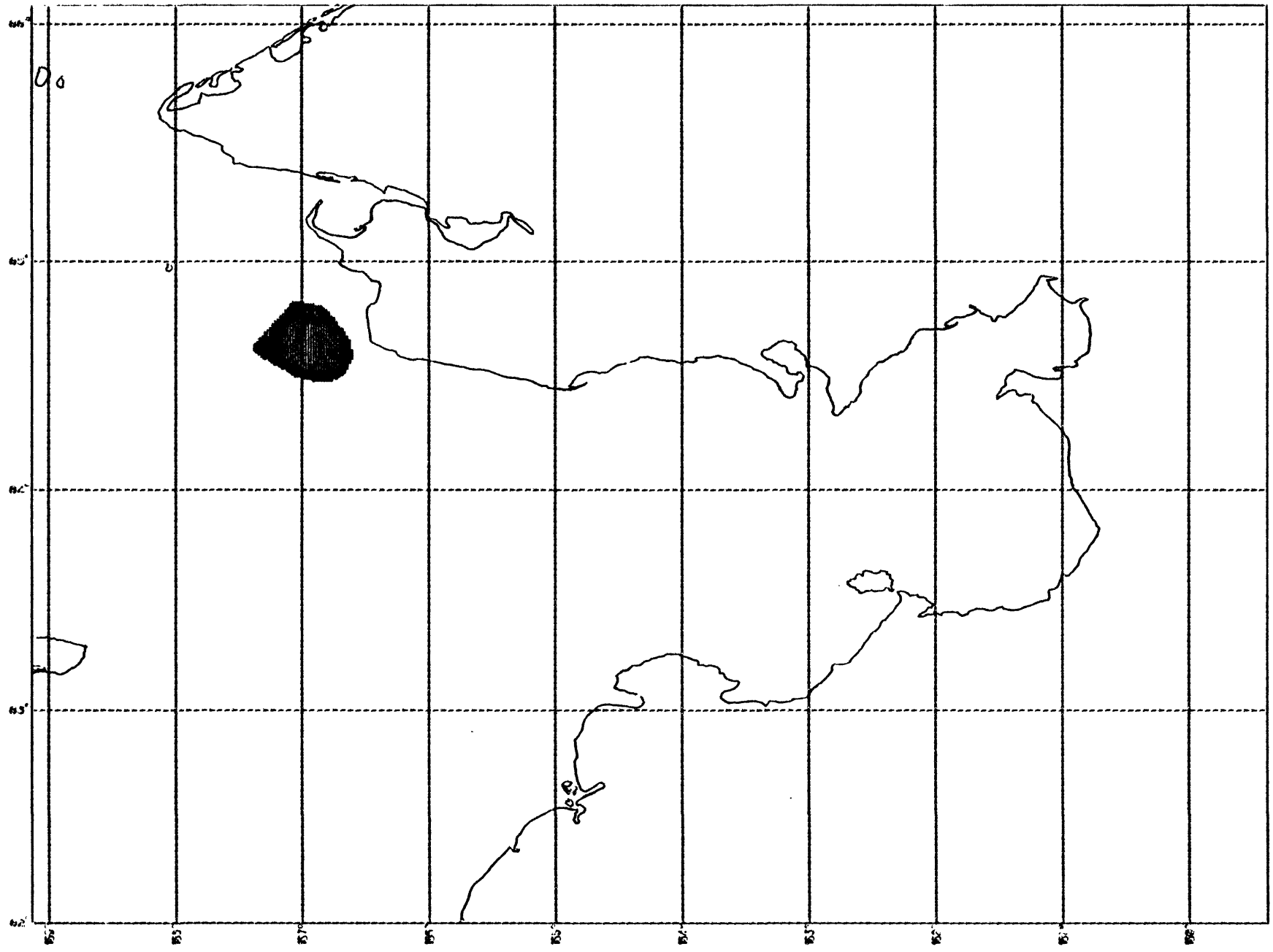

Figure A-12.--Map showing the location of Seabird foraging area 1, Norton Sound OCS Lease Sale 57: cross hatching indicates areal extent.

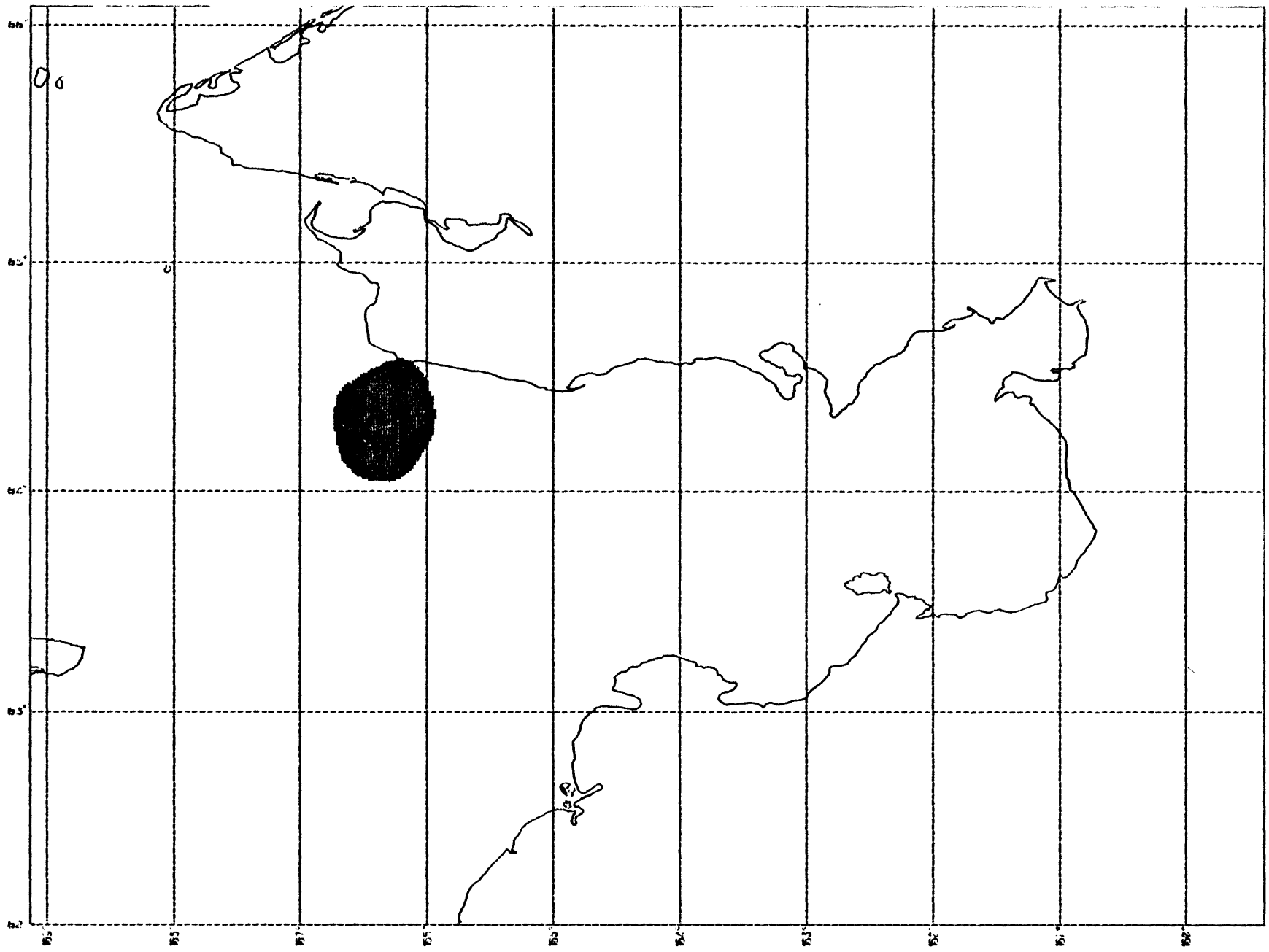

Figure A-13.--Map showing the location of Seabird foraging area 2, Norton Sound OCS Lease Sale 57: cross hatching indicates areal extent.

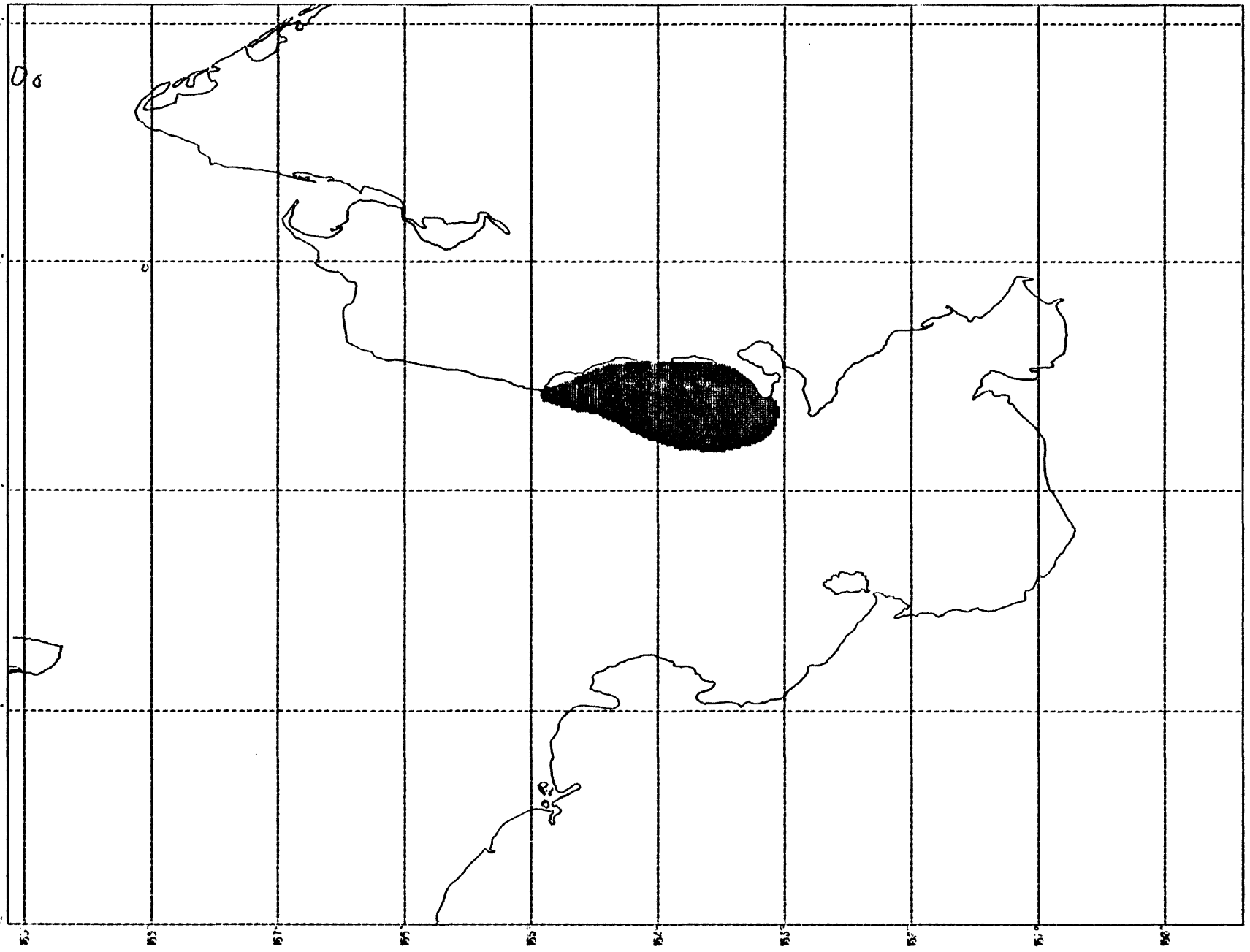

Figure A-14.--Map showing the location of Seabird foraging area 3, Norton Sound OCS Lease Sale 57: cross hatching indicates areal extent.

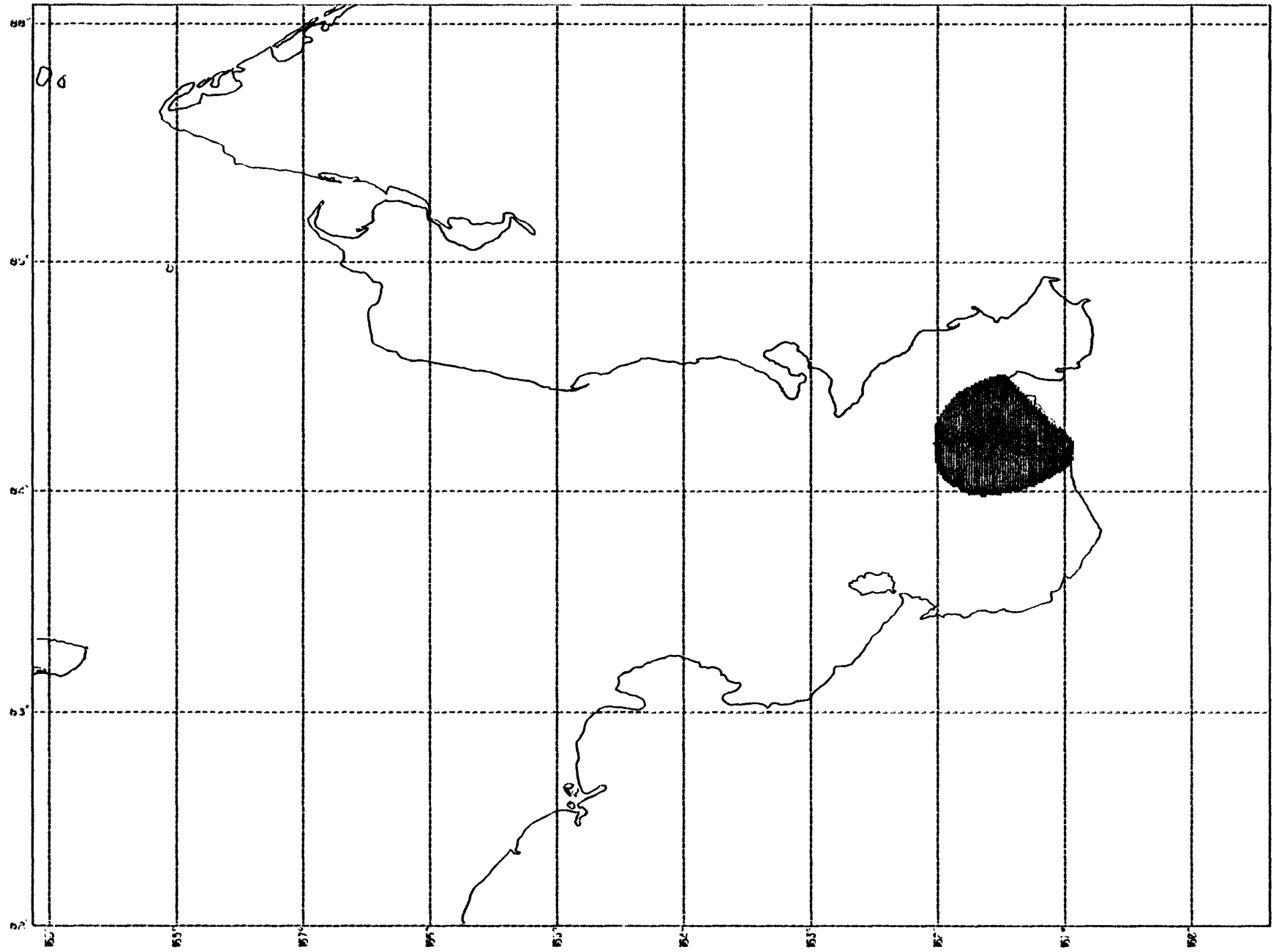

Figure A-15.--Map showing the location of Seabird foraging area 4, Norton Sound OCS Lease Sale 57: cross hatching indicates areal extent.

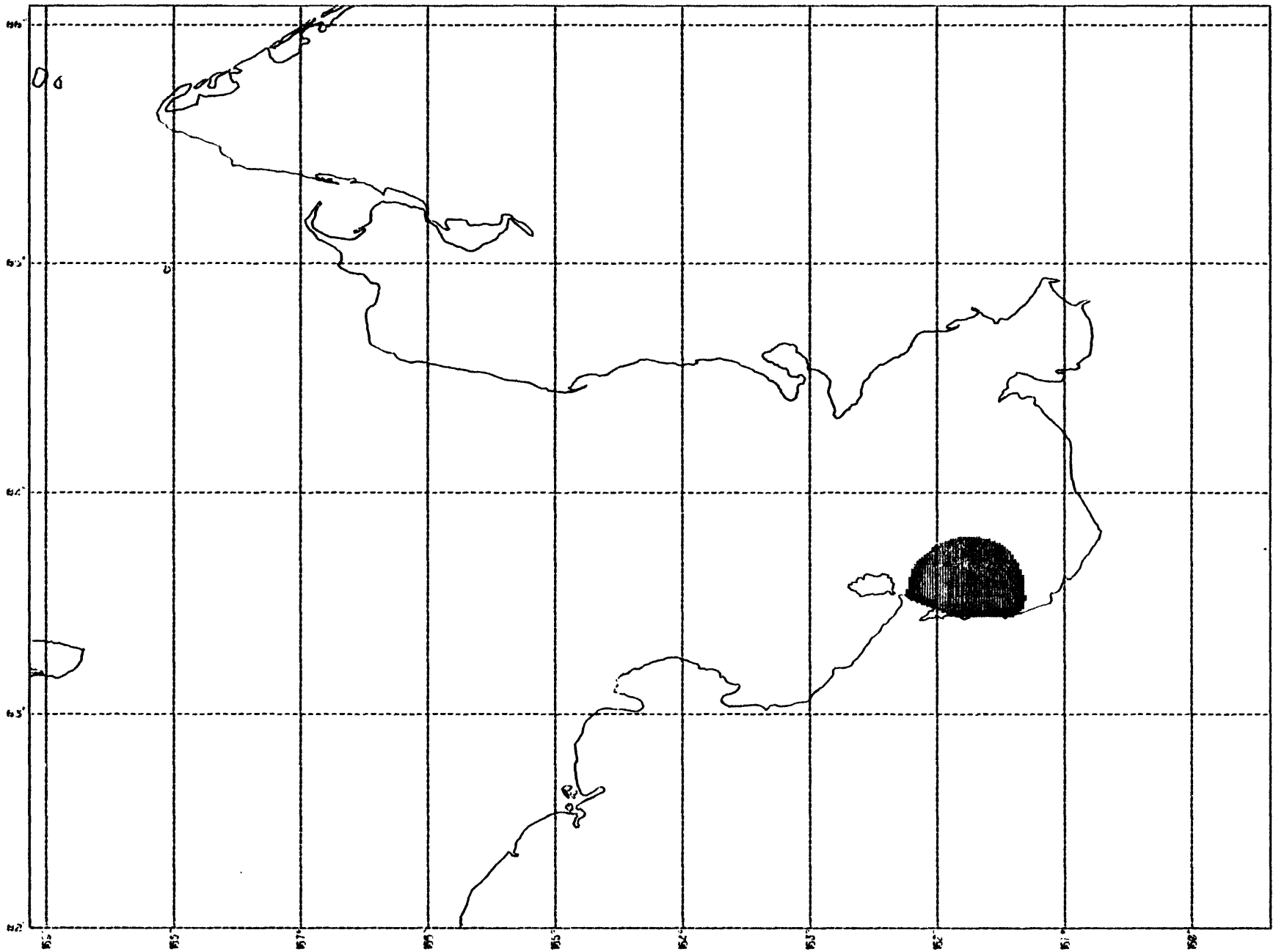

Figure A-16.--Map showing the location of Seabird foraging area 5, Norton Sound OCS Lease Sale 57: cross hatching indicates areal extent.

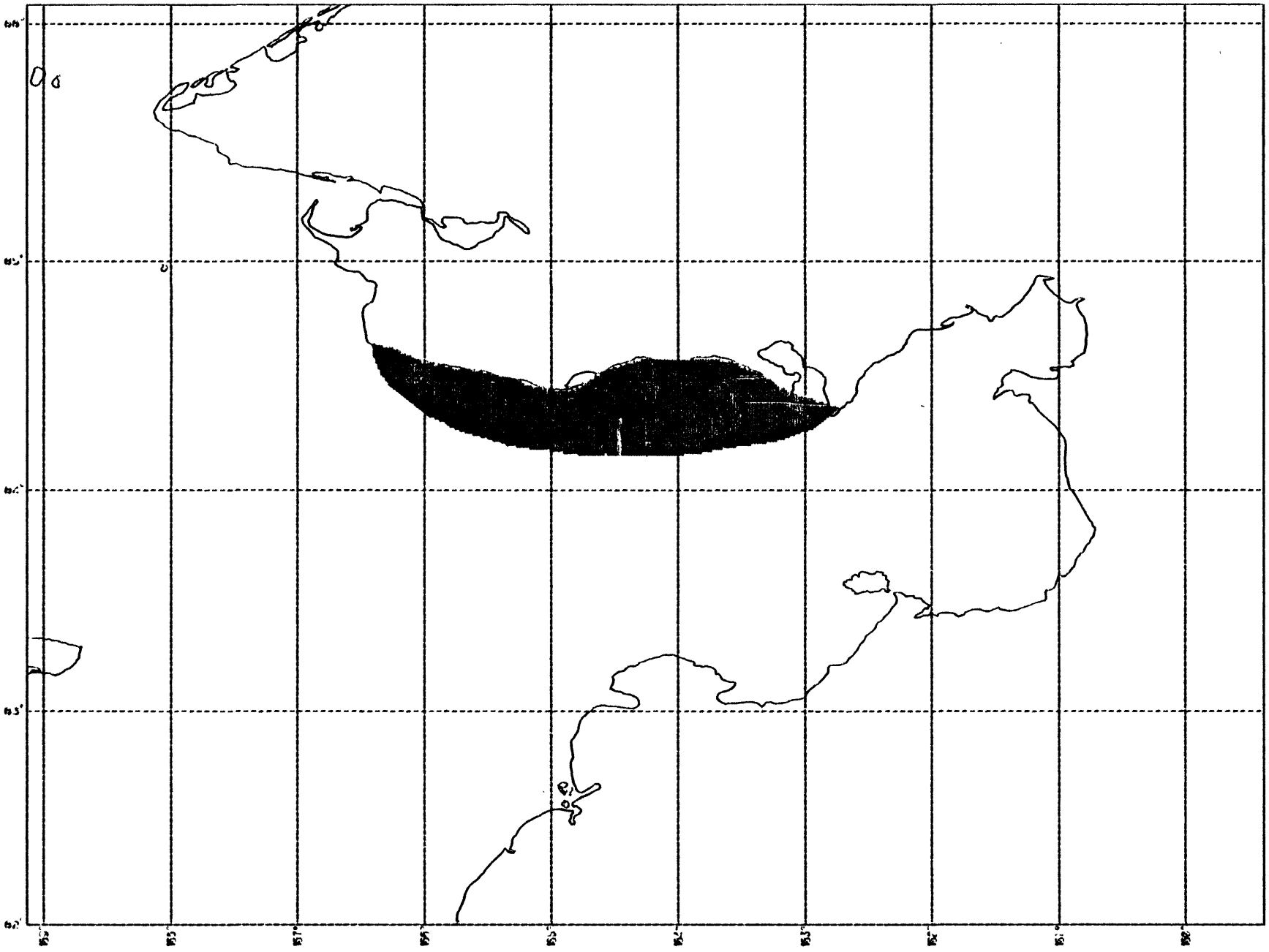

Figure A-17.--Map showing the location of the King crab fishery area, Norton Sound OCS Lease Sale 57: cross hatching indicates areal extent.

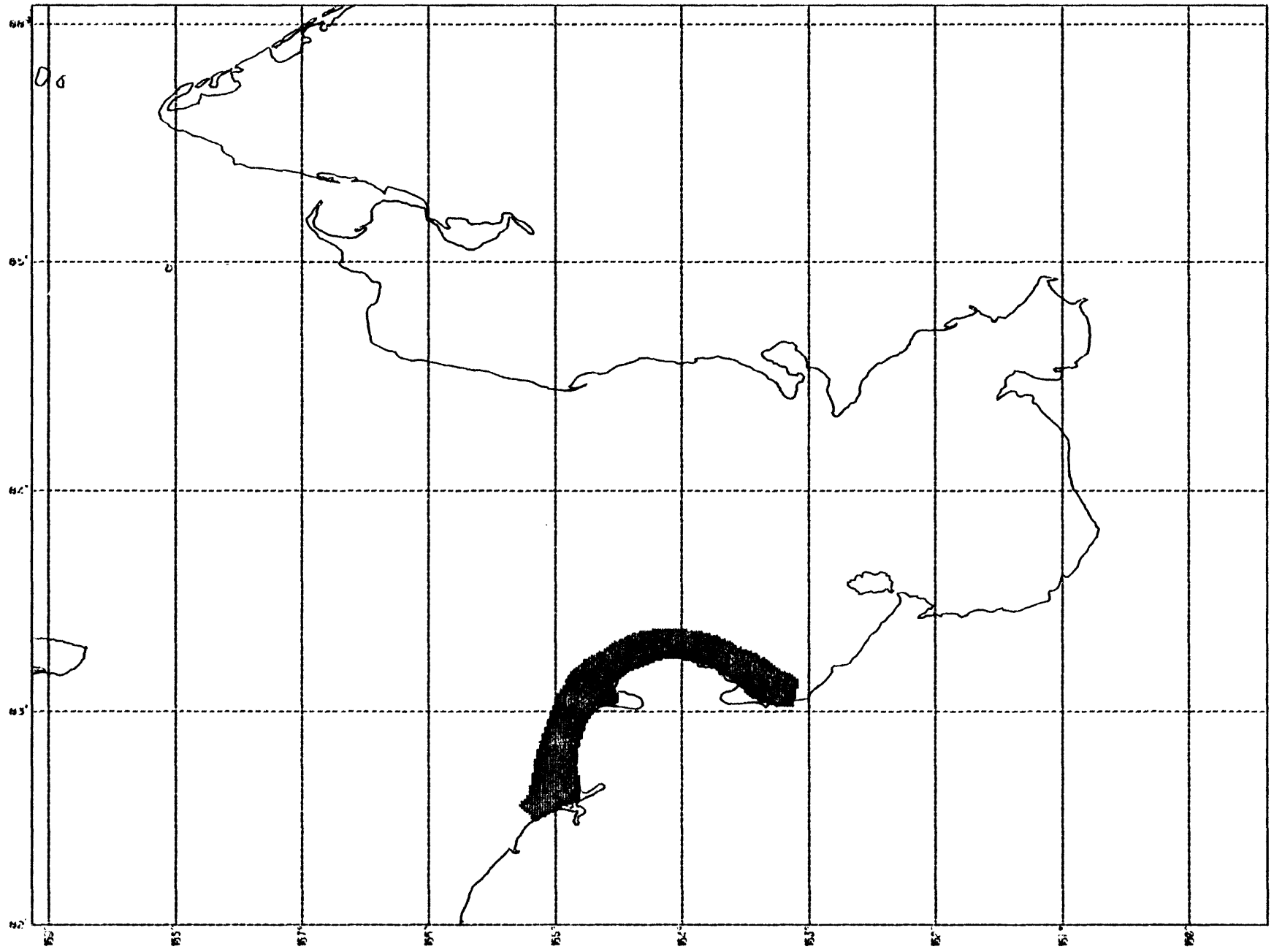

Figure A-18.--Map showing the location of the Yukon Delta entrainment area, Norton Sound OCS Lease Sale 57: cross hatching indicates areal extent.

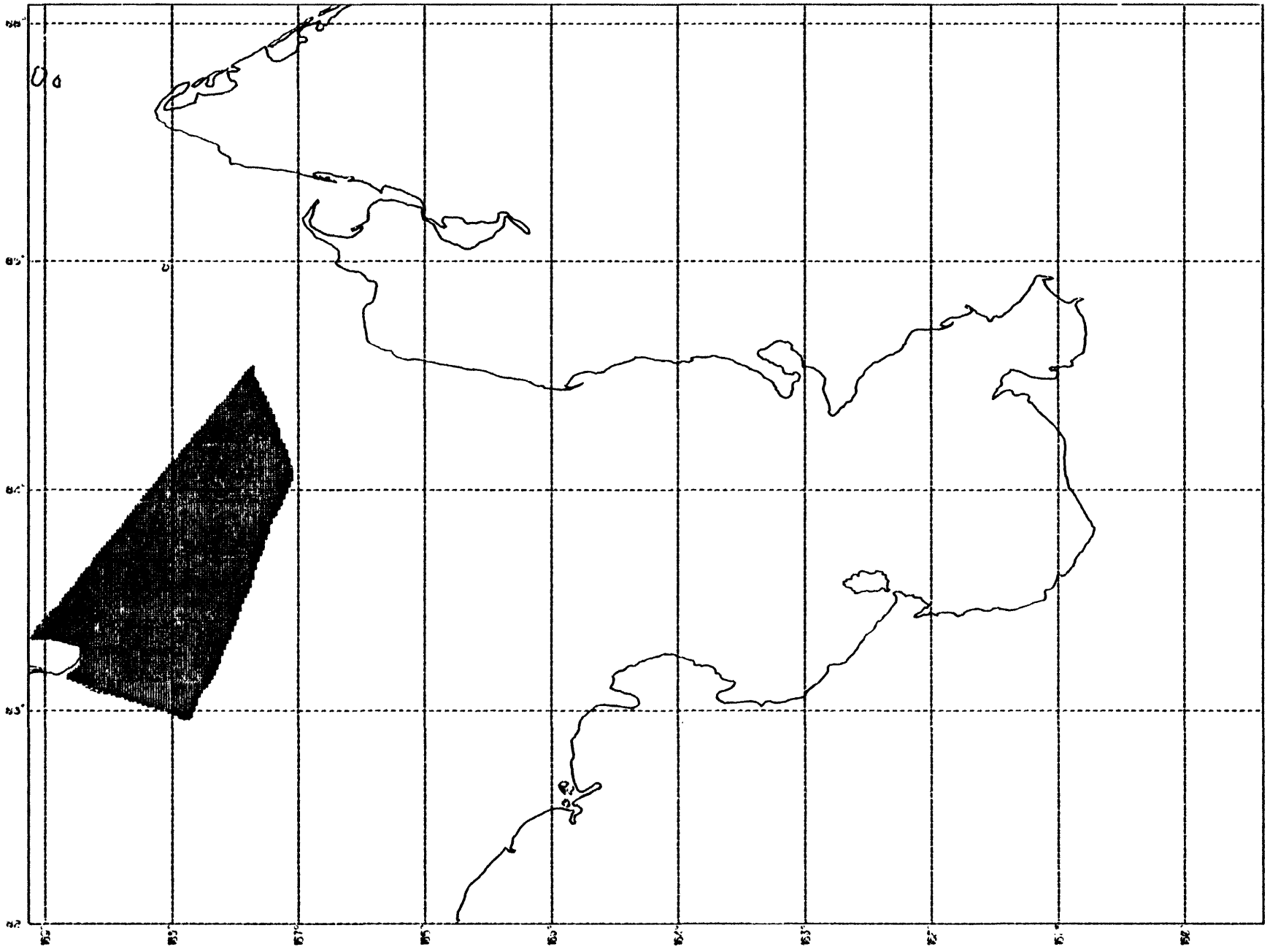

Figure A-19.--Map showing the location of the Gray Whale feeding area and hypothetical Bowhead Whale migration corridor: cross hatching indicates areal extent.

Appendix B

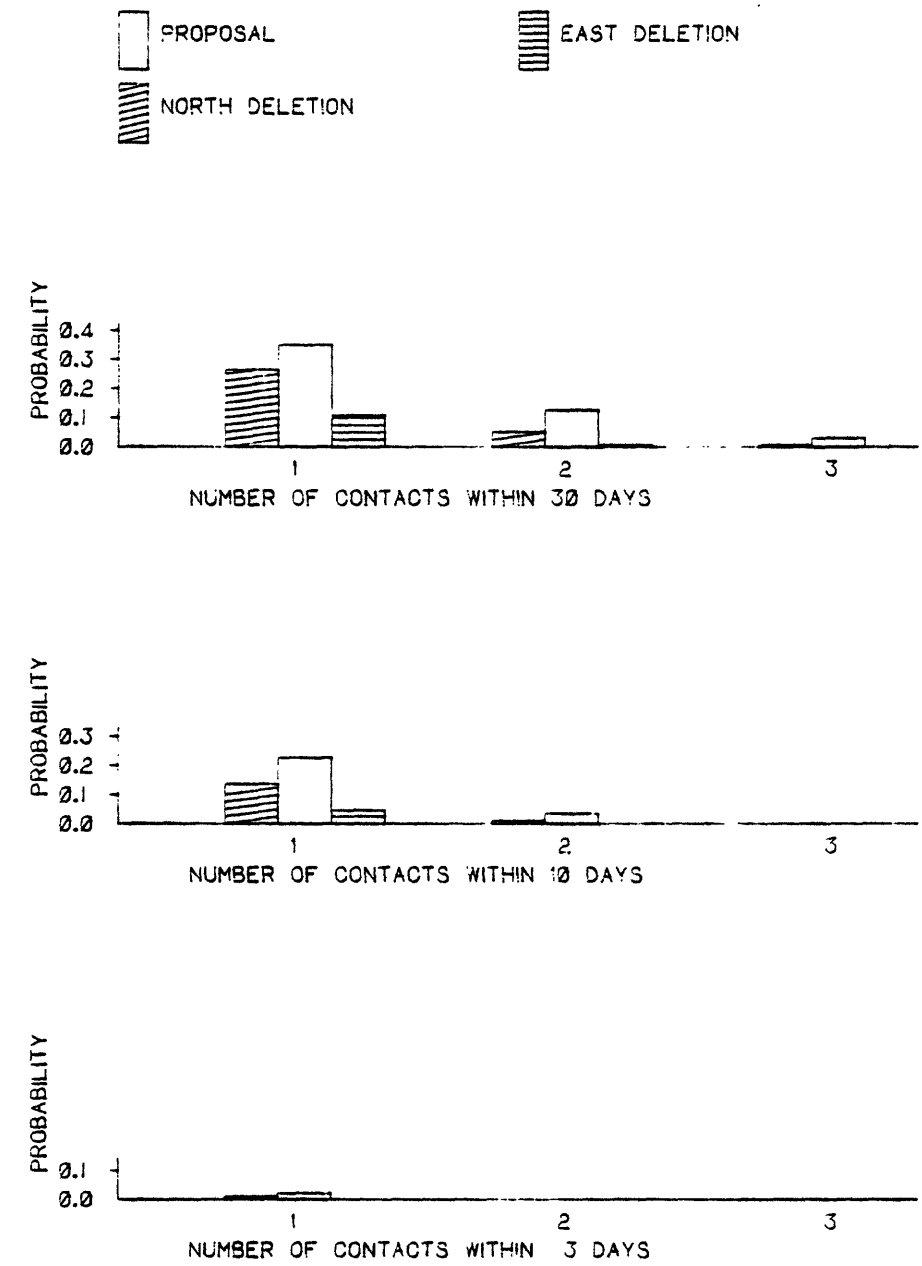

Figure 3-1.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting land as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the onshore transportation scenario.

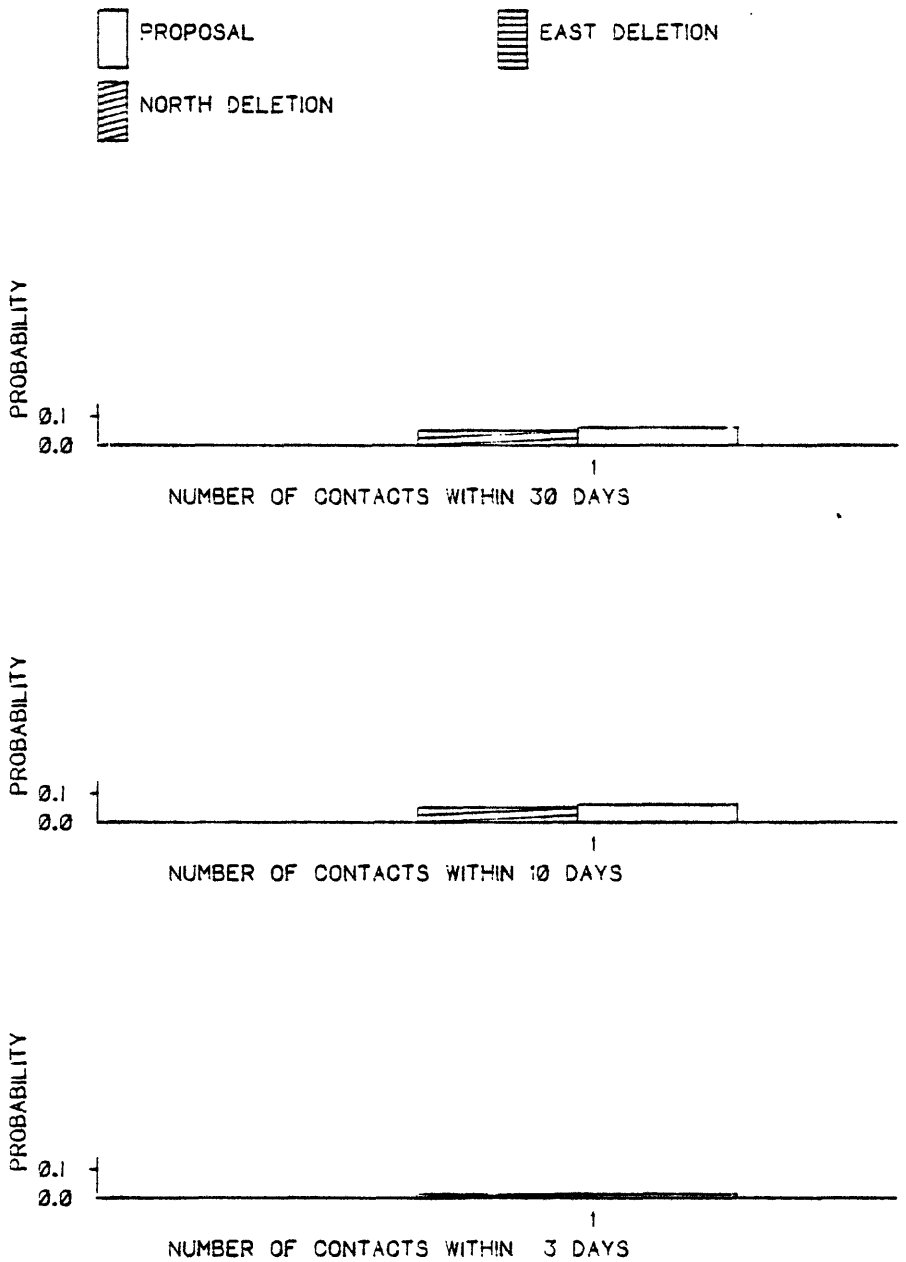

Figure B-2.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting ice zone 5 as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the onshore transportation scenario.

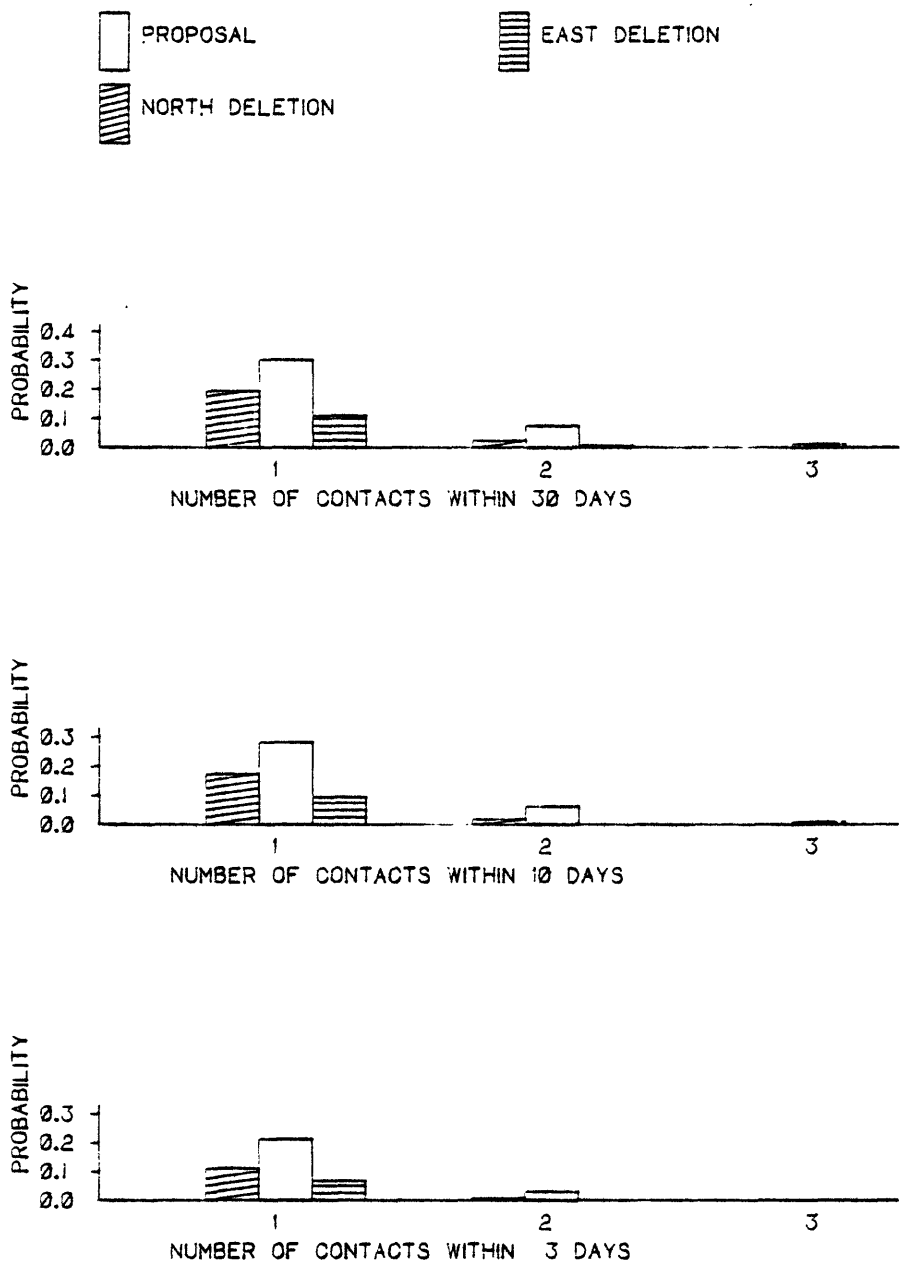

Figure B-3.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting mid-boundary area 1 (summer) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the onshore transportation scenario.

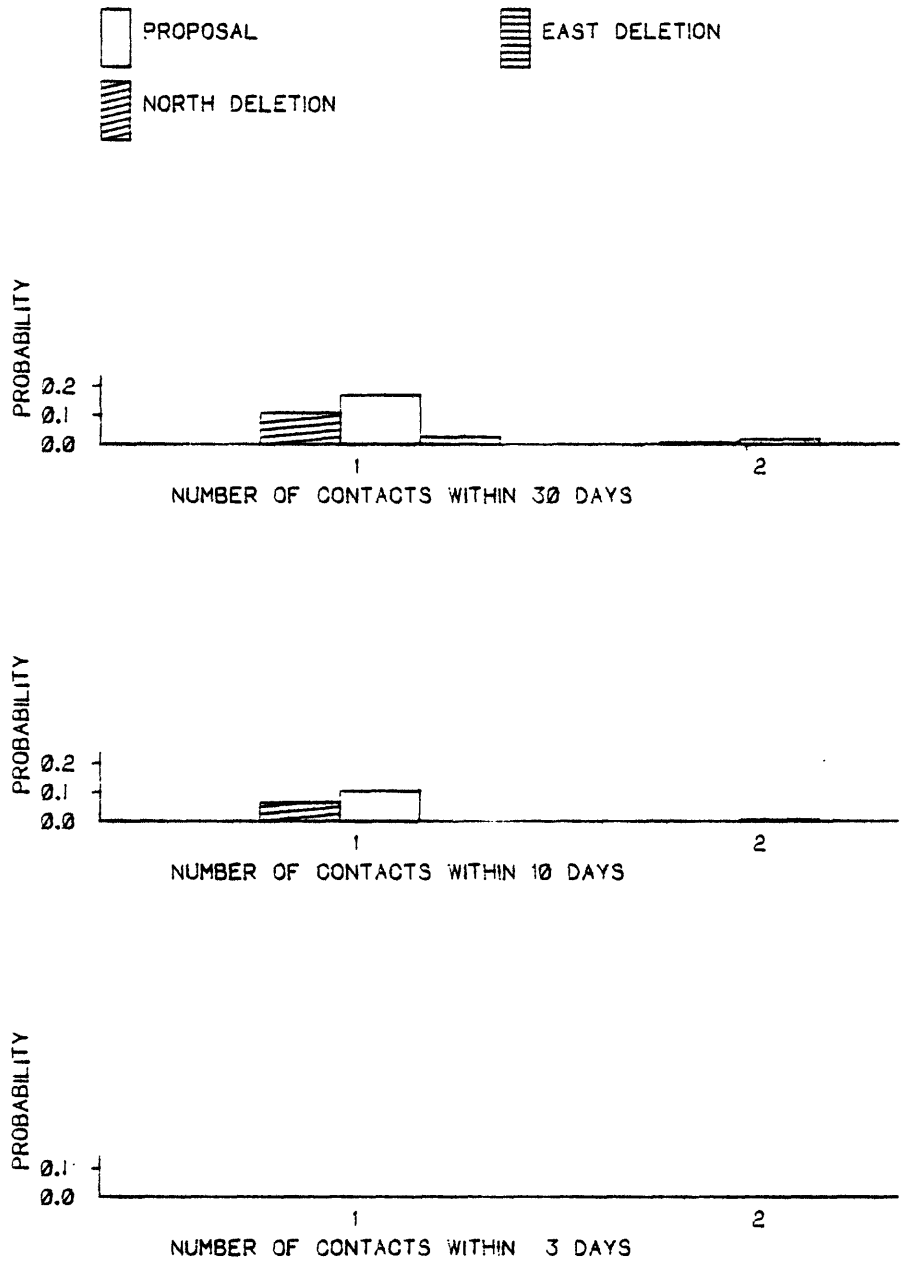

Figure B-4.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting mid-boundary area 2 (summer) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the onshore transportation scenario.

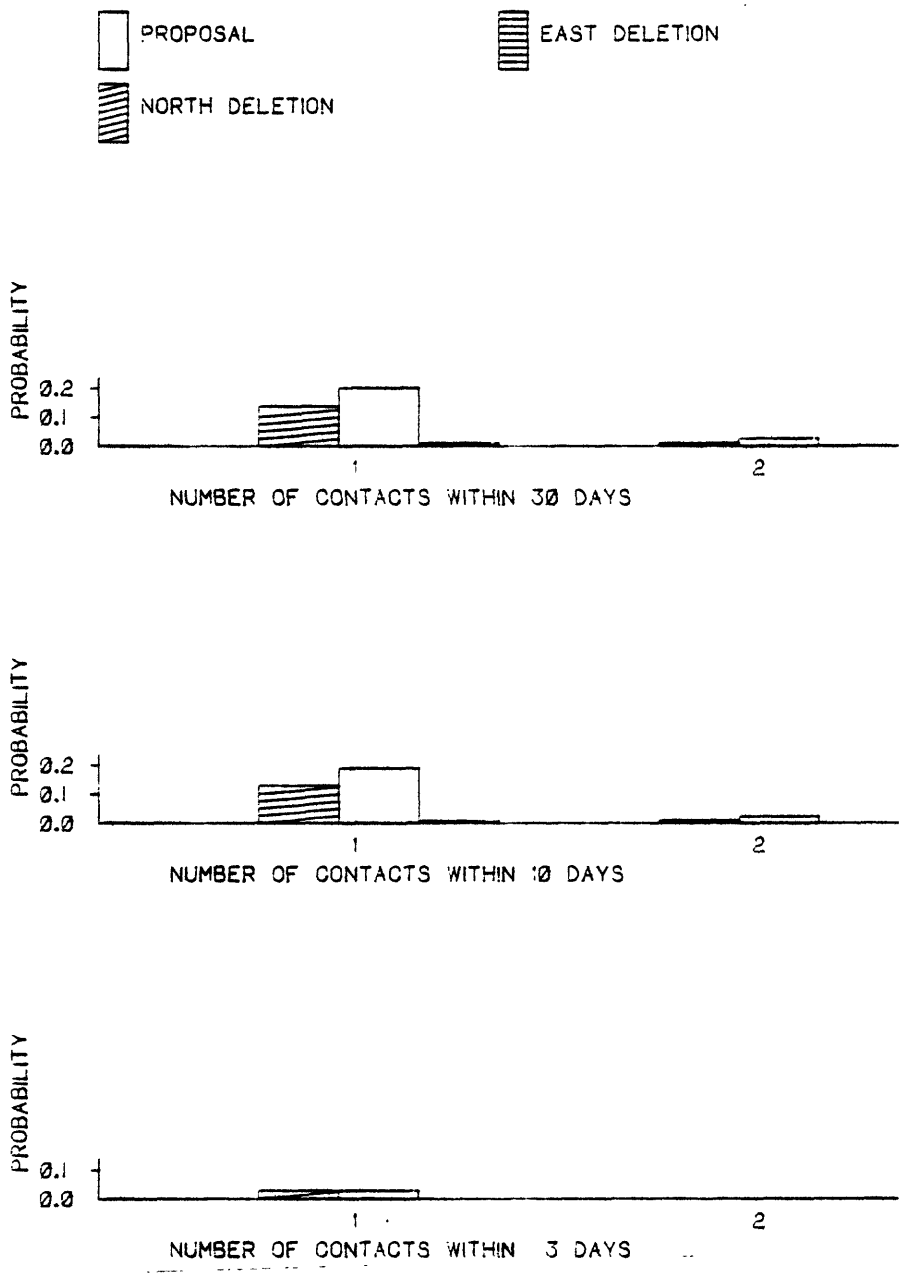

Figure B-5.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting mid-boundary area 3 (summer) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the onshore transportation scenario.

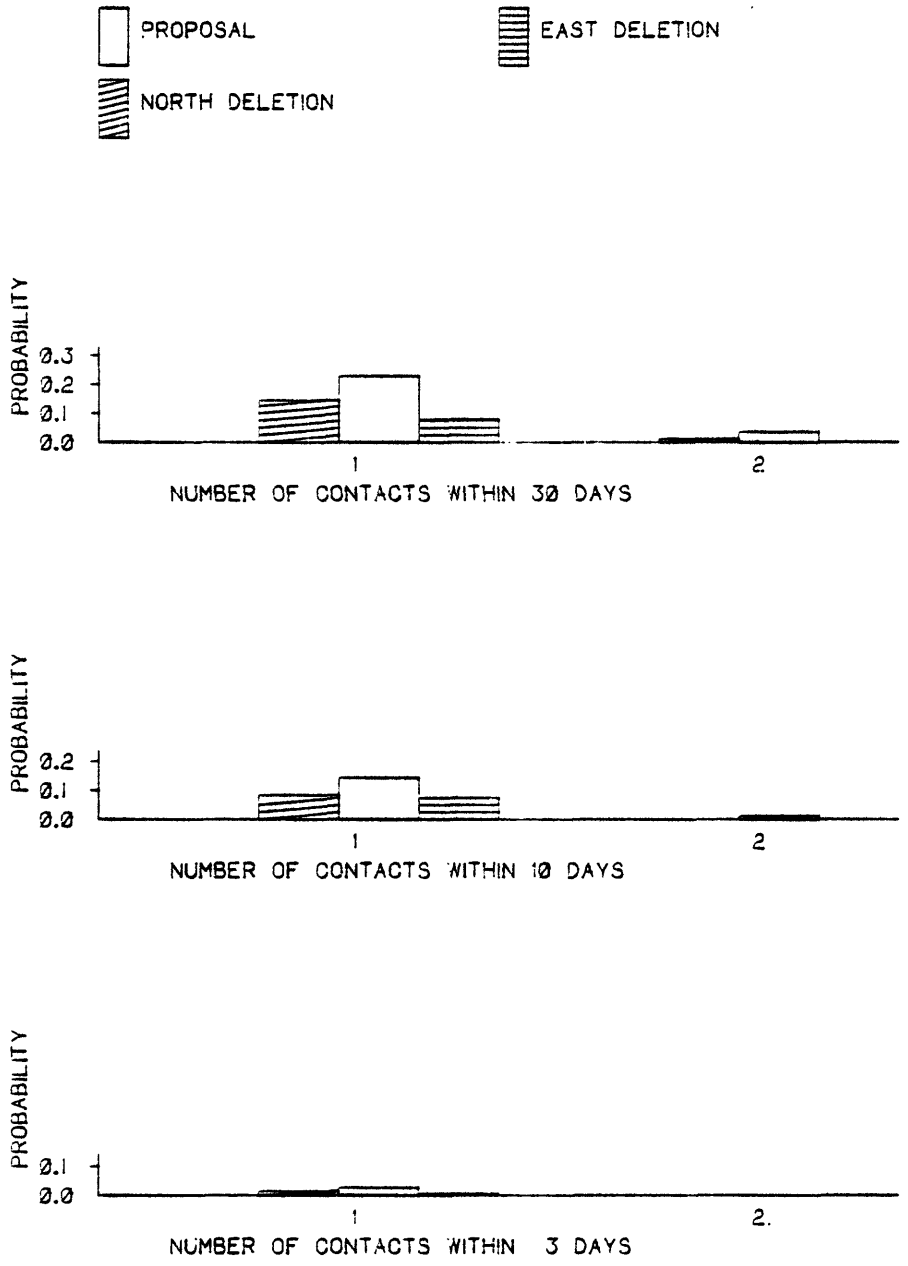

Figure 3-6.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting mid-boundary area 4 (summer) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the onshore transportation scenario.

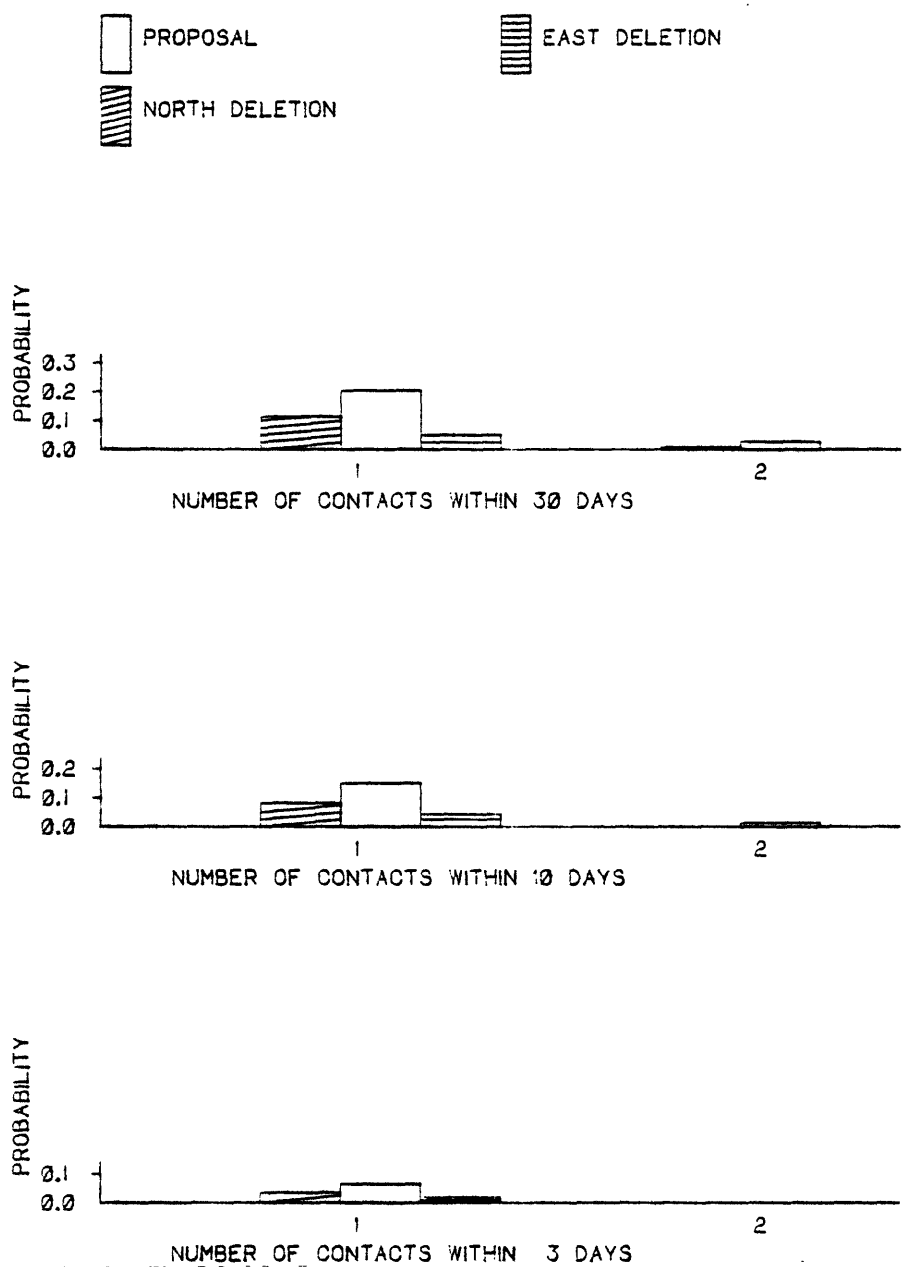

Figure 8-7.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting mid-boundary area 5 (summer) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the onshore transportation scenario.

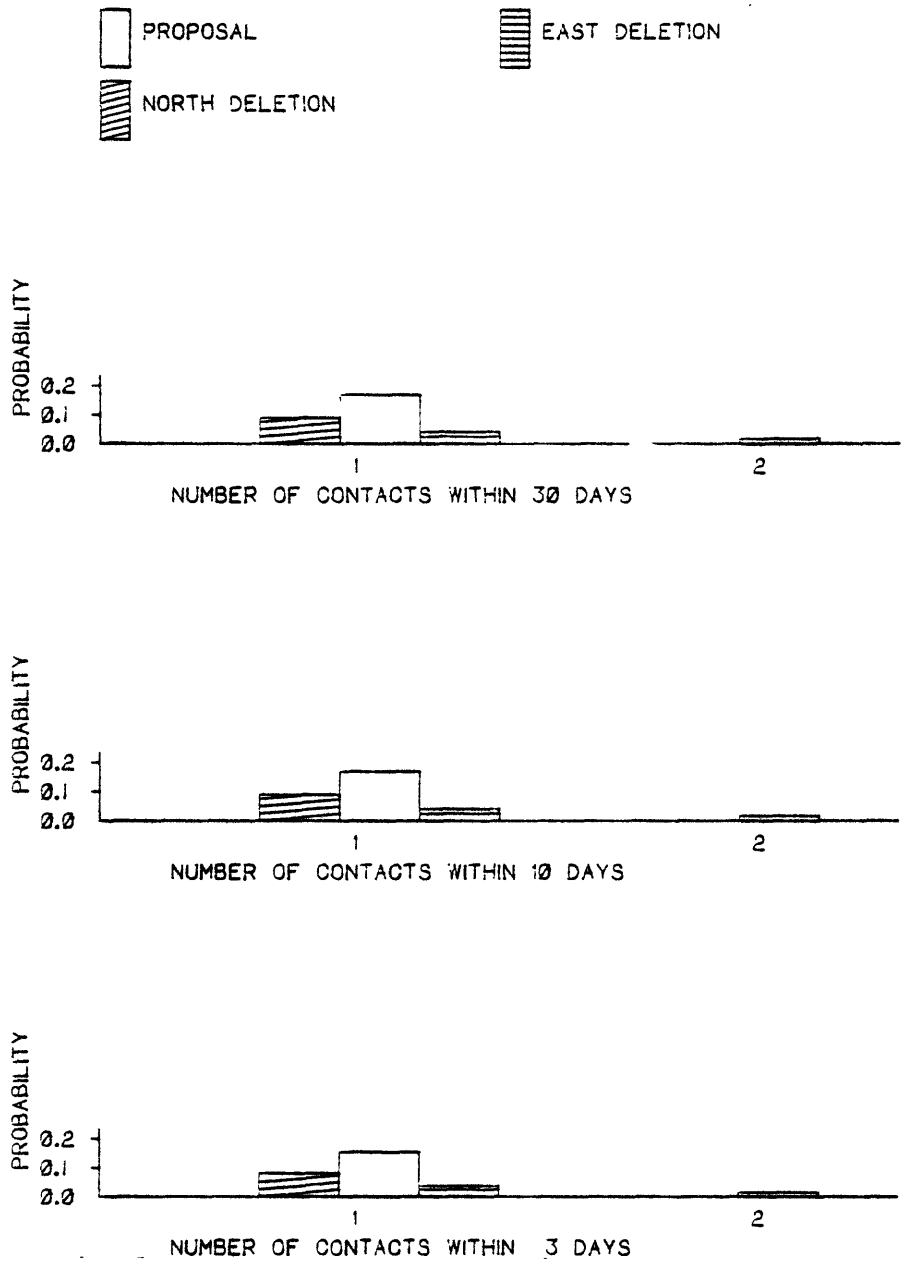

Figure 8-8.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting mid-boundary area 1 (winter) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the onshore transportation scenario.

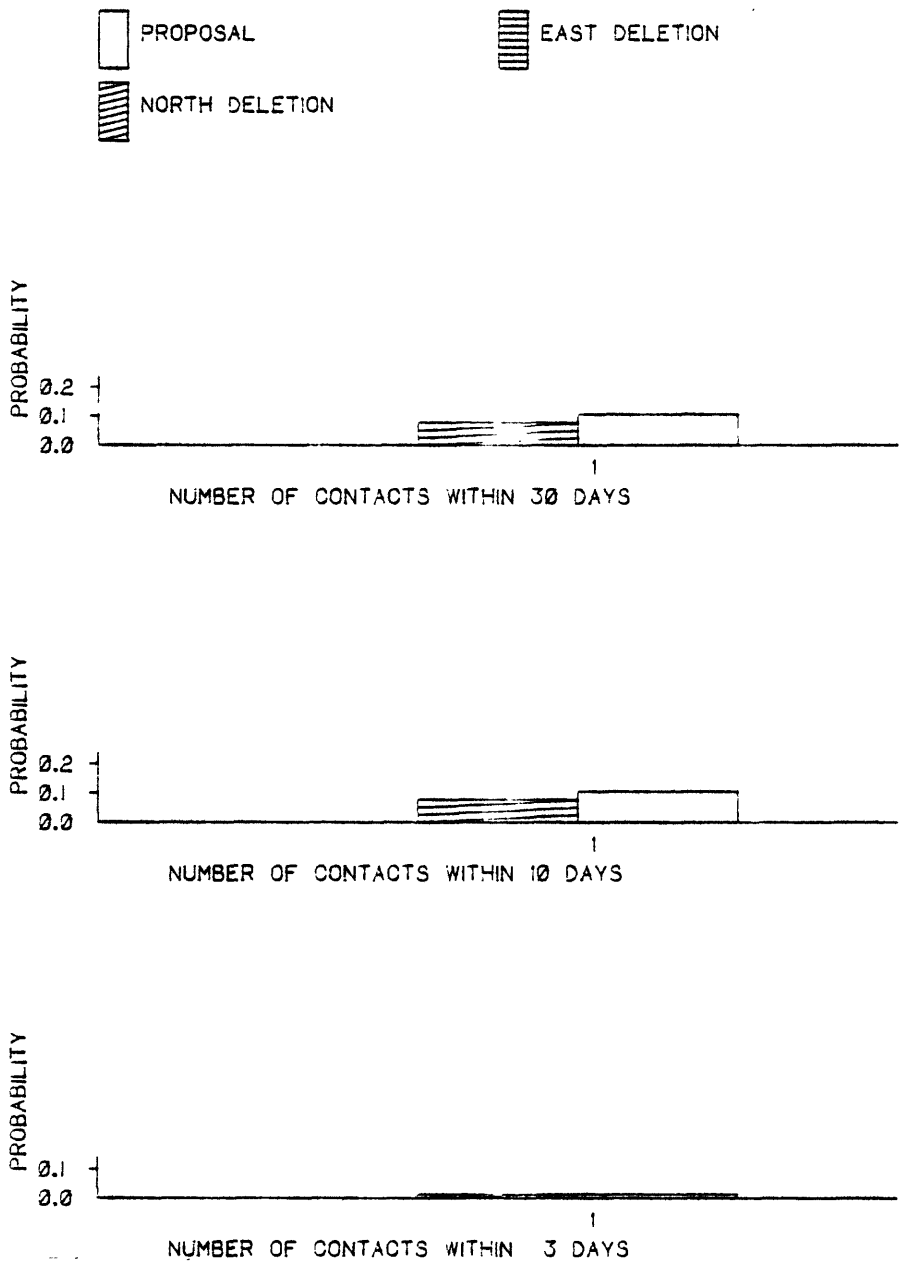

Figure 3-9.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting mid-boundary area 3 (winter) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the onshore transportation scenario.

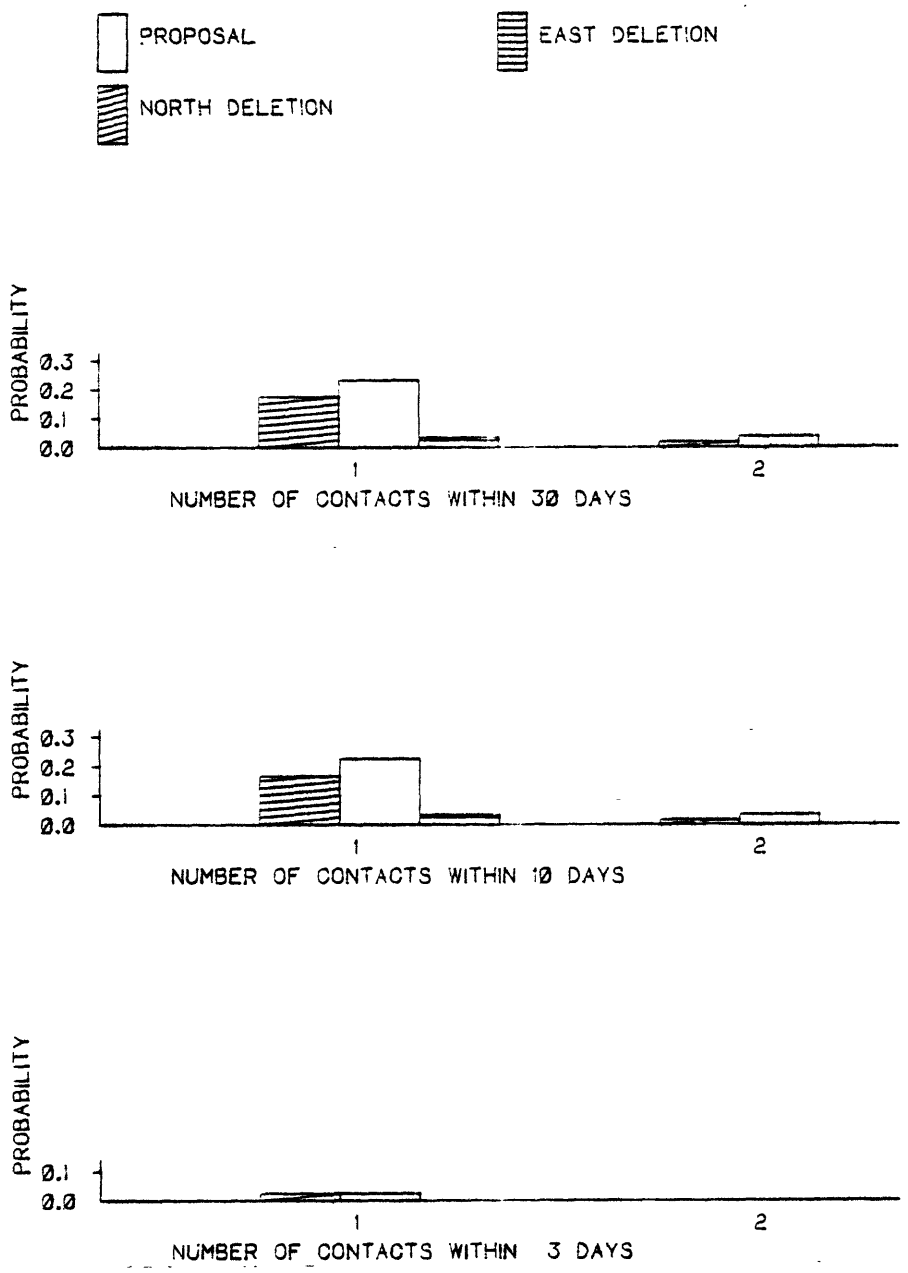

Figure 8-10.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting mid-boundary area 4 (winter) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the onshore transportation scenario.

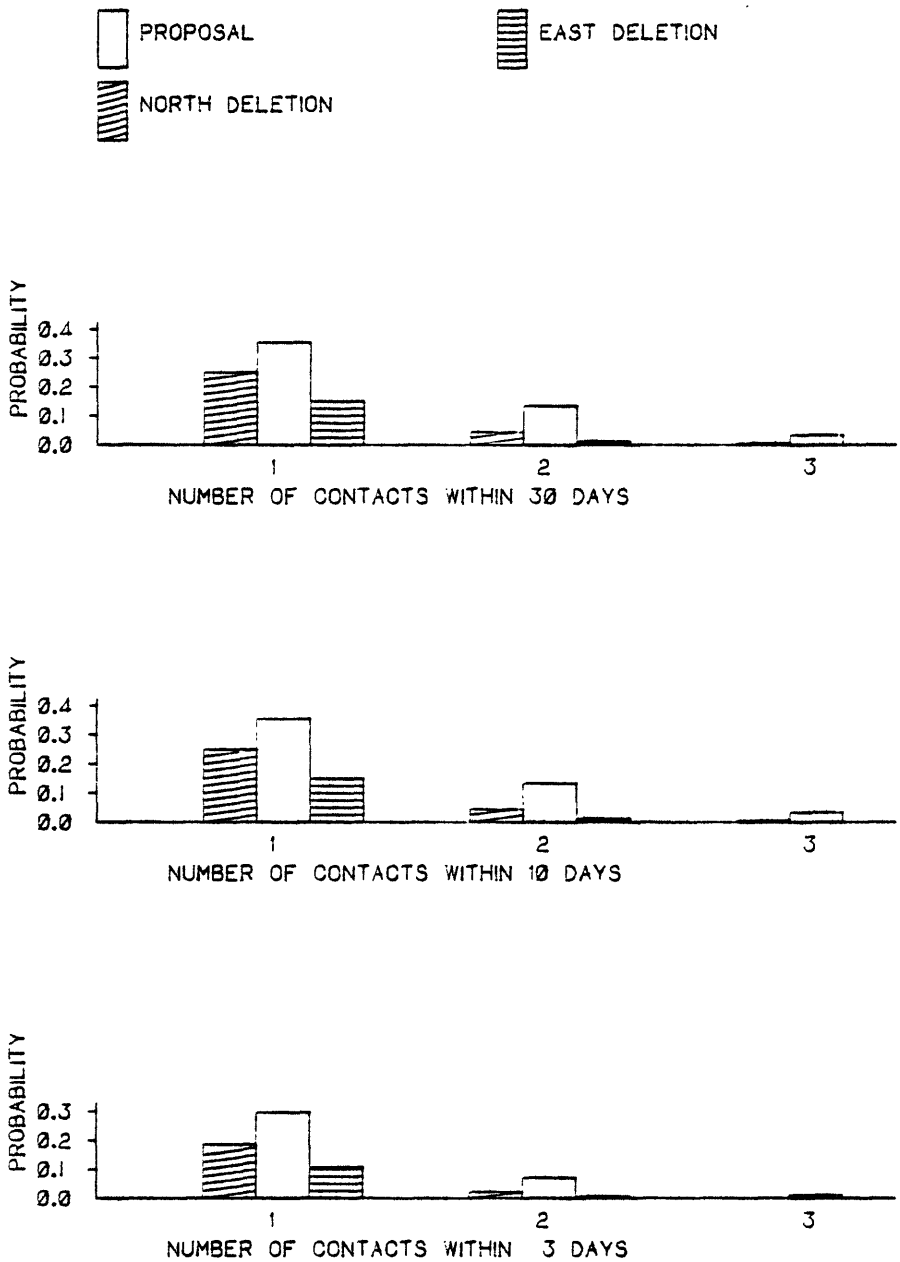

Figure B-11.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting mid-boundary area 5 (winter) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the onshore transportation scenario.

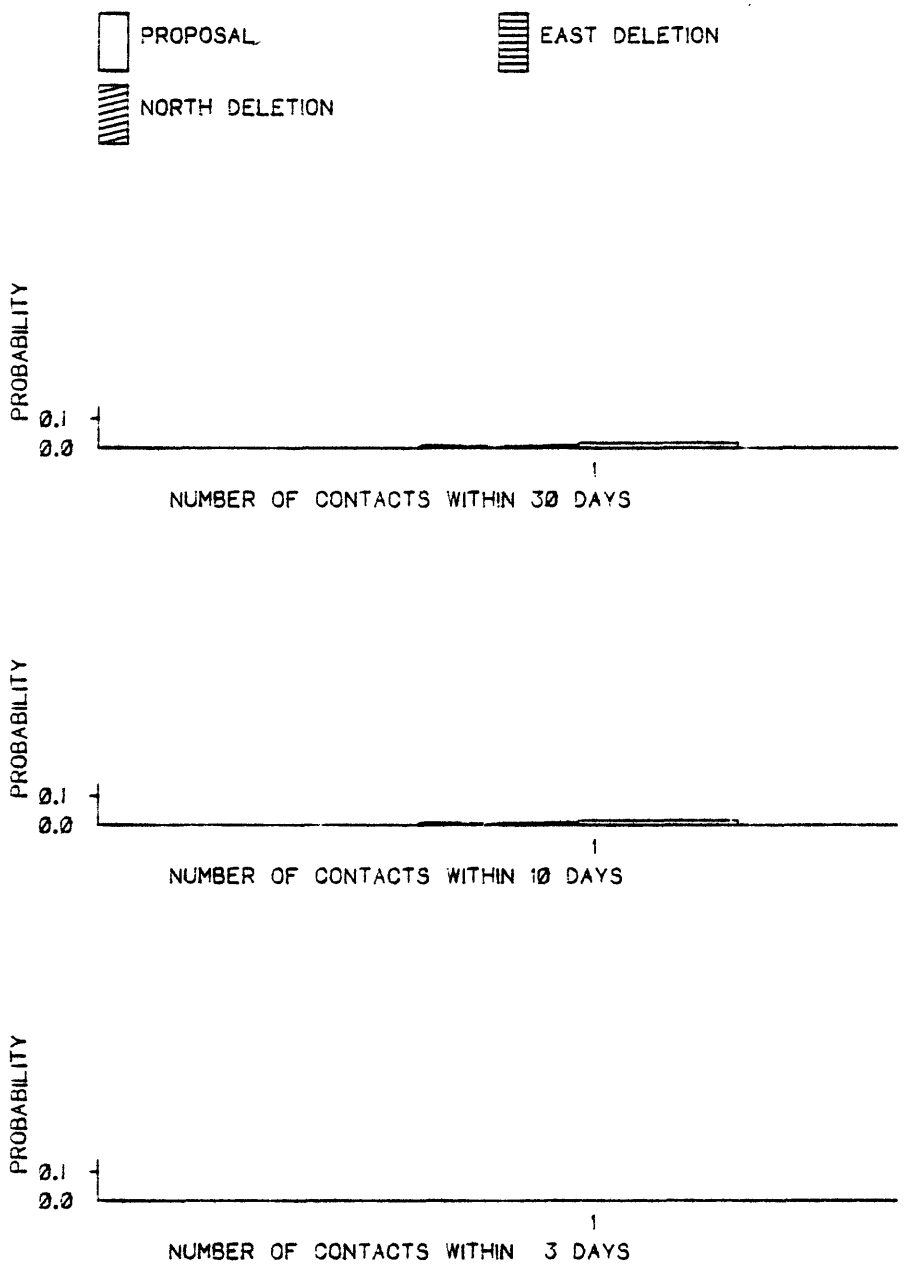

Figure B-12.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting seabird foraging area 1 (summer) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the onshore transportation scenario.

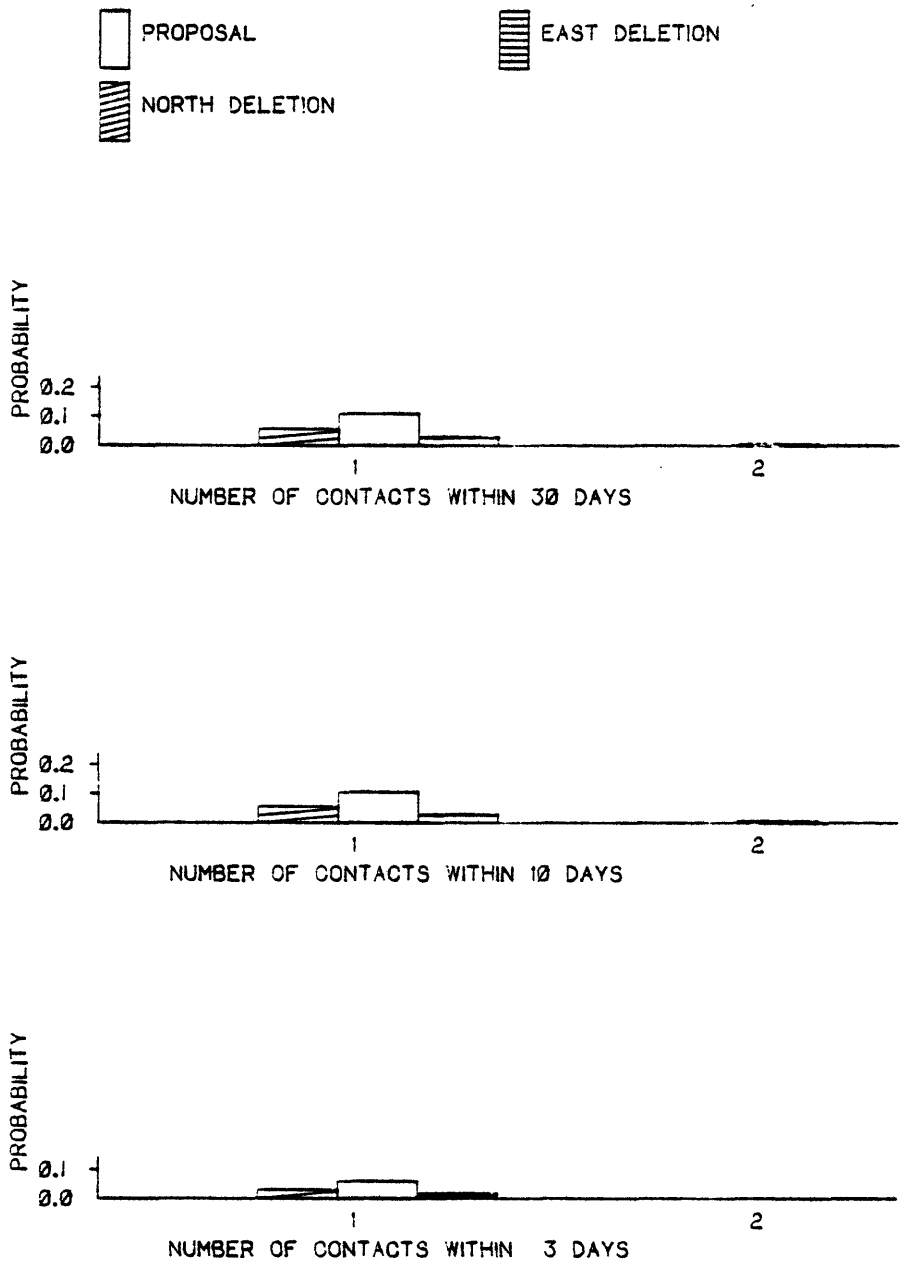

Figure 3-13.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting seabird foraging area 2 (summer) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the onshore transportation scenario.

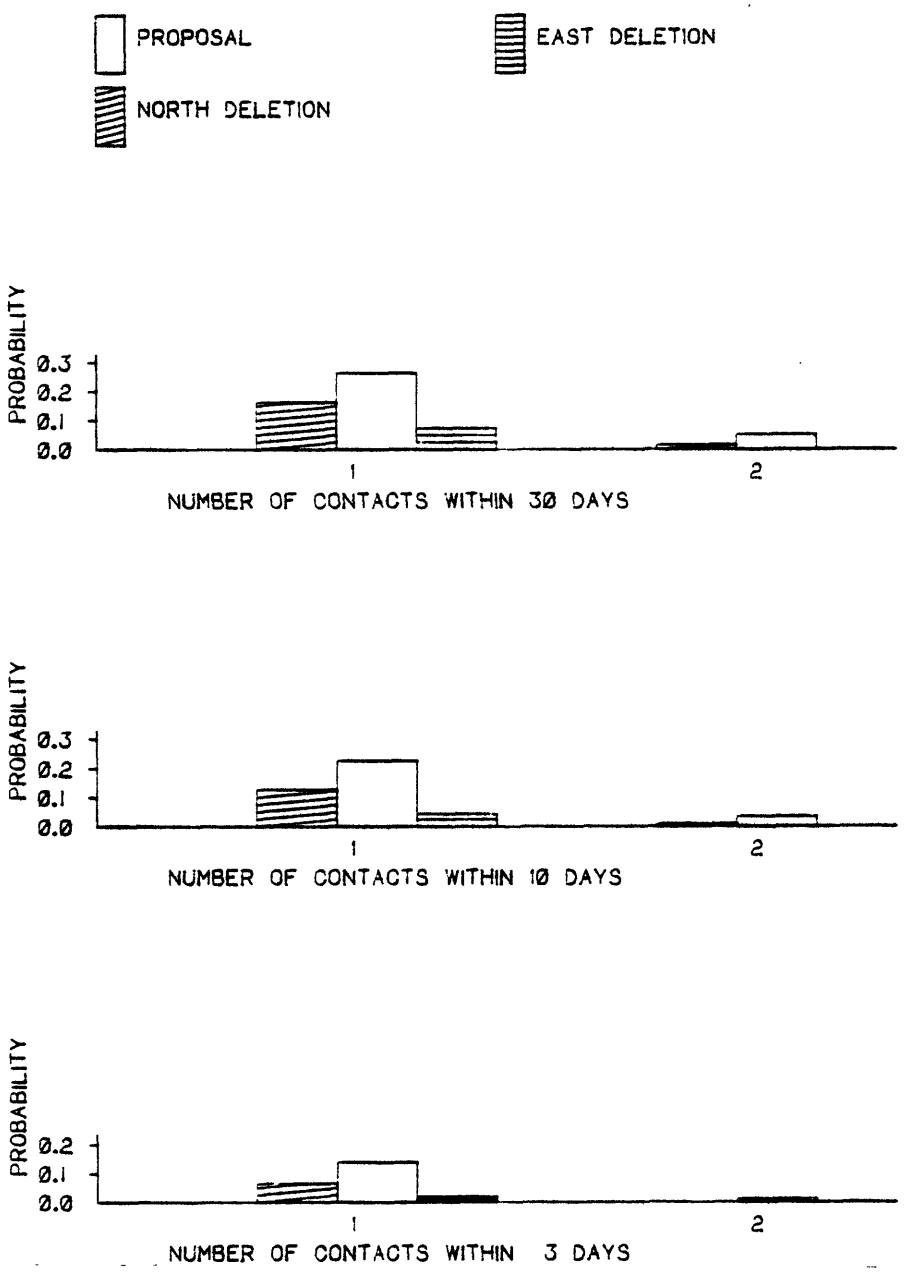

Figure 8-14.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting seabird foraging area 3 (summer) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the onshore transportation scenario.

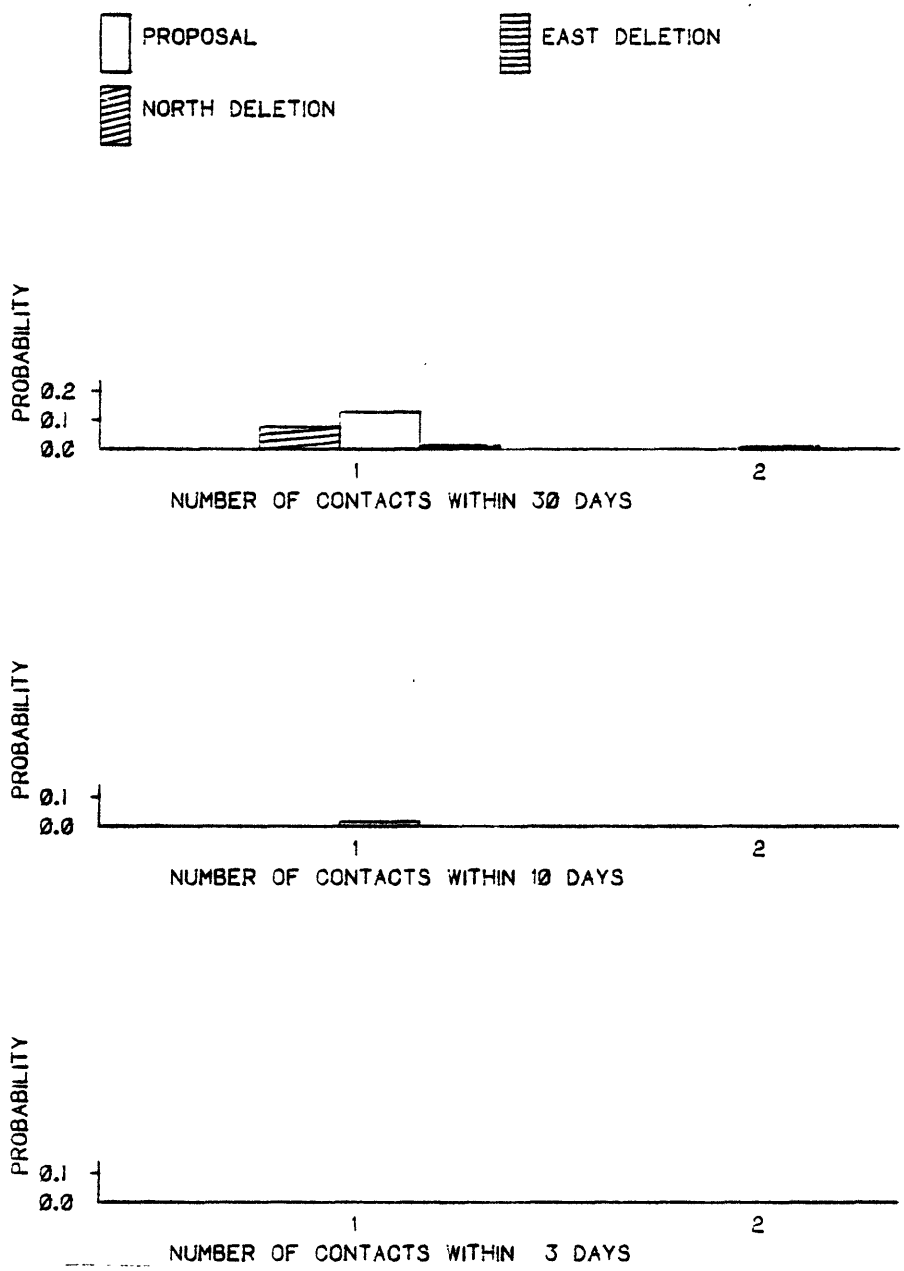

Figure B-15.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting seabird foraging area 4 (summer) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the onshore transportation scenario.

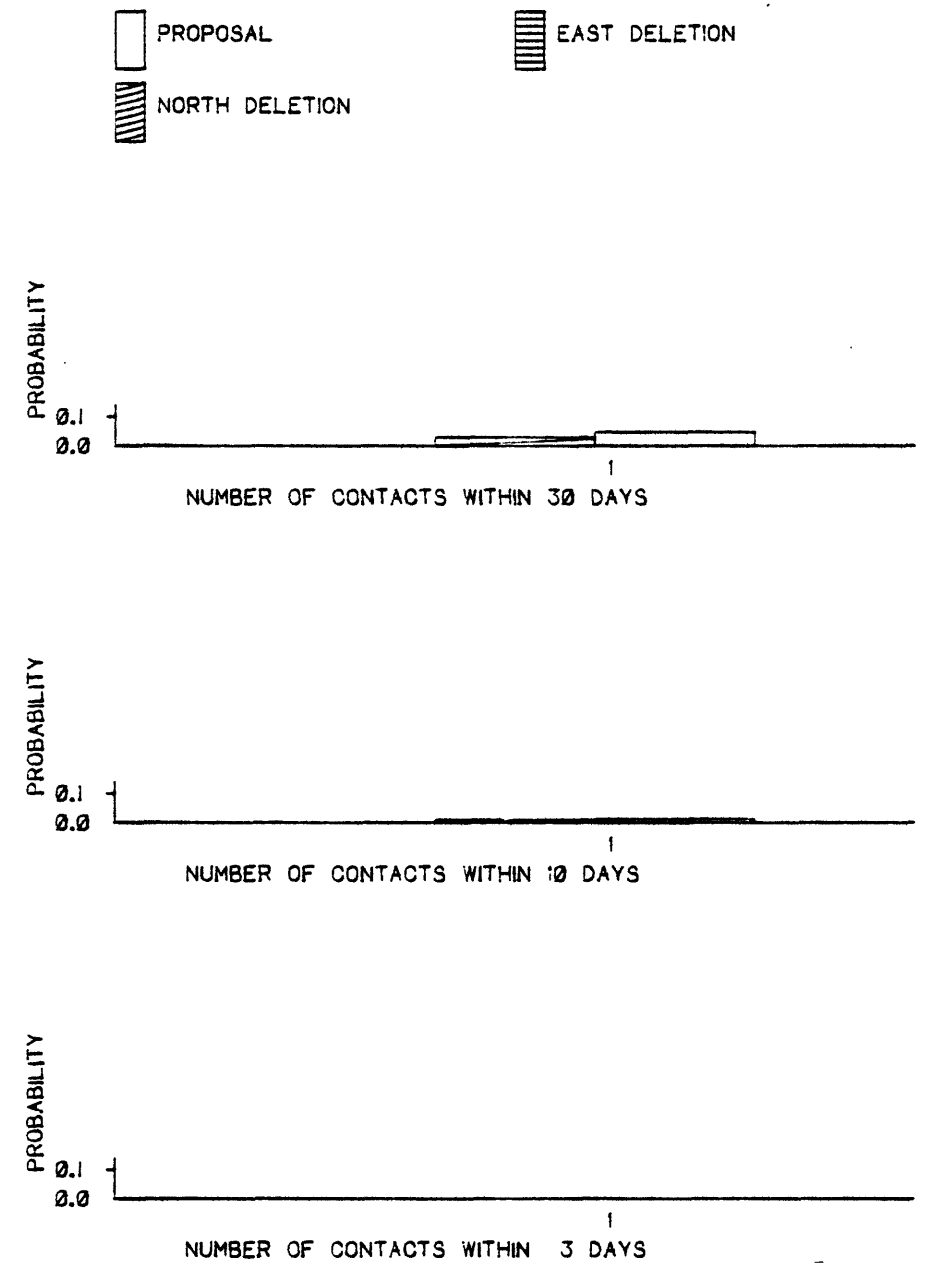

Figure B-16.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting seabird foraging area 5 (summer) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the onshore transportation scenario.

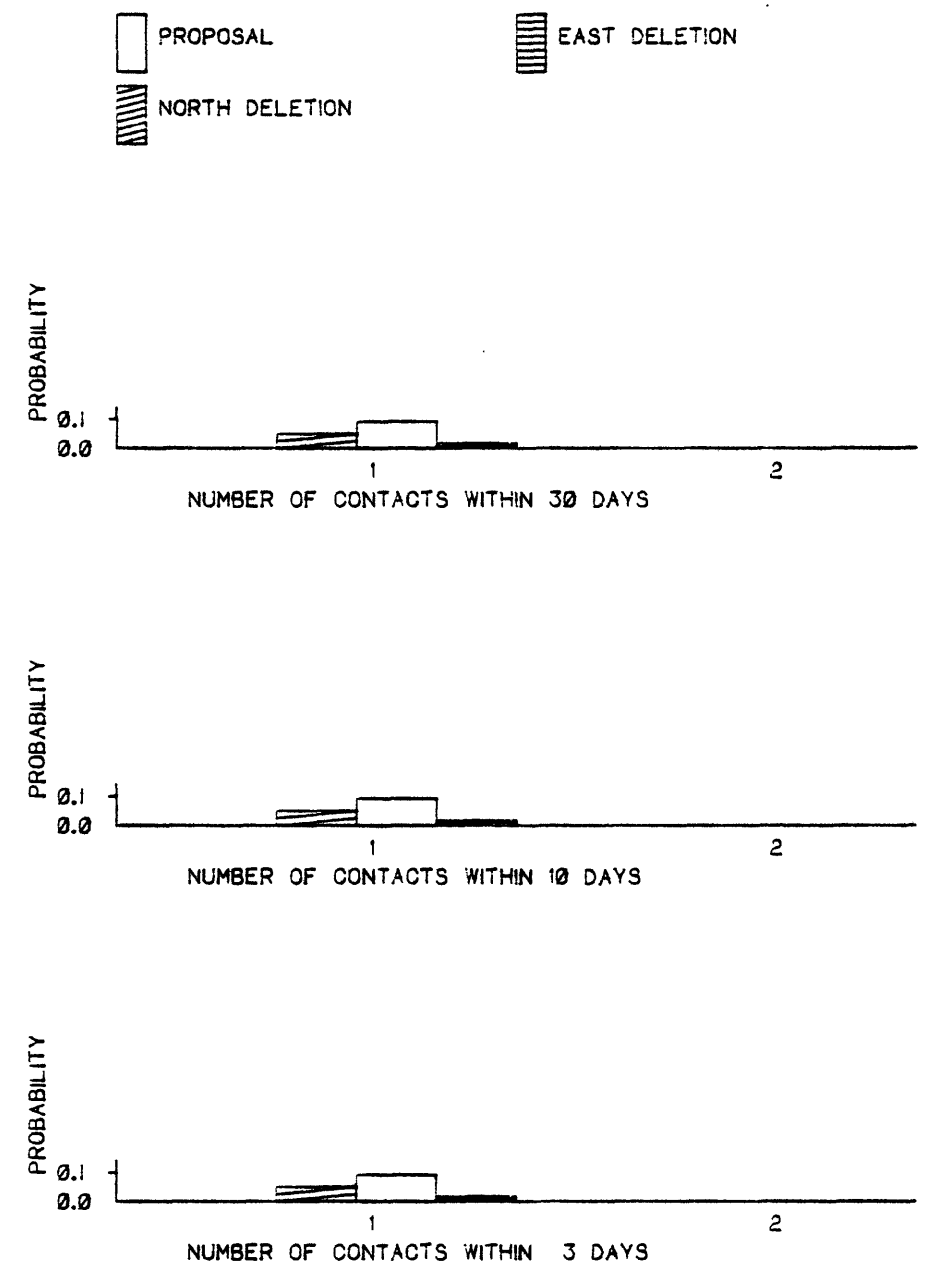

Figure B-17.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting seabird foraging area 1 (winter) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the onshore transportation scenario.

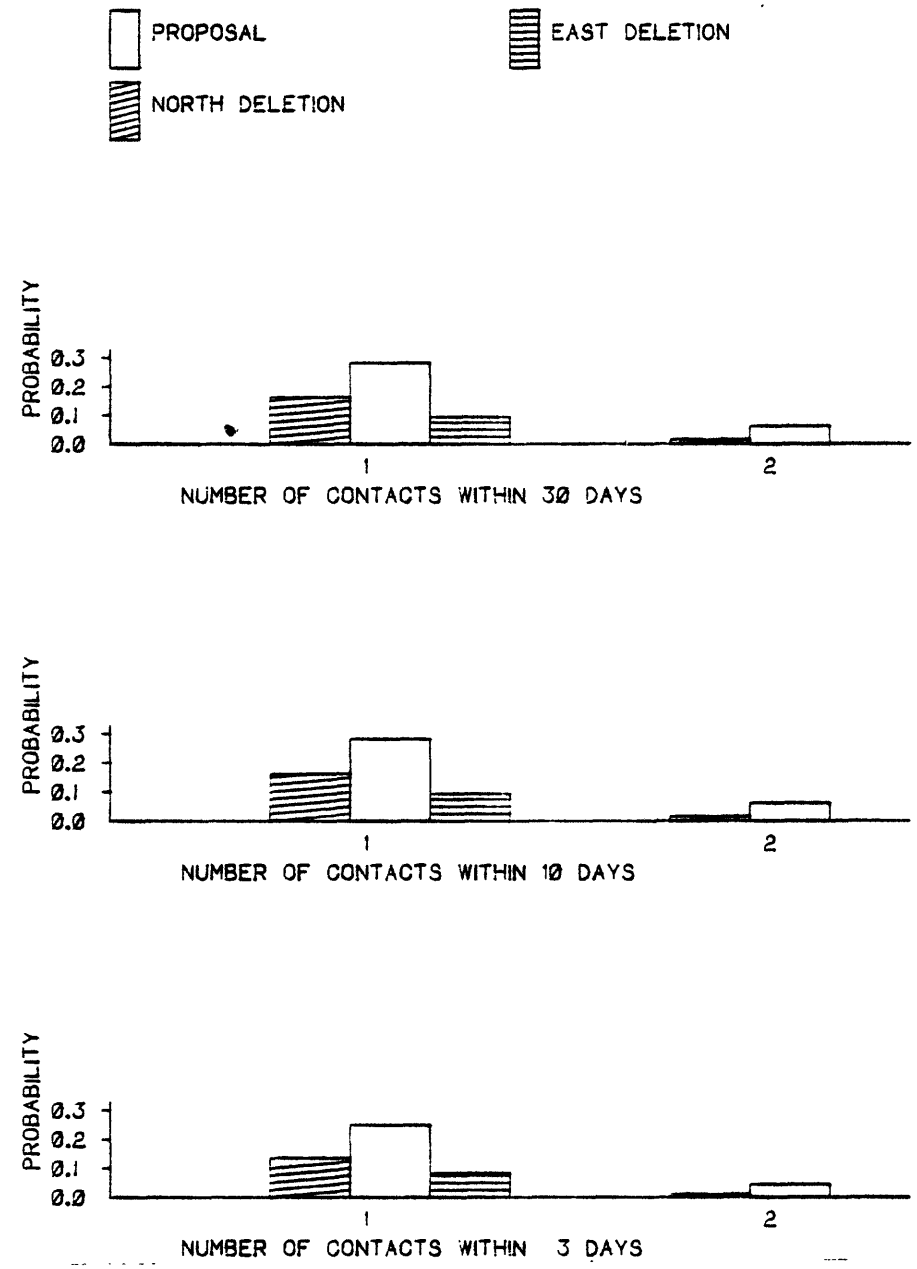

Figure B-18.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting seabird foraging area 2 (winter) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the onshore transportation scenario.

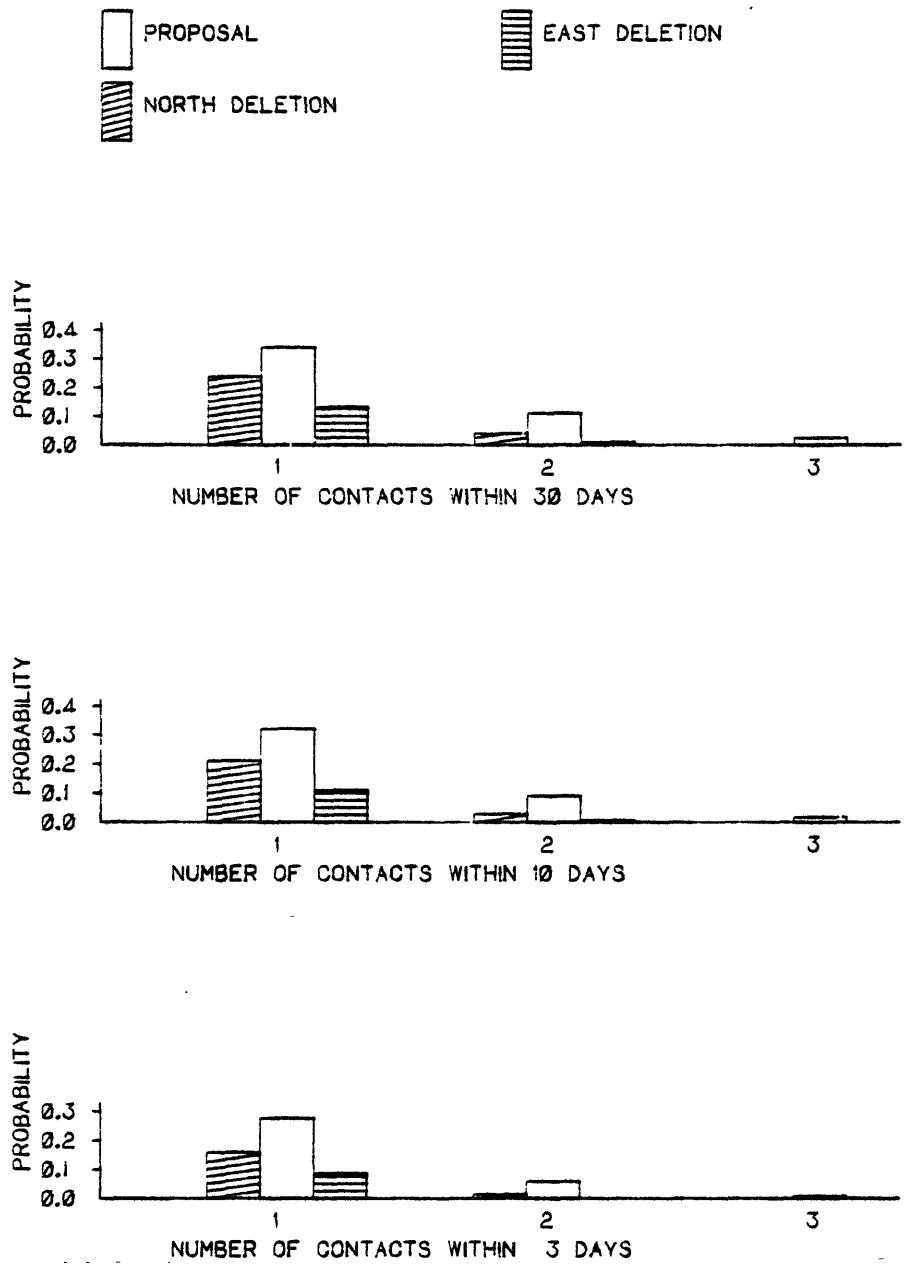

Figure B-19.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting King crab area (summer) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the onshore transportation scenario.

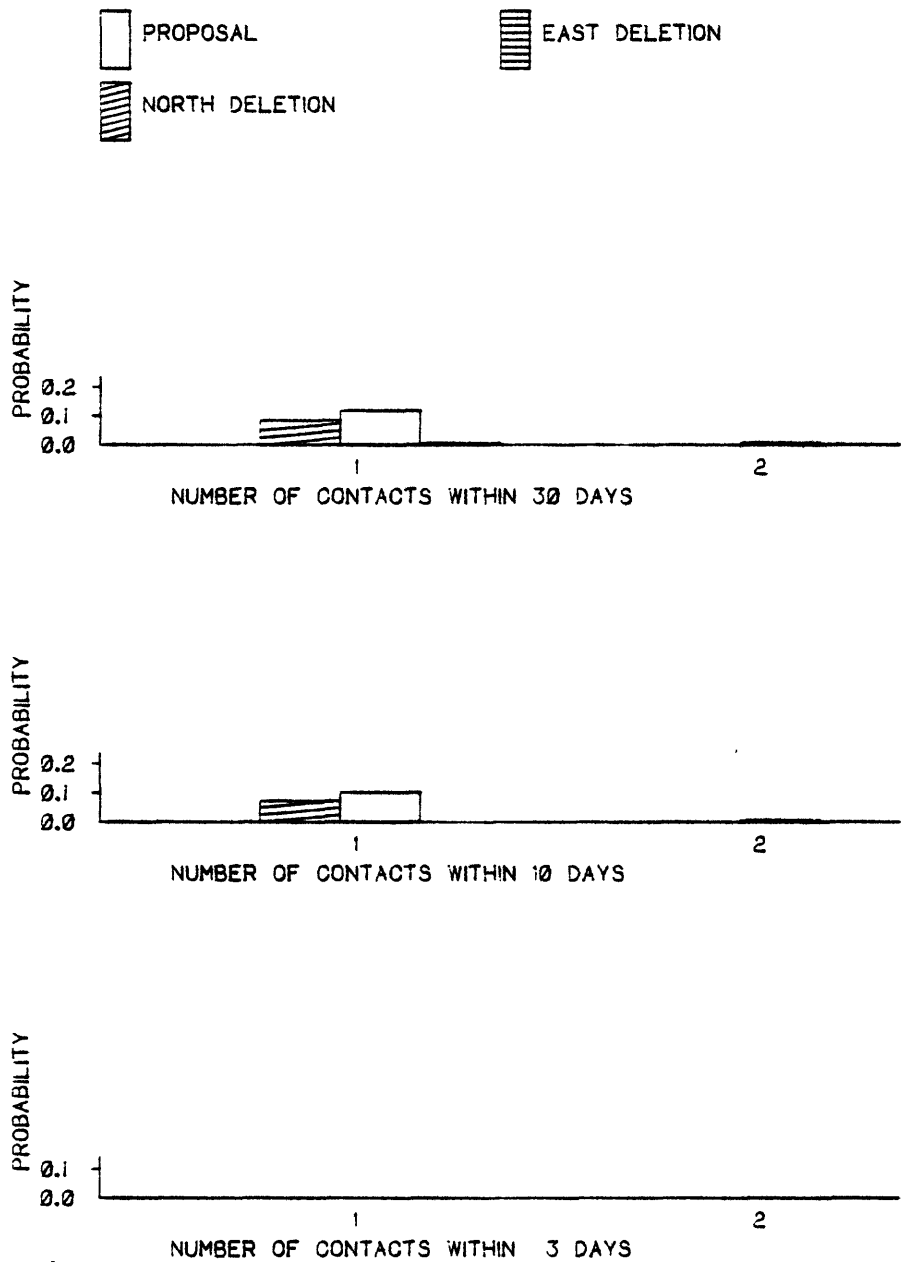

Figure B-20.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting Yukon Delta (summer) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the onshore transportation scenario.

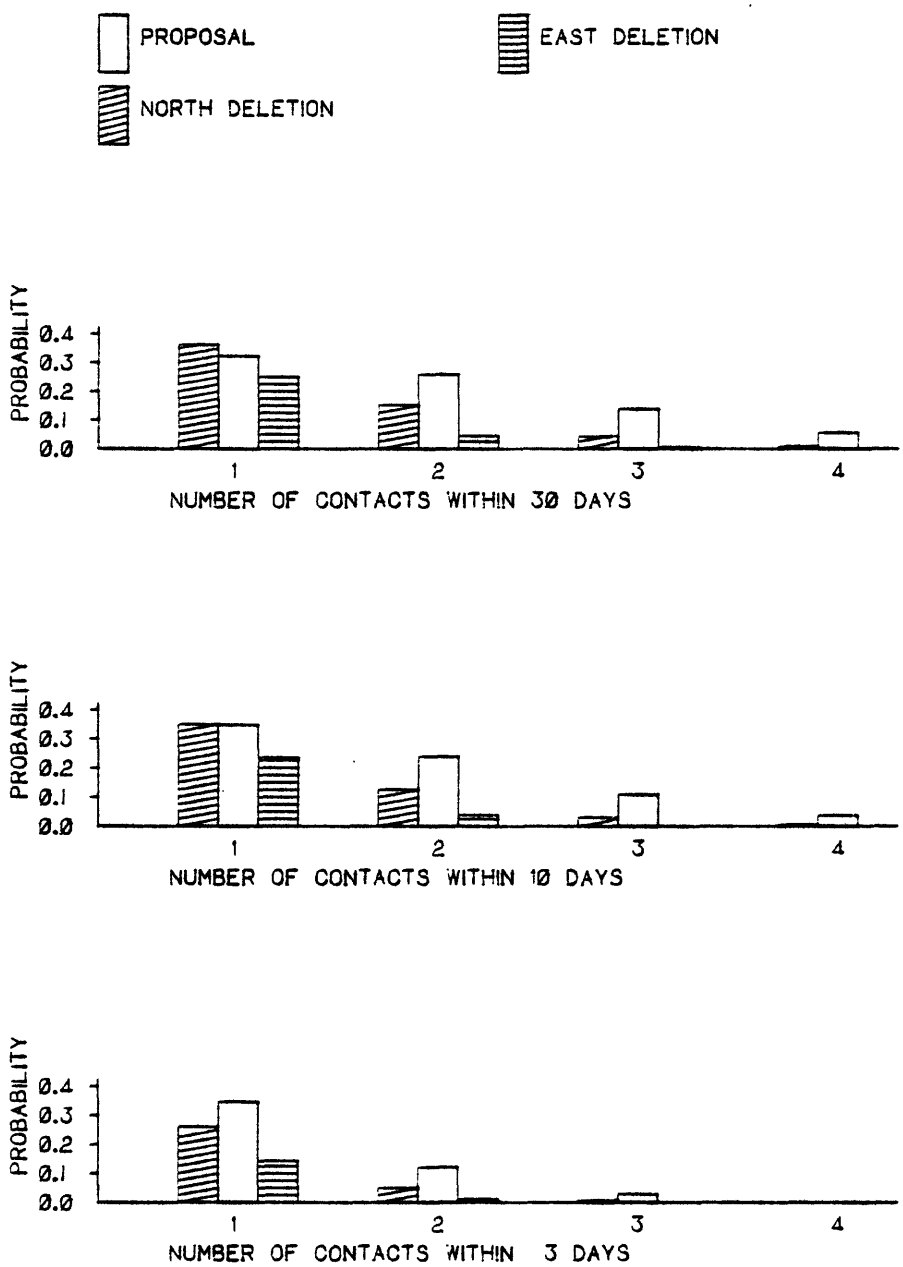

Figure 8-21.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting Gray whale area as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the onshore transportation scenario.

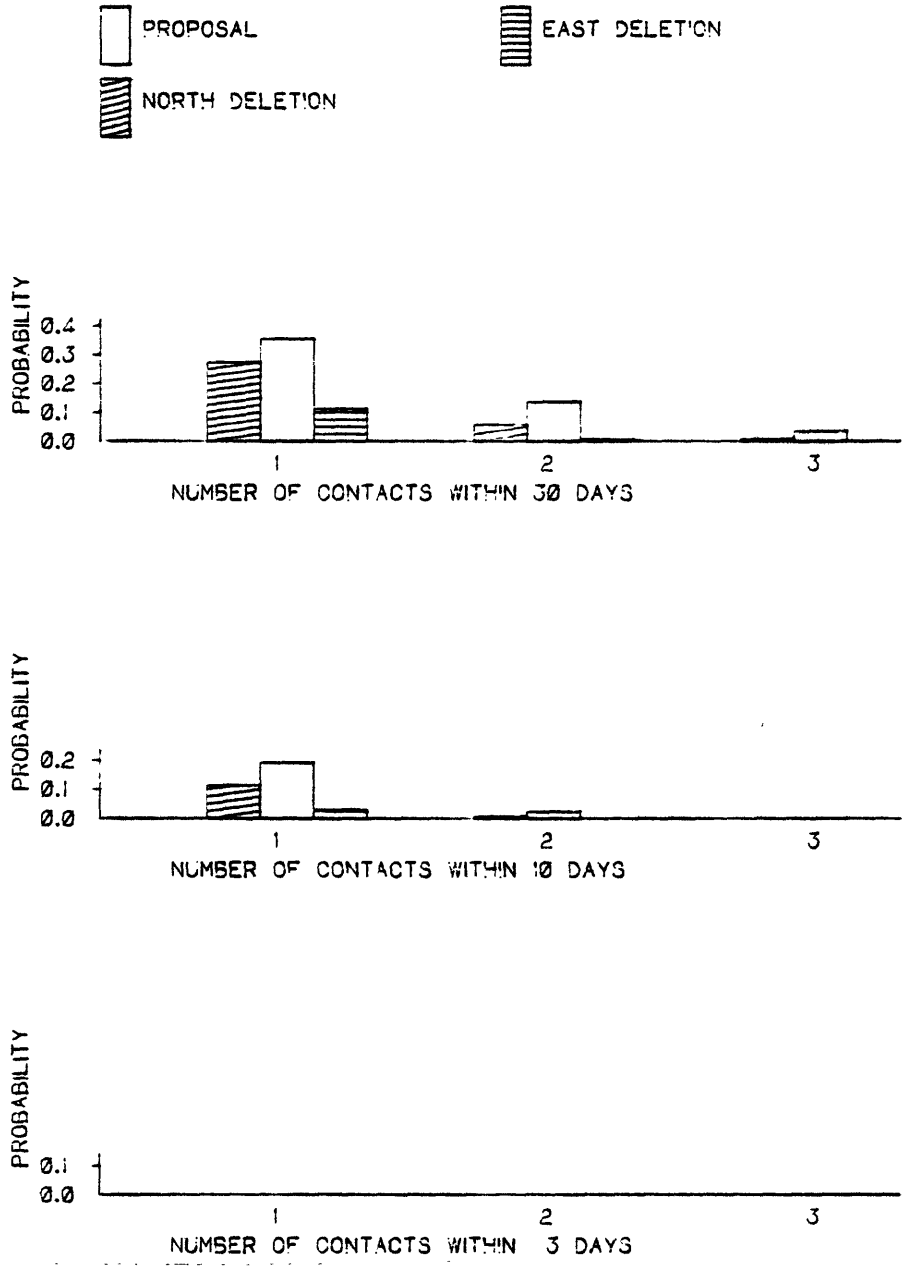

Figure B-22.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting land as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the offshore transportation scenario.

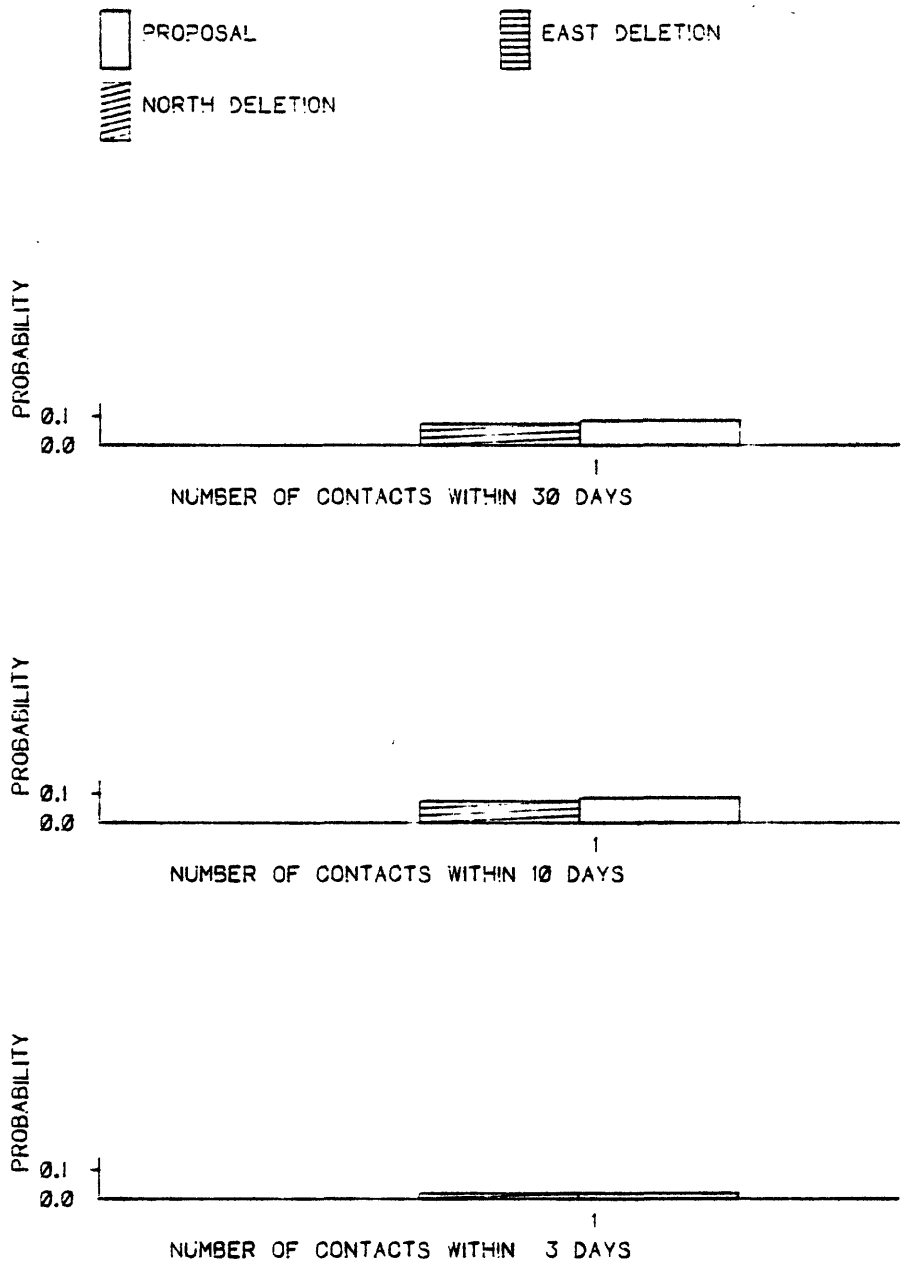

Figure B-23.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting ice zone 5 as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the offshore transportation scenario.

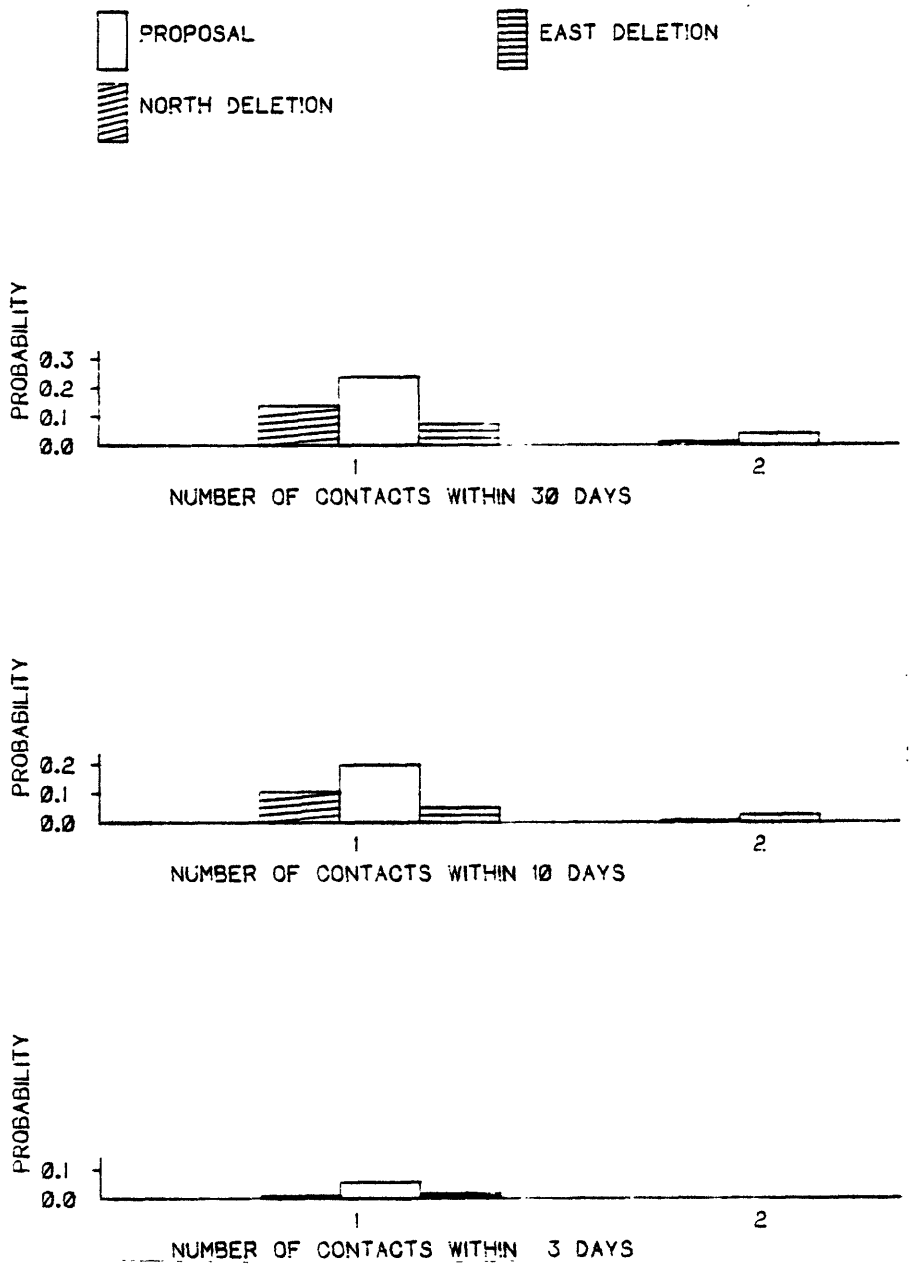

Figure B-24.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting mid-boundary area 1 (summer) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the offshore transportation scenario.

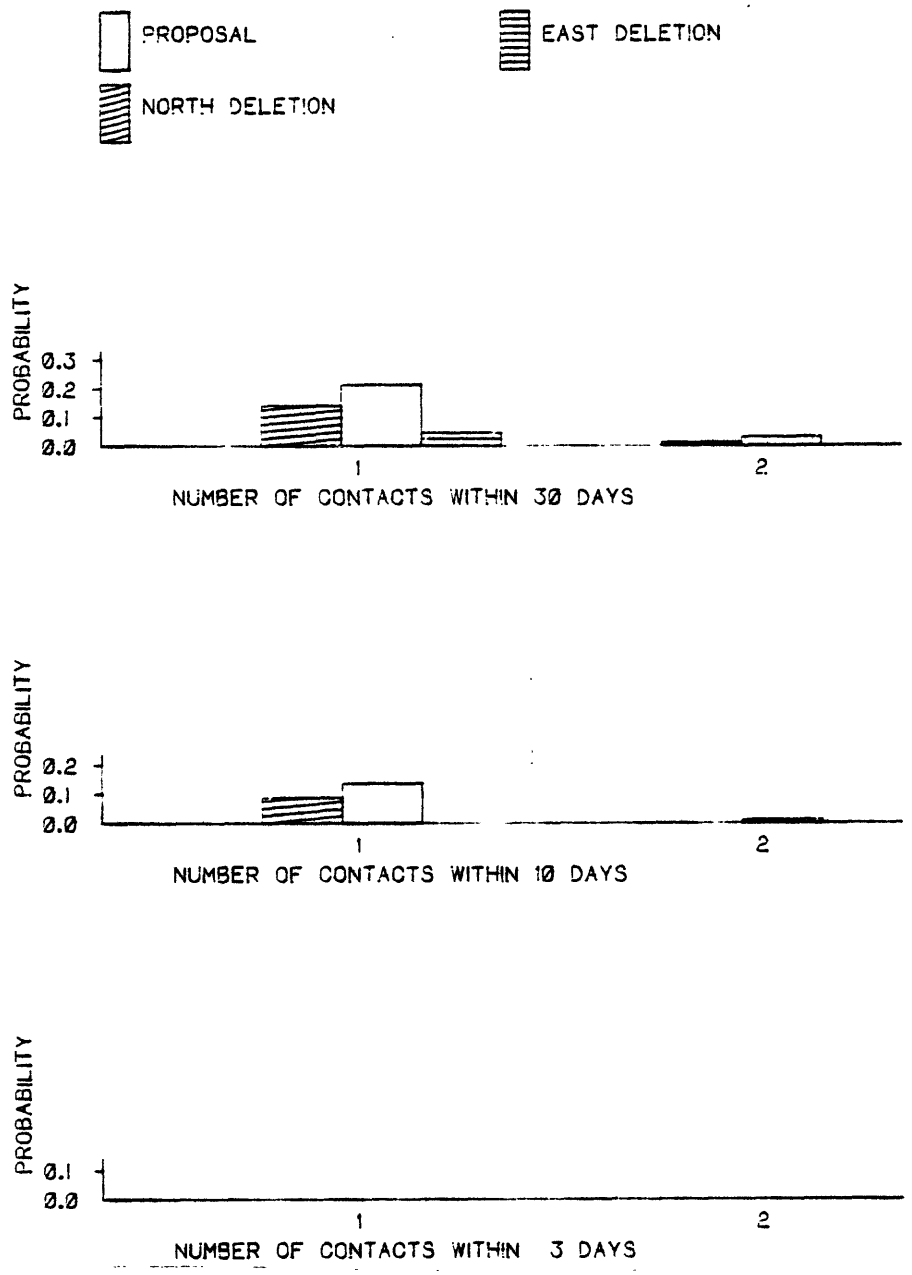

Figure B-25.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting mid-boundary area 2 (summer) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the offshore transportation scenario.

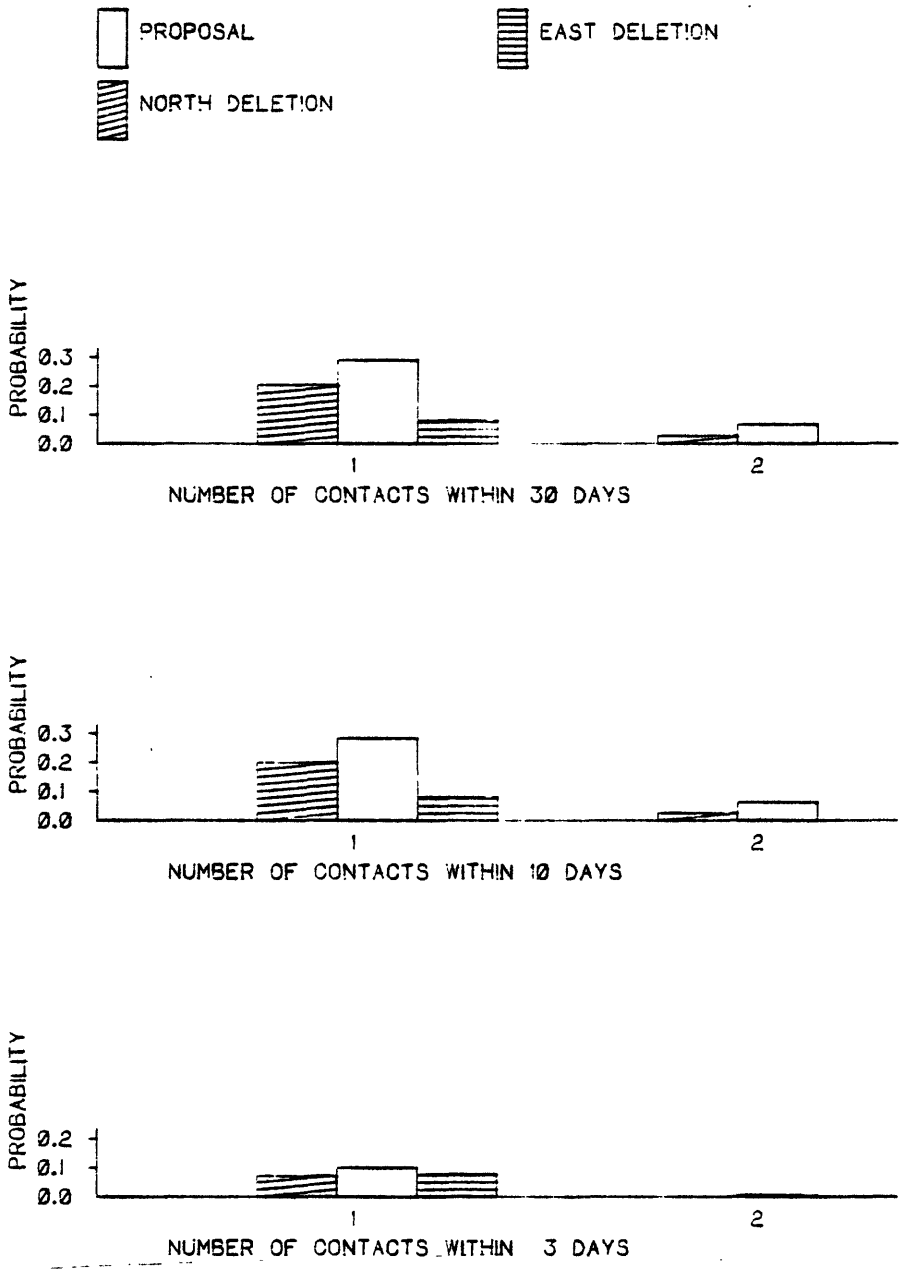

Figure B-26.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting mid-boundary area 3 (summer) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the offshore transportation scenario.

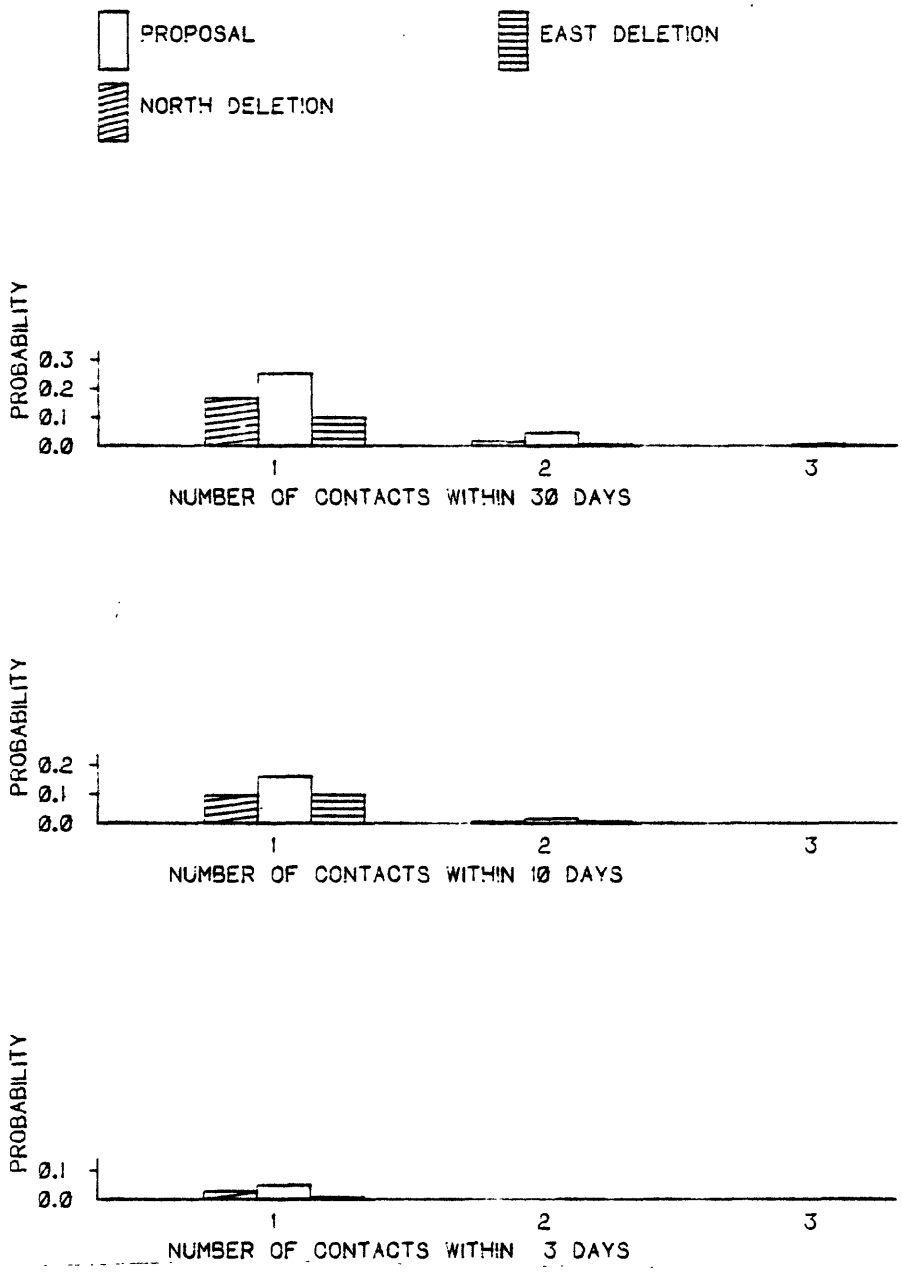

Figure B-27.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting mid-boundary area 4 (summer) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the offshore transportation scenario.

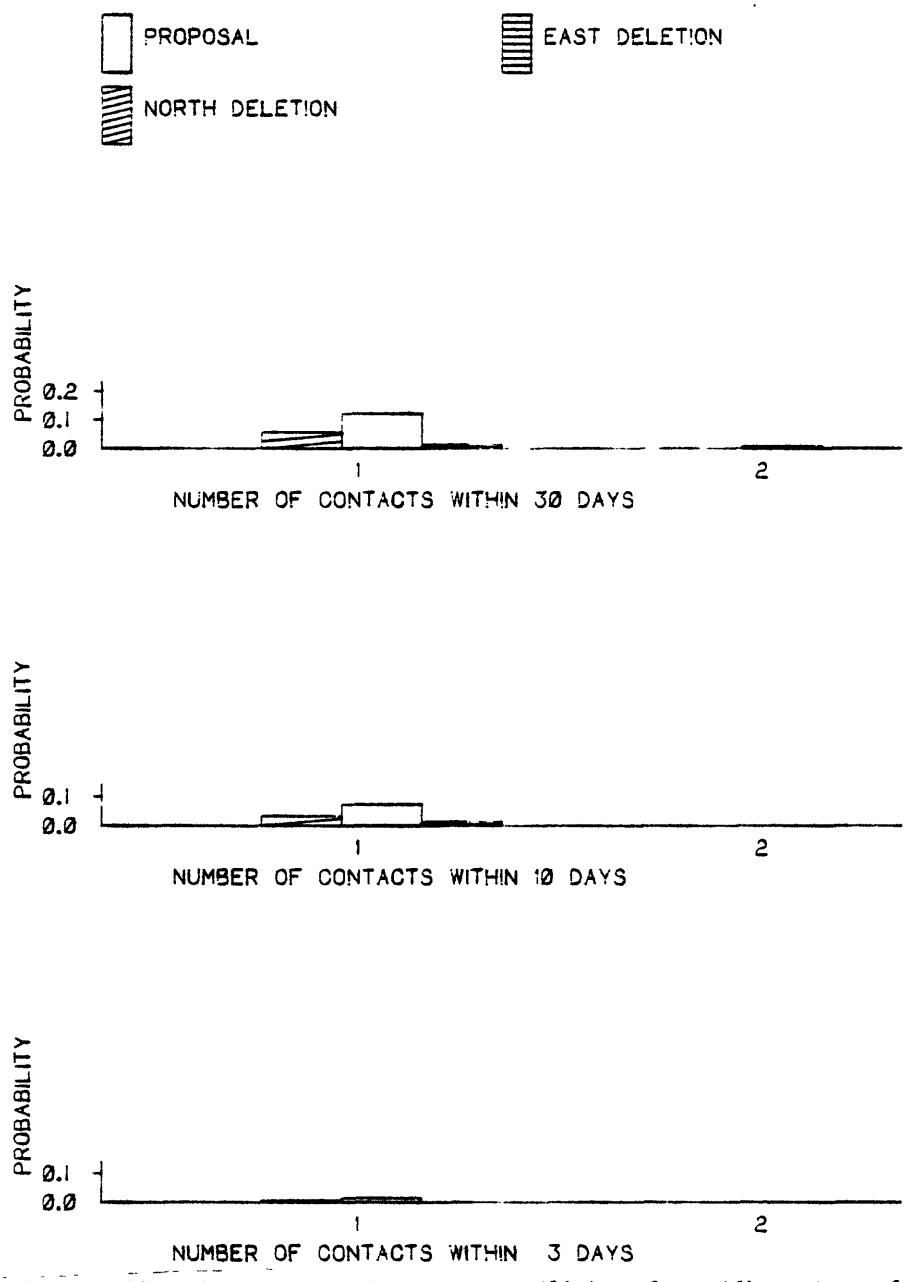

Figure B-28.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting mid-boundary area 5 (summer) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the offshore transportation scenario.

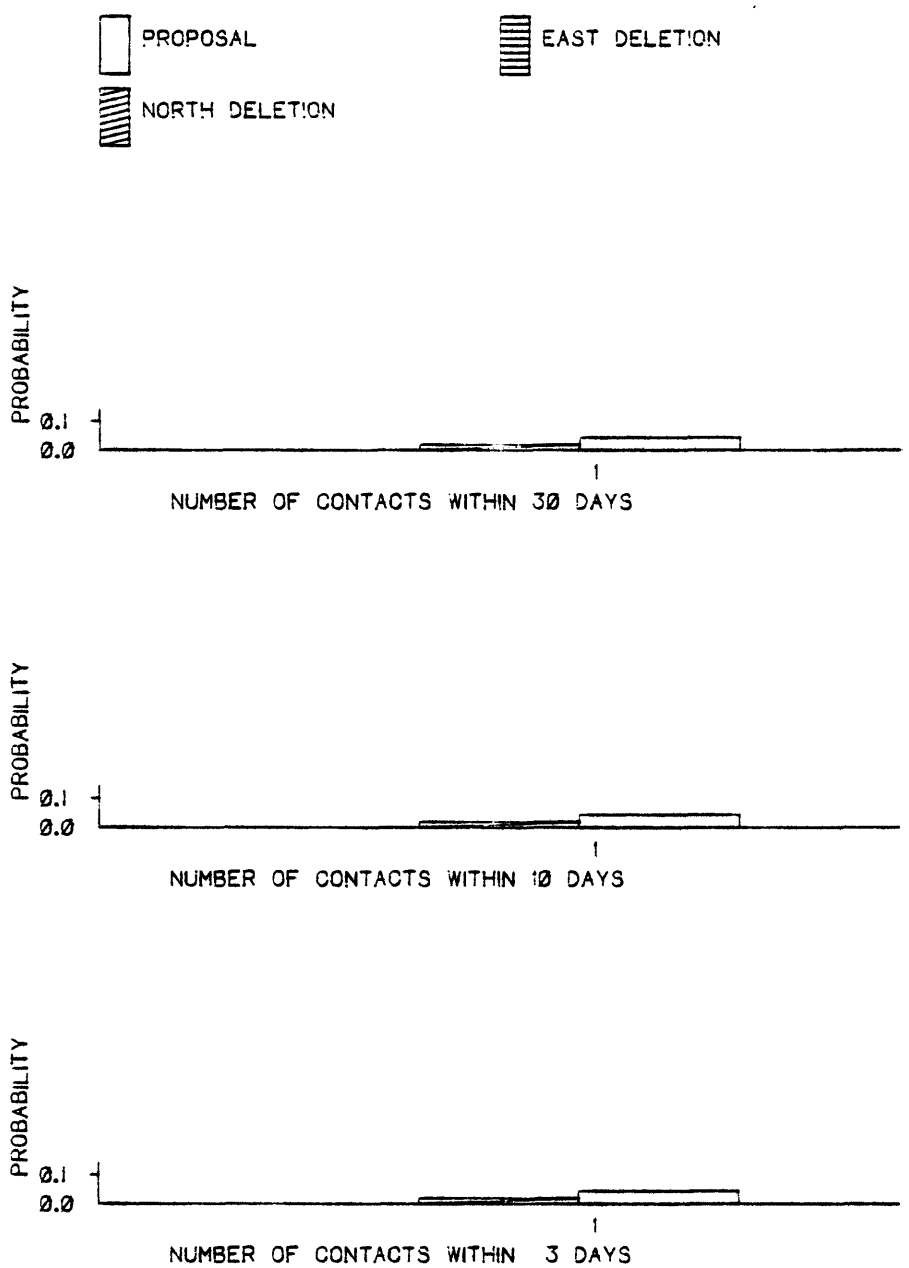

Figure B-29.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting mid-boundary area 1 (winter) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the offshore transportation scenario.

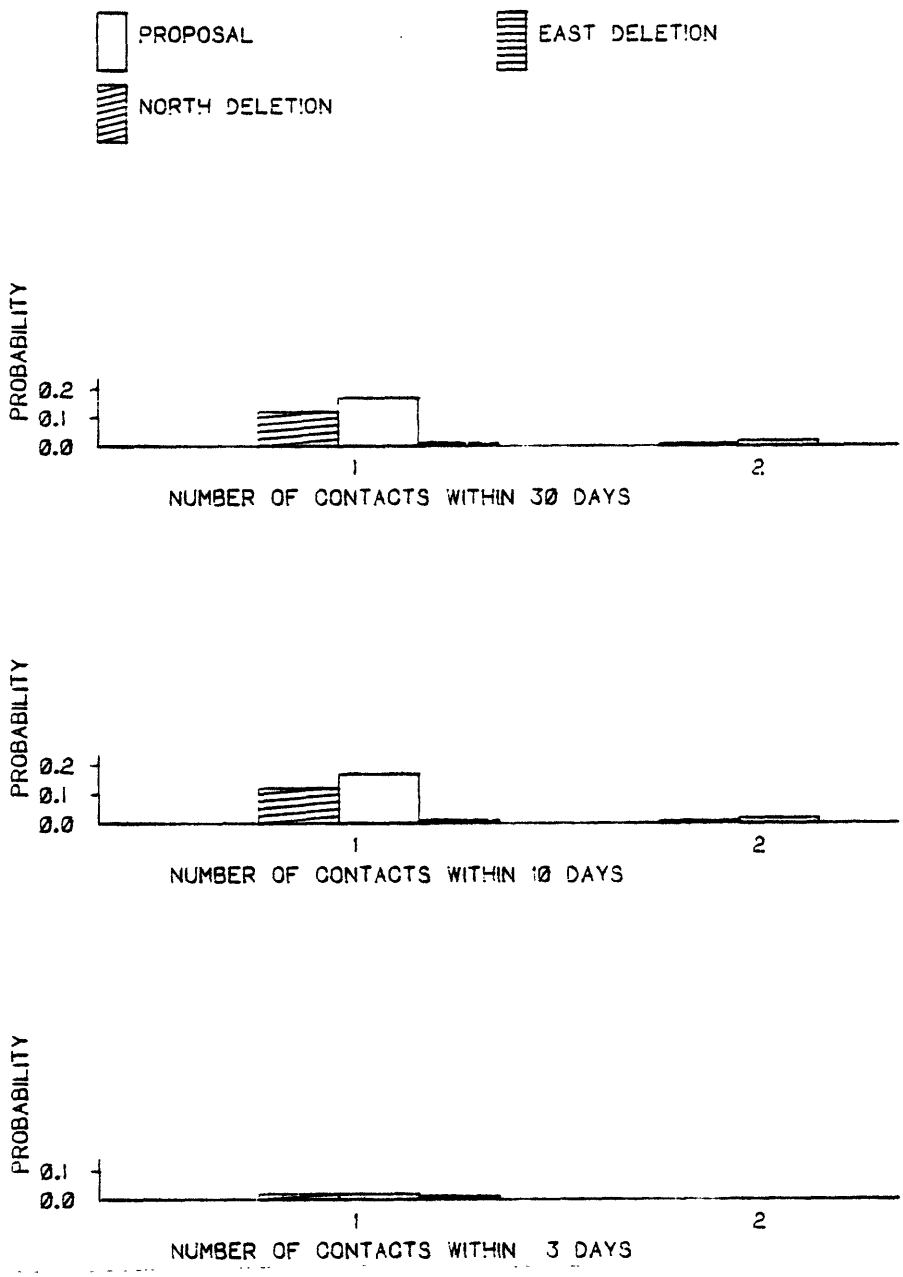

Figure 8-30.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting mid-boundary area 3 (winter) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the offshore transportation scenario.

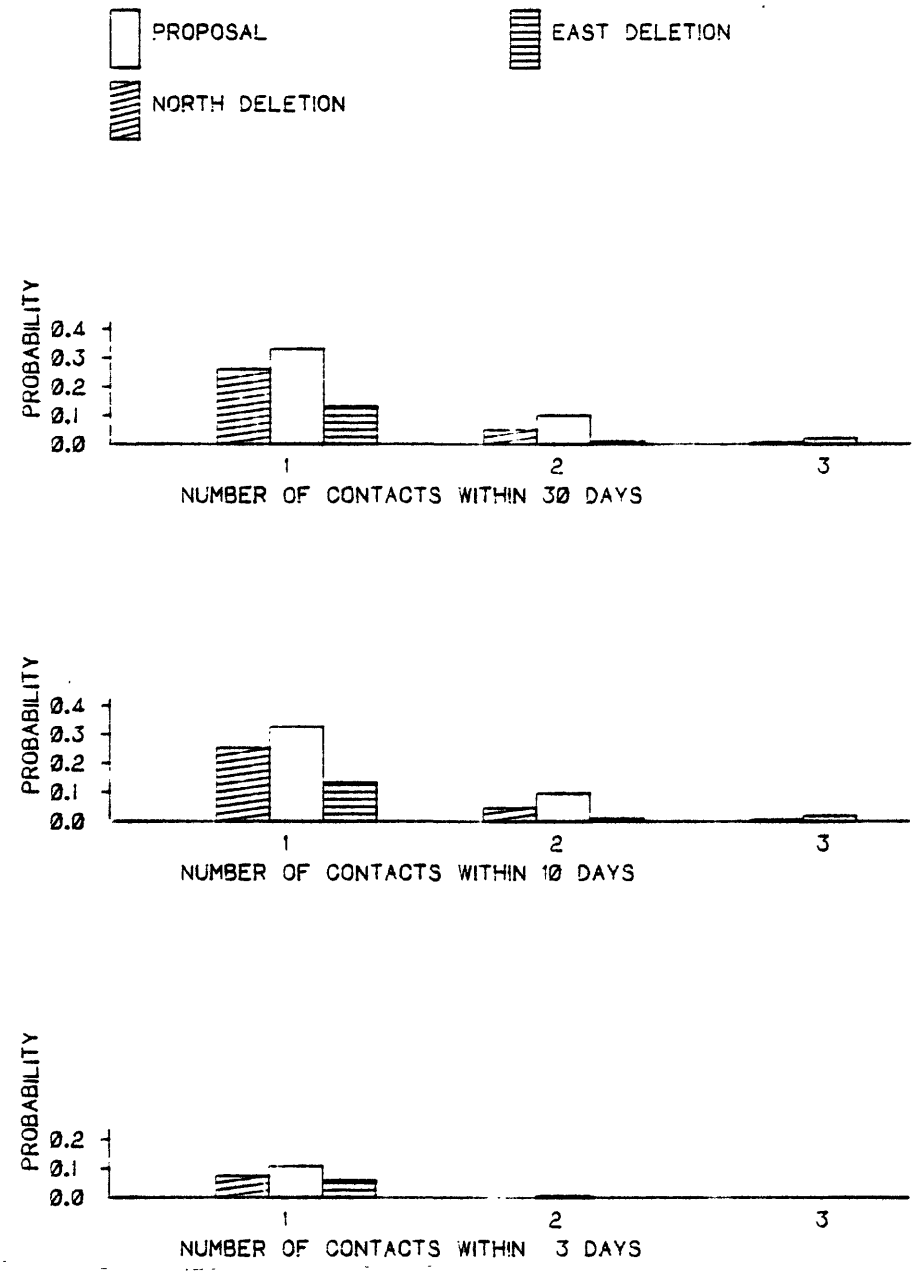

Figure B-31.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting mid-boundary area 4 (winter) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the onshore transportation scenario.

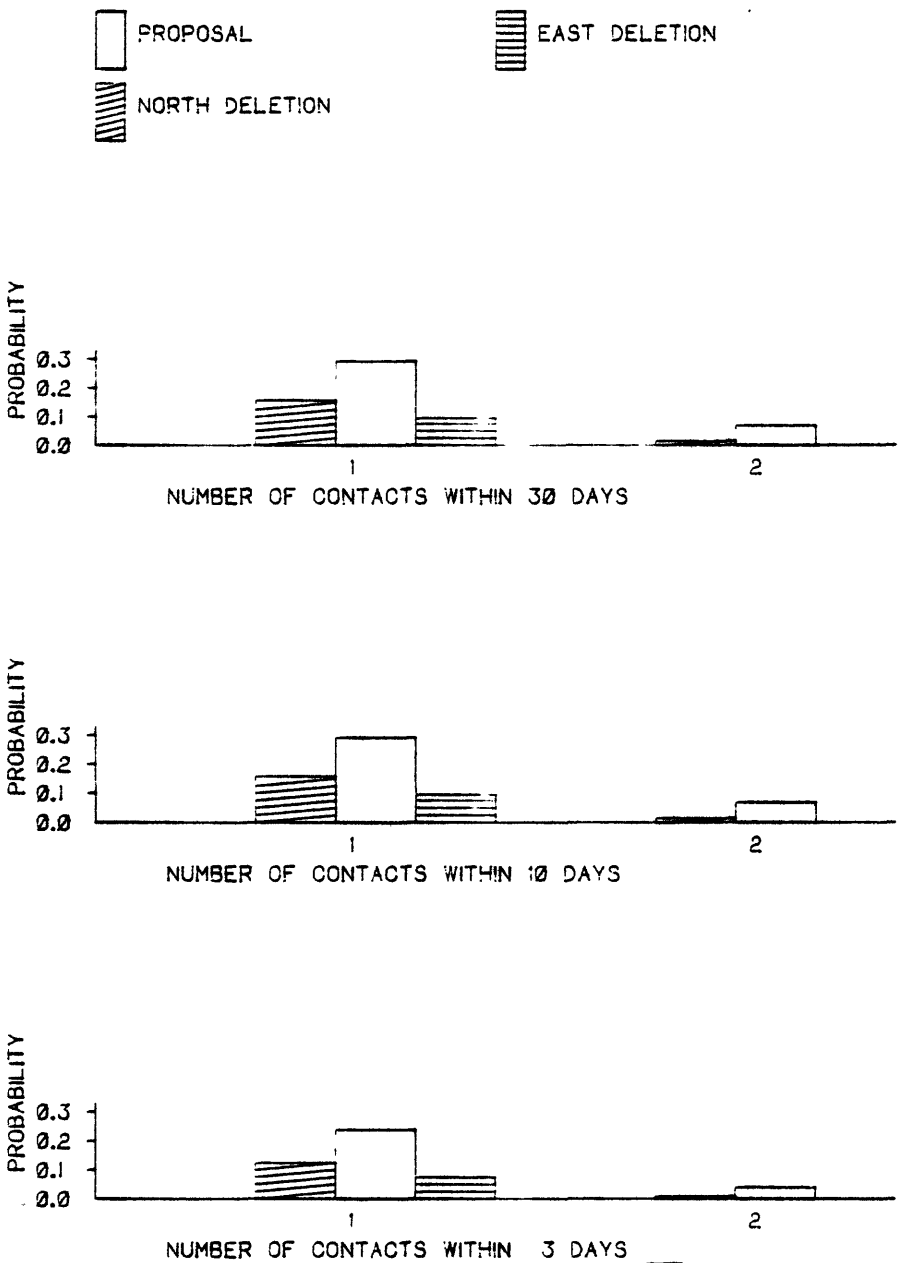

Figure 8-32.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting mid-boundary area 5 (winter) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the offshore transportation scenario.

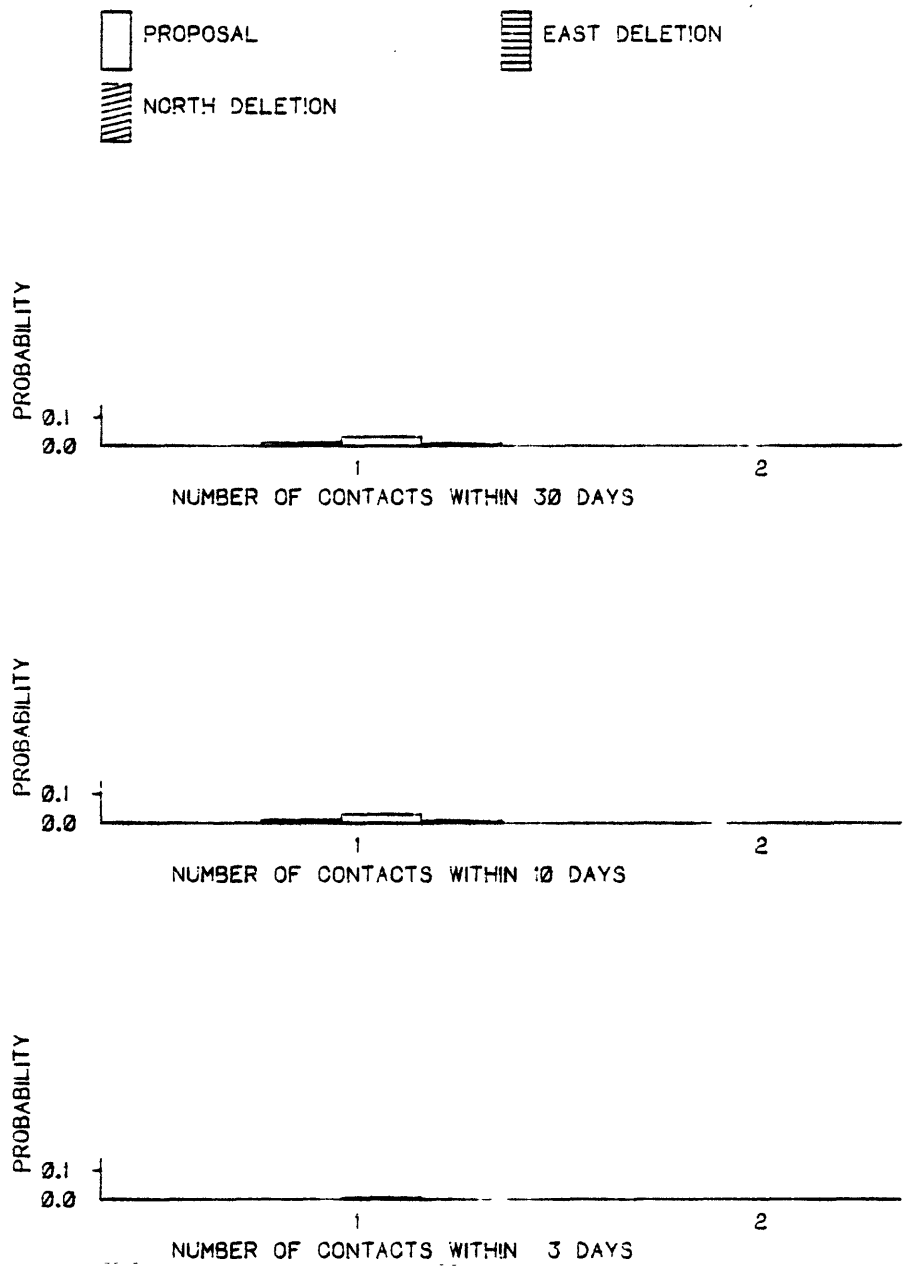

Figure B-33.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting seabird foraging area 2 (summer) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the offshore transportation scenario.

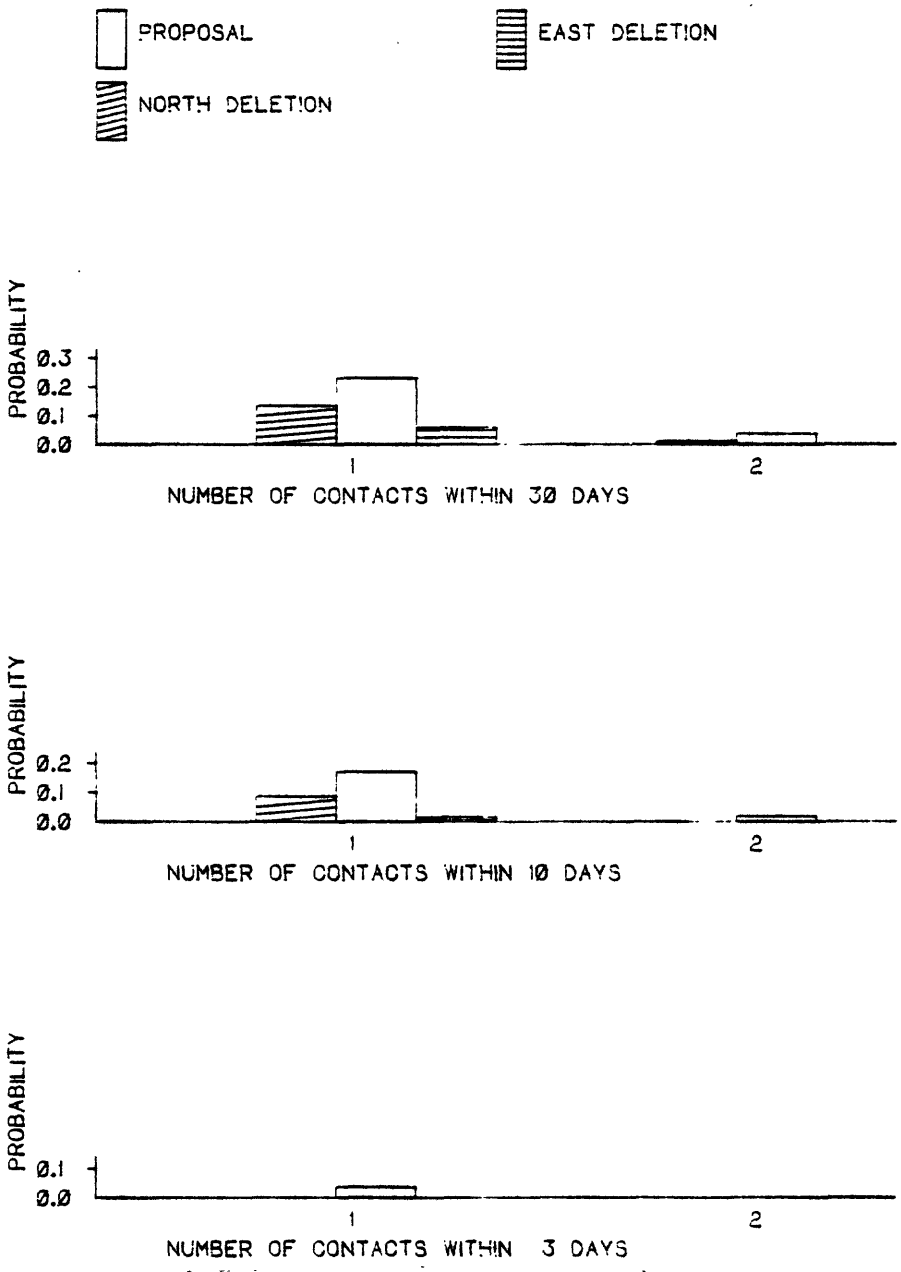

Figure B-34.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting seabird foraging area 3 (summer) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the offshore transportation scenario.

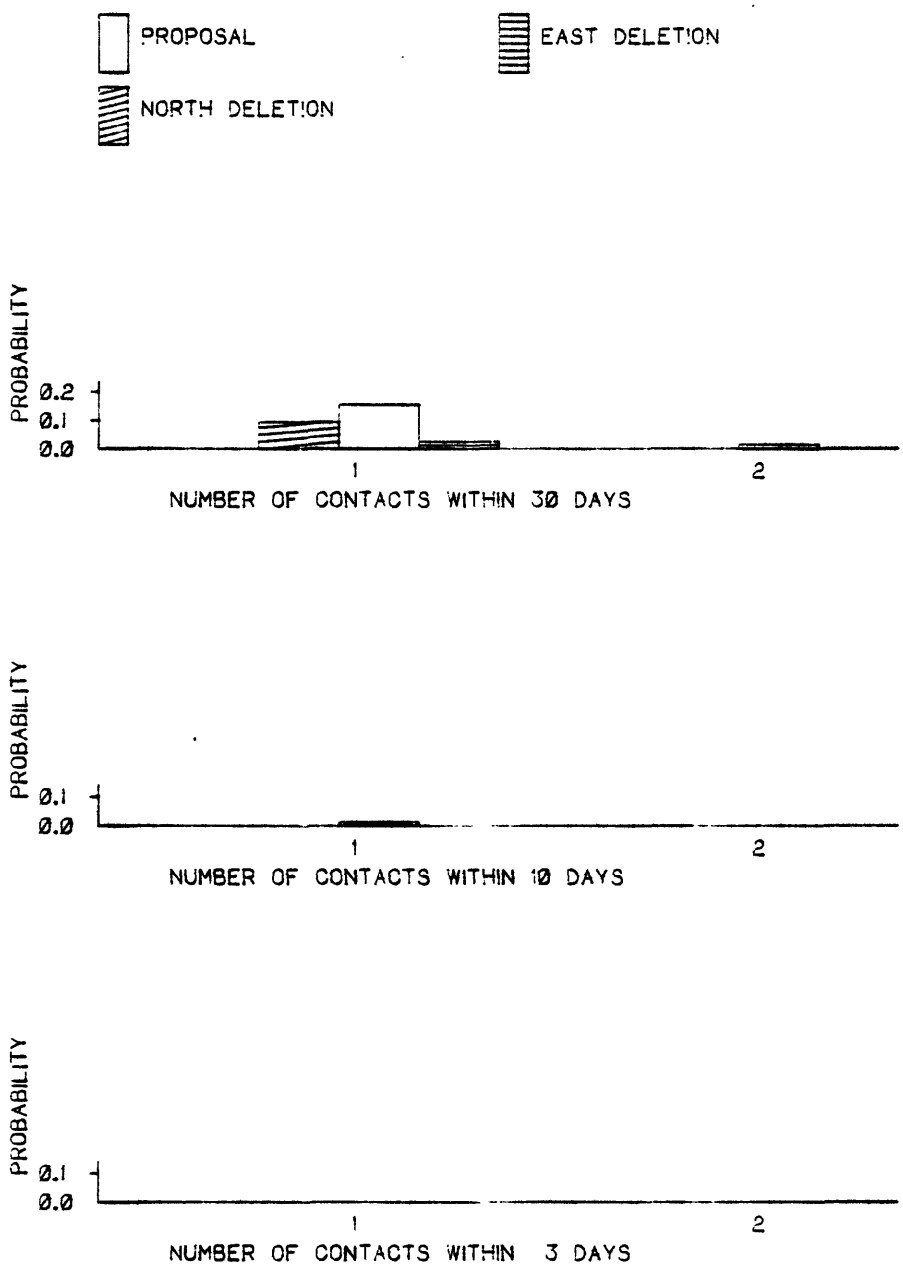

Figure B-35.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting seabird foraging area 4 (summer) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the offshore transportation scenario.

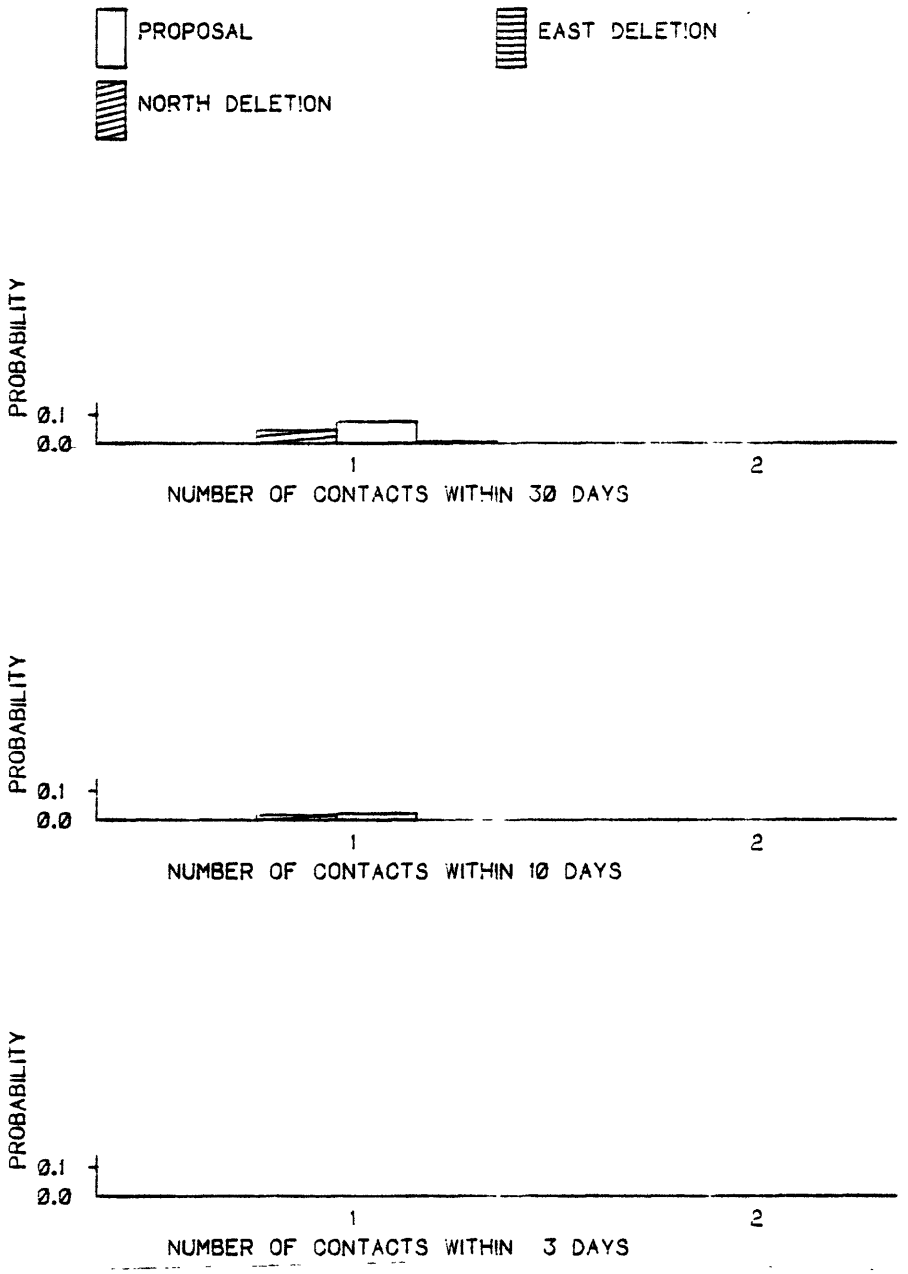

Figure B-36.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting seabird foraging area 5 (summer) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the offshore transportation scenario.

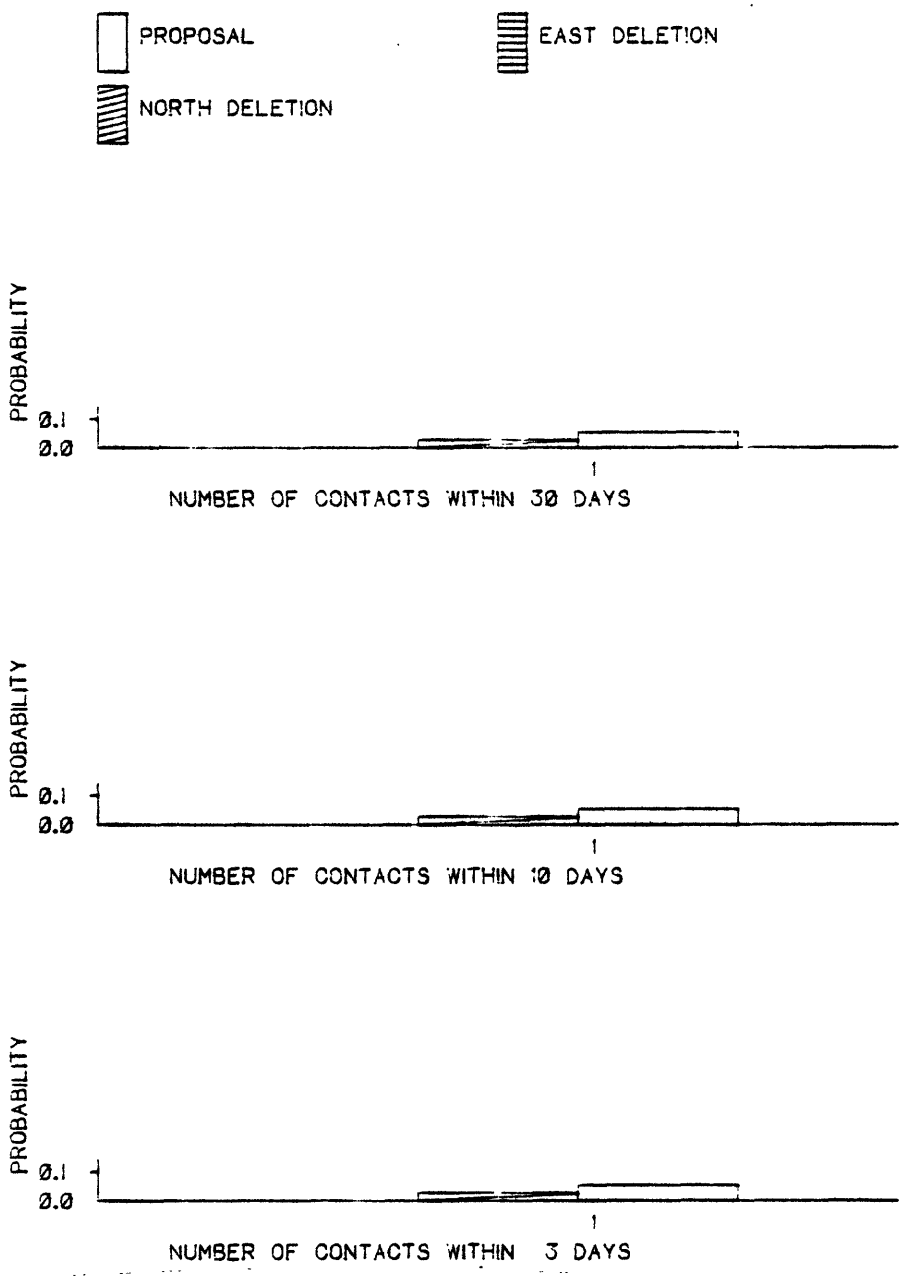

Figure B-37.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting seabird foraging area 1 (winter) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the offshore transportation scenario.

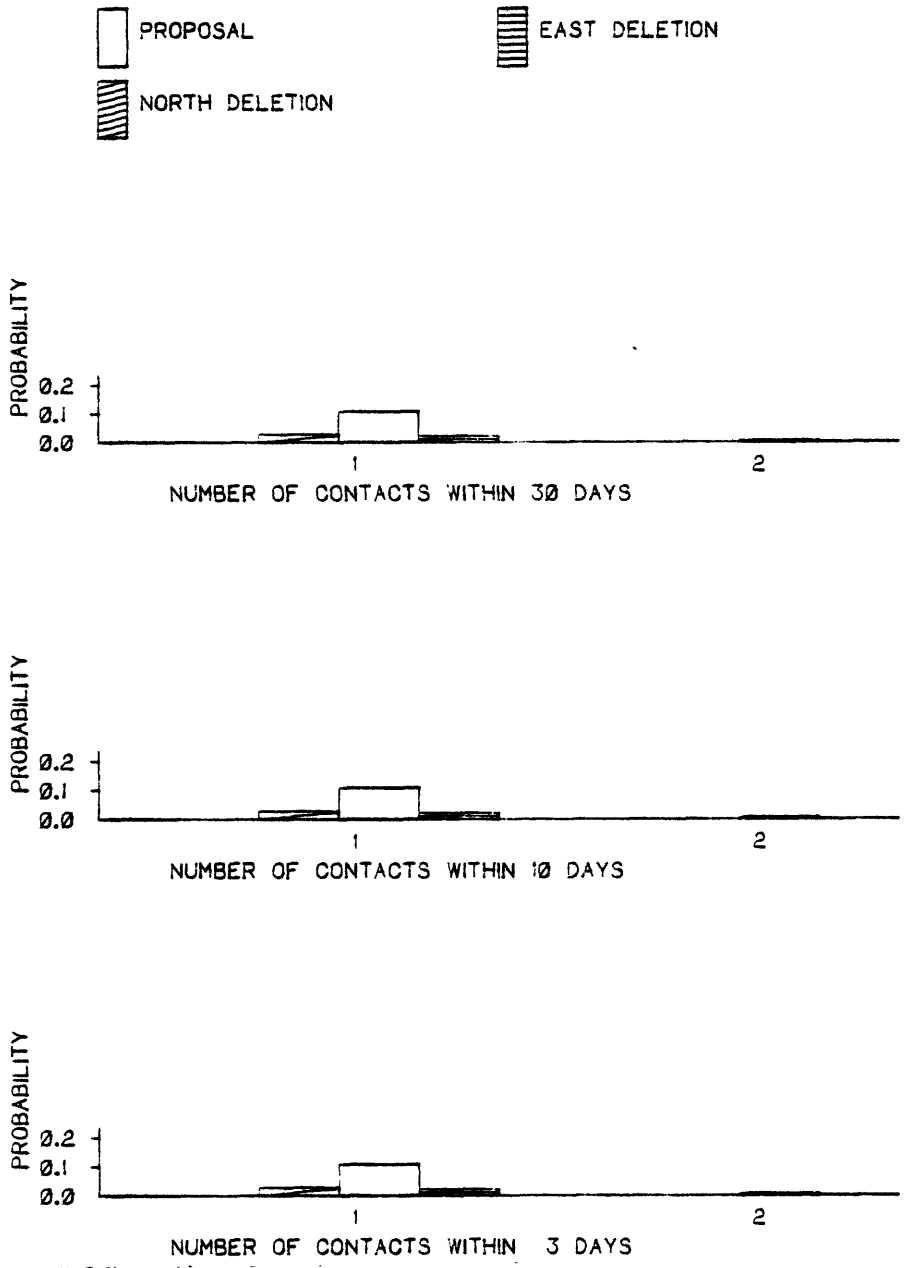

Figure B-38.---Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting seabird foraging area 2 (winter) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the offshore transportation scenario.

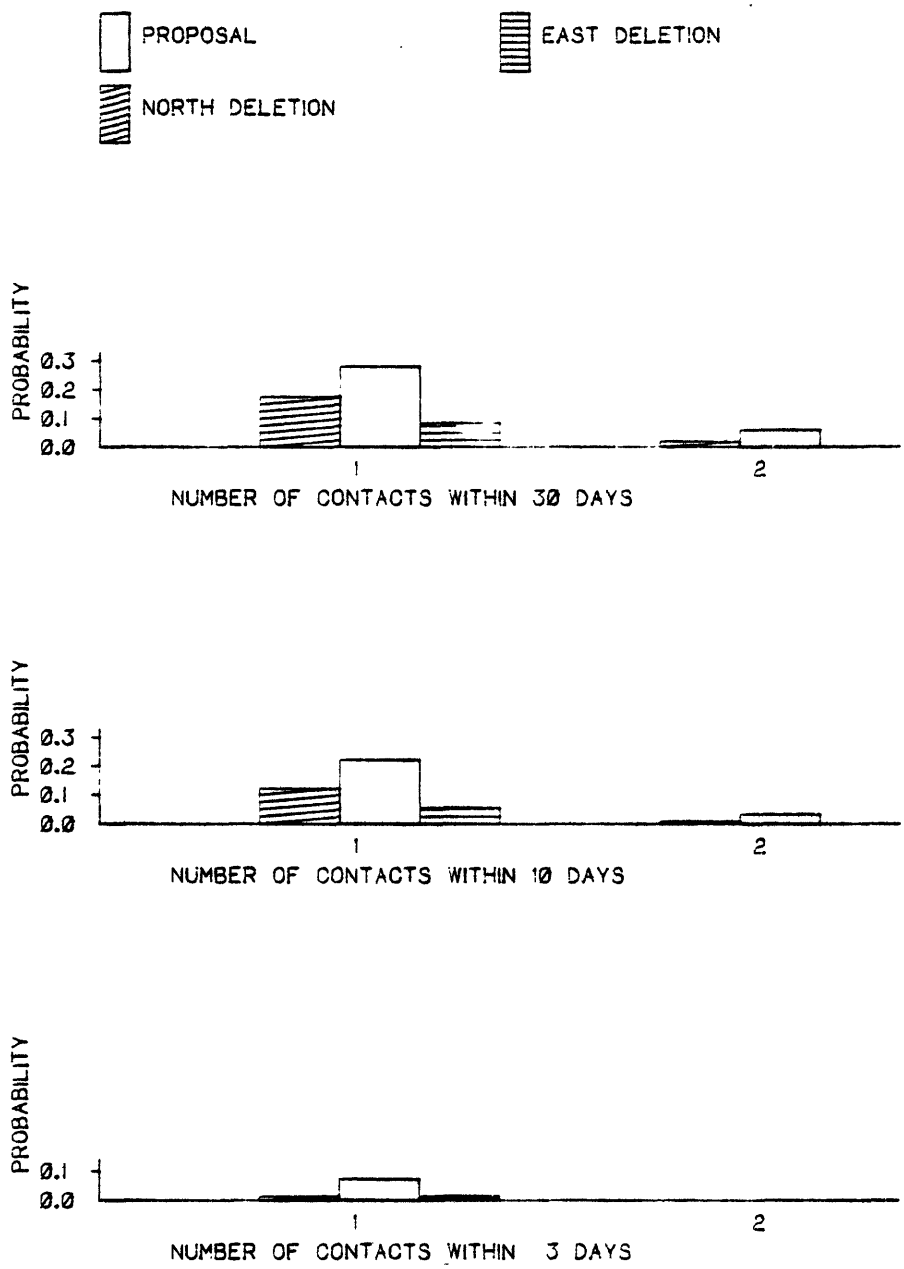

Figure B-39.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting King crab area (summer) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the offshore transportation scenario.

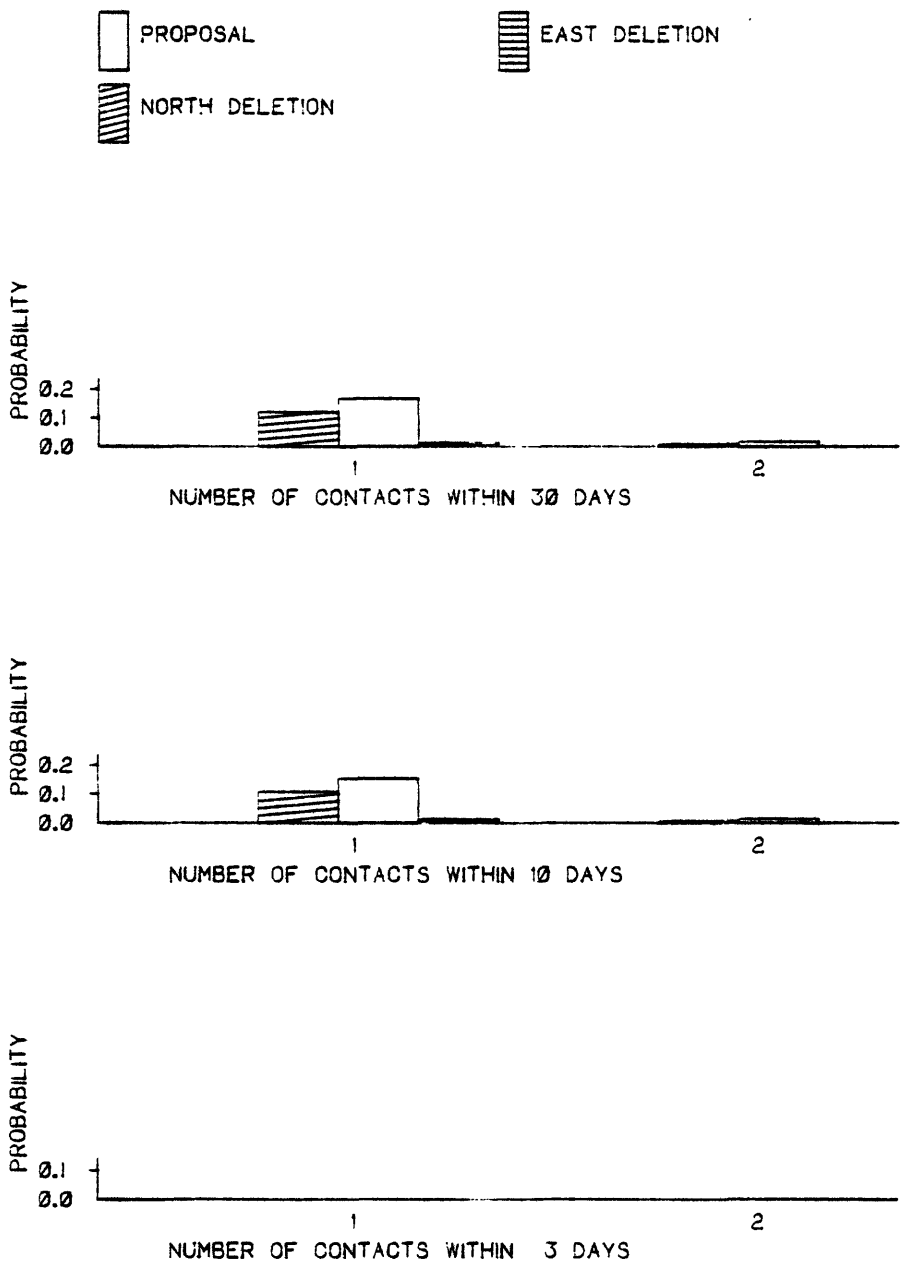

Figure 8-40.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting Yukon Delta (summer) as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the offshore transportation scenario.

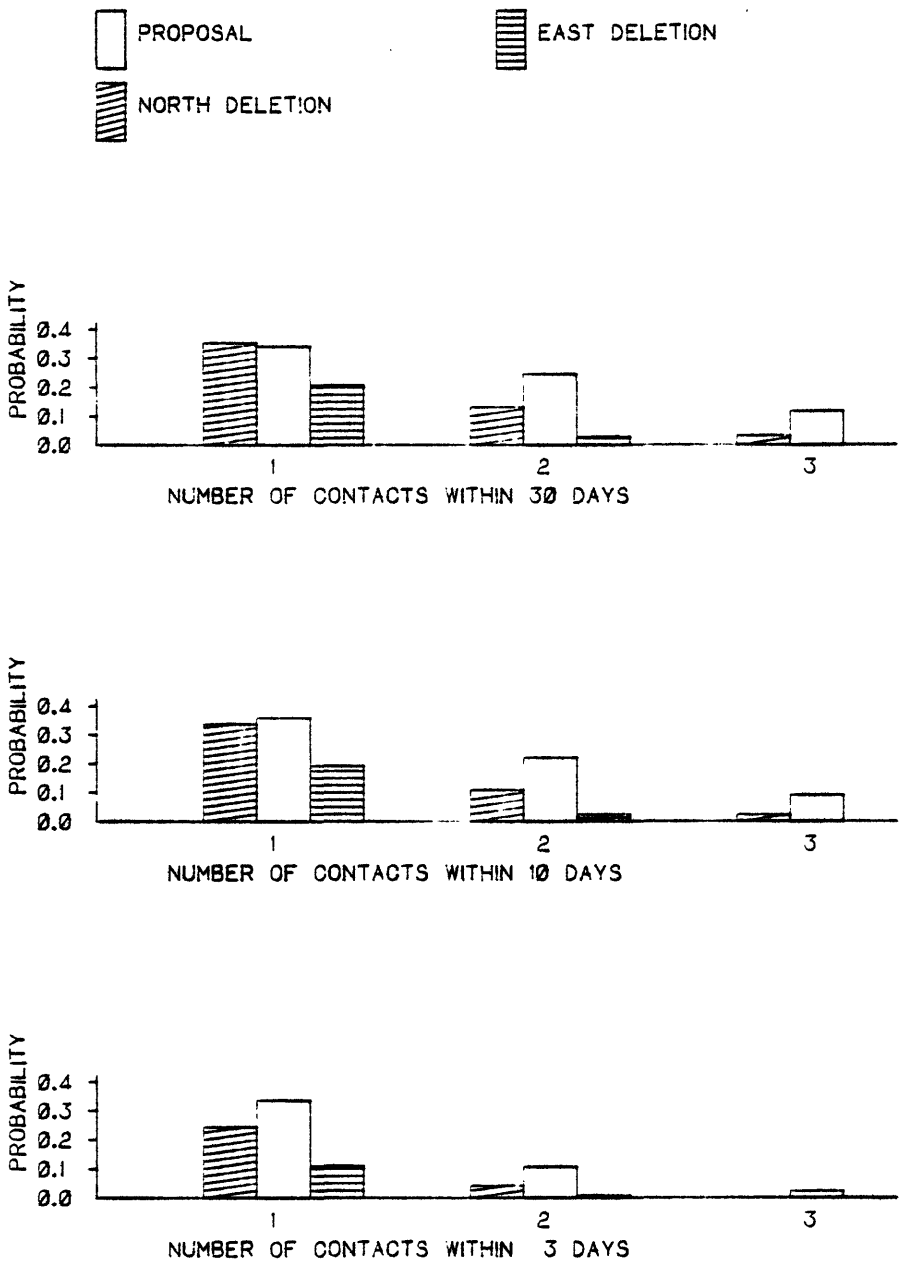

Figure B-41.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting Gray Whale area as a result of (1) the proposed action, (2) the north deletion alternative, and (3) the east deletion alternative, for the offshore transportation scenario.

Appendix C

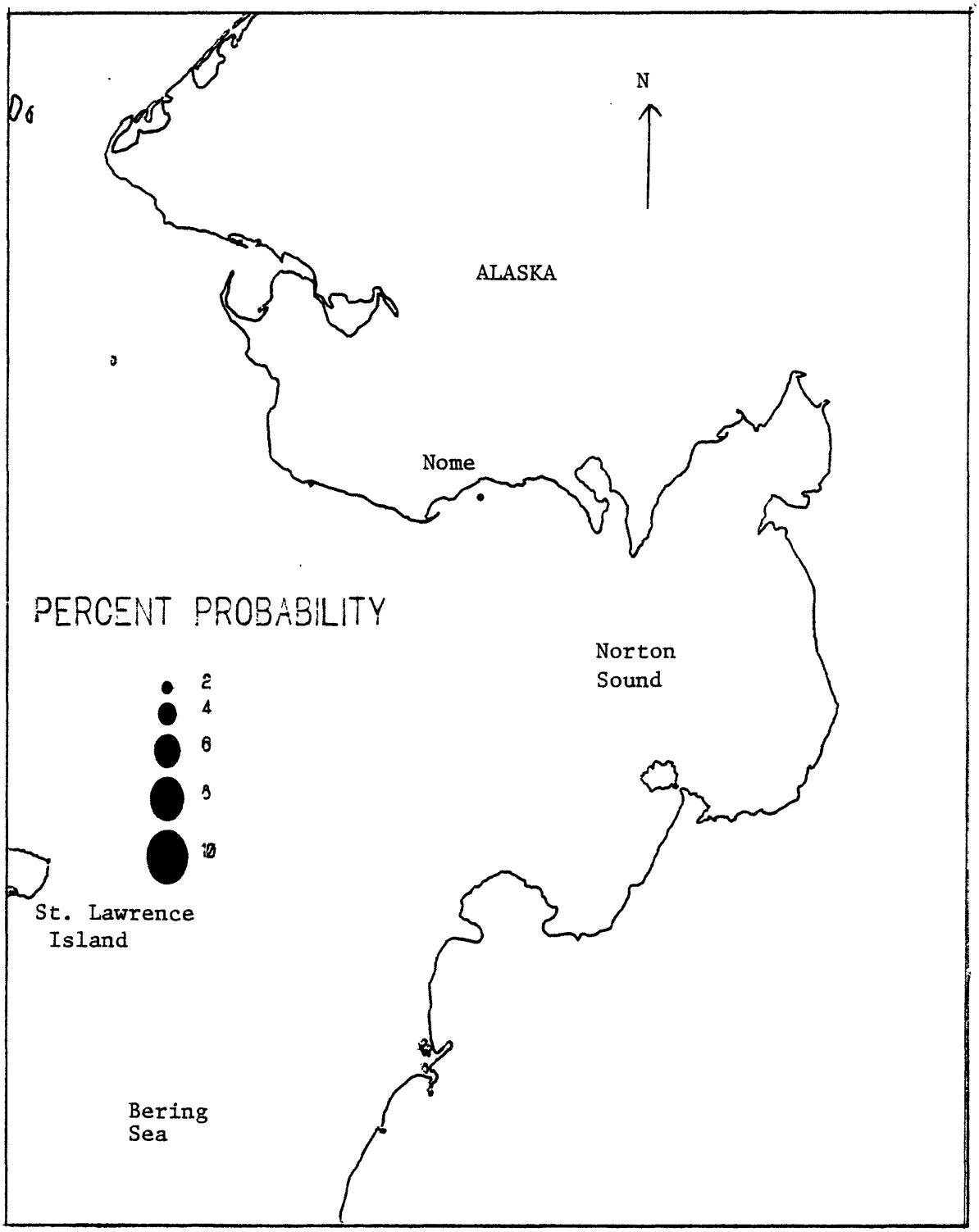

Figure C-1.--Map showing the probability (percent chance) of one or more spills (1,000 barrels and greater) occurring and contacting sections of the coastline for 3 days travel time, proposed action, onshore transportation scenario.

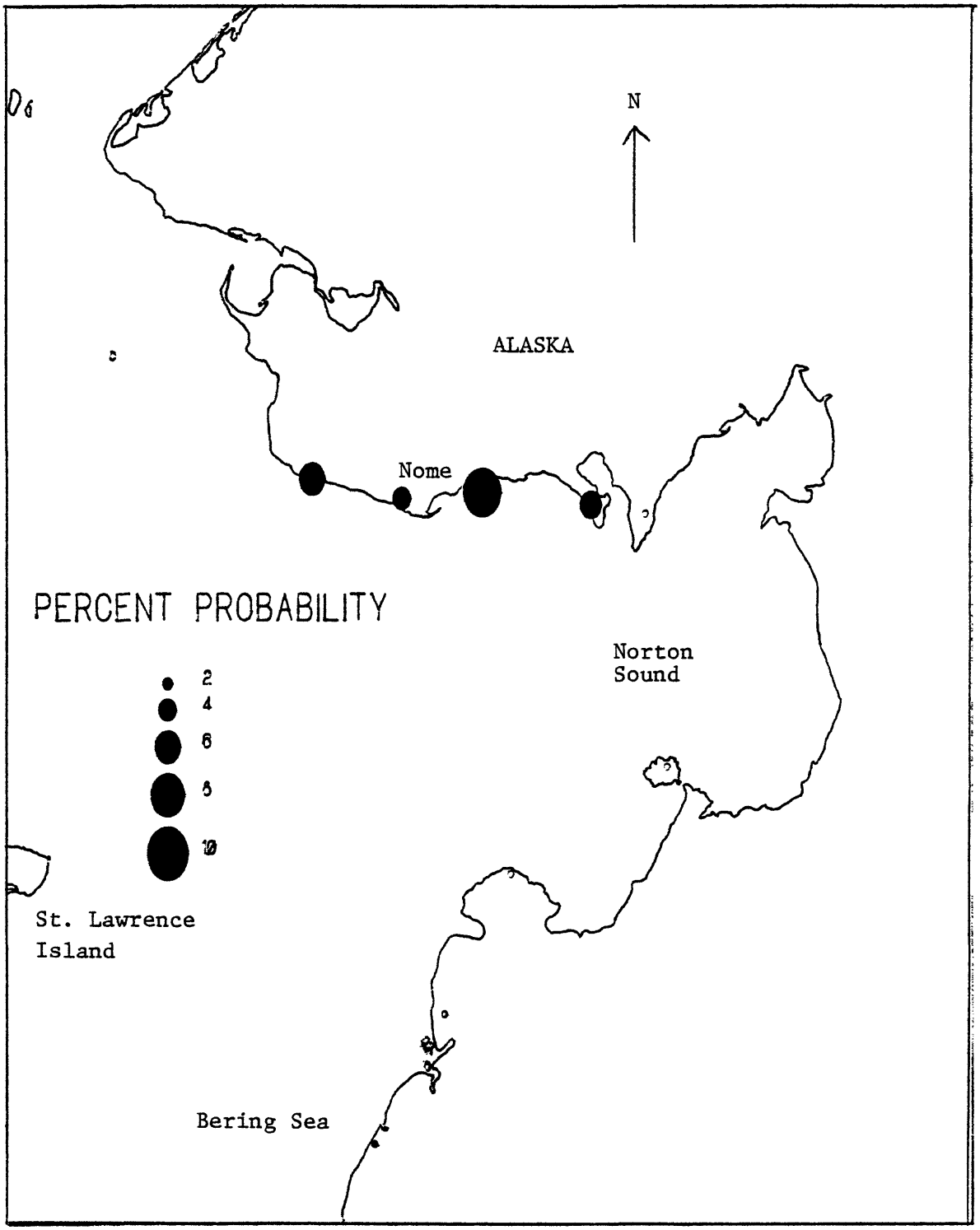

Figure C-2.--Map showing the probability (percent chance) of one or more spills (1,000 barrels and greater) occurring and contacting sections of the coastline for 10 days travel time, proposed action, onshore transportation scenario.

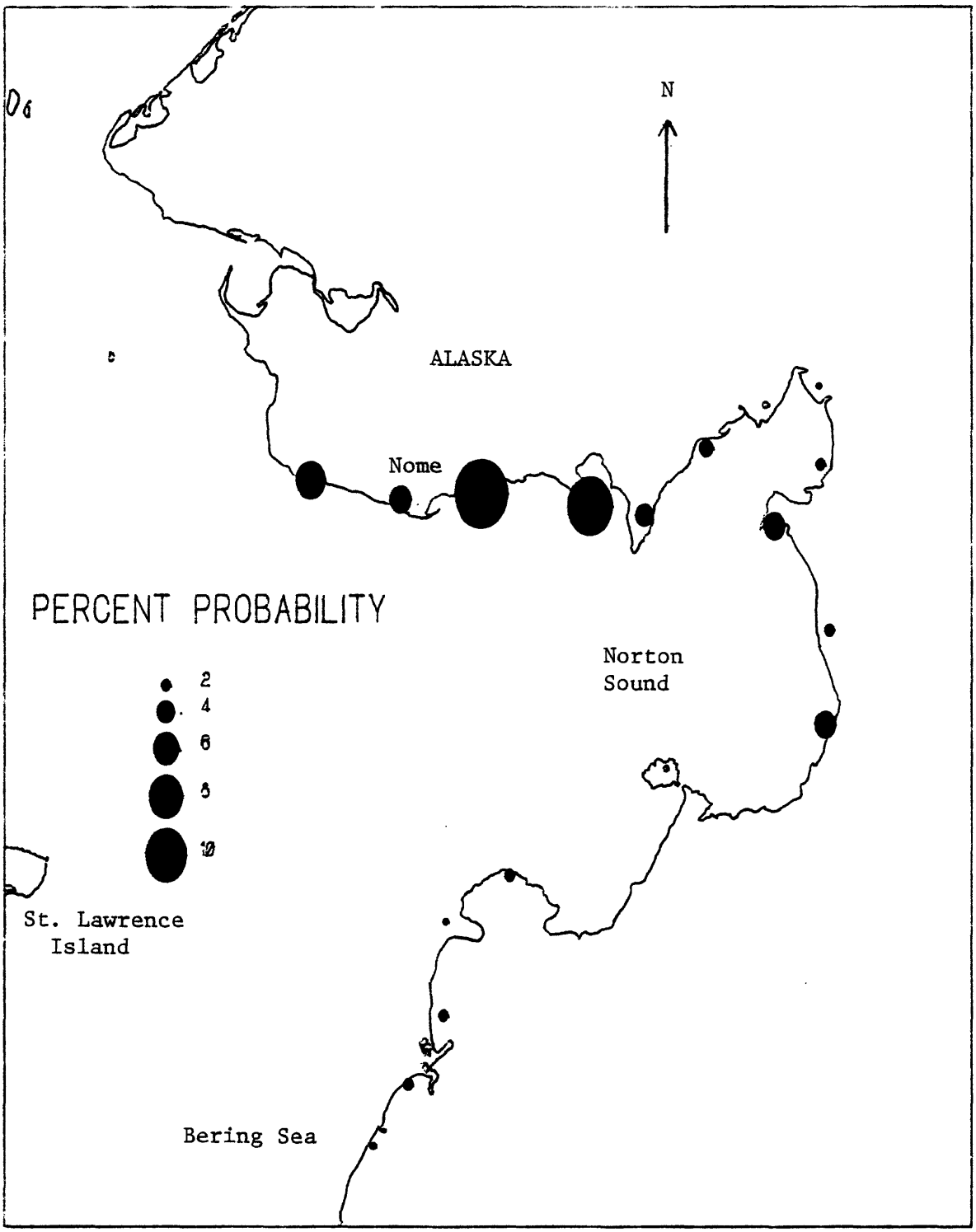

Figure C-3.--Map showing the probability (percent chance) of one or more spills (1,000 barrels and greater) occurring and contacting sections of the coastline for 30 days travel time, proposed action, onshore transportation scenario.

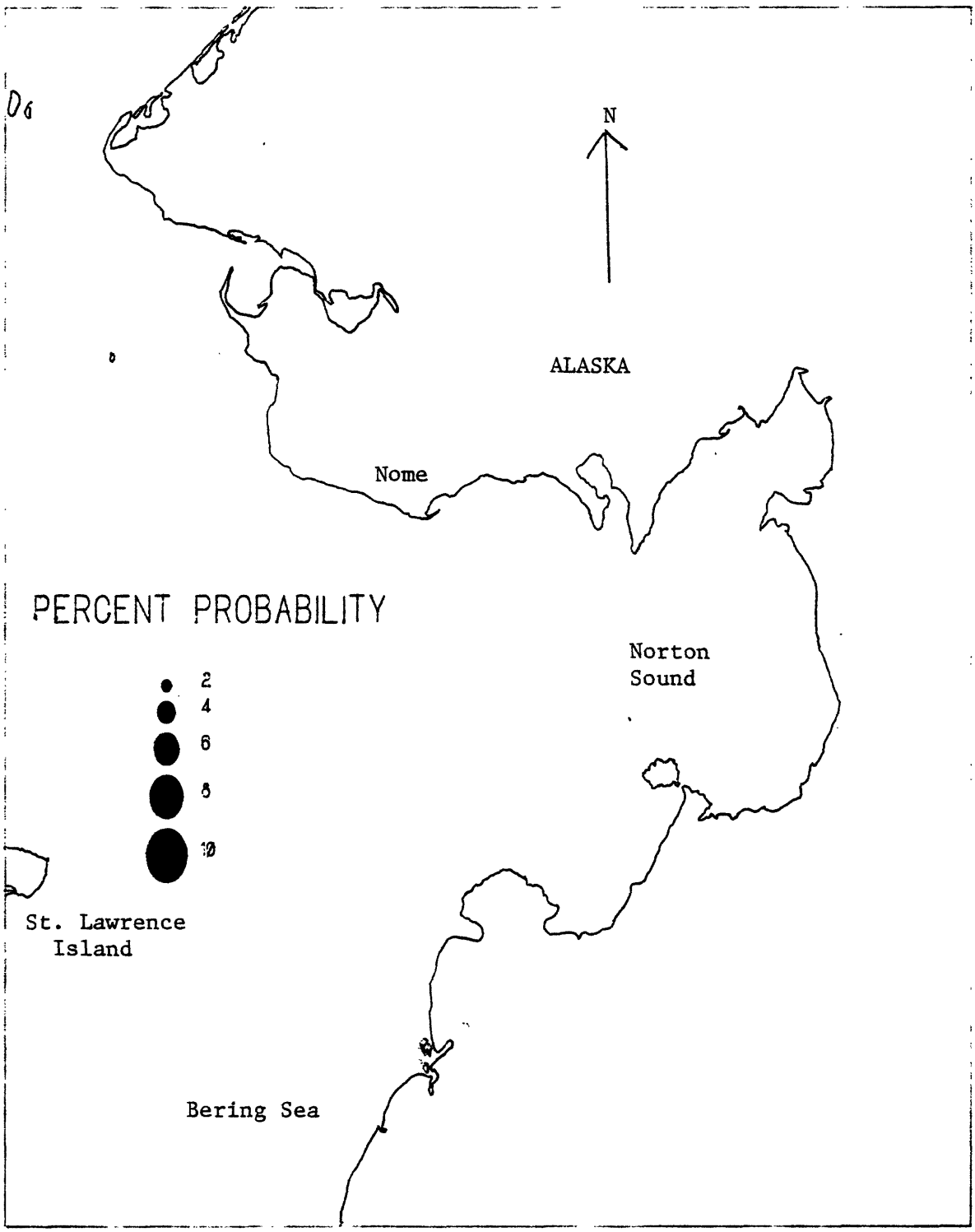

Figure C-4.--Map showing the probability (percent chance) of one or more spills (1,000 barrels and greater) occurring and contacting sections of the coastline for 3 days travel time, proposed action, offshore transportation scenario.

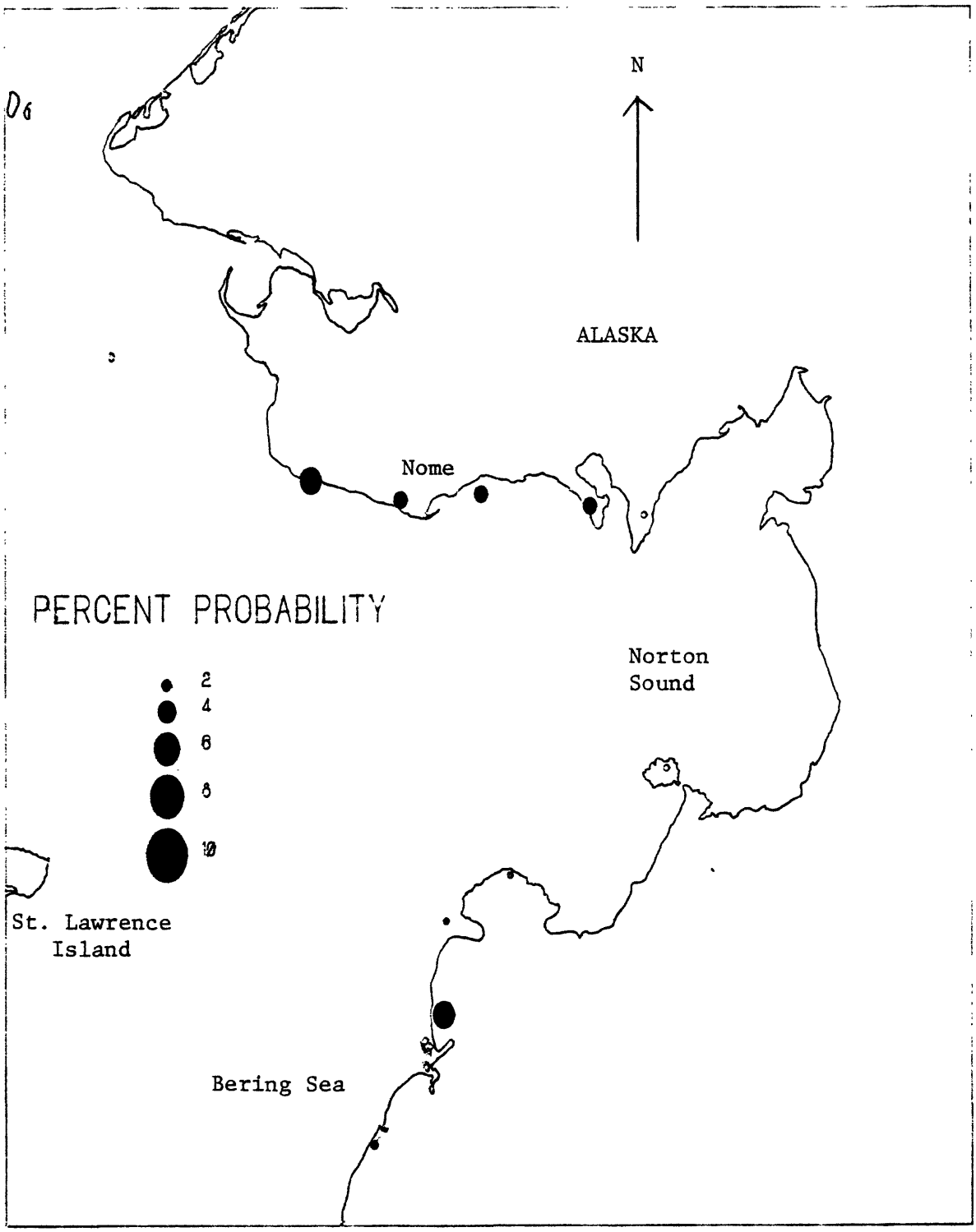

Figure C-5.--Map showing the probability (percent chance) of one or more spills (1,000 barrels and greater) occurring and contacting sections of the coastline for 10 days travel time, proposed action, offshore transportation scenario.

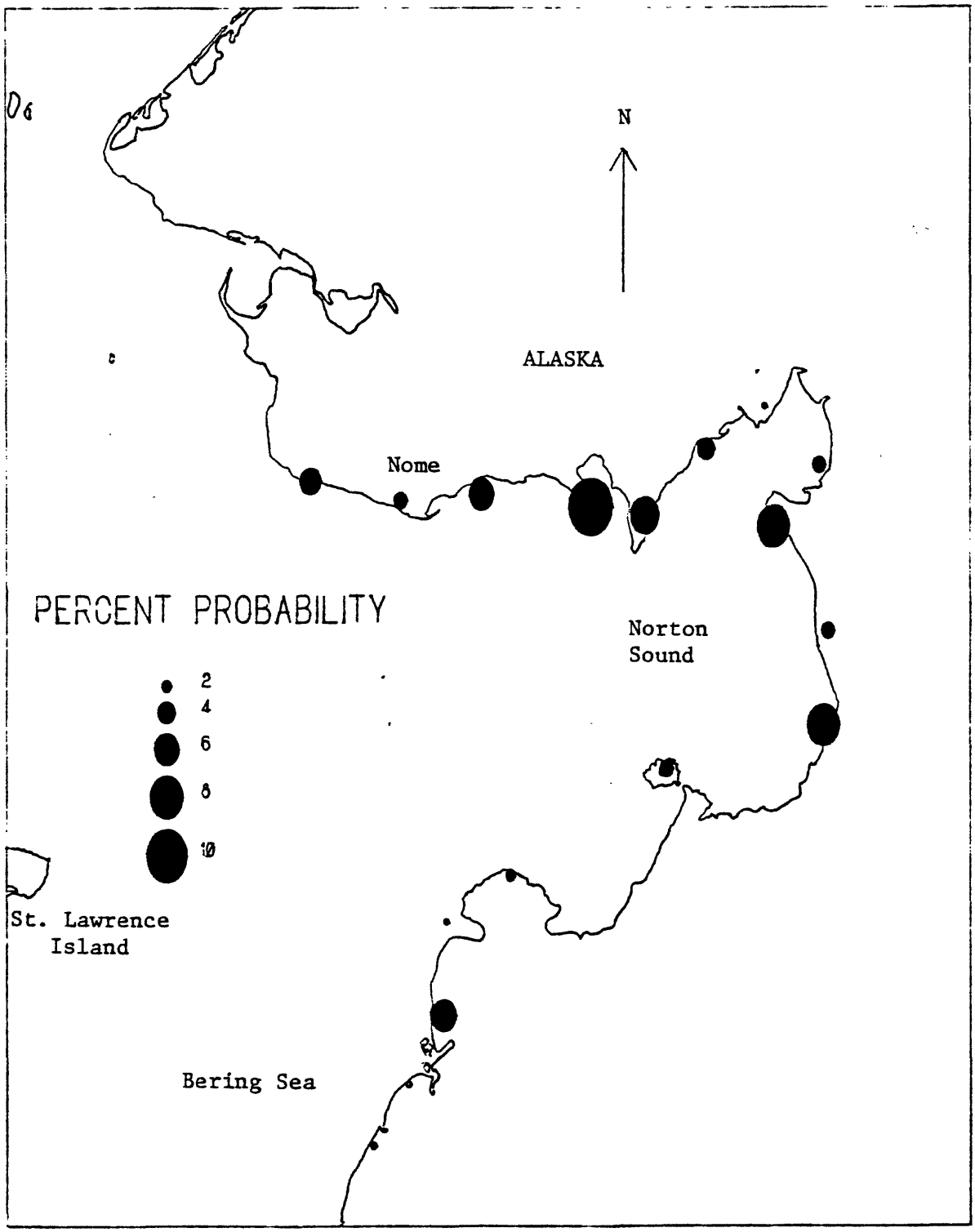

Figure C-6.--Map showing the probability (percent chance) of one or more spills (1,000 barrels and greater) occurring and contacting sections of the coastline for 30 days travel time, proposed action, offshore transportation scenario.