AN OILSPILL RISK ANALYSIS FOR THE BEAUFORT SEA, ALASKA, (PROPOSED SALE 71) OUTER CONTINENTAL SHELF LEASE AREA

By William B. Samuels, Dorothy Hopkins, and Kenneth J. Lanfear

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Contents

Abstract ---------- 1

Introduction ---------- 2

Decisionmaking under risk and uncertainty ---------- 3

Summary of the proposed action and the major alternatives ---------- 4

Environmental resources ---------- 4

Estimated quantity of oil resources ---------- 8

Probability of oilspills occurring ---------- 11

Oilspill trajectory simulations ---------- 25

Combined analysis of oilspill occurrence and oilspill trajectory simulations ---------- 38

Discussion of results ---------- 56

Conclusions ---------- 58

References cited ---------- 60

Appendix A ---------- 62

Appendix B ---------- 68

Appendix C ---------- 81

Appendix D ---------- 90

Illustrations

Page

1. Map showing the Beaufort Sea OCS Lease Sale 71 study area and the proposed lease tracts. ---------- 5

2. Map showing the subdivisions of the proposed Beaufort Sea OCS Lease Sale 71 (A through H) and area of existing Federal leases from joint Federal and State lease sale (I). ---------- 6

3. Map showing the launch points (P1-P45) which represent platform locations, pipelines, and tanker routes. ---------- 7

4. Map showing the location of 12 areas (A-L) which represent hypothetical impact zones for seabirds and marine mammals. ---------- 9

5. Map showing the division of the Beaufort Sea open sea boundary and coastline into 71 segments of approximately equal length. ---------- 10

6a. 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 Beaufort Sea OCS Lease Sale 71 based on U.S. OCS oilspill statistics for the conterminous 48 States. ---------- 17

6b. Estimated frequency distribution for oilspills greater than 1,000 and 10,000 barrels occurring during the expected production life of the Beaufort Sea OCS Lease Sale 71, Halkett deletion alternative, based on U.S. OCS oilspill statistics for the conterminous 48 States. ---------- 18

6c. Estimated frequency distribution for oilspills greater than 1,000 and 10,000 barrels occurring during the expected production life of the Beaufort Sea OCS Lease Sale 71, Colville deletion alternative, based on U.S. OCS oilspill statistics for the conterminous 48 States. ---------- 19

Illustrations (continued)

Page

6d. Estimated frequency distribution for oilspills greater than 1,000 and 10,000 barrels occurring during the expected production life of the Beaufort Sea OCS Lease Sale 71, Simpson deletion alternative, based on U.S. OCS oilspill statistics for the conterminous 48 States. ---------- 20

7a. 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 Beaufort Sea OCS Lease Sale 71 based on Prudhoe Bay oilspill statistics. ---------- 21

7b. Estimated frequency distribution for oilspills greater than 1,000 and 10,000 barrels occurring during the expected production life of the Beaufort Sea OCS Lease Sale 71, Halkett deletion alternative, based on Prudhoe Bay oilspill statistics. ---------- 22

7c. Estimated frequency distribution for oilspills greater than 1,000 and 10,000 barrels occurring during the expected production life of the Beaufort Sea OCS Lease Sale 71, Colville deletion alternative based on Prudhoe Bay oilspill statistics. ---------- 23

7d. Estimated frequency distribution for oilspills greater than 1,000 and 10,000 barrels occurring during the expected production life of the Beaufort Sea OCS Lease Sale 71, Simpson deletion alternative, based on Prudhoe Bay oilspill statistics. ---------- 24

8. Results of a significance test for any two probabilities (100 trials, 90-percent confidence level). ---------- 28

Tables

Page

1a. Oilspill probability estimates for spills greater than 1,000 and 10,000 barrels resulting from OCS Lease Sale 71 (based on U.S. OCS oilspill statistics). ---------- 15

1b. Oilspill probability estimates for spills greater than 1,000 and 10,000 barrels resulting from OCS Lease Sale 71 (based on Prudhoe Bay oilspill statistics). ---------- 16

2. Monte Carlo error as a function of the number of trials and the estimated probability. ---------- 27

3. Probabilities (expressed as percent chance) that an oilspill starting at a particular location will contact a certain target or impact zone within 3 days. ---------- 29

4. Probabilities (expressed as percent chance) that an oilspill starting at a particular location will contact a certain target or impact zone within 10 days. ---------- 30

5. Probabilities (expressed as percent chance) that an oilspill starting at a particular location will contact a certain target or impact zone within 30 days. ---------- 31

6. Probabilities (expressed as percent chance) that an oilspill starting at a particular location will contact a certain land or boundary segment within 3 days. ---------- 32

7. Probabilities (expressed as percent chance) that an oilspill starting at a particular location will contact a certain land or boundary segment within 10 days. ---------- 34

Tables (continued)

Page

8. Probabilities (expressed as percent chance) that an oilspill starting at a particular location will contact a certain land or boundary segment within 30 days. ---------- 36

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 expected production life of the lease area (proposed action). Probabilities calculated using U.S. OCS oilspill statistics for the conterminous 48 States.---------- 40

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 expected production life of the lease area, Halkett deletion alternative. Probabilities calculated using U.S. OCS oilspill statistics for the conterminous 48 States. ---------- 41

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 expected production life of the lease area, Colville deletion alternative. Probabilities calculated using U.S. OCS oilspill statistics for the conterminous 48 States. ---------- 42

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 expected production life of the lease area, Simpson deletion alternative. Probabilities calculated using U.S. OCS oilspill statistics for the conterminous 48 States. ---------- 43

Tables (continued)

Page

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 land or boundary segments over the expected production life of the lease area, proposed action. Probabilities calculated using U.S. OCS oilspill statistics for the conterminous 48 States. ---------- 44

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 land or boundary segments over the expected production life of the lease area, Halkett deletion alternative. Probabilities calculated using U.S. OCS oilspill statistics for the conterminous 48 States. ---------- 45

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 land or boundary segments over the expected production life of the lease area, Colville deletion alternative. Probabilities calculated using U.S. OCS oilspill statistics for the conterminous 48 States. ---------- 46

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 land or boundary segments over the expected production life of the lease area, Simpson deletion alternative. Probabilities calculated using U.S. OCS oilspill statistics for the conterminous 48 States. ---------- 47

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 expected production life of the proposed lease tracts. Probabilities calculated using Prudhoe Bay oilspill statistics. ---------- 48

Tables (continued)

Page

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 expected production life of the lease area, Halkett deletion alternative. Probabilities calculated using Prudhoe Bay oilspill statistics. ---------- 49

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 expected production life of the lease area, Colville deletion alternative. Probabilities calculated using Prudhoe Bay oilspill statistics. ---------- 50

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 expected production life of the lease area, Simpson deletion alternative. Probabilities calculated using Prudhoe Bay oilspill statistics. ---------- 51

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 land or boundary segments over the expected production life of the proposed lease tracts. Probabilities calculated using Prudhoe Bay oilspill statistics. ---------- 52

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 land or boundary segments over the expected production life of the lease area, Halkett deletion alternative. Probabilities calculated using Prudhoe Bay oilspill statistics. ---------- 53

Tables (continued)

Page

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 land or boundary segments over the expected production life of the lease area, Colville deletion alternative. Probabilities calculated using Prudhoe Bay oilspill statistics. ---------- 54

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 land or boundary segments over the expected production life of the lease area, Simpson deletion alternative. Probabilities calculated using Prudhoe Bay oilspill statistics. ---------- 55

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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 Beaufort Sea, Alaska, (Proposed Sale 71) 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 model predicted movement of the center of spill mass and estimated the times between spill occurrence and contact with various resources, to allow a qualitative assessment of oil characteristics at the time of contact; no direct computation was made of weathering and cleanup. The model also assumed that any oil spilled under ice would remain in place, unchanged, until spring breakup. Ice movements, or travel of oil under ice, if occurring, would affect the results in a manner not directly predictable at this time. The combined results of spill occurrence and spill movement predictions yielded estimates of the overall risks associated with development of the proposed lease area. Assuming that oil exists in the lease area (a 99.3-percent chance) it is estimated that the leasing of the tracts proposed for OCS Sale 71 will result in an expected 9.2 oilspills (of 1,000 barrels or larger) over the lease lifetime of 25 years. This estimate is based on historic oilspill accident data for platforms and pipelines on the U.S. OCS (Gulf of Mexico and California). 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 (not counting any time trapped under ice) is greater than 99.5 percent. If oilspill accident data for Prudhoe Bay, Alaska, is used in the analysis, it is estimated that 5.6 oilspills (1,000 barrels or larger) will occur over the lease lifetime. The estimated probability that one or more oilspills (1,000 barrels or larger) will occur and contact land is 99 percent. The results of a recent experimental cleanup operation for oilspills under ice in Canadian Arctic waters showed a substantial degree of success; this should be considered in evaluating impacts of spills predicted by this model. Oilspill occurrence probabilities are high primarily because of the large amount of oil believed to be present in the area.

Introduction

The Federal Government has proposed to offer Outer Continental Shelf (OCS) lands off the Beaufort Sea, Alaska, coast for oil and gas leasing. The conditional mean estimate of oil resources for the proposed 372 tracts is 2.38 billion barrels of crude oil. The probability that oil occurs in commercial quantities in the sale area is 99.3 percent. 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, current, and ice 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 Beaufort Sea OCS Lease Sale 71. 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 basic 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 trajectory portion of the model for the Beaufort Sea is described in Mungall (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 and expressed as an "expected number of spills," 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, which may, in some cases, be greater than the risks of producing oil. 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 372 tracts on the Outer Continental Shelf off the Beaufort Sea coast. The study area for this analysis includes all of these tracts and extends from longitude 144° 30' W to 154° 38' W, and offshore approximately 200 to 350 km (see model boundaries in figure 1).

The study area and the proposed lease tracts are shown in figure 1. The subdivisions of the proposed sale and existing tracts from the joint Federal and State sale are shown in figure 2. The launch points, which represent platform locations, pipeline routes, and tanker routes, are shown in figure 3. The oil from the proposed lease tracts is transported via a proposed pipeline buried in the shorefast ice zone; it follows the coastline to Prudhoe Bay where it would connect with a pipeline draining producing fields offshore from Prudhoe Bay.

In addition to the proposed action three tract deletion alternatives were examined:

1. Halkett deletion, delete area A.
2. Colville deletion, delete area E.
3. Simpson deletion, delete area H.

A cumulative analysis was also performed which included leases from a joint Federal and State sale (area I) held in December 1979. This analysis also included a hypothetical tanker route (P1-P9) which represents the transportation of oil by ice-strengthened tankers from MacKenzie Bay (east of the study area) to Pacific rim countries.

Environmental Resources

The locations of eight 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-5. 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. The targets listed below are vulnerable during open-water conditions (approximately June to September):

Seabird staging and feeding area 1
Seabird staging and feeding area 2
Marine mammal area A
Marine mammal area B
potential Bowhead whale feeding area A (high-intensity use)
potential Bowhead whale feeding area B (low-intensity use)
Overwintering area (boreal smelt, fourhorn sculpin)
Boulder patches

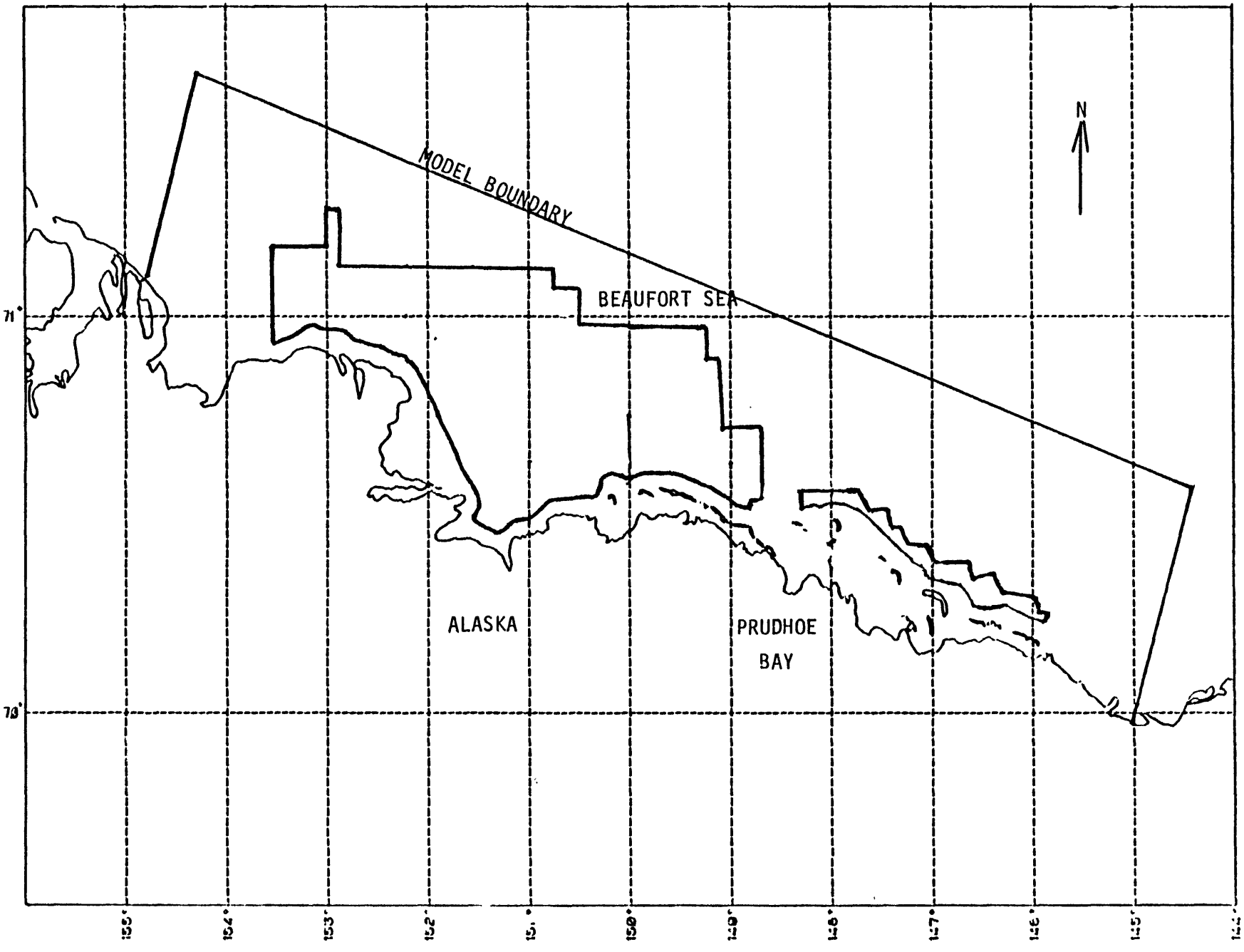

Figure 1.--Map showing the Beaufort Sea OCS Lease Sale 71 study area and the proposed lease tracts.

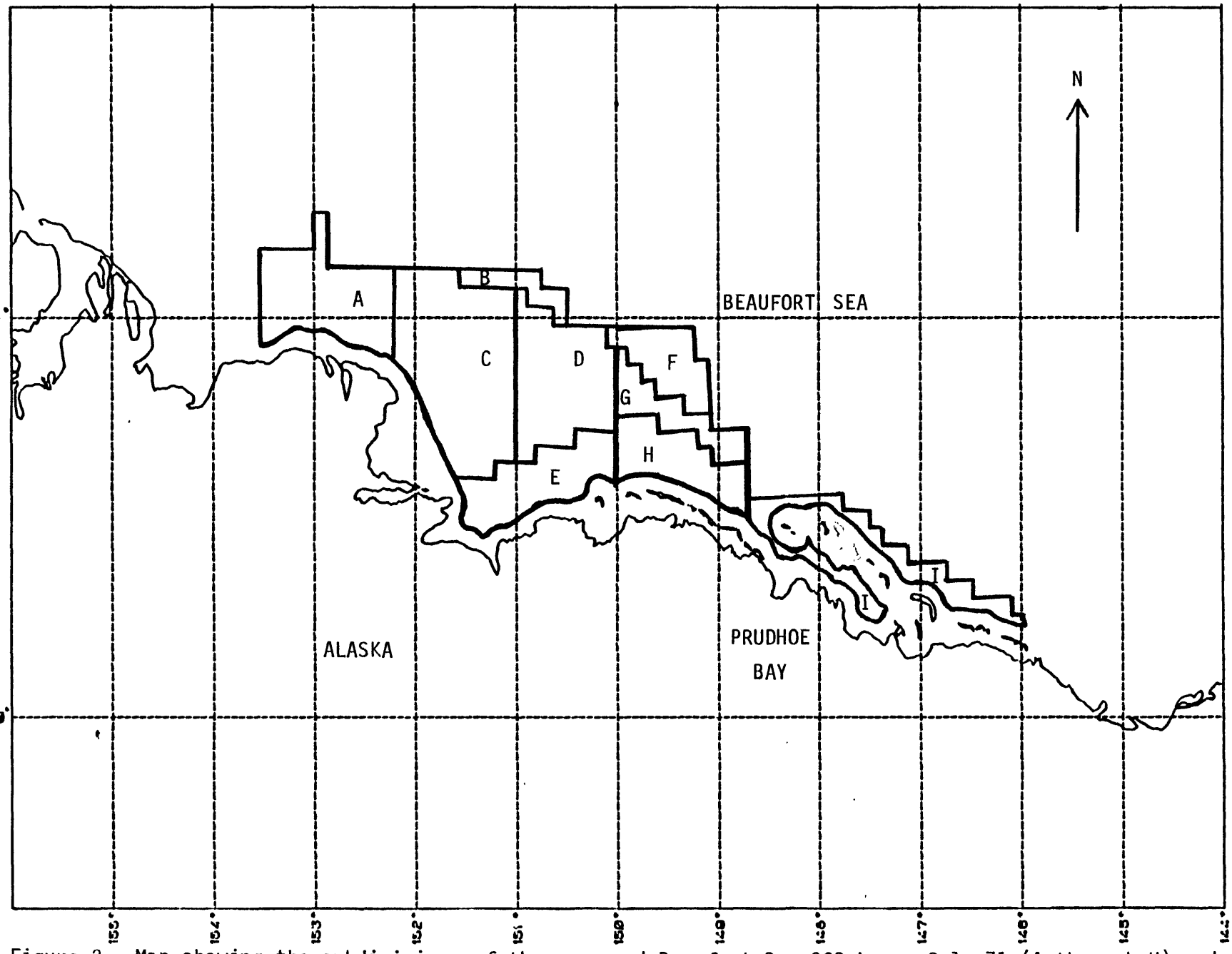

Figure 2.--Map showing the subdivisions of the proposed Beaufort Sea OCS Lease Sale 71 (A through H) and area of existing Federal leases from joint Federal and State lease Sale (I).

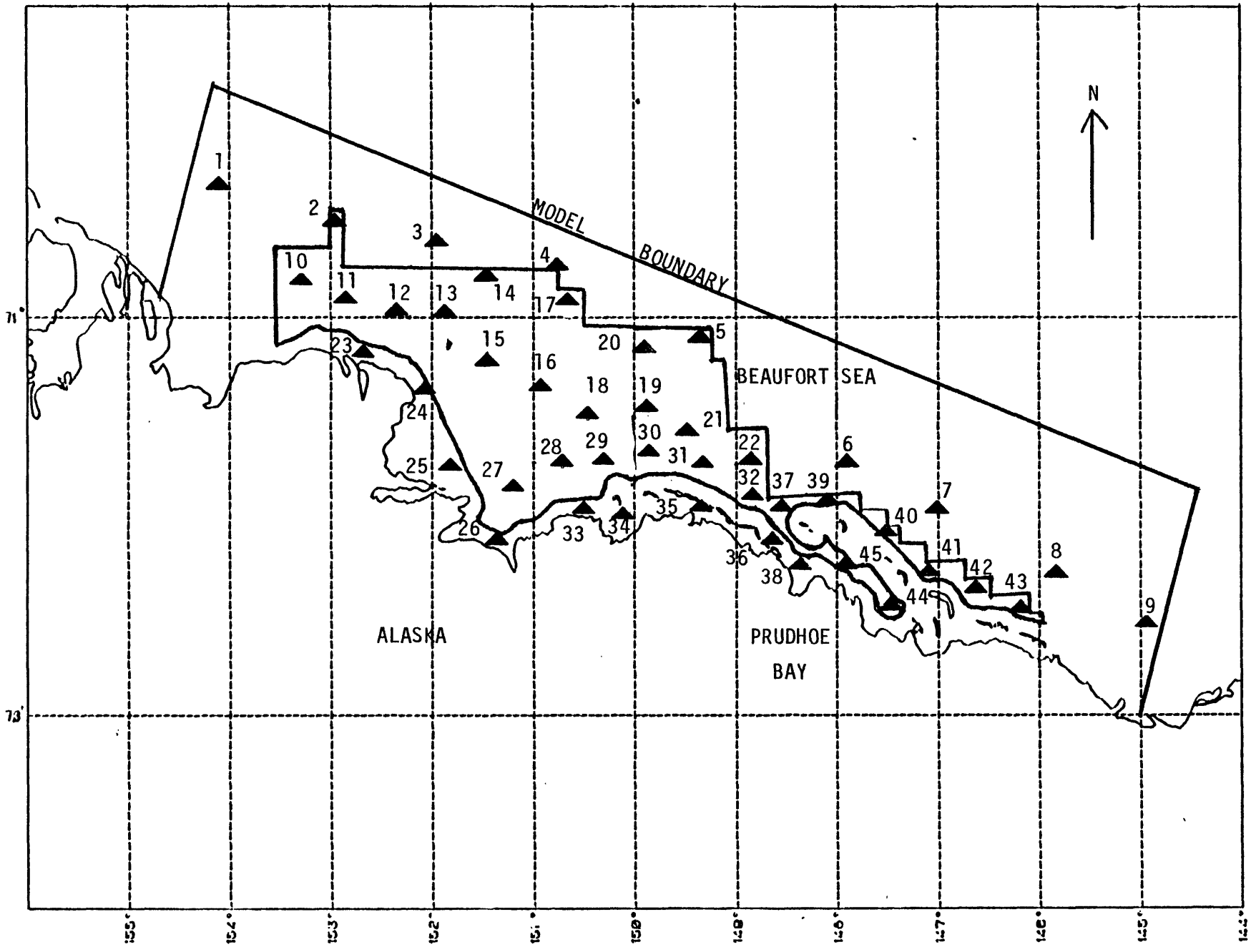

Figure 3.--Map showing the launch points (P1-P45) which represent platform locations, pipelines, and tanker routes.

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. The locations of these targets are shown on maps in appendix A. Twelve areas which represent hypothetical impact zones for seabirds and marine mammals were also included in the analysis. These areas were selected by BLM analysts. The locations of these areas are shown in figure 4.

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 5 shows the coastline divided into 42 segments of approximately equal length. The open sea boundaries were also divided into 29 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. Sale 71, for example, is expected to yield a relatively large amount of oil, 2.38 billion barrels (memorandum of October 17, 1980, USGS Conservation Division to BLM) -- an amount comparable to half the total historic production from the Gulf of Mexico. Thus, although the number of spills predicted in this analysis may seem high, one must keep in mind that this corresponds to a large resource estimate and high economic benefits.

The estimated oil resources used for oilspill risk calculations in this report correspond to those used by BLM in preparing the

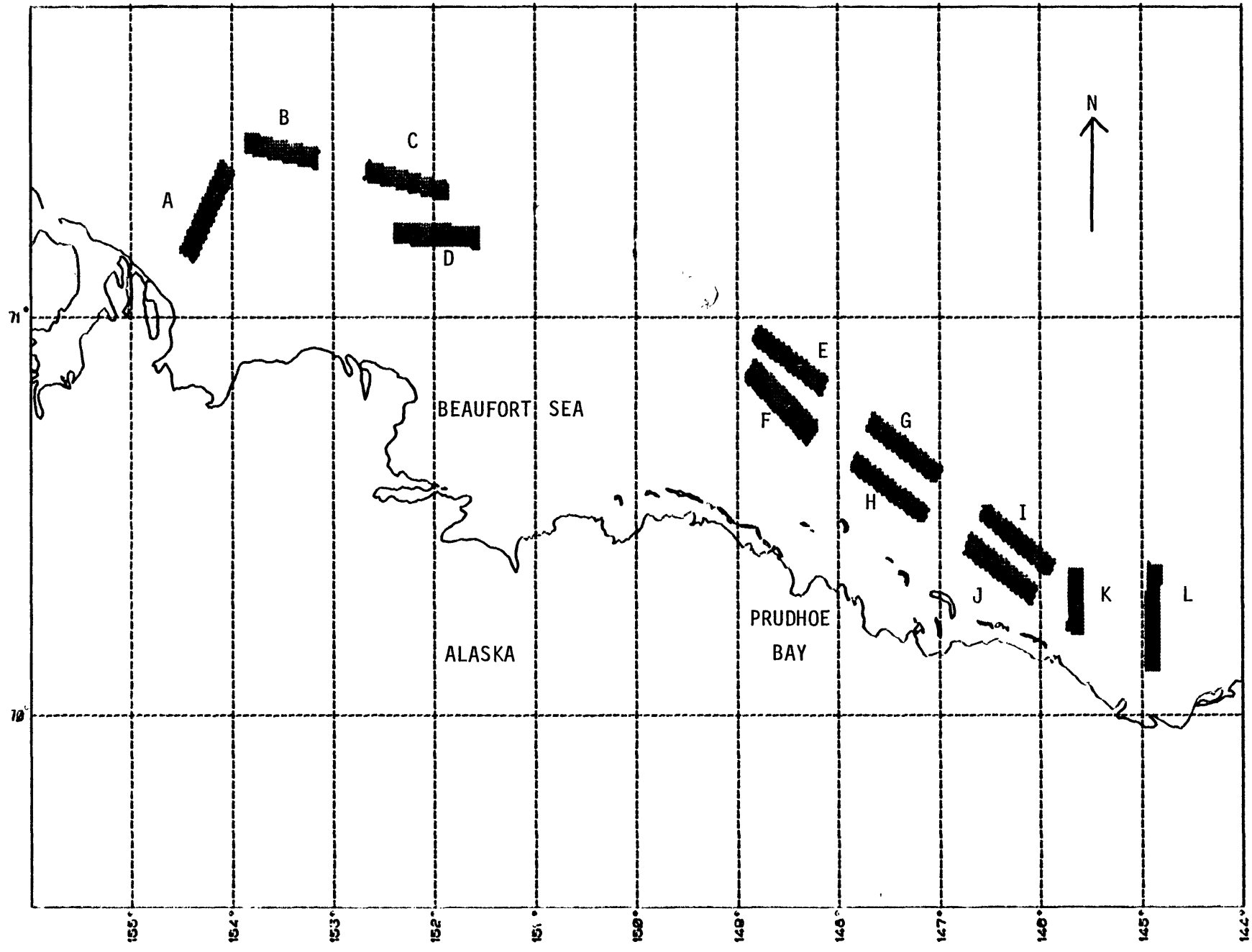

Figure 4.--Map showing the location of 12 areas (A-L) which represent hypothetical impact zones for seabirds and marine mammals.

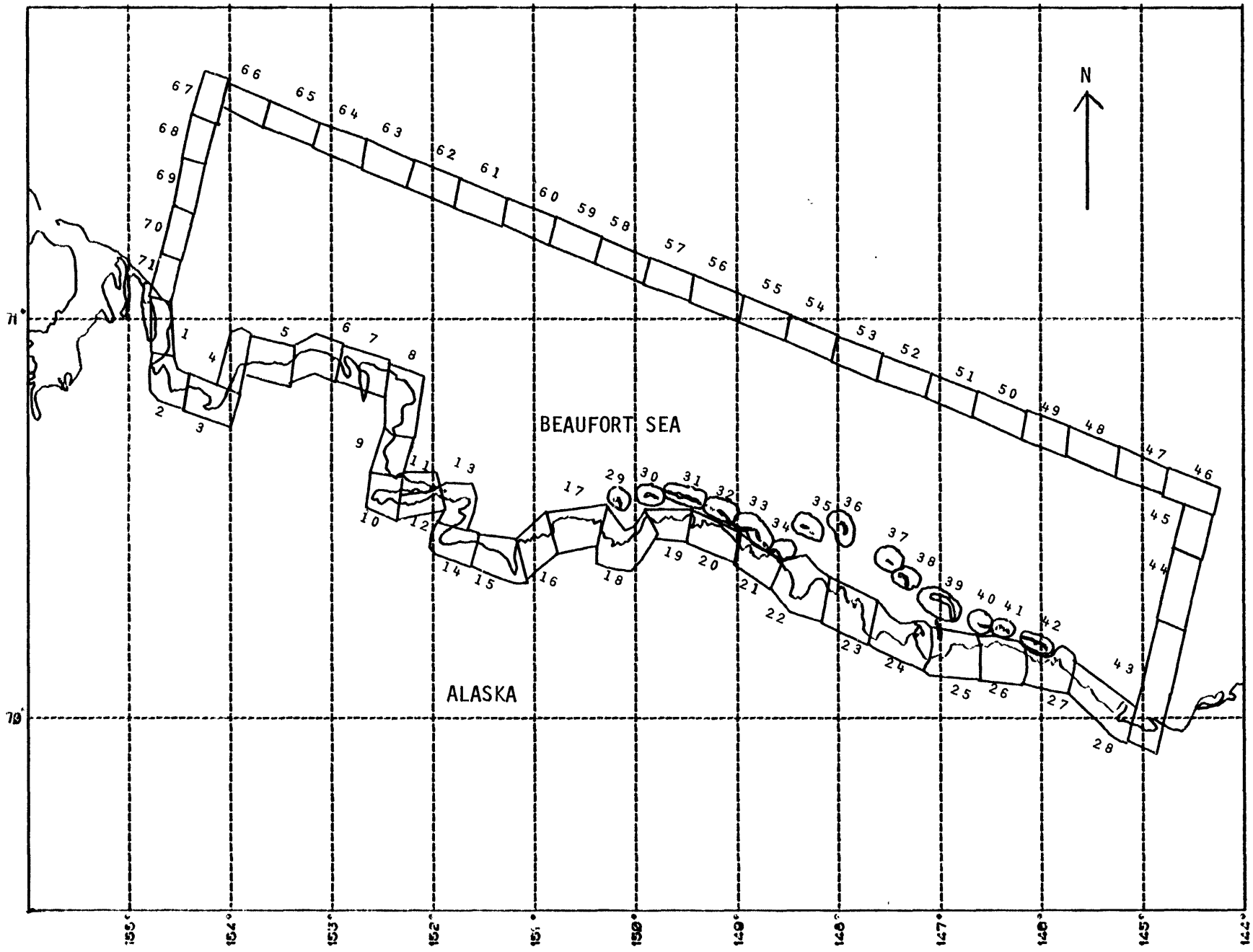

Figure 5.--Map showing the division of the Beaufort Sea open sea boundary and coastline into 71 segments of approximately equal length.

draft EIS for the lease sale. These estimates are based on those derived by the USGS Conservation Division for the draft EIS (memorandum of October 17, 1980, USGS Conservation Division to BLM). A 99.3-percent chance exists that oil is present in economically recoverable quantities in the sale area. An estimated conditional mean value of 2.38 billion barrels, distributed among the various subareas (A-H), may occur. The probability of finding oil is reduced 1.4 percent for the Halkett deletion alternative, 0.2 percent for the Colville deletion alternative, and 5.1 percent for the Simpson deletion alternative. Thus, the estimates are 1.94, 2.29, and 1.63 billion barrels for the Halkett, Colville, and Simpson tract deletion alternatives, respectively. These conditional mean estimates are also based on those derived by the USGS Conservation Division for the draft EIS (memorandum of October 17, 1980, USGS Conservation Division to BLM). The conditional mean estimate of oil resources in the joint Federal and State leases (area I) is 750 million barrels of crude oil. In addition to oil from the proposed lease tracts, BLM estimates that 1.7 billion barrels of oil will be transported along the tanker route within the study area. The assumption was made that only one-fourth the oilspill risk occurs along the tanker route within the study area.

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. Although the primary causes of spills (hurricanes or collisions) may differ among OCS areas, each historic accident is an indicator of man's propensity to accept risks. In each accident, the designers of the platform, pipeline, or ship presumably tried to account for expected hazards; failure may reflect either the inability to foresee all risks or an acceptance of known risks which in turn requires a value judgement (concerning safety vs costs, for example). There does not appear to be any a priori reason to believe that designers of arctic facilities, faced with known and unknown hazards, would perform any better than their equally qualified counterparts in the Gulf of Mexico. The assumption here is that accident rates are fundamentally determined by the adequacy of the engineering and by cultural tendencies to accept risks to gain benefits.

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, (Danenberger, 1976; 1980) are included in the data base, but comprise only a part of the data.

This report examines, when the data permit, spills in two size ranges: 10,000 barrels or greater, and 1,000 barrels or greater (which includes the first category). To place these sizes in a rough perspective, spills in the larger category are usually associated with catastrophies such as large blowouts or shipwrecks. Accidents in the 1,000 to 10,000 barrels size 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 more than 10,000 barrels and seven spills (including the two) of more than 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 are not maintained by the USGS, so tanker accident rates must be derived from published literature. The tanker worldwide 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 (based on U.S. OCS oilspill statistics for the conterminous 48 states) 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 530 million barrels of petroleum have been produced from platforms in Cook Inlet; no spills of 1,000 barrels or greater have occurred. Applying the spill rates used for platforms in this analysis, we find a 34-percent chance of no spills in producing 530 million barrels in this manner. Thus, the data base for Alaska (530 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. The record could indicate, for example, that the Alaskan oil industry implicitly acknowledges a smaller degree of risk than the industry in the conterminous 48 States.

In the Beaufort Sea as well as other areas of the Alaska OCS, producing wells may be located on artificial gravel islands, rather than on platforms. The costs of safety measures for a gravel island may be lower than those for a platform. A lower cost for safety may result in the spill rate for oil production on gravel islands being lower than the spill rate for platforms. The first problem in testing this hypothesis is that there is no oil producion from gravel islands in the Beaufort Sea. Operations at Prudhoe Bay, however, are similar to those proposed for the Beaufort Sea. According to Gilbreth (1969, 1970), in producing approximately 1.826 billion barrels of oil, only 1 spill (60,000 gallons, or 1,430 barrels) occurred at Prudhoe Bay. This spill was fuel oil, not crude oil, but could reasonably have occurred on a gravel island. Using a spill rate of 2.05 spills per billion barrels, there is only an 11-percent chance of observing 0 or 1 spills in producing 1.826 billion barrels of oil, and a 2-percent chance of no spills. At the 89-percent confidence level, we could reject the hypothesis that the spill rate at Prudhoe Bay is the same as that for the conterminous 48 States, and calculate a new spill rate for Prudhoe Bay of 0.55 spills (of 1,000 barrels or greater) per billion barrels. Since no spills of 10,000 barrels or greater occurred, the rate for this spill size category was calculated by multiplying 0.55 times the ratio of the 10,000 barrel and greater rate and the 1,000 barrel and greater rate for spills on the U.S. OCS (0.91/2.05). Thus, the estimated spill rate for 10,000 barrel spills and greater is 0.24 per billion barrels. These rates are about one fourth those of the rest of the U.S. OCS, and would apply only if gravel islands, not platforms, are used for production. It must also be noted that these rates are based on only one spill and could change substantially with additional experience at Prudhoe Bay.

Similar data do not exist for pipelines at Prudhoe Bay because the pipelines at Prudhoe Bay are mostly on land. The Trans-Alaskan pipeline is also on land, and its accident history does not appear to be very different than that of the established pipeline accident rate for the U.S. OCS. Therefore, although the oilspill rate for gravel islands is substantially lower than the platform spill rate for the U.S. OCS, the inclusion of pipeline risks tends to moderate this effect.

Spill frequency estimates were calculated for production and transportation of oil from Sale 71 by using oilspill statistics for the U.S. OCS and for Prudhoe Bay, Alaska. 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. Figures 6 and 7 show the probability that 0, 1, 2, ..., N spills will occur, based on U.S. OCS and Prudhoe Bay oilspill statistics.

Table 1a. -- Oilspill probability estimates for spills greater than 1,000 and 10,000 barrels resulting from OCS Lease Sale 71 (based on U.S. OCS oilspill statistics).

	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	9.2	3.3	9	3	0.99+	0.96
Halkett deletion	7.5	2.7	7	2	0.99+	0.93
Colville deletion	8.9	3.1	8	3	0.99+	0.95
Simpson deletion	6.3	2.2	6	2	0.99+	0.89
Proposed action plus joint Federal and State leases	12.1	4.3	12	4	0.99+	0.99
Proposed action plus tanker transportation	10.9	4.3	10	4	0.99+	0.99
Proposed action plus joint Federal and State leases and tanker transportation	13.7	5.3	13	5	0.99+	0.99+

Table 1b. -- Oilspill probability estimates for spills greater than 1,000 and 10,000 barrels resulting from OCS Lease Sale 71 (based on Prudhoe Bay oilspill statistics).

	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	5.6	1.7	5	1	0.99+	0.82
Halkett deletion	4.6	1.4	4	1	0.99	0.75
Colville deletion	5.4	1.6	5	1	0.99+	0.80
Simpson deletion	3.9	1.1	3	1	0.98	0.67
Proposed action plus joint Federal and State leases	7.4	2.2	7	2	0.99+	0.90
Proposed action plus tanker transportation	7.2	2.7	7	2	0.99+	0.93
Proposed action plus joint Federal and State leases and tanker transportation	9.0	3.2	9	3	0.99+	0.96

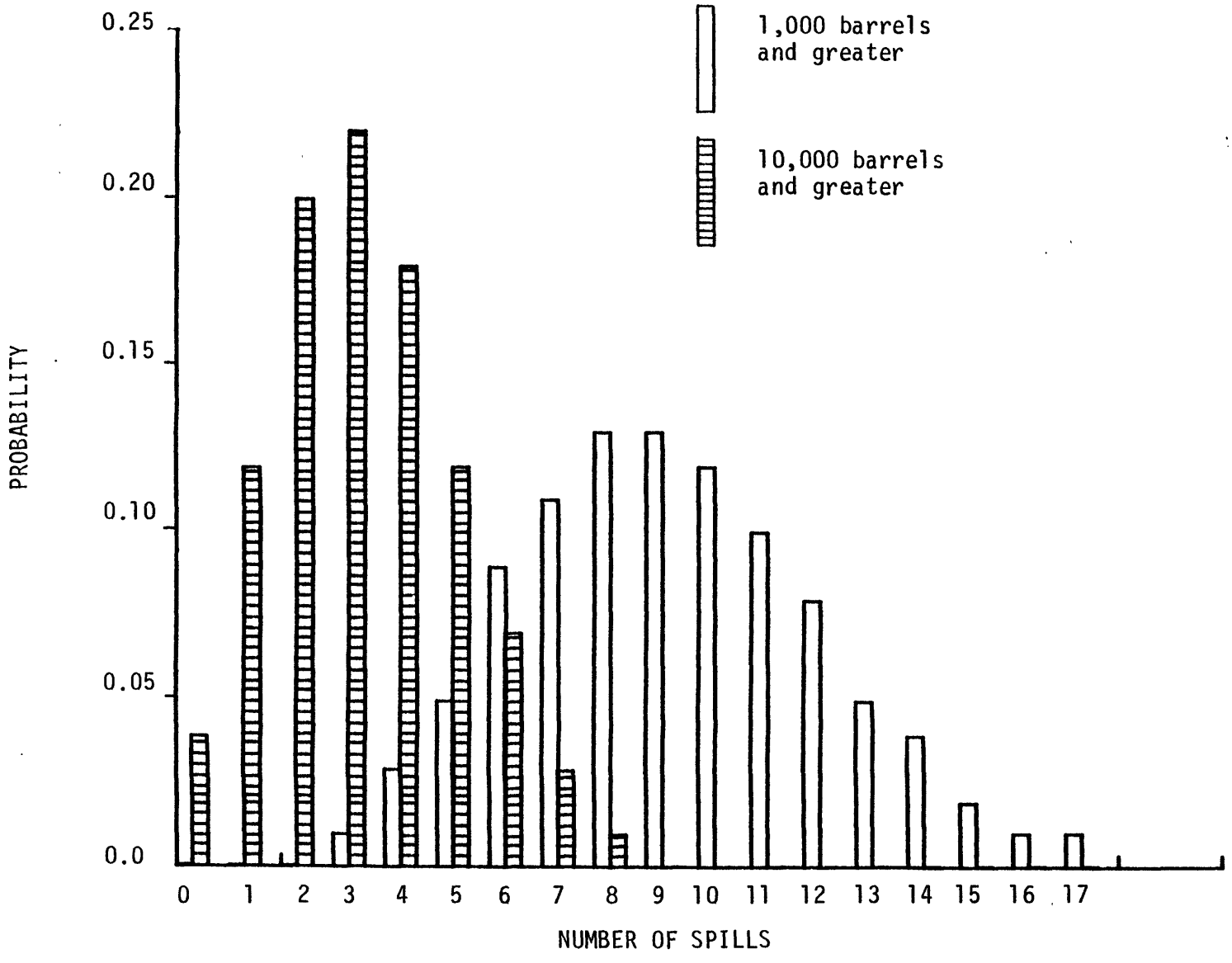

Figure 6a.--Estimated frequency distribution for oilspills greater than 1,000 and 10,000 barrels occurring during the expected production life of the proposed lease tracts for Beaufort Sea OCS Lease Sale 71 based on U.S. OCS oilspill statistics for the conterminous 48 States.

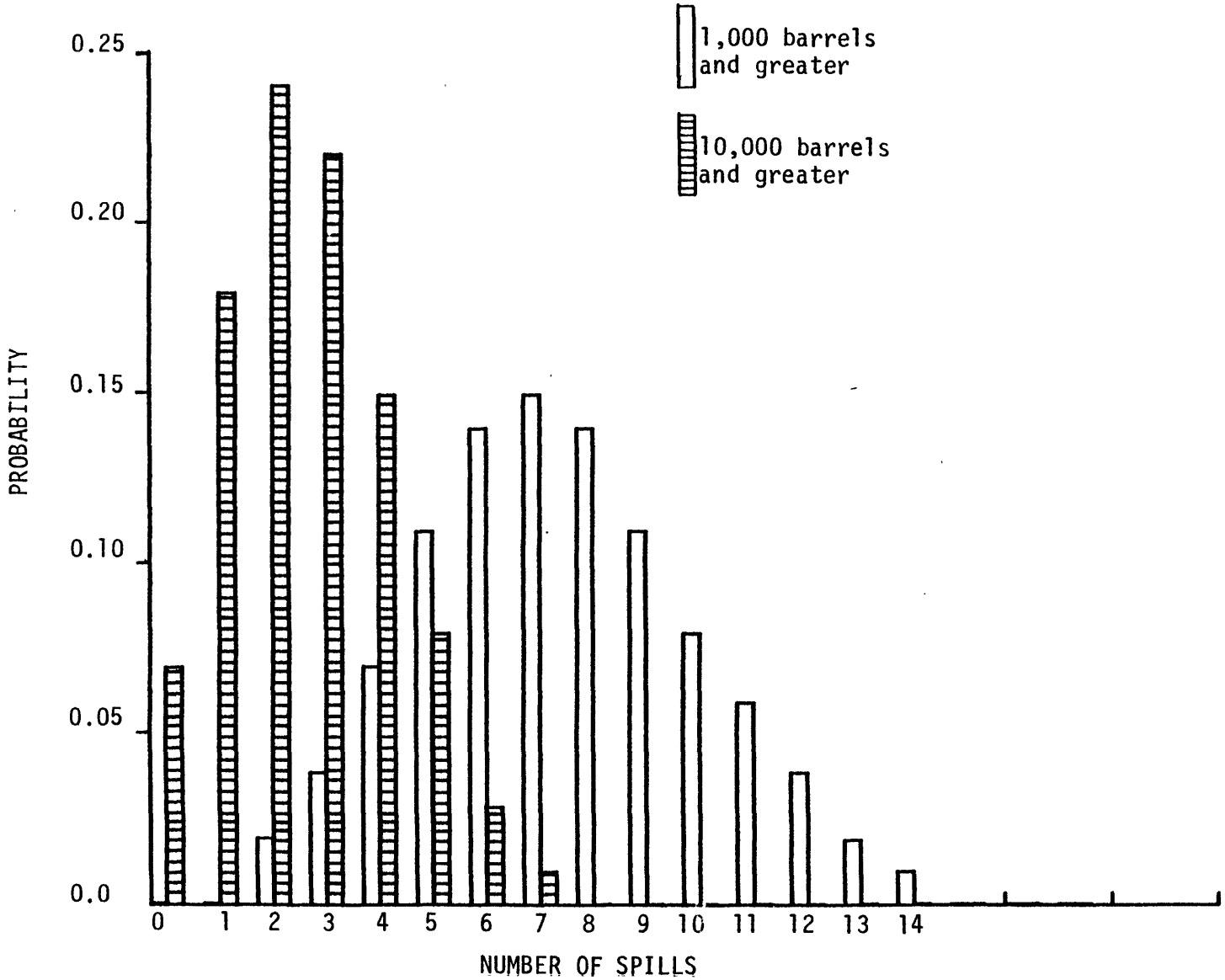

Figure 6b.--Estimated frequency distribution for oilspills greater than 1,000 and 10,000 barrels occurring during the expected production life of the Beaufort Sea OCS Lease Sale 71, Halkett deletion alternative, based on U.S. OCS oilspill statistics for the conterminous 48 States.

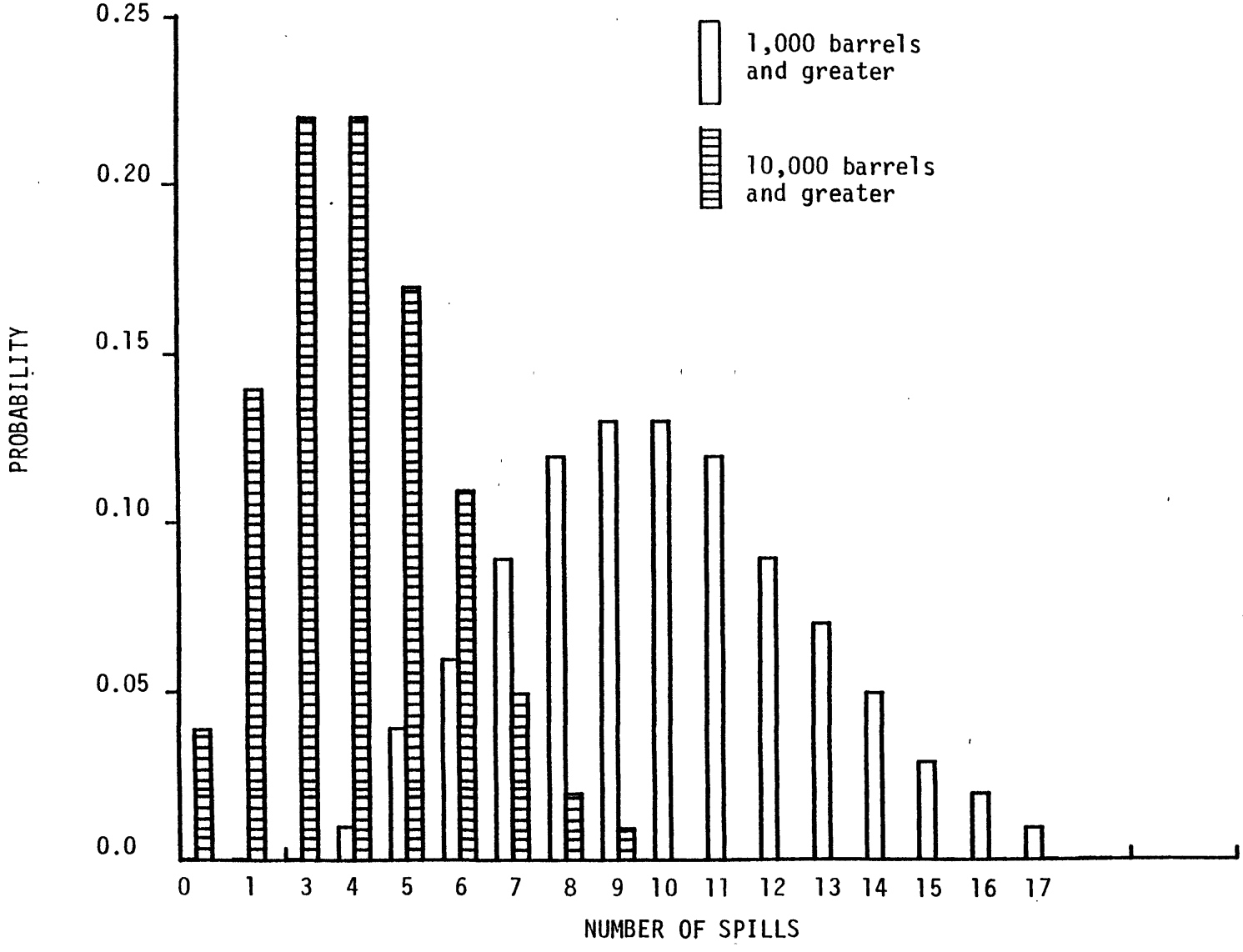

Figure 6c.--Estimated frequency distribution for oilspills greater than 1,000 and 10,000 barrels occurring during the expected production life of the Beaufort Sea OCS Lease Sale 71, Colville deletion alternative based on U.S. OCS oilspill statistics for the conterminous 48 States.

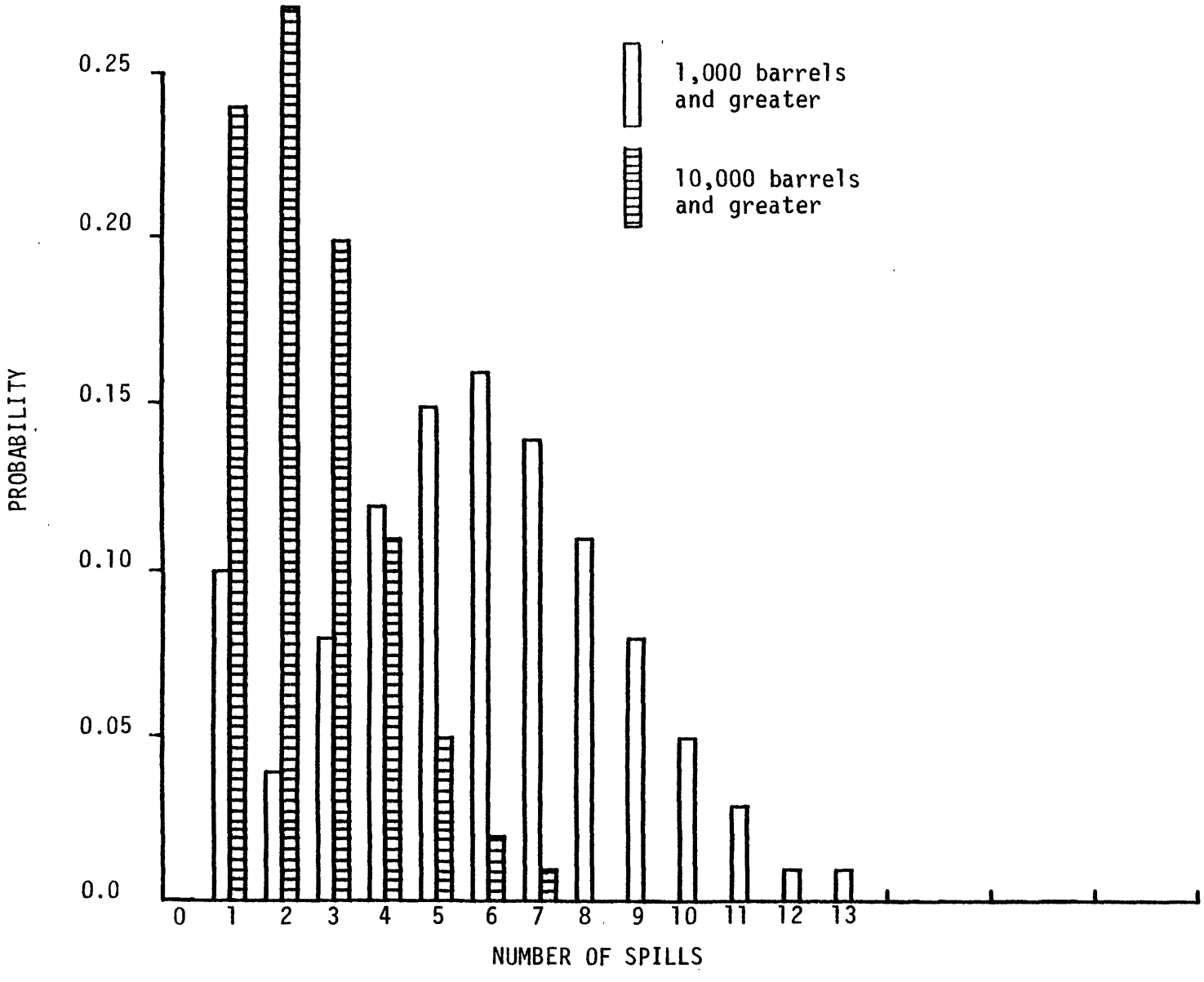

Figure 6d.--Estimated frequency distribution for oilspills greater than 1,000 and 10,000 barrels occurring during the expected production life of the Beaufort Sea OCS Lease Sale 71, Simpson deletion alternative, based on U.S. OCS oilspill statistics for the conterminous 48 States.

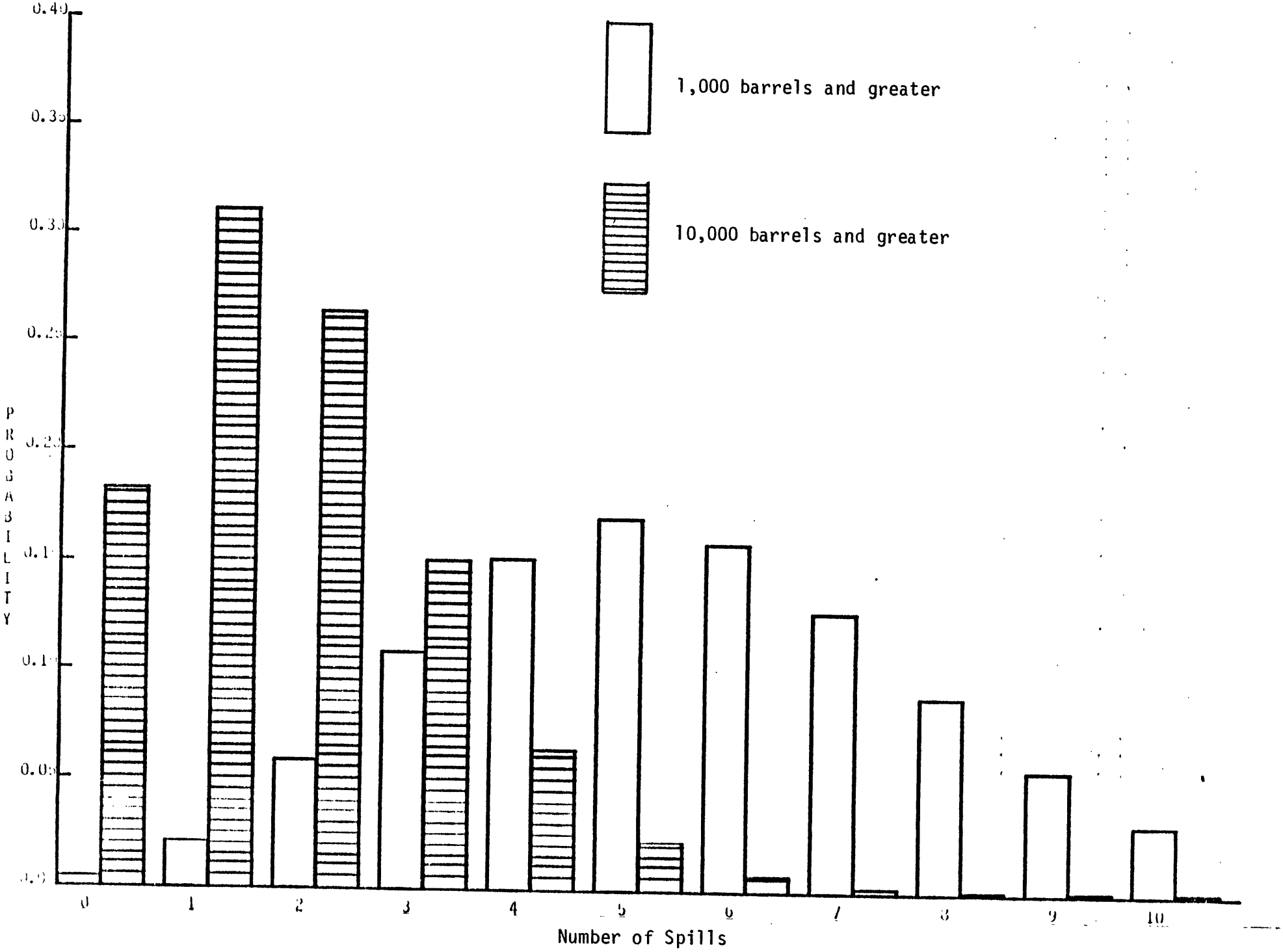

Figure 7a.--Estimated frequency distribution for oilspills greater than 1,000 and 10,000 barrels occurring during the expected production life of the proposed lease tracts for Beaufort Sea OCS Lease Sale 71 based on Prudhoe Bay oilspill statistics.

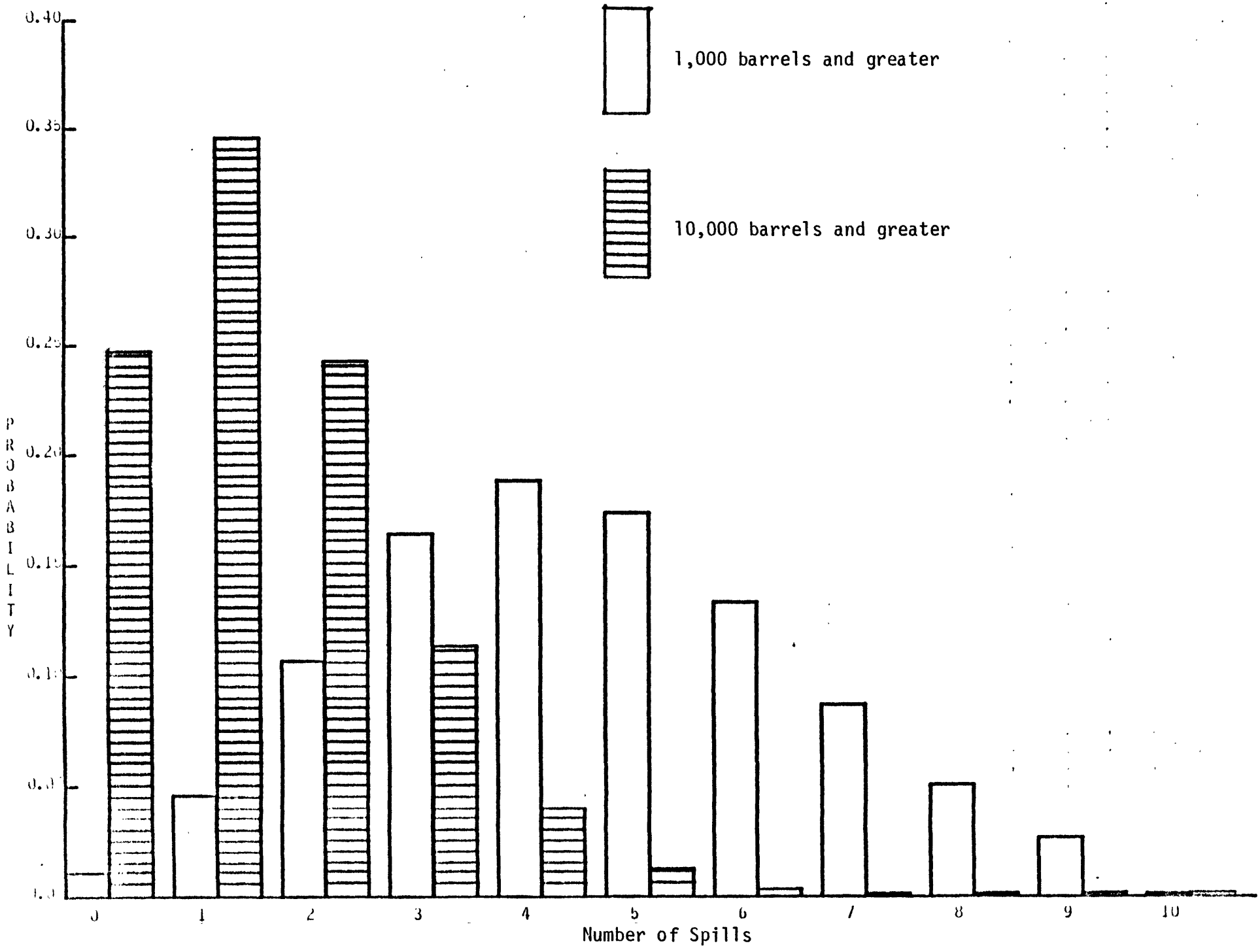

Figure 7b.--Estimated frequency distribution for oilspills greater than 1,000 and 10,000 barrels occurring during the expected production life of the Beaufort Sea OCS Lease Sale 71, Halkett deletion alternative, based on Prudhoe Bay oilspill statistics.

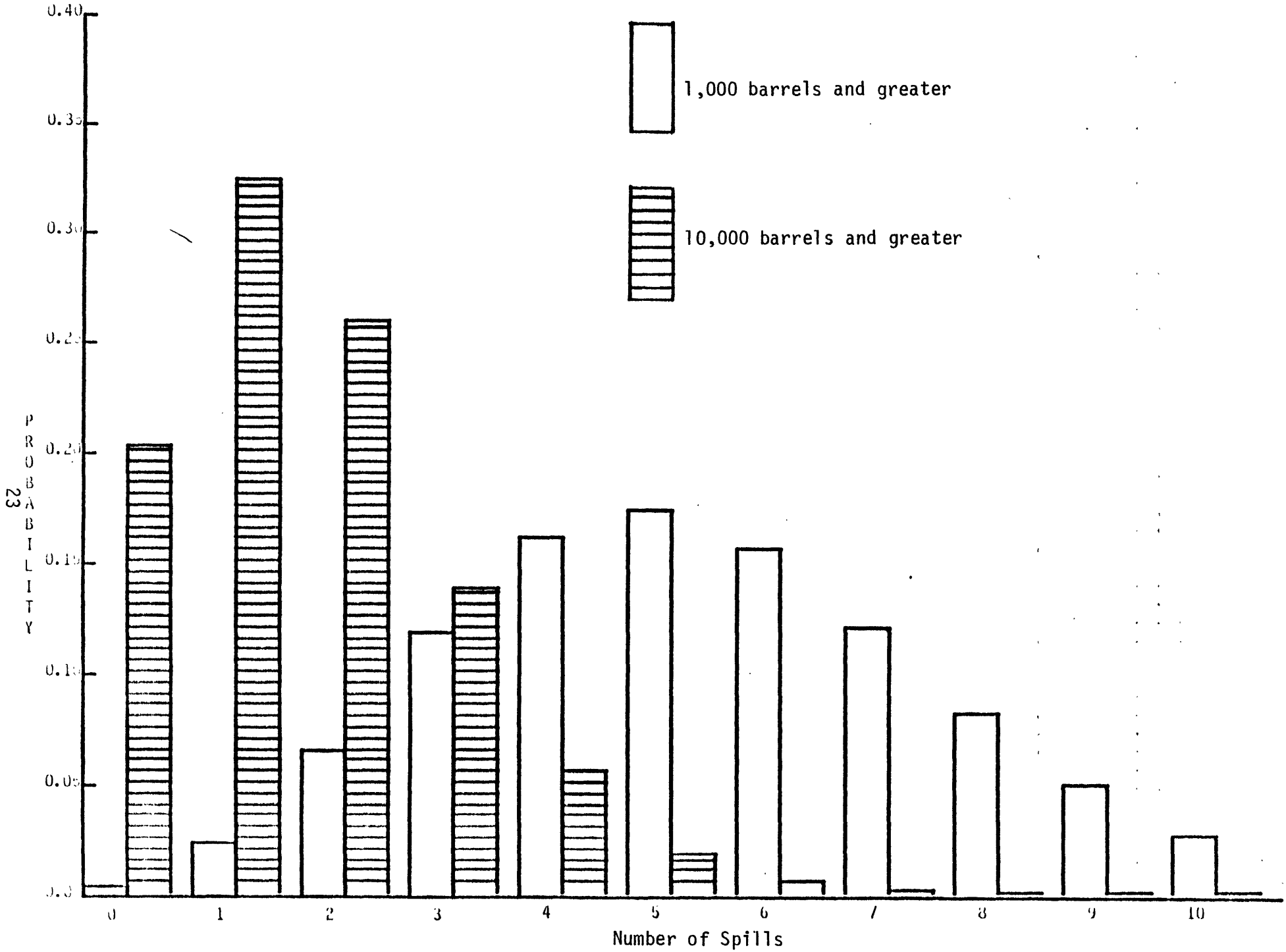

Figure 7c.--Estimated frequency distribution for oilspills greater than 1,000 and 10,000 barrels occurring during the expected production life of the Beaufort Sea OCS Lease Sale 71, Colville deletion alternative based on Prudhoe Bay oilspill statistics.

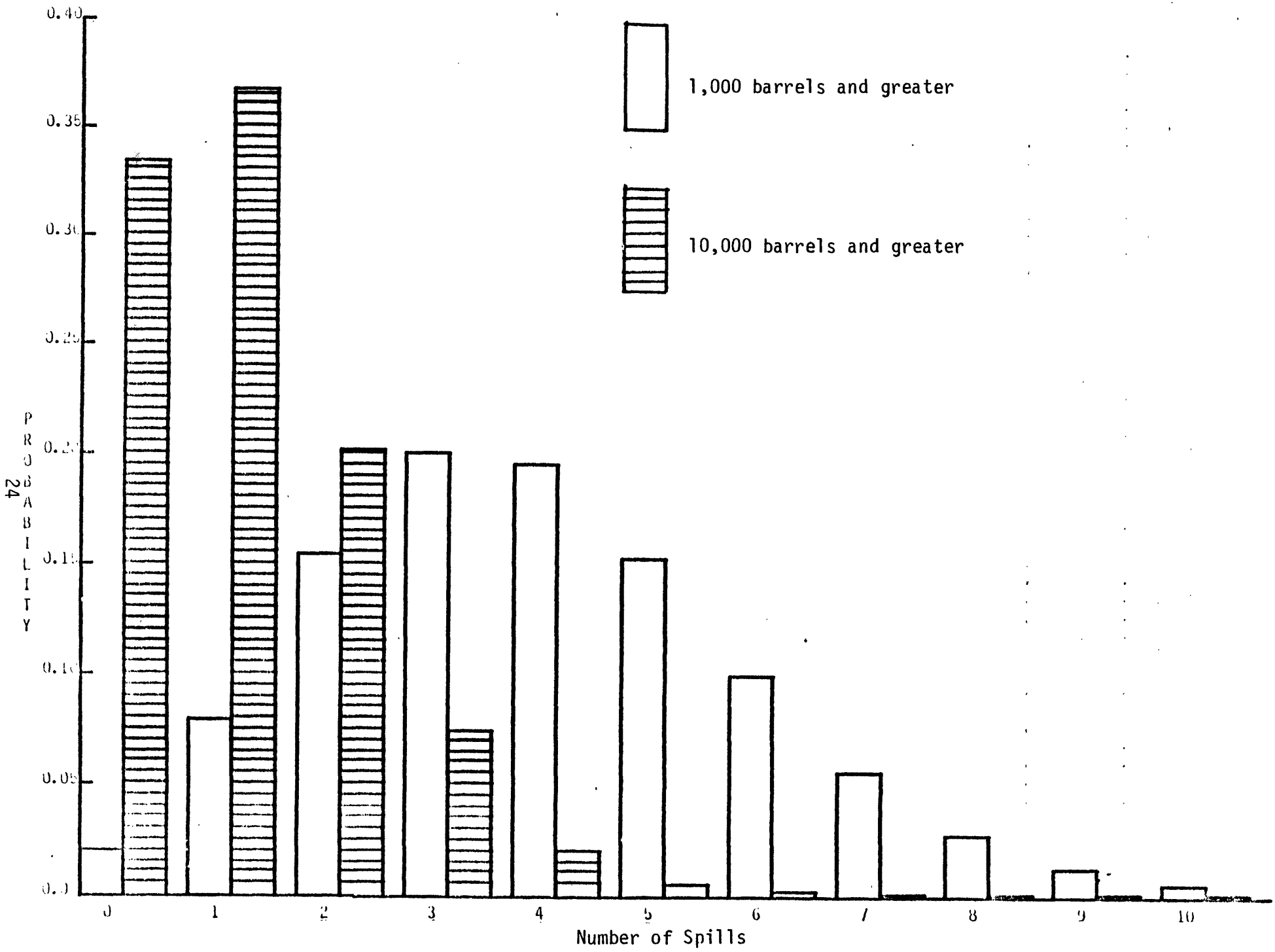

Figure 7d.--Estimated frequency distribution for oilspills greater than 1,000 and 10,000 barrels occurring during the expected production life of the Beaufort Sea OCS Lease Sale 71, Simpson deletion alternative, based on Prudhoe Bay oilspill statistics.

Oilspill Trajectory Simulations

Oilspill trajectories were simulated by Kinnetic Laboratories, Santa Cruz, Calif. (Mungall, 1981). The application of this model was developed as part of the BLM environmental studies program in the Beaufort Sea. The oilspill trajectory movement algorithm is essentially the vector sum of the current velocity and 3 percent of the wind velocity. A 20-degree turning angle was applied to the wind vector. Forty-five 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 3 hours. Oilspill trajectories were simulated during open-water conditions in the Beaufort Sea, which occur from approximately June to September (Mungall, Kinnetics Laboratories, oral communication). According to Mungall (1981), the oilspill trajectory movement algorithm is appropriate for the Beaufort Sea in open-water conditions (relatively ice-free conditions, that is, ice concentrations less than 40 percent). During the rest of the year, when the Beaufort Sea is covered by ice, it was assumed, for the purposes of this modeling effort, that any oil spilled would essentially remain in place and that little change would take place in the oil before breakup. Thus, the trajectories of these spills began after ice breakup and then were tracked as previously described. These assumptions are based on the work of Thomas (1981) and were presented at the Beaufort Sea Sale 71 Workshop held in Chena Hot Springs, Alaska, in April 1981. The model is not capable of predicting large-scale movements of ice in the Beaufort Sea nor of determining the fate of oil during any such movements; discussion of these effects here would be purely speculative. Weathering of oil and cleanup measures for oil trapped under ice (for as long as 8 months) have also not been considered. Although the model, as run, is believed to represent the most likely circumstances, one must recognize that other conditions could prevail.

One hundred oilspills were launched from each point during the open-water conditions. The trajectories calculated by Kinnetic Laboratories were transmitted to the U.S. Geological Survey, Reston, Va., on computer-compatible tapes. The x,y coordinates of the trajectories in the Kinnetic 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 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. Note that these times do not include any time trapped under ice - a period as long as 8 months.

Experimental oilspills under ice in the Beaufort Sea were conducted by Dome Petroleum during the winter of 1979/1980 (Buist and Dickins, 1981). Of the oil discharged (about 120 barrels of Prudhoe Bay crude oil), 80 percent appeared on the ice surface prior to breakup, and, of this, 50 percent was burned off using air deployable ignitors and 30 percent removed using manual techniques. Considering natural weathering, it was estimated that only 20 percent of the oil dispersed into the marine environment. In light of this experiment, it appears likely that significant removals of oil spilled under ice could be achieved, particularly for spills in the 1,000- to 10,000-barrel range. Although such cleanup is not directly considered in this model, analysts should bear in mind that the probabilities presented could refer only to the remaining 20 percent of the oil.

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:

$$s = \mathrm{SQRT}(p(1-p)/N)$$

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 8 shows the results of this significance test, which is 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. This figure applies to conditional probabilities only; overall probabilities (discussed in the next section) typically are determined from several conditional probabilities, and include a greater number of trials, giving them a lower error.

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 or boundary 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.

Table 2.--Monte Carlo error as a function of the number of trials and the estimated probability.

PROBABILITY	NUMBER OF TRIALS 50	100	200	500	1000	2000
0.05	0.05	0.04	0.03	0.02	0.01	0.01
0.10	0.07	0.05	0.04	0.02	0.02	0.01
0.15	0.08	0.06	0.04	0.03	0.02	0.01
0.20	0.09	0.07	0.05	0.03	0.02	0.01
0.25	0.10	0.07	0.05	0.03	0.02	0.02
0.30	0.11	0.08	0.05	0.03	0.02	0.02
0.35	0.11	0.08	0.06	0.04	0.02	0.02
0.40	0.11	0.08	0.06	0.04	0.03	0.02
0.45	0.12	0.08	0.06	0.04	0.03	0.02
0.50	0.12	0.08	0.06	0.04	0.03	0.02

Level of significance = 90 percent.

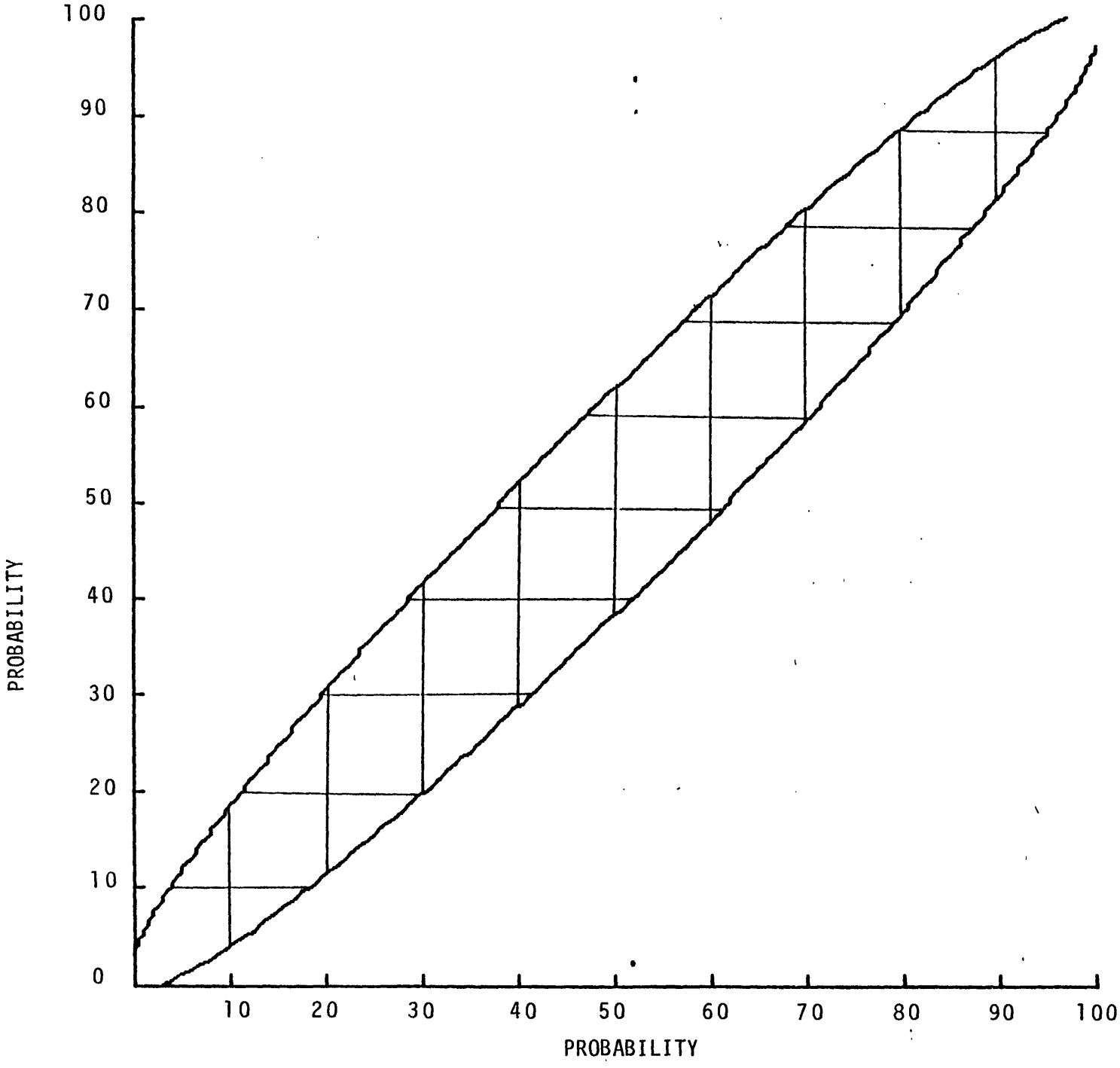

Figure 8.--Results of a significance test for any two probabilities (100 trials, 90 percent confidence level).

Table 3. -- Probabilities (expressed as percent chance) that an oilspill starting at a particular location will contact a certain target or impact zone 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	P21	P22	P23	P24	P25
Land	n	n	3	n	n	2	13	4	8	12	25	16	7	2	3	14	n	5	n	n	4	5	43	44	69
Seabird area 1	n	n	n	n	n	n	n	n	n	6	25	17	13	3	2	25	n	14	3	n	n	n	56	**	21
Seabird area 2	n	n	n	n	n	5	10	n	n	n	n	1	n	n	n	2	n	3	1	n	7	6	2	2	4
Marine mammal area A	n	7	18	**	45	n	n	n	n	2	2	2	6	43	14	9	**	11	39	62	7	8	n	1	n
Marine mammal area B	n	n	n	6	**	**	70	27	17	n	n	n	n	2	1	8	6	6	30	31	32	**	n	n	n
Bowhead feeding A	n	16	10	n	n	n	n	n	n	48	29	14	18	3	5	2	n	2	2	n	1	n	21	3	n
Bowhead feeding B	9	28	18	6	n	2	n	n	n	**	**	71	47	24	34	16	7	7	5	n	2	n	**	39	5
Overwintering area	n	n	n	n	n	5	n	n	n	n	n	1	n	n	n	n	n	2	n	n	1	2	1	2	n
Boulder patches	n	n	n	1	n	n	4	8	4	n	n	n	n	1	n	n	n	1	1	1	n	n	n	n	n
Impact zone A	**	36	10	3	n	n	n	n	n	14	7	3	3	7	3	n	n	n	2	n	n	n	1	n	n
Impact zone B	3	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Impact zone C	1	1	3	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Impact zone D	n	9	**	14	n	n	n	n	n	n	n	n	n	18	1	n	8	n	1	n	n	n	n	n	n
Impact zone E	n	n	n	n	4	n	n	n	n	n	n	n	n	n	n	n	1	n	1	1	1	1	n	n	n
Impact zone F	n	n	n	1	11	13	2	3	n	n	n	n	n	n	n	n	n	n	5	4	8	2	n	n	n
Impact zone G	n	n	n	n	2	8	6	2	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n
Impact zone H	n	n	n	n	n	40	46	7	n	n	n	n	n	n	n	n	n	n	n	n	2	2	n	n	n
Impact zone I	n	n	n	n	n	1	5	58	8	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n
Impact zone J	n	n	n	n	n	6	12	37	13	n	n	n	n	n	n	n	n	n	n	n	1	2	n	n	n
Impact zone K	n	n	n	n	n	n	5	28	44	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Impact zone L	n	n	n	n	n	n	n	7	47	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n

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

Target	Hypothetical Spill Location																			
	P26	P27	P28	P29	P30	P31	P32	P33	P34	P35	P36	P37	P38	P39	P40	P41	P42	P43	P44	P45
Land	91	76	71	42	18	12	24	68	78	77	67	46	59	19	21	26	36	49	85	76
Seabird area 1	n	1	n	9	2	1	1	n	n	n	n	5	n	2	1	n	n	n	n	n
Seabird area 2	n	10	13	39	41	22	47	34	**	**	**	59	63	28	7	10	13	2	5	22
Marine mammal area A	n	n	n	n	n	1	n	n	n	n	n	n	n	n	1	n	n	n	n	n
Marine mammal area B	n	n	n	n	8	24	17	n	n	1	6	28	18	90	**	85	**	58	7	6
Bowhead feeding A	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Bowhead feeding B	n	n	n	3	2	1	n	n	n	n	n	n	n	2	n	n	n	n	n	n
Overwintering area	n	6	7	36	9	10	27	17	**	27	5	13	3	8	n	n	2	1	n	n
Boulder patches	n	n	n	n	2	2	2	n	n	n	3	11	11	16	18	13	31	16	26	24
Impact zone A	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Impact zone B	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Impact zone C	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Impact zone D	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Impact zone E	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Impact zone F	n	n	n	n	n	5	n	n	n	n	n	n	n	n	n	1	n	n	n	n
Impact zone G	n	n	n	n	n	n	1	n	n	n	n	n	n	1	n	1	n	n	n	n
Impact zone H	n	n	n	n	1	1	2	n	n	n	n	1	n	1	12	14	4	n	n	n
Impact zone I	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	4	4	n	n	n
Impact zone J	n	n	n	n	n	n	1	n	n	n	n	1	n	1	2	13	11	15	n	n
Impact zone K	n	n	n	n	n	n	1	n	n	n	n	n	n	2	1	4	5	6	n	1
Impact zone L	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	2	2	4	n	n

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 or impact zone 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	P21	P22	P23	P24	P25
Land	1	15	18	20	26	45	55	44	34	37	60	53	53	18	39	59	19	52	28	18	54	49	74	86	89
Seabird area 1	n	10	9	14	6	8	n	1	n	17	36	34	24	9	20	35	14	38	17	7	20	9	61	**	21
Seabird area 2	n	n	n	n	14	24	25	12	1	n	n	1	1	n	5	18	5	17	19	9	28	33	2	3	4
Marine mammal area A	n	8	21	**	58	3	n	n	n	5	4	6	9	48	15	10	**	15	52	75	14	19	3	3	n
Marine mammal area B	n	2	1	6	**	**	93	58	32	3	2	4	6	3	6	11	10	8	38	37	36	**	2	7	5
Bowhead feeding A	11	26	26	18	6	2	n	1	n	57	35	36	31	27	33	8	25	6	7	7	3	2	26	6	n
Bowhead feeding B	19	52	43	31	21	4	n	1	n	**	**	81	55	59	55	27	39	30	20	23	7	9	**	40	5
Overwintering area	n	n	n	n	8	14	3	3	n	n	n	1	1	n	3	4	5	12	2	4	5	10	1	2	n
Boulder patches	n	n	n	1	n	15	17	23	12	n	n	n	n	1	n	n	n	n	1	1	2	2	n	n	n
Impact zone A	**	56	36	11	7	n	n	n	n	21	12	10	10	18	7	n	9	n	3	4	n	n	7	n	n
Impact zone B	3	9	3	1	n	n	n	n	n	n	n	n	n	2	n	n	1	n	n	n	n	n	n	n	n
Impact zone C	1	1	4	3	n	n	n	n	n	n	n	n	n	5	n	n	2	n	n	n	n	n	n	n	n
Impact zone D	n	10	**	27	5	n	n	n	n	2	n	n	n	22	5	6	21	2	3	8	n	n	n	n	n
Impact zone E	n	n	1	n	5	n	5	n	n	n	n	n	1	1	1	4	1	4	5	1	3	2	n	1	n
Impact zone F	n	1	1	1	15	17	7	3	n	n	n	1	1	1	2	2	1	7	7	4	10	4	n	1	3
Impact zone G	n	n	1	1	2	8	13	8	n	n	n	n	2	1	n	1	1	3	4	n	5	2	n	n	n
Impact zone H	n	n	n	n	1	43	47	23	n	n	n	n	2	n	1	4	n	n	n	n	2	2	n	1	1
Impact zone I	n	n	n	n	n	1	8	59	10	n	n	n	n	n	n	n	n	2	n	n	2	1	n	n	n
Impact zone J	n	n	n	n	n	6	20	53	17	n	n	n	n	n	n	4	n	n	n	n	1	2	n	n	1
Impact zone K	n	n	n	n	n	n	5	36	47	n	n	n	n	n	n	n	n	n	n	n	1	1	n	n	n
Impact zone L	n	n	n	n	n	2	1	7	54	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n

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

Target	Hypothetical Spill Location																		
	P26	P27	P28	P29	P30	P31	P32	P33	P34	P35	P36	P37	P38	P39	P40	P41	P42	P43	P44	P45
Land	98	93	88	90	67	58	69	87	96	98	84	83	88	70	73	73	73	84	91	87
Seabird area 1	n	7	4	13	10	8	4	3	n	n	n	6	n	6	5	1	2	n	n	n
Seabird area 2	2	10	15	51	54	47	62	36	**	**	**	68	66	42	15	27	24	12	9	27
Marine mammal area A	n	n	n	n	7	13	13	n	n	n	n	n	1	n	1	1	n	n	n	n
Marine mammal area B	2	2	4	3	8	24	20	2	1	1	8	34	24	90	**	92	**	59	13	8
Bowhead feeding A	n	n	n	n	2	1	n	n	n	n	n	n	n	1	1	1	n	n	n	n
Bowhead feeding B	n	1	2	7	4	5	1	1	n	n	n	n	n	3	2	1	n	n	n	n
Overwintering area	2	6	9	44	21	15	29	18	**	27	7	14	5	18	4	2	2	1	n	2
Boulder patches	n	1	1	n	3	3	3	n	n	n	4	13	18	22	27	20	38	21	26	25
Impact zone A	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Impact zone B	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Impact zone C	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Impact zone D	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Impact zone E	n	n	n	n	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Impact zone F	n	n	n	n	4	7	1	n	n	n	n	n	n	n	14	6	1	n	n	n
Impact zone G	n	n	2	n	3	5	4	n	n	n	n	1	n	1	n	1	1	n	n	n
Impact zone H	2	1	3	2	4	2	3	2	1	1	2	2	n	1	14	14	13	4	n	n
Impact zone I	n	n	1	1	1	2	n	n	1	1	3	3	n	n	1	7	5	n	n	1
Impact zone J	n	n	1	1	n	n	1	1	n	n	1	1	n	1	2	17	11	16	n	2
Impact zone K	n	n	1	2	n	n	1	1	1	n	1	1	n	2	1	4	5	6	1	2
Impact zone L	n	n	1	2	1	2	n	1	n	1	2	1	n	n	n	5	5	5	2	2

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 or impact zone 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	P21	P22	P23	P24	P25
Land	1	23	31	40	56	90	92	83	45	44	66	70	76	41	61	88	49	87	81	69	88	93	79	94	96
Seabird area 1	n	11	20	28	16	13	1	1	n	18	39	44	35	22	33	47	30	44	40	31	34	22	61	**	21
Seabird area 2	n	n	n	n	16	44	36	20	2	n	n	1	1	n	5	19	5	20	30	14	36	49	2	3	4
Marine mammal area A	n	8	21	**	61	6	2	n	n	5	4	6	9	48	15	10	**	15	52	75	16	23	3	3	2
Marine mammal area B	n	2	1	6	**	**	93	72	32	3	2	4	6	3	6	11	11	8	38	37	36	**	2	7	5
Bowhead feeding A	11	33	36	21	14	2	n	1	n	58	37	38	33	35	44	11	32	10	12	17	4	4	27	7	2
Bowhead feeding B	19	60	63	49	32	7	1	1	n	**	**	84	63	71	68	30	59	35	28	42	18	14	**	41	7
Overwintering area	n	n	n	n	10	20	7	7	n	n	n	1	1	n	3	5	5	15	13	13	16	22	1	2	n
Boulder patches	n	n	n	1	n	20	29	31	13	n	n	n	n	1	n	n	n	n	1	1	2	2	n	n	n
Impact zone A	**	57	48	22	10	n	n	n	n	21	12	10	10	26	13	2	19	1	3	7	n	n	7	n	n
Impact zone B	3	9	5	1	n	n	n	n	n	n	n	n	n	2	n	n	1	n	n	n	n	n	n	n	n
Impact zone C	1	1	4	7	n	n	n	n	n	n	n	n	n	5	n	n	2	n	n	n	n	n	n	n	n
Impact zone D	n	10	**	27	14	n	n	n	n	2	n	n	n	22	8	6	24	2	4	17	n	n	n	1	n
Impact zone E	n	n	1	n	5	n	5	n	n	n	n	n	1	1	1	4	2	4	5	1	3	2	n	1	n
Impact zone F	n	1	1	1	15	17	9	4	n	n	n	1	1	1	2	2	1	7	8	5	10	4	n	1	3
Impact zone G	n	n	1	1	2	8	13	11	n	n	n	n	2	1	n	1	1	3	5	1	5	2	n	n	n
Impact zone H	n	n	n	n	2	43	49	27	n	n	n	n	2	n	1	4	1	n	1	n	2	2	n	1	2
Impact zone I	n	n	n	n	1	1	8	59	10	n	n	n	n	n	n	n	1	2	1	n	2	1	n	n	2
Impact zone J	n	n	n	n	n	6	20	55	19	n	n	n	n	n	n	4	1	n	n	n	1	2	n	n	3
Impact zone K	n	n	n	n	n	n	5	38	47	n	n	n	n	n	n	n	1	n	n	n	1	1	n	n	1
Impact zone L	n	n	n	n	1	2	1	7	54	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n

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

Target	Hypothetical Spill Location																		
	P26	P27	P28	P29	P30	P31	P32	P33	P34	P35	P36	P37	P38	P39	P40	P41	P42	P43	P44	P45
Land	98	98	98	97	94	93	96	98	99	99	96	98	98	96	94	91	91	90	97	95
Seabird area 1	n	7	6	13	16	16	8	4	n	1	1	9	2	6	6	1	2	n	n	n
Seabird area 2	2	10	15	51	60	54	70	36	**	**	**	76	73	56	23	32	25	13	9	27
Marine mammal area A	n	n	n	n	7	14	13	1	n	n	n	n	1	n	1	3	n	n	n	n
Marine mammal area B	2	2	4	3	8	24	20	2	1	1	8	34	24	91	**	92	**	59	13	8
Bowhead feeding A	n	n	n	n	3	2	n	n	n	n	n	n	n	1	1	1	n	n	n	n
Bowhead feeding B	n	1	4	7	10	14	5	1	n	n	n	1	n	3	3	1	n	n	n	n
Overwintering area	2	6	9	44	25	21	33	19	**	27	7	14	5	18	5	5	2	1	n	2
Boulder patches	n	1	1	n	3	3	3	n	n	n	4	13	18	22	34	25	45	21	26	25
Impact zone A	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Impact zone B	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Impact zone C	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Impact zone D	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Impact zone E	n	n	n	n	n	2	n	n	n	n	n	1	n	n	n	n	n	n	n	n
Impact zone F	n	n	2	n	4	7	1	n	n	n	n	n	n	n	14	6	1	n	n	n
Impact zone G	n	n	2	n	3	5	4	n	n	n	n	1	n	1	n	1	1	n	n	n
Impact zone H	2	1	3	2	4	2	3	2	1	1	2	3	n	1	14	14	13	4	n	n
Impact zone I	n	1	1	1	1	2	n	n	1	1	3	3	n	n	1	7	5	n	n	1
Impact zone J	2	1	1	1	n	n	1	1	n	n	1	1	n	1	2	17	11	16	n	2
Impact zone K	2	1	1	2	n	n	1	1	1	n	1	1	n	2	1	4	5	6	1	2
Impact zone L	2	1	1	2	1	2	n	1	1	1	2	1	n	n	n	5	5	5	2	2

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 boundary segment within 3 days.

Land or Boundary Segment	Hypothetical Spill Location																							
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	P23	P24	P25
1	n	n	n	n	n	n	n	n	n	3	7	6	4	n	n	n	n	n	n	n	n	n	9	n	n
2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	2	n	n
3	n	n	n	n	n	n	n	n	n	3	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
4	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	1	n	n
5	n	n	n	n	n	n	n	n	n	n	1	n	2	n	n	n	n	n	n	n	n	n	n	n	n
6	n	n	n	n	n	n	n	n	n	4	9	1	n	n	2	7	n	n	n	n	n	n	9	7	1
7	n	n	n	n	n	n	n	n	n	1	4	6	n	1	n	2	n	3	n	n	n	n	13	22	n
8	n	n	n	n	n	n	n	n	n	n	2	2	n	n	n	4	n	2	n	n	n	n	8	12	23
9	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	26
10	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	1
11	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	3
12	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	2
13	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	5
15	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	2
16	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	1	n
17	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	1	n	n	n	6
20	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n
23	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
24	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
25	n	n	n	n	n	n	n	1	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
26	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
27	n	n	n	n	n	n	n	n	2	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n
30	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n
31	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n
32	n	n	n	n	n	n	1	n	n	n	1	n	n	n	n	n	n	n	n	n	n	1	n	n	n
35	n	n	3	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	2	n	n	n
36	n	n	n	n	n	2	9	3	1	n	n	n	n	1	n	n	n	n	n	n	n	1	n	n	n
39	n	n	n	n	n	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
40	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n
41	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n
43	n	n	n	n	1	1	1	2	37	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n
44	n	n	n	n	n	n	n	7	4	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
46	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
51	n	n	n	n	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
53	n	n	n	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
54	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n
55	n	n	n	n	3	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n
56	n	n	n	n	5	n	n	n	n	n	n	n	n	n	n	n	2	n	n	3	n	n	n	n	n
57	n	n	n	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
58	n	n	n	5	1	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n
59	n	n	n	2	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n
60	n	n	1	5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
61	n	n	4	3	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
62	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
63	1	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
65	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
68	24	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
69	48	12	2	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
70	3	19	7	n	n	n	n	n	n	12	7	2	3	6	3	n	n	n	1	n	n	n	1	n	n
71	n	2	n	n	n	n	n	n	n	24	10	3	n	n	n	2	n	1	n	n	n	n	10	1	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 6. (Continued) -- Probabilities (expressed as percent chance) that an oilspill starting at a particular location will contact a certain land or boundary segment within 3 days.

Land or Boundary	Hypothetical Spill Location																			
	P26	P27	P28	P29	P30	P31	P32	P33	P34	P35	P36	P37	P38	P39	P40	P41	P42	P43	P44	P45
7	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n
8	n	3	2	3	n	n	n	n	n	1	n	2	n	n	n	n	n	n	n	n
9	2	1	4	4	n	n	n	6	1	n	1	n	n	n	n	n	n	n	n	n
10	1	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
11	2	3	3	4	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n
12	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
13	26	27	14	1	n	n	n	15	6	2	n	n	n	n	n	n	n	n	n	n
14	20	5	2	n	n	n	n	9	1	n	n	n	n	n	n	n	n	n	n	n
15	30	13	n	1	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n
16	7	13	7	n	n	n	n	1	1	n	n	n	n	n	n	n	n	n	n	n
17	3	1	37	11	1	1	n	24	9	1	n	n	n	n	n	n	n	n	n	n
18	n	7	1	7	n	n	1	8	40	7	n	n	1	n	n	n	n	n	n	n
19	n	n	1	n	1	n	n	3	4	12	1	n	n	1	n	n	n	n	n	n
20	n	n	n	1	1	n	1	n	1	19	4	7	7	4	n	3	2	n	n	1
21	n	n	n	n	n	2	1	n	1	3	5	1	n	n	n	n	1	n	1	1
22	n	n	n	n	n	n	2	n	n	n	5	4	5	n	n	n	n	n	2	33
23	n	n	n	n	n	n	n	n	n	n	1	3	n	n	2	2	2	6	39	25
24	n	n	n	n	n	n	n	n	n	n	n	n	2	n	n	n	2	4	39	1
25	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	1	1	1
26	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	2	1	1	n
27	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	2	14	n	1
28	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	3	n	n
29	n	1	n	6	n	1	2	n	5	1	n	n	n	n	n	n	n	n	n	n
30	n	n	n	2	6	n	1	n	5	1	n	n	n	n	n	n	n	1	n	n
31	n	n	n	n	8	n	4	n	3	20	3	9	2	3	n	2	n	n	n	2
32	n	n	n	1	n	n	4	1	n	9	1	5	2	2	1	2	n	n	n	2
33	n	n	n	n	n	2	4	n	n	1	37	7	26	1	1	1	6	n	n	5
34	n	n	n	n	1	2	n	n	n	n	6	1	2	n	2	n	1	n	n	2
35	n	n	n	n	n	n	1	n	n	n	1	4	8	n	1	n	n	n	n	1
36	n	n	n	n	n	1	n	n	n	n	n	2	1	5	10	12	6	n	n	1
37	n	n	n	n	n	3	1	n	n	n	n	n	n	2	2	3	n	n	n	n
38	n	n	n	n	n	n	2	n	n	n	n	n	n	1	n	n	3	n	n	n
39	n	n	n	n	n	n	n	n	n	n	n	n	1	n	2	n	3	2	1	n
40	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	3	4	1	n
41	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	4	n	n
42	n	n	n	n	n	n	n	n	n	n	1	n	1	n	n	n	1	9	n	n
43	n	n	n	n	n	n	n	n	n	n	n	n	n	2	1	2	2	7	n	n
44	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	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 7. -- Probabilities (expressed as percent chance) that an oilspill starting at a particular location will contact a certain land or boundary segment within 10 days.

Land or Boundary Segment	Hypothetical Spill Location																							
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	P23	P24	P25
1	1	7	3	5	3	n	n	n	n	6	12	16	22	3	12	2	8	n	1	2	1	4	16	1	n
2	n	1	1	n	1	n	n	n	n	3	n	5	1	1	2	n	n	n	2	2	1	n	4	n	n
3	n	n	n	n	n	n	n	n	n	4	1	n	n	1	n	n	n	n	n	n	n	n	n	n	n
4	n	n	n	n	n	n	n	n	n	n	n	n	1	1	n	n	n	n	n	n	n	n	3	n	n
5	n	n	n	1	1	n	n	n	n	n	2	n	4	n	3	n	n	n	n	n	n	n	1	n	1
6	n	n	2	5	2	1	n	n	n	11	18	6	2	2	2	10	3	10	4	4	n	1	12	9	1
7	n	2	3	2	n	3	n	n	n	6	14	8	2	5	4	9	5	13	3	1	5	1	18	27	n
8	n	3	6	6	3	3	n	1	n	2	10	5	6	4	9	9	2	10	5	3	19	3	11	26	24
9	n	n	n	n	1	n	2	n	n	1	n	n	2	n	4	2	1	n	2	2	2	8	4	1	27
10	n	n	n	n	1	1	n	n	n	n	n	n	2	n	n	n	n	n	n	n	1	1	n	2	2
11	n	n	n	n	7	4	1	n	n	n	n	1	n	n	n	3	n	1	1	1	n	1	2	5	3
12	n	n	n	n	1	1	n	n	n	n	n	n	n	n	n	1	n	2	n	n	2	n	n	1	3
13	n	n	n	n	n	4	n	1	n	n	n	9	7	n	n	1	n	n	n	n	2	1	n	4	12
14	n	n	n	n	1	1	1	n	n	n	n	1	1	n	n	n	n	n	n	n	n	n	n	n	3
15	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	2	7
16	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	1	n
17	n	n	n	n	n	n	n	n	n	n	n	1	n	n	1	9	n	n	n	n	1	2	n	1	6
18	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	1	n	4	n	n	n	3	n	n	n
19	n	n	n	n	1	n	1	n	n	n	n	n	n	n	n	n	n	3	n	n	n	n	n	n	n
20	n	n	n	n	n	1	3	n	n	n	n	n	n	n	n	3	n	3	3	n	5	n	n	1	n
21	n	n	n	n	n	1	n	2	n	n	n	n	n	n	n	n	n	n	2	n	3	n	n	n	n
22	n	n	n	n	n	n	3	4	n	n	n	n	n	n	n	n	n	n	n	n	n	6	n	n	n
23	n	n	n	n	n	1	3	1	6	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
24	n	n	n	n	n	4	n	6	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
25	n	n	n	n	n	n	n	1	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
26	n	n	n	n	n	n	7	1	9	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
27	n	n	n	n	n	n	n	n	4	n	n	1	n	n	n	2	n	n	n	n	1	n	n	n	n
28	n	n	n	1	n	n	n	7	4	n	n	n	n	n	n	2	n	n	n	n	n	n	n	n	n
29	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n
30	n	n	n	n	1	n	2	n	n	n	n	n	n	n	n	n	2	n	n	1	2	n	n	n	n
31	n	n	n	n	3	2	3	n	n	1	n	n	n	n	n	1	n	1	2	1	2	2	n	n	n
32	n	n	n	n	n	n	2	1	n	n	1	n	n	n	n	n	n	1	n	n	6	n	1	n	n
33	n	n	n	n	n	3	2	4	n	n	n	n	n	n	n	n	n	2	1	2	1	5	n	n	n
34	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n
35	n	n	3	n	n	1	n	n	n	1	1	n	n	n	1	n	n	n	1	n	n	2	n	n	n
36	n	1	n	n	n	10	14	8	2	2	n	n	n	1	n	n	n	n	1	n	n	2	n	n	n
37	n	n	n	n	n	2	1	3	1	n	n	n	n	n	n	n	n	n	n	n	1	2	n	n	n
38	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	2	n	n
39	n	n	n	n	n	n	4	1	n	n	n	n	n	n	n	1	n	n	n	n	n	n	1	1	n
40	n	1	n	n	n	n	1	1	1	n	n	n	1	n	1	1	n	n	n	n	1	n	n	1	n
41	n	n	n	n	n	n	4	n	2	n	n	n	2	n	n	1	n	n	n	n	n	1	1	n	n
42	n	n	n	n	n	n	n	1	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n
43	n	n	1	n	2	1	1	2	46	n	n	n	2	1	n	n	1	2	1	n	2	1	n	n	1
44	n	n	n	n	n	3	1	7	6	n	n	n	n	n	n	1	n	2	1	n	2	n	n	n	n
45	n	n	n	n	n	1	1	2	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n
46	n	n	n	n	n	n	1	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
47	n	n	n	n	n	n	1	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
48	n	n	n	n	n	1	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
50	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	2	2	n	n	n
51	n	n	n	n	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
52	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	1	n	n	n
53	n	n	n	n	2	n	n	n	n	n	n	n	n	n	n	1	n	n	1	1	1	n	n	n	n
54	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	1	n	1	3	n	1	n	n	n	n
55	n	n	n	1	3	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n
56	n	n	n	n	5	n	n	n	n	n	1	1	1	n	2	n	2	n	n	4	n	n	n	n	n
57	n	n	n	1	5	n	n	n	n	n	1	1	1	n	1	n	1	n	n	n	n	n	n	n	n
58	n	n	n	6	1	n	n	n	n	n	n	n	2	2	n	n	1	n	3	n	n	n	n	n	n
59	n	2	n	2	4	n	n	n	n	n	n	n	n	2	n	n	n	n	n	5	n	n	n	n	n
60	n	2	3	8	n	n	n	n	n	1	n	n	n	n	n	n	1	n	n	1	n	n	n	n	n
61	n	2	4	6	n	n	n	n	n	n	n	n	n	n	n	n	5	n	n	n	n	n	n	n	n
62	n	2	n	3	n	n	n	n	n	n	n	n	n	n	n	n	3	n	n	n	n	n	n	n	n
63	1	n	3	1	n	n	n	n	n	n	n	n	n	2	n	n	1	n	n	n	n	n	n	n	n
64	n	n	2	n	n	n	n	n	n	n	n	n	n	3	n	n	n	n	n	n	n	n	n	n	n
65	2	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n
67	n	3	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
68	24	4	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
69	56	24	10	5	1	n	n	n	n	n	1	1	n	2	n	n	3	n	n	n	n	n	2	n	n
70	10	25	19	5	6	n	n	n	n	19	12	9	10	15	8	n	5	n	3	4	n	n	3	1	n
71	6	8	9	10	2	2	n	1	n	34	17	15	6	19	11	5	14	4	1	3	2	2	15	2	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 7. (Continued) -- Probabilities (expressed as percent chance) that an oilspill starting at a particular location will contact a certain land or boundary segment within 10 days.

Land or Boundary	Hypothetical Spill Location																			
	P26	P27	P28	P29	P30	P31	P32	P33	P34	P35	P36	P37	P38	P39	P40	P41	P42	P43	P44	P45
1	n	n	n	n	1	n	n	n	n	n	n	n	n	2	1	1	n	n	n	n
6	n	n	n	1	n	n	n	n	n	n	n	n	n	1	1	n	n	n	n	n
7	n	1	n	6	n	1	3	n	n	n	n	3	n	3	2	n	2	n	n	n
8	2	6	5	3	4	3	1	1	1	2	n	3	3	2	1	n	n	1	n	n
9	2	1	4	12	12	11	3	7	1	1	2	n	n	5	n	1	n	n	n	n
10	1	4	n	1	2	1	2	n	n	n	n	n	n	n	n	n	n	n	n	n
11	2	3	3	9	2	4	6	1	1	1	n	n	n	n	n	n	n	n	n	n
12	n	n	n	2	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n
13	26	33	15	7	2	n	10	18	9	7	1	n	n	1	n	n	n	n	n	n
14	20	5	4	2	2	1	6	9	4	3	n	2	n	3	n	n	n	n	n	n
15	34	16	3	1	n	n	n	3	1	n	1	1	n	n	n	n	n	n	n	n
16	8	14	9	2	n	n	n	3	1	n	n	n	n	n	n	n	n	n	n	1
17	3	1	40	11	2	1	n	25	15	5	n	1	1	1	2	n	n	n	n	n
18	n	7	3	21	1	1	1	13	43	8	n	n	1	1	n	n	n	n	n	n
19	n	n	1	n	5	n	n	3	4	13	1	1	n	1	n	n	n	n	n	n
20	n	n	n	1	4	4	2	n	1	22	5	7	8	4	n	5	4	n	n	1
21	n	n	n	n	n	3	3	n	1	3	6	2	n	1	n	n	3	1	2	1
22	n	n	n	n	1	2	5	n	n	n	13	14	9	3	5	n	3	1	2	34
23	n	n	n	n	1	n	2	n	n	n	1	7	10	7	2	5	4	11	39	28
24	n	n	n	n	n	n	n	n	n	n	n	2	4	1	8	n	4	5	43	3
25	n	n	n	n	n	n	n	n	n	n	n	n	n	1	4	10	5	2	1	1
26	n	n	n	n	n	n	n	n	n	n	1	n	n	n	1	2	5	1	1	n
27	n	n	n	n	n	n	n	n	n	n	n	n	1	n	2	2	3	21	n	1
28	n	n	n	n	1	n	n	n	n	n	n	n	n	n	2	1	4	6	n	n
29	n	1	n	8	2	4	2	2	5	1	n	n	n	1	n	n	n	n	n	1
30	n	n	n	2	7	1	1	n	6	1	n	3	2	1	n	1	n	1	n	n
31	n	n	n	n	10	4	5	n	3	21	3	11	3	4	2	6	1	1	n	3
32	n	n	n	1	6	3	6	1	n	9	2	5	2	2	1	4	2	2	n	2
33	n	n	n	n	1	8	6	n	n	1	38	12	31	7	6	4	7	2	1	5
34	n	n	n	n	1	2	1	n	n	n	7	2	2	2	2	n	1	3	n	2
35	n	n	n	n	n	n	1	n	n	n	2	5	8	n	2	2	2	n	n	1
36	n	1	n	n	n	1	n	n	n	n	n	2	1	8	18	14	9	2	n	2
37	n	n	n	n	n	3	1	n	n	n	n	n	n	2	3	3	n	2	n	1
38	n	n	n	n	n	n	2	n	n	n	n	n	n	1	3	1	3	n	n	n
39	n	n	n	n	n	n	n	n	n	n	n	n	1	1	5	6	3	2	1	n
40	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	2	4	5	1	n
41	n	n	n	n	n	n	n	n	n	n	n	n	n	2	n	1	n	4	n	n
42	n	n	1	n	n	n	n	n	n	n	1	n	1	2	n	2	4	11	n	n
43	n	n	1	2	n	1	1	1	n	n	1	1	n	2	1	2	3	8	3	2
44	n	n	n	1	1	1	1	n	n	1	1	n	n	n	n	2	3	1	n	1
45	n	n	n	n	1	n	n	n	n	n	n	n	n	1	3	1	2	n	n	n
46	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n
47	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	2	n	n	n	n
48	n	n	n	n	n	n	1	n	n	n	n	n	n	n	1	n	n	n	n	n
50	n	n	n	n	n	3	n	n	n	n	n	n	n	n	n	n	n	n	n	n
52	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n
71	n	n	n	n	1	1	n	n	n	n	n	n	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 boundary segment within 30 days.

Land or Boundary Segment	Hypothetical Spill Location																								
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	P23	P24	P25
1	1	12	7	5	7	n	n	n	n	6	12	17	23	6	12	2	11	n	2	8	2	6	17	1	2
2	n	1	4	n	1	1	n	n	n	3	n	5	1	1	2	n	n	1	2	3	1	n	4	n	n
3	n	n	n	n	n	n	n	n	n	4	1	n	n	1	n	n	n	n	n	n	1	n	n	n	n
4	n	1	n	n	n	n	n	n	n	n	n	n	2	2	n	n	n	1	n	n	1	n	3	n	n
5	n	n	3	2	2	n	n	n	n	4	2	2	4	n	3	n	1	n	1	n	n	n	1	n	1
6	n	1	3	10	5	3	n	n	n	14	24	8	6	6	7	15	7	15	6	10	3	2	15	13	1
7	n	3	5	10	2	4	n	n	n	6	14	16	9	12	9	10	13	17	9	5	11	7	19	28	2
8	n	3	6	9	10	3	n	1	n	2	10	5	9	8	15	14	9	16	16	18	19	8	11	26	25
9	n	n	n	3	6	4	2	3	n	1	n	1	3	3	8	12	7	4	13	6	8	11	4	1	27
10	n	n	n	n	3	1	n	1	n	n	n	2	8	1	n	1	1	n	1	9	1	4	n	2	2
11	n	n	n	n	8	8	1	1	n	n	n	1	n	n	2	5	n	2	5	2	2	6	2	5	3
12	n	n	n	n	1	1	1	n	n	n	n	n	n	n	n	1	n	3	2	n	3	n	n	1	3
13	n	n	n	n	1	11	n	1	n	n	n	10	7	n	n	3	n	9	2	5	6	4	n	6	12
14	n	n	n	n	1	1	1	n	n	n	n	1	1	n	n	2	n	n	3	n	n	n	n	1	3
15	n	n	n	n	1	1	n	n	n	n	n	n	n	n	n	n	n	n	4	n	2	n	n	2	9
16	n	n	n	n	2	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	1	n	n	1	n
17	n	n	n	n	1	1	n	n	n	n	n	1	n	n	1	9	n	n	2	n	2	3	n	1	6
18	n	n	n	n	n	1	3	n	n	n	n	n	n	n	n	1	n	4	n	n	n	3	n	n	n
19	n	n	n	n	1	3	2	n	n	n	n	n	n	n	n	n	n	3	1	n	2	3	n	n	n
20	n	n	n	n	n	4	4	1	1	n	n	n	n	n	n	3	n	3	3	n	5	n	n	1	n
21	n	n	n	n	n	1	6	4	n	n	n	n	n	n	n	n	n	n	2	n	3	n	n	n	n
22	n	n	n	n	n	1	6	6	n	n	n	n	n	n	n	n	n	n	n	n	n	9	n	n	n
23	n	n	n	n	n	2	8	5	7	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
24	n	n	n	n	n	4	2	11	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
25	n	n	n	n	n	n	n	1	4	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
26	n	n	n	n	n	n	8	1	11	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
27	n	n	n	n	n	n	n	3	5	n	n	1	n	n	n	2	n	n	n	n	n	1	n	n	n
28	n	n	n	1	n	n	n	9	6	n	n	n	n	n	n	2	n	n	n	n	n	n	n	n	n
29	n	n	n	n	n	1	1	1	n	n	n	n	n	n	n	2	n	3	n	n	n	n	n	n	n
30	n	n	n	n	1	n	2	n	n	n	n	n	n	n	n	n	n	2	n	n	1	5	n	n	n
31	n	n	n	n	3	4	6	n	n	1	n	n	n	n	n	1	n	1	4	1	2	3	n	n	n
32	n	n	n	n	n	6	2	2	n	n	1	n	n	n	n	n	n	1	n	n	8	1	1	n	n
33	n	n	n	n	n	8	3	5	n	n	n	n	n	n	n	n	n	2	1	2	2	9	n	n	n
34	n	n	n	n	n	2	3	1	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n
35	n	n	3	n	n	1	n	3	n	1	1	n	n	n	1	n	n	n	1	n	n	2	n	n	n
36	n	1	n	n	n	10	14	11	3	2	n	n	n	1	n	n	n	n	1	n	n	2	n	n	n
37	n	n	n	n	n	2	3	4	1	n	n	n	n	n	n	n	n	n	n	n	1	2	n	n	n
38	n	n	n	n	n	1	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	2	n	
39	n	n	n	n	n	n	5	3	n	n	n	n	n	n	n	1	n	n	n	n	n	1	1	n	
40	n	1	n	n	n	n	1	1	2	n	n	n	1	n	1	1	n	n	n	n	1	n	1	n	
41	n	n	n	n	n	n	6	3	2	n	n	n	2	n	n	1	n	n	n	n	n	1	1	n	n
42	n	n	n	n	n	n	n	1	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n
43	n	n	1	n	2	1	1	5	49	n	n	n	2	1	n	n	2	2	1	n	2	1	n	n	3
44	n	n	n	n	1	3	2	7	6	n	n	n	n	n	n	1	n	2	2	1	2	n	n	n	n
45	n	n	n	n	n	1	1	2	n	n	n	n	n	n	n	n	n	n	1	n	1	n	n	n	n
46	n	n	n	n	n	n	1	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
47	n	n	n	n	n	n	1	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
48	n	n	n	n	n	1	2	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n
50	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	2	2	n	n	n
51	n	n	n	n	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
52	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	1	n	n	n	1	n	n	n
53	n	n	n	n	3	n	n	n	n	n	n	n	n	n	n	1	n	n	1	1	1	n	n	n	n
54	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	1	n	1	3	n	1	n	n	n	n
55	n	n	n	1	3	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n
56	n	n	n	n	5	n	n	n	n	n	1	1	1	n	2	n	2	n	n	4	n	n	n	n	n
57	n	n	n	1	5	n	n	n	n	n	1	1	1	n	1	n	1	n	n	n	n	n	n	n	n
58	n	n	n	6	1	n	n	n	n	n	n	n	2	2	n	n	1	n	1	3	n	n	n	n	n
59	n	2	n	2	5	n	n	n	n	n	n	n	n	2	n	n	n	n	1	5	n	n	n	n	n
60	n	2	3	8	n	n	n	n	n	1	n	n	n	n	n	n	1	n	n	1	n	n	n	n	n
61	n	2	4	6	n	n	n	n	n	n	n	n	n	n	1	n	5	n	n	n	n	n	n	n	n
62	n	2	n	3	n	n	n	n	n	n	n	n	n	n	n	n	3	n	n	n	n	n	n	n	n
63	1	n	3	1	n	n	n	n	n	n	n	n	n	2	n	n	1	n	n	n	n	n	n	n	n
64	n	n	2	n	n	n	n	n	n	n	n	n	n	3	n	n	n	n	n	n	n	n	n	n	n
65	2	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n
67	n	3	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
68	24	6	n	n	n	n	n	n	n	1	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n
69	56	24	13	12	2	n	n	n	n	n	1	1	n	4	n	n	3	n	n	n	n	n	2	n	n
70	10	26	30	8	8	n	n	n	n	19	12	9	10	23	14	1	3	1	3	8	n	n	3	1	n
71	6	11	11	11	6	2	n	1	n	35	19	16	8	20	21	7	16	5	4	7	2	2	15	3	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. (Continued) -- Probabilities (expressed as percent chance) that an oilspill starting at a particular location will contact a certain land or boundary segment within 30 days.

Land or Boundary	Hypothetical Spill Location																			
	P26	P27	P28	P29	P30	P31	P32	P33	P34	P35	P36	P37	P38	P39	P40	P41	P42	P43	P44	P45
1	n	n	n	n	1	3	n	n	n	n	n	n	n	2	1	1	n	n	n	n
2	n	n	n	n	1	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n
5	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n
6	n	n	n	1	2	2	n	n	n	n	n	n	n	1	1	n	n	n	n	n
7	n	1	2	6	3	2	3	n	n	n	n	3	n	3	2	n	2	n	n	n
8	2	6	5	3	13	12	1	3	1	3	n	3	5	2	1	n	n	1	n	n
9	2	1	5	12	12	11	4	7	1	1	2	2	n	5	1	1	n	n	n	n
10	1	4	n	1	2	1	3	n	n	n	n	n	n	n	n	n	n	n	n	n
11	2	3	3	9	2	7	7	1	1	1	n	n	n	n	1	n	n	n	n	n
12	n	n	n	2	n	n	1	1	n	n	n	n	n	n	n	n	n	n	n	n
13	26	35	16	8	5	5	13	19	9	7	2	3	n	3	n	n	n	n	n	n
14	20	7	4	2	3	1	6	9	4	3	n	2	n	4	n	n	n	n	n	n
15	34	17	8	3	1	n	n	4	1	n	2	1	n	n	n	n	n	n	n	n
16	8	14	10	2	n	n	2	10	3	n	n	n	n	2	n	n	n	n	n	1
17	3	1	40	15	5	2	n	25	16	5	n	2	1	3	4	1	n	n	n	n
18	n	7	3	21	2	3	4	13	43	8	n	n	1	1	1	1	n	n	n	n
19	n	n	1	n	7	n	2	3	4	13	6	1	1	1	n	1	n	n	n	n
20	n	n	n	1	4	5	5	n	1	22	5	12	11	8	1	6	4	n	n	2
21	n	n	n	n	n	4	3	n	1	3	6	2	1	1	1	2	3	1	2	3
22	n	n	n	n	1	2	5	n	n	n	13	14	9	7	10	2	4	1	6	34
23	n	n	n	n	1	n	2	n	n	n	1	7	10	10	4	8	7	11	41	28
24	n	n	n	n	n	n	n	n	n	n	n	2	4	1	9	n	9	5	43	3
25	n	n	n	n	n	n	n	n	n	n	n	n	n	1	4	10	6	3	1	1
26	n	n	n	n	n	n	n	n	n	n	1	n	n	n	1	2	7	3	1	n
27	n	n	n	n	n	n	n	n	n	n	n	n	1	n	2	2	3	21	n	1
28	n	n	n	n	1	n	n	n	n	n	n	n	n	n	2	1	4	6	n	n
29	n	1	n	8	3	5	2	2	5	1	n	n	n	1	n	1	n	n	n	1
30	n	n	n	2	7	2	1	n	6	1	n	3	2	2	n	1	n	1	n	n
31	n	n	n	n	10	7	10	n	3	21	8	14	5	5	3	8	1	1	n	4
32	n	n	n	1	6	5	9	1	n	9	2	6	3	3	1	4	3	2	n	5
33	n	n	n	n	1	8	6	n	n	1	38	12	31	10	7	4	8	2	1	6
34	n	n	n	n	1	2	1	n	n	n	7	2	2	4	4	1	1	3	n	2
35	n	n	n	n	n	n	1	n	n	n	2	5	8	n	4	3	2	1	n	1
36	n	1	n	n	n	1	n	n	n	n	n	2	1	8	18	16	10	2	n	2
37	n	n	n	n	n	3	1	n	n	n	n	n	n	2	3	3	n	2	n	1
38	n	n	n	n	n	n	2	n	n	n	n	n	n	1	3	1	4	n	n	n
39	n	n	n	n	n	n	n	n	n	n	n	n	1	1	5	6	5	4	1	n
40	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	2	4	5	1	n
41	n	n	n	n	n	n	n	n	n	n	n	n	n	2	n	1	n	4	n	n
42	n	n	1	n	n	n	n	n	n	n	1	n	1	2	n	2	4	11	n	n
43	2	1	1	2	n	1	1	1	n	n	1	1	n	2	1	2	3	8	3	2
44	n	n	n	1	1	1	1	n	1	1	2	1	n	n	n	3	3	1	n	1
45	n	n	n	n	1	n	n	n	n	n	n	n	n	1	3	1	2	n	n	n
46	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n
47	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	2	n	n	n	n
48	n	n	n	n	n	n	1	n	n	n	n	n	n	n	1	n	n	n	n	n
50	n	n	n	n	n	3	n	n	n	n	n	n	n	n	n	n	n	n	n	n
52	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n
71	n	n	n	n	2	1	n	n	n	n	n	n	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.

Combined Analysis of Oilspill Occurrence and Oilspill Trajectory Simulations

Data in figure 6 indicate the probabilities of different numbers of oilspills occurring. These data are based on oilspill accidents for platforms and pipelines occurring on the U.S. OCS. The data shown in figure 7 are similar in nature to that in figure 6, except the platform spill rate is based on oilspill statistics for Prudhoe Bay, Alaska. Tables 3 to 8 indicate the probabilities that targets or land or boundary segments will be contacted, given that an oilspill occurs. The probability that, if an oilspill occurs at a certain location, or launch point, it will contact a specific target within a given time-of-travel (under the circumstances described above) is termed a conditional probability, because it depends on oilspill occurrence. For a set of nt targets and nl launch points, these conditional probabilities can be represented in a matrix form. Let [C] be an nt x nl matrix, where each element c(i,j) is the probability that an oilspill will hit target i, given that a spill occurs at launch point j. Note that launch points can represent potential spill starting points from production areas or transportation routes.

Spill occurrence can be represented by another matrix [S]. With nl launch points and ns production sites, the dimensions of [S] are nl x ns. Let each element s(j,k) be the expected number of spills occurring at launch point j due to production of a unit volume of oil at site k. These spills can result from either production or transportation. The s(j,k) can be determined as functions of the volume of oil (spills per billion barrels). Each column of [S] corresponds to one production site and one transportation route. If alternative and mutually exclusive transportation routes are considered for the same production site, they can be represented by additional columns of [S], effectively increasing ns.

Define matrix [U] as:

$$[U] = [C] \times [S]$$

Matrix [U] which has dimensions nt x ns, is termed the unit risk matrix because each element u(i,j) corresponds to the expected number of spills occurring and contacting target i due to the production of a unit volume of oil at site k. With [U], it is a relatively simple matter to find the expected contacts to each target, given a set of oil volumes at each site. Let [V] be a vector of dimension ns, where each element v(k) corresponds to the volume of oil expected to be found at production site k. Then, if [L] is a vector of dimension nt, where each element l(i) corresponds to the expected number of contacts to target i,

$$[L] = [U] \times [V]$$

Similar calculations can also be made for land segments.

Using Bayesian techniques, Devanney and Stewart (1974) showed that the probability of n oilspill contacts can be described by a negative binomial distribution. Smith and others (1980), however, noted that when actual exposure is much less than historical exposure, as is the case for most oilspill risk analyses, the negative binomial distribution can be approximated by a Poisson distribution. The Poisson distribution has a significant advantage in calculations because it is defined by only one parameter, the expected number of spills. The matrix [L] thus contains all the information needed to use the Poisson distribution: if P(n,i) is the probability of exactly n contacts to target i,

$$P(n,i) = [l(i)^{n} * \exp(-l(i))]/n!$$

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 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 to 12 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, or 30 days (not counting time trapped under ice), over the expected production life of the lease area for the proposed tracts and the three tract deletion alternatives, respectively. Tables 13 to 16 show similar probabilities to land and boundary segments for the proposed lease tracts and the three tract deletion alternatives. The data in these tables were calculated using the platform spill rate for the U.S. OCS (Gulf of Mexico and California). Tables 17 to 24 show similar probabilities to targets and land and boundary segments, however, the platform spill rate used was based on oilspill statistics for Prudhoe Bay, Alaska. Tables 17 to 24 would be applicable only if gravel islands, not platforms, are constructed. Tables in Appendix B show the oilspill risks from a cumulative analysis of the proposed lease tracts along with the joint Federal and State leases and the tankering of oil through the study area.

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 expected production life of the lease area (proposed action). Probabilities calculated using U.S. OCS oilspill statistics for the conterminous 48 States.

Target	Within 3 days						Within 10 days						Within 30 days					
	≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
Land	94	2	2.8	56	0	0.8	**	5	5.9	86	1	2.0	**	7	7.5	92	2	2.6
Seabird area 1	54	0	0.8	24	0	0.3	78	1	1.5	43	0	0.6	86	1	2.0	53	0	0.7
Seabird area 2	92	2	2.5	53	0	0.7	96	3	3.1	62	0	1.0	96	3	3.3	65	1	1.1
Marine mammal area A	27	0	0.3	12	0	0.1	49	0	0.7	23	0	0.3	50	0	0.7	24	0	0.3
Marine mammal area B	49	0	0.7	21	0	0.2	61	0	0.9	29	0	0.3	61	0	0.9	29	0	0.3
Bowhead feeding A	51	0	0.7	25	0	0.3	73	1	1.3	41	0	0.5	78	1	1.5	45	0	0.6
Bowhead feeding B	90	2	2.3	59	0	0.9	94	2	2.8	67	1	1.1	96	3	3.2	72	1	1.3
Overwintering area	58	0	0.9	23	0	0.3	67	1	1.1	30	0	0.4	71	1	1.2	34	0	0.4
Boulder patches	11	0	0.1	3	0	0.0	16	0	0.2	5	0	0.1	16	0	0.2	5	0	0.1
Impact zone A	28	0	0.3	13	0	0.1	46	0	0.6	22	0	0.2	48	0	0.7	23	0	0.3
Impact zone B	n	0	0.0	n	0	0.0	4	0	0.0	2	0	0.0	4	0	0.0	2	0	0.0
Impact zone C	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Impact zone D	5	0	0.1	2	0	0.0	11	0	0.1	5	0	0.0	13	0	0.1	6	0	0.1
Impact zone E	1	0	0.0	n	0	0.0	6	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
Impact zone F	5	0	0.1	2	0	0.0	15	0	0.2	6	0	0.1	16	0	0.2	6	0	0.1
Impact zone G	1	0	0.0	n	0	0.0	11	0	0.1	5	0	0.0	11	0	0.1	5	0	0.0
Impact zone H	3	0	0.0	1	0	0.0	12	0	0.1	5	0	0.0	13	0	0.1	5	0	0.0
Impact zone I	n	0	0.0	n	0	0.0	5	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
Impact zone J	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0
Impact zone K	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
Impact zone L	n	0	0.0	n	0	0.0	4	0	0.0	1	0	0.0	5	0	0.0	2	0	0.0

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 expected production life of the lease area, Halkett deletion alternative. Probabilities calculated using U.S. OCS oilspill statistics for the conterminous 48 States.

Target	Within 3 days						Within 10 days						Within 30 days					
	≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
Land	90	2	2.3	49	0	0.7	99	5	5.0	82	1	1.7	**	6	6.7	90	2	2.3
Seabird area 1	35	0	0.4	14	0	0.2	63	0	1.0	31	0	0.4	77	1	1.5	43	0	0.6
Seabird area 2	92	2	2.5	53	0	0.8	96	3	3.2	64	1	1.0	97	3	3.4	67	1	1.1
Marine mammal area A	26	0	0.3	12	0	0.1	48	0	0.7	23	0	0.3	49	0	0.7	23	0	0.3
Marine mammal area B	53	0	0.8	24	0	0.3	62	0	1.0	30	0	0.4	62	0	1.0	30	0	0.4
Bowhead feeding A	19	0	0.2	8	0	0.1	46	0	0.6	23	0	0.3	54	0	0.8	27	0	0.3
Bowhead feeding B	57	0	0.8	28	0	0.3	72	1	1.3	40	0	0.5	81	1	1.7	49	0	0.7
Overwintering area	56	0	0.8	23	0	0.3	67	1	1.1	31	0	0.4	72	1	1.3	35	0	0.4
Boulder patches	11	0	0.1	4	0	0.0	17	0	0.2	6	0	0.1	17	0	0.2	6	0	0.1
Impact zone A	5	0	0.1	2	0	0.0	14	0	0.1	6	0	0.1	18	0	0.2	8	0	0.1
Impact zone B	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Impact zone C	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Impact zone D	1	0	0.0	n	0	0.0	7	0	0.1	3	0	0.0	9	0	0.1	4	0	0.0
Impact zone E	1	0	0.0	n	0	0.0	7	0	0.1	3	0	0.0	7	0	0.1	3	0	0.0
Impact zone F	6	0	0.1	2	0	0.0	16	0	0.2	7	0	0.1	17	0	0.2	7	0	0.1
Impact zone G	1	0	0.0	n	0	0.0	13	0	0.1	5	0	0.1	13	0	0.1	5	0	0.1
Impact zone H	4	0	0.0	1	0	0.0	13	0	0.1	5	0	0.1	14	0	0.1	5	0	0.1
Impact zone I	n	0	0.0	n	0	0.0	6	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
Impact zone J	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0
Impact zone K	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
Impact zone L	n	0	0.0	n	0	0.0	4	0	0.0	1	0	0.0	5	0	0.0	2	0	0.0

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 expected production life of the lease area, Colville deletion alternative. Probabilities calculated using U.S. OCS oilspill statistics for the conterminous 48 States.

Target	Within 3 days						Within 10 days						Within 30 days					
	≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
Land	93	2	2.6	54	0	0.8	**	5	5.6	85	1	1.9	**	7	7.2	92	2	2.5
Seabird area 1	54	0	0.8	23	0	0.3	77	1	1.5	42	0	0.5	86	1	2.0	52	0	0.7
Seabird area 2	91	2	2.4	51	0	0.7	95	2	3.0	61	0	0.9	96	3	3.2	64	1	1.0
Marine mammal area A	27	0	0.3	12	0	0.1	49	0	0.7	23	0	0.3	50	0	0.7	24	0	0.3
Marine mammal area B	49	0	0.7	21	0	0.2	60	0	0.9	28	0	0.3	60	0	0.9	28	0	0.3
Bowhead feeding A	51	0	0.7	25	0	0.3	73	1	1.3	41	0	0.5	78	1	1.5	45	0	0.6
Bowhead feeding B	90	2	2.3	59	0	0.9	94	2	2.8	67	1	1.1	96	3	3.2	72	1	1.3
Overwintering area	55	0	0.8	22	0	0.2	64	1	1.0	28	0	0.3	69	1	1.2	32	0	0.4
Boulder patches	11	0	0.1	3	0	0.0	16	0	0.2	5	0	0.1	16	0	0.2	5	0	0.1
Impact zone A	28	0	0.3	13	0	0.1	46	0	0.6	22	0	0.2	48	0	0.7	23	0	0.3
Impact zone B	n	0	0.0	n	0	0.0	4	0	0.0	2	0	0.0	4	0	0.0	2	0	0.0
Impact zone C	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Impact zone D	5	0	0.1	2	0	0.0	11	0	0.1	5	0	0.0	13	0	0.1	6	0	0.1
Impact zone E	1	0	0.0	n	0	0.0	6	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
Impact zone F	5	0	0.1	2	0	0.0	15	0	0.2	6	0	0.1	15	0	0.2	6	0	0.1
Impact zone G	1	0	0.0	n	0	0.0	11	0	0.1	4	0	0.0	11	0	0.1	5	0	0.0
Impact zone H	3	0	0.0	1	0	0.0	12	0	0.1	4	0	0.0	12	0	0.1	5	0	0.0
Impact zone I	n	0	0.0	n	0	0.0	5	0	0.1	2	0	0.0	5	0	0.1	2	0	0.0
Impact zone J	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0
Impact zone K	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
Impact zone L	n	0	0.0	n	0	0.0	4	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0

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 expected production life of the lease area, Simpson deletion alternative. Probabilities calculated using U.S. OCS oilspill statistics for the conterminous 48 States.

Target	Within 3 days						Within 10 days						Within 30 days					
	≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
Land	86	1	1.9	43	0	0.6	98	3	3.9	72	1	1.3	99	4	4.8	80	1	1.6
Seabird area 1	52	0	0.7	22	0	0.2	73	1	1.3	38	0	0.5	81	1	1.6	46	0	0.6
Seabird area 2	70	1	1.2	27	0	0.3	76	1	1.4	33	0	0.4	77	1	1.5	34	0	0.4
Marine mammal area A	26	0	0.3	11	0	0.1	35	0	0.4	16	0	0.2	36	0	0.4	16	0	0.2
Marine mammal area B	24	0	0.3	9	0	0.1	39	0	0.5	16	0	0.2	39	0	0.5	16	0	0.2
Bowhead feeding A	50	0	0.7	24	0	0.3	71	1	1.2	39	0	0.5	75	1	1.4	43	0	0.6
Bowhead feeding B	89	2	2.2	58	0	0.9	93	2	2.7	65	1	1.0	94	2	2.9	68	1	1.1
Overwintering area	37	0	0.5	12	0	0.1	43	0	0.6	15	0	0.2	45	0	0.6	16	0	0.2
Boulder patches	4	0	0.0	1	0	0.0	7	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
Impact zone A	27	0	0.3	12	0	0.1	44	0	0.6	21	0	0.2	47	0	0.6	23	0	0.3
Impact zone B	n	0	0.0	n	0	0.0	4	0	0.0	2	0	0.0	4	0	0.0	2	0	0.0
Impact zone C	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Impact zone D	5	0	0.0	2	0	0.0	11	0	0.1	4	0	0.0	13	0	0.1	5	0	0.1
Impact zone E	n	0	0.0	n	0	0.0	4	0	0.0	2	0	0.0	4	0	0.0	2	0	0.0
Impact zone F	2	0	0.0	1	0	0.0	8	0	0.1	3	0	0.0	8	0	0.1	3	0	0.0
Impact zone G	n	0	0.0	n	0	0.0	4	0	0.0	1	0	0.0	4	0	0.0	2	0	0.0
Impact zone H	n	0	0.0	n	0	0.0	6	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
Impact zone I	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
Impact zone J	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
Impact zone K	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
Impact zone L	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0

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 land or boundary segments over the expected production life of the lease area, proposed action. Probabilities calculated using U.S. OCS oilspill statistics for the conterminous 48 States.

Segment	Within 3 days						Within 10 days						Within 30 days					
	≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
1	11	0	0.1	4	0	0.0	38	0	0.5	17	0	0.2	42	0	0.5	19	0	0.2
2	n	0	0.0	n	0	0.0	7	0	0.1	3	0	0.0	8	0	0.1	3	0	0.0
3	1	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
4	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0
5	2	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0	9	0	0.1	4	0	0.0
6	12	0	0.1	5	0	0.0	25	0	0.3	10	0	0.1	38	0	0.5	17	0	0.2
7	12	0	0.1	4	0	0.0	30	0	0.4	12	0	0.1	43	0	0.6	19	0	0.2
8	12	0	0.1	4	0	0.0	39	0	0.5	16	0	0.2	53	0	0.7	24	0	0.3
9	9	0	0.1	2	0	0.0	30	0	0.4	12	0	0.1	37	0	0.5	15	0	0.2
10	1	0	0.0	n	0	0.0	6	0	0.1	2	0	0.0	12	0	0.1	5	0	0.1
11	2	0	0.0	1	0	0.0	13	0	0.1	5	0	0.1	18	0	0.2	7	0	0.1
12	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
13	15	0	0.2	4	0	0.0	34	0	0.4	13	0	0.1	42	0	0.6	17	0	0.2
14	7	0	0.1	2	0	0.0	16	0	0.2	5	0	0.1	18	0	0.2	6	0	0.1
15	8	0	0.1	2	0	0.0	11	0	0.1	3	0	0.0	14	0	0.2	4	0	0.0
16	4	0	0.0	1	0	0.0	5	0	0.1	2	0	0.0	9	0	0.1	3	0	0.0
17	16	0	0.2	5	0	0.1	23	0	0.3	8	0	0.1	26	0	0.3	9	0	0.1
18	17	0	0.2	5	0	0.0	22	0	0.3	7	0	0.1	26	0	0.3	8	0	0.1
19	9	0	0.1	2	0	0.0	12	0	0.1	4	0	0.0	18	0	0.2	6	0	0.1
20	16	0	0.2	4	0	0.0	24	0	0.3	8	0	0.1	27	0	0.3	9	0	0.1
21	6	0	0.1	2	0	0.0	9	0	0.1	3	0	0.0	10	0	0.1	3	0	0.0
22	6	0	0.1	2	0	0.0	16	0	0.2	5	0	0.1	16	0	0.2	5	0	0.1
23	1	0	0.0	n	0	0.0	7	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
24	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	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	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
28	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
29	4	0	0.0	1	0	0.0	8	0	0.1	3	0	0.0	10	0	0.1	4	0	0.0
30	7	0	0.1	2	0	0.0	10	0	0.1	3	0	0.0	11	0	0.1	4	0	0.0
31	20	0	0.2	7	0	0.1	25	0	0.3	9	0	0.1	32	0	0.4	12	0	0.1
32	9	0	0.1	3	0	0.0	17	0	0.2	6	0	0.1	20	0	0.2	7	0	0.1
33	31	0	0.4	9	0	0.1	37	0	0.5	13	0	0.1	38	0	0.5	13	0	0.1
34	6	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
35	6	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
36	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
37	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
38	1	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
39	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
40	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
41	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
42	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
43	n	0	0.0	n	0	0.0	5	0	0.0	2	0	0.0	6	0	0.1	2	0	0.0
44	n	0	0.0	n	0	0.0	4	0	0.0	1	0	0.0	5	0	0.1	2	0	0.0
45	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
47	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
48	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
50	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
52	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
54	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
56	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
57	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
58	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
59	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
60	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0
61	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
62	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
67	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0
68	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
69	6	0	0.1	2	0	0.0	12	0	0.1	5	0	0.1	12	0	0.1	5	0	0.1
70	21	0	0.2	9	0	0.1	36	0	0.4	17	0	0.2	39	0	0.5	18	0	0.2
71	19	0	0.2	8	0	0.1	42	0	0.5	19	0	0.2	49	0	0.7	24	0	0.3

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 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 land or boundary segments over the expected production life of the lease area, Halkett deletion alternative. Probabilities calculated using U.S. OCS oilspill statistics for the conterminous 48 States.

Segment	Within 3 days						Within 10 days						Within 30 days					
	≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
1	3	0	0.0	1	0	0.0	26	0	0.3	12	0	0.1	29	0	0.3	13	0	0.1
2	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	5	0	0.0	2	0	0.0
4	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
5	2	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0	7	0	0.1	3	0	0.0
6	5	0	0.0	2	0	0.0	11	0	0.1	4	0	0.0	23	0	0.3	10	0	0.1
7	4	0	0.0	1	0	0.0	18	0	0.2	7	0	0.1	31	0	0.4	13	0	0.1
8	7	0	0.1	2	0	0.0	32	0	0.4	13	0	0.1	49	0	0.7	22	0	0.3
9	6	0	0.1	2	0	0.0	30	0	0.4	12	0	0.1	38	0	0.5	16	0	0.2
10	1	0	0.0	n	0	0.0	7	0	0.1	3	0	0.0	13	0	0.1	5	0	0.1
11	2	0	0.0	1	0	0.0	13	0	0.1	5	0	0.1	19	0	0.2	8	0	0.1
12	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
13	12	0	0.1	4	0	0.0	30	0	0.4	11	0	0.1	39	0	0.5	16	0	0.2
14	5	0	0.0	1	0	0.0	15	0	0.2	5	0	0.1	16	0	0.2	6	0	0.1
15	5	0	0.1	1	0	0.0	8	0	0.1	2	0	0.0	11	0	0.1	3	0	0.0
16	3	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0	8	0	0.1	2	0	0.0
17	14	0	0.2	5	0	0.0	21	0	0.2	7	0	0.1	25	0	0.3	9	0	0.1
18	14	0	0.2	4	0	0.0	20	0	0.2	6	0	0.1	24	0	0.3	8	0	0.1
19	8	0	0.1	2	0	0.0	12	0	0.1	4	0	0.0	18	0	0.2	6	0	0.1
20	15	0	0.2	4	0	0.0	24	0	0.3	8	0	0.1	28	0	0.3	10	0	0.1
21	6	0	0.1	2	0	0.0	9	0	0.1	3	0	0.0	11	0	0.1	4	0	0.0
22	6	0	0.1	2	0	0.0	16	0	0.2	5	0	0.1	16	0	0.2	5	0	0.1
23	n	0	0.0	n	0	0.0	7	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
24	1	0	0.0	n	0	0.0	2	0	0.0	n	0	0.0	2	0	0.0	n	0	0.0
27	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
28	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0
29	4	0	0.0	2	0	0.0	3	0	0.1	3	0	0.0	11	0	0.1	4	0	0.0
30	7	0	0.1	3	0	0.0	10	0	0.1	4	0	0.0	11	0	0.1	4	0	0.0
31	20	0	0.2	7	0	0.1	26	0	0.3	9	0	0.1	33	0	0.4	12	0	0.1
32	9	0	0.1	3	0	0.0	18	0	0.2	6	0	0.1	22	0	0.2	8	0	0.1
33	30	0	0.4	9	0	0.1	37	0	0.5	13	0	0.1	38	0	0.5	13	0	0.1
34	6	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
35	6	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
36	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
37	3	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0
38	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
39	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
40	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
41	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
42	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
43	n	0	0.0	n	0	0.0	5	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
44	n	0	0.0	n	0	0.0	5	0	0.0	2	0	0.0	5	0	0.1	2	0	0.0
45	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
47	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
48	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
50	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
52	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
53	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
54	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
56	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
57	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
58	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
61	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
70	5	0	0.1	2	0	0.0	14	0	0.2	6	0	0.1	19	0	0.2	8	0	0.1
71	1	0	0.0	n	0	0.0	18	0	0.2	8	0	0.1	27	0	0.3	12	0	0.1

e: 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 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 land or boundary segments over the expected production life of the lease area, Colville deletion alternative. Probabilities calculated using U.S. OCS oilspill statistics for the conterminous 48 States.

Segment	Within 3 days						Within 10 days						Within 30 days					
	≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
1	11	0	0.1	4	0	0.0	38	0	0.5	17	0	0.2	42	0	0.5	19	0	0.2
2	n	0	0.0	n	0	0.0	7	0	0.1	3	0	0.0	8	0	0.1	3	0	0.0
3	1	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
4	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0
5	2	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0	9	0	0.1	4	0	0.0
6	12	0	0.1	5	0	0.0	25	0	0.3	10	0	0.1	38	0	0.5	17	0	0.2
7	12	0	0.1	4	0	0.0	30	0	0.4	12	0	0.1	42	0	0.5	19	0	0.2
8	11	0	0.1	4	0	0.0	38	0	0.5	16	0	0.2	52	0	0.7	24	0	0.3
9	8	0	0.1	2	0	0.0	29	0	0.3	11	0	0.1	36	0	0.4	15	0	0.2
10	1	0	0.0	n	0	0.0	6	0	0.1	2	0	0.0	12	0	0.1	5	0	0.0
11	1	0	0.0	n	0	0.0	12	0	0.1	5	0	0.0	18	0	0.2	7	0	0.1
12	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
13	13	0	0.1	3	0	0.0	32	0	0.4	12	0	0.1	40	0	0.5	16	0	0.2
14	7	0	0.1	2	0	0.0	16	0	0.2	5	0	0.1	17	0	0.2	6	0	0.1
15	7	0	0.1	2	0	0.0	10	0	0.1	3	0	0.0	12	0	0.1	3	0	0.0
16	3	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0	7	0	0.1	2	0	0.0
17	13	0	0.1	4	0	0.0	20	0	0.2	6	0	0.1	23	0	0.3	8	0	0.1
18	16	0	0.2	4	0	0.0	20	0	0.2	6	0	0.1	23	0	0.3	7	0	0.1
19	8	0	0.1	2	0	0.0	12	0	0.1	4	0	0.0	17	0	0.2	6	0	0.1
20	15	0	0.2	4	0	0.0	23	0	0.3	8	0	0.1	27	0	0.3	9	0	0.1
21	6	0	0.1	2	0	0.0	9	0	0.1	3	0	0.0	10	0	0.1	3	0	0.0
22	6	0	0.1	2	0	0.0	15	0	0.2	5	0	0.1	16	0	0.2	5	0	0.1
23	n	0	0.0	n	0	0.0	7	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
24	1	0	0.0	n	0	0.0	2	0	0.0	n	0	0.0	2	0	0.0	n	0	0.0
27	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
28	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
29	4	0	0.0	1	0	0.0	8	0	0.1	3	0	0.0	10	0	0.1	4	0	0.0
30	6	0	0.1	2	0	0.0	9	0	0.1	3	0	0.0	10	0	0.1	4	0	0.0
31	19	0	0.2	6	0	0.1	25	0	0.3	9	0	0.1	31	0	0.4	11	0	0.1
32	9	0	0.1	3	0	0.0	17	0	0.2	6	0	0.1	20	0	0.2	7	0	0.1
33	30	0	0.4	9	0	0.1	37	0	0.5	12	0	0.1	37	0	0.5	12	0	0.1
34	6	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
35	6	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
36	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
37	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
38	1	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
39	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
40	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
41	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
42	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
43	n	0	0.0	n	0	0.0	5	0	0.0	2	0	0.0	5	0	0.1	2	0	0.0
44	n	0	0.0	n	0	0.0	4	0	0.0	1	0	0.0	5	0	0.0	2	0	0.0
45	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
47	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
48	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
50	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
52	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
54	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
56	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
57	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
58	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
59	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
60	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0
61	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
62	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
67	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0
68	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
69	6	0	0.1	2	0	0.0	12	0	0.1	5	0	0.1	12	0	0.1	5	0	0.1
70	21	0	0.2	9	0	0.1	36	0	0.4	17	0	0.2	39	0	0.5	18	0	0.2
71	19	0	0.2	8	0	0.1	42	0	0.5	19	0	0.2	49	0	0.7	24	0	0.3

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 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 land or boundary segments over the expected production life of the lease area, Simpson deletion alternative. Probabilities calculated using U.S. OCS oilspill statistics for the conterminous 48 States.

Segment	Within 3 days						Within 10 days						Within 30 days					
	≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
1	10	0	0.1	4	0	0.0	36	0	0.4	17	0	0.2	39	0	0.5	18	0	0.2
2	n	0	0.0	n	0	0.0	7	0	0.1	3	0	0.0	7	0	0.1	3	0	0.0
3	1	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
4	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
5	2	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0	8	0	0.1	4	0	0.0
6	11	0	0.1	4	0	0.0	24	0	0.3	10	0	0.1	35	0	0.4	16	0	0.2
7	11	0	0.1	4	0	0.0	27	0	0.3	11	0	0.1	38	0	0.5	17	0	0.2
8	11	0	0.1	4	0	0.0	34	0	0.4	14	0	0.1	41	0	0.5	18	0	0.2
9	8	0	0.1	2	0	0.0	16	0	0.2	5	0	0.1	23	0	0.3	9	0	0.1
10	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	8	0	0.1	3	0	0.0
11	2	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0	9	0	0.1	3	0	0.0
12	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
13	14	0	0.2	4	0	0.0	27	0	0.3	9	0	0.1	31	0	0.4	11	0	0.1
14	7	0	0.1	2	0	0.0	10	0	0.1	3	0	0.0	11	0	0.1	3	0	0.0
15	7	0	0.1	2	0	0.0	11	0	0.1	3	0	0.0	13	0	0.1	4	0	0.0
16	4	0	0.0	1	0	0.0	5	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
17	14	0	0.2	4	0	0.0	20	0	0.2	6	0	0.1	21	0	0.2	7	0	0.1
18	15	0	0.2	4	0	0.0	19	0	0.2	6	0	0.1	19	0	0.2	6	0	0.1
19	5	0	0.1	1	0	0.0	6	0	0.1	2	0	0.0	9	0	0.1	2	0	0.0
20	9	0	0.1	2	0	0.0	12	0	0.1	4	0	0.0	13	0	0.1	4	0	0.0
21	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0
22	3	0	0.0	1	0	0.0	7	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
23	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
24	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	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
29	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0
30	2	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0
31	8	0	0.1	2	0	0.0	10	0	0.1	3	0	0.0	12	0	0.1	3	0	0.0
32	4	0	0.0	1	0	0.0	5	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
33	17	0	0.2	5	0	0.0	19	0	0.2	5	0	0.1	20	0	0.2	6	0	0.1
34	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
35	3	0	0.0	1	0	0.0	5	0	0.0	1	0	0.0	5	0	0.0	1	0	0.0
36	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
39	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
40	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
41	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
42	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
43	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0
44	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
54	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
56	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
57	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
58	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0
59	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
60	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0
61	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
62	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
67	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0
68	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
69	5	0	0.1	2	0	0.0	11	0	0.1	5	0	0.0	11	0	0.1	5	0	0.0
70	20	0	0.2	9	0	0.1	35	0	0.4	16	0	0.2	38	0	0.5	18	0	0.2
71	18	0	0.2	8	0	0.1	39	0	0.5	18	0	0.2	47	0	0.6	22	0	0.3

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 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 expected production life of the proposed lease tracts. Probabilities calculated using Prudhoe Bay oilspill statistics.

Target	Within 3 days						Within 10 days						Within 30 days					
	≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
Land	90	2	2.3	46	0	0.6	98	4	4.0	68	1	1.1	99	4	4.9	76	1	1.4
Seabird area 1	40	0	0.5	14	0	0.1	56	0	0.8	22	0	0.3	65	1	1.0	28	0	0.3
Seabird area 2	88	2	2.1	43	0	0.6	91	2	2.4	48	0	0.7	92	2	2.5	50	0	0.7
Marine mammal area A	12	0	0.1	4	0	0.0	26	0	0.3	10	0	0.1	27	0	0.3	10	0	0.1
Marine mammal area B	32	0	0.4	11	0	0.1	42	0	0.5	15	0	0.2	42	0	0.5	15	0	0.2
Bowhead feeding A	27	0	0.3	10	0	0.1	43	0	0.6	17	0	0.2	47	0	0.6	20	0	0.2
Bowhead feeding B	65	1	1.1	30	0	0.4	72	1	1.3	35	0	0.4	77	1	1.5	39	0	0.5
Overwintering area	49	0	0.7	17	0	0.2	55	0	0.8	20	0	0.2	58	0	0.9	22	0	0.2
Boulder patches	9	0	0.1	2	0	0.0	14	0	0.1	4	0	0.0	14	0	0.1	4	0	0.0
Impact zone A	13	0	0.1	5	0	0.0	23	0	0.3	8	0	0.1	24	0	0.3	9	0	0.1
Impact zone B	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
Impact zone C	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Impact zone D	2	0	0.0	1	0	0.0	5	0	0.0	2	0	0.0	6	0	0.1	2	0	0.0
Impact zone E	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
Impact zone F	2	0	0.0	1	0	0.0	8	0	0.1	3	0	0.0	8	0	0.1	3	0	0.0
Impact zone G	n	0	0.0	n	0	0.0	6	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
Impact zone H	2	0	0.0	n	0	0.0	8	0	0.1	2	0	0.0	8	0	0.1	2	0	0.0
Impact zone I	n	0	0.0	n	0	0.0	4	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0
Impact zone J	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
Impact zone K	n	0	0.0	n	0	0.0	2	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
Impact zone L	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0

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

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 expected production life of the lease area, Halkett deletion alternative. Probabilities calculated using Prudhoe Bay oilspill statistics.

Target	Within 3 days						Within 10 days						Within 30 days					
	≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
Land	85	1	1.9	40	0	0.5	97	3	3.4	62	0	1.0	99	4	4.2	71	1	1.2
Seabird area 1	23	0	0.3	8	0	0.1	40	0	0.5	15	0	0.2	52	0	0.7	21	0	0.2
Seabird area 2	87	2	2.0	42	0	0.5	90	2	2.3	48	0	0.6	92	2	2.5	50	0	0.7
Marine mammal area A	12	0	0.1	4	0	0.0	26	0	0.3	9	0	0.1	26	0	0.3	10	0	0.1
Marine mammal area B	35	0	0.4	12	0	0.1	43	0	0.6	16	0	0.2	43	0	0.6	16	0	0.2
Bowhead feeding A	8	0	0.1	3	0	0.0	22	0	0.2	8	0	0.1	27	0	0.3	10	0	0.1
Bowhead feeding B	30	0	0.4	11	0	0.1	42	0	0.5	17	0	0.2	51	0	0.7	22	0	0.2
Overwintering area	46	0	0.6	15	0	0.2	53	0	0.8	19	0	0.2	57	0	0.8	21	0	0.2
Boulder patches	9	0	0.1	2	0	0.0	14	0	0.1	4	0	0.0	14	0	0.1	4	0	0.0
Impact zone A	2	0	0.0	1	0	0.0	5	0	0.1	2	0	0.0	7	0	0.1	3	0	0.0
Impact zone B	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Impact zone C	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Impact zone D	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0
Impact zone E	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
Impact zone F	3	0	0.0	1	0	0.0	8	0	0.1	3	0	0.0	8	0	0.1	3	0	0.0
Impact zone G	n	0	0.0	n	0	0.0	7	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
Impact zone H	2	0	0.0	1	0	0.0	8	0	0.1	2	0	0.0	8	0	0.1	2	0	0.0
Impact zone I	n	0	0.0	n	0	0.0	4	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0
Impact zone J	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
Impact zone K	n	0	0.0	n	0	0.0	2	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
Impact zone L	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0

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

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 expected production life of the lease area, Colville deletion alternative. Probabilities calculated using Prudhoe Bay oilspill statistics.

Target	Within 3 days						Within 10 days						Within 30 days					
	≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
Land	89	2	2.2	44	0	0.6	98	3	3.9	67	1	1.1	99	4	4.7	74	1	1.4
Seabird area 1	40	0	0.5	14	0	0.1	56	0	0.8	22	0	0.3	64	1	1.0	28	0	0.3
Seabird area 2	87	2	2.0	42	0	0.5	90	2	2.3	47	0	0.6	91	2	2.4	49	0	0.7
Marine mammal area A	12	0	0.1	4	0	0.0	26	0	0.3	10	0	0.1	27	0	0.3	10	0	0.1
Marine mammal area B	32	0	0.4	11	0	0.1	42	0	0.5	15	0	0.2	42	0	0.5	15	0	0.2
Bowhead feeding A	27	0	0.3	10	0	0.1	43	0	0.6	17	0	0.2	47	0	0.6	20	0	0.2
Bowhead feeding B	65	1	1.1	30	0	0.4	72	1	1.3	35	0	0.4	77	1	1.5	39	0	0.5
Overwintering area	47	0	0.6	16	0	0.2	53	0	0.8	19	0	0.2	56	0	0.8	21	0	0.2
Boulder patches	9	0	0.1	2	0	0.0	13	0	0.1	4	0	0.0	13	0	0.1	4	0	0.0
Impact zone A	13	0	0.1	5	0	0.0	23	0	0.3	8	0	0.1	24	0	0.3	9	0	0.1
Impact zone B	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
Impact zone C	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Impact zone D	2	0	0.0	1	0	0.0	5	0	0.0	2	0	0.0	6	0	0.1	2	0	0.0
Impact zone E	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
Impact zone F	2	0	0.0	1	0	0.0	8	0	0.1	3	0	0.0	8	0	0.1	3	0	0.0
Impact zone G	n	0	0.0	n	0	0.0	5	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
Impact zone H	2	0	0.0	n	0	0.0	7	0	0.1	2	0	0.0	8	0	0.1	2	0	0.0
Impact zone I	n	0	0.0	n	0	0.0	4	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0
Impact zone J	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
Impact zone K	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
Impact zone L	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0

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

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 expected production life of the lease area, Simpson deletion alternative. Probabilities calculated using Prudhoe Bay oilspill statistics.

Target	Within 3 days						Within 10 days						Within 30 days					
	≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
Land	81	1	1.7	35	0	0.4	93	2	2.7	54	0	0.8	96	3	3.2	60	0	0.9
Seabird area 1	38	0	0.5	13	0	0.1	51	0	0.7	20	0	0.2	58	0	0.9	24	0	0.3
Seabird area 2	69	1	1.2	26	0	0.3	72	1	1.3	28	0	0.3	73	1	1.3	29	0	0.3
Marine mammal area A	12	0	0.1	4	0	0.0	17	0	0.2	6	0	0.1	18	0	0.2	6	0	0.1
Marine mammal area B	16	0	0.2	5	0	0.1	26	0	0.3	8	0	0.1	26	0	0.3	8	0	0.1
Bowhead feeding A	26	0	0.3	10	0	0.1	41	0	0.5	16	0	0.2	45	0	0.6	19	0	0.2
Bowhead feeding B	64	1	1.0	28	0	0.3	70	1	1.2	33	0	0.4	73	1	1.3	35	0	0.4
Overwintering area	35	0	0.4	11	0	0.1	39	0	0.5	12	0	0.1	40	0	0.5	13	0	0.1
Boulder patches	4	0	0.0	1	0	0.0	7	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
Impact zone A	13	0	0.1	5	0	0.0	22	0	0.2	8	0	0.1	23	0	0.3	9	0	0.1
Impact zone B	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
Impact zone C	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Impact zone D	2	0	0.0	1	0	0.0	4	0	0.0	2	0	0.0	5	0	0.1	2	0	0.0
Impact zone E	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
Impact zone F	1	0	0.0	n	0	0.0	4	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0
Impact zone G	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
Impact zone H	n	0	0.0	n	0	0.0	4	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0
Impact zone I	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
Impact zone J	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
Impact zone K	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	2	0	0.0	n	0	0.0
Impact zone L	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0

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

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 land or boundary segments over the expected production life of the proposed lease tracts. Probabilities calculated using Prudhoe Bay oilspill statistics.

Segment	Within 3 days						Within 10 days						Within 30 days					
	≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
1	5	0	0.1	2	0	0.0	18	0	0.2	7	0	0.1	21	0	0.2	8	0	0.1
2	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0
3	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
4	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
5	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0
6	6	0	0.1	2	0	0.0	13	0	0.1	4	0	0.0	20	0	0.2	7	0	0.1
7	8	0	0.1	2	0	0.0	18	0	0.2	6	0	0.1	25	0	0.3	9	0	0.1
8	10	0	0.1	3	0	0.0	26	0	0.3	8	0	0.1	35	0	0.4	12	0	0.1
9	8	0	0.1	2	0	0.0	20	0	0.2	6	0	0.1	23	0	0.3	8	0	0.1
10	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0
11	2	0	0.0	n	0	0.0	8	0	0.1	3	0	0.0	11	0	0.1	3	0	0.0
12	1	0	0.0	n	0	0.0	2	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
13	14	0	0.1	4	0	0.0	26	0	0.3	8	0	0.1	31	0	0.4	10	0	0.1
14	7	0	0.1	2	0	0.0	13	0	0.1	4	0	0.0	14	0	0.1	4	0	0.0
15	7	0	0.1	2	0	0.0	11	0	0.1	3	0	0.0	13	0	0.1	3	0	0.0
16	3	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0	7	0	0.1	2	0	0.0
17	14	0	0.2	4	0	0.0	19	0	0.2	6	0	0.1	21	0	0.2	6	0	0.1
18	16	0	0.2	4	0	0.0	20	0	0.2	6	0	0.1	22	0	0.2	6	0	0.1
19	8	0	0.1	2	0	0.0	10	0	0.1	3	0	0.0	14	0	0.2	4	0	0.0
20	15	0	0.2	4	0	0.0	20	0	0.2	6	0	0.1	23	0	0.3	7	0	0.1
21	5	0	0.1	1	0	0.0	7	0	0.1	2	0	0.0	8	0	0.1	2	0	0.0
22	6	0	0.1	1	0	0.0	13	0	0.1	4	0	0.0	13	0	0.1	4	0	0.0
23	1	0	0.0	n	0	0.0	6	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
24	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	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	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
28	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
29	3	0	0.0	1	0	0.0	5	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
30	4	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
31	16	0	0.2	5	0	0.0	19	0	0.2	6	0	0.1	24	0	0.3	7	0	0.1
32	8	0	0.1	2	0	0.0	12	0	0.1	4	0	0.0	14	0	0.1	4	0	0.0
33	29	0	0.3	8	0	0.1	34	0	0.4	10	0	0.1	34	0	0.4	10	0	0.1
34	5	0	0.1	1	0	0.0	6	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
35	5	0	0.1	1	0	0.0	6	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
36	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
37	1	0	0.0	n	0	0.0	2	0	0.0	n	0	0.0	2	0	0.0	n	0	0.0
38	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
39	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
40	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
41	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
42	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
43	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0
44	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
50	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
52	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
56	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
57	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
58	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
60	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
61	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
67	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
68	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
69	2	0	0.0	1	0	0.0	5	0	0.1	2	0	0.0	5	0	0.1	2	0	0.0
70	9	0	0.1	3	0	0.0	17	0	0.2	6	0	0.1	19	0	0.2	7	0	0.1
71	9	0	0.1	3	0	0.0	21	0	0.2	8	0	0.1	25	0	0.3	9	0	0.1

te: 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 land or boundary segments over the expected production life of the lease area, Halkett deletion alternative. Probabilities calculated using Prudhoe Bay oilspill statistics.

Segment	Within 3 days						Within 10 days						Within 30 days					
	≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
1	1	0	0.0	n	0	0.0	11	0	0.1	4	0	0.0	13	0	0.1	5	0	0.0
2	n	0	0.0	n	0	0.0	1	0	0.0	n	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	n	0	0.0
5	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
6	2	0	0.0	1	0	0.0	5	0	0.1	2	0	0.0	11	0	0.1	4	0	0.0
7	3	0	0.0	1	0	0.0	10	0	0.1	3	0	0.0	16	0	0.2	6	0	0.1
8	6	0	0.1	2	0	0.0	20	0	0.2	6	0	0.1	30	0	0.4	11	0	0.1
9	6	0	0.1	1	0	0.0	19	0	0.2	6	0	0.1	23	0	0.3	8	0	0.1
10	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0
11	1	0	0.0	n	0	0.0	8	0	0.1	2	0	0.0	11	0	0.1	4	0	0.0
12	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
13	10	0	0.1	3	0	0.0	21	0	0.2	7	0	0.1	27	0	0.3	9	0	0.1
14	5	0	0.0	1	0	0.0	11	0	0.1	3	0	0.0	11	0	0.1	3	0	0.0
15	5	0	0.0	1	0	0.0	7	0	0.1	2	0	0.0	9	0	0.1	3	0	0.0
16	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0
17	12	0	0.1	3	0	0.0	17	0	0.2	5	0	0.1	19	0	0.2	6	0	0.1
18	13	0	0.1	4	0	0.0	17	0	0.2	5	0	0.0	19	0	0.2	6	0	0.1
19	8	0	0.1	2	0	0.0	10	0	0.1	3	0	0.0	14	0	0.2	4	0	0.0
20	14	0	0.2	4	0	0.0	20	0	0.2	6	0	0.1	22	0	0.3	7	0	0.1
21	5	0	0.1	1	0	0.0	7	0	0.1	2	0	0.0	8	0	0.1	2	0	0.0
22	5	0	0.1	1	0	0.0	13	0	0.1	4	0	0.0	13	0	0.1	4	0	0.0
23	n	0	0.0	n	0	0.0	6	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
24	1	0	0.0	n	0	0.0	2	0	0.0	n	0	0.0	2	0	0.0	n	0	0.0
27	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
28	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
29	3	0	0.0	1	0	0.0	5	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
30	4	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
31	16	0	0.2	5	0	0.0	19	0	0.2	6	0	0.1	25	0	0.3	8	0	0.1
32	7	0	0.1	2	0	0.0	12	0	0.1	4	0	0.0	14	0	0.2	4	0	0.0
33	28	0	0.3	8	0	0.1	33	0	0.4	10	0	0.1	33	0	0.4	10	0	0.1
34	5	0	0.1	1	0	0.0	6	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
35	5	0	0.1	1	0	0.0	5	0	0.1	1	0	0.0	5	0	0.1	1	0	0.0
36	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
37	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
38	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
39	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
40	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
41	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
42	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
43	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
44	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
45	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
50	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
52	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
56	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
57	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
58	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
70	2	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0	8	0	0.1	3	0	0.0
71	n	0	0.0	n	0	0.0	7	0	0.1	3	0	0.0	12	0	0.1	4	0	0.0

e: 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 land or boundary segments over the expected production life of the lease area, Colville deletion alternative. Probabilities calculated using Prudhoe Bay oilspill statistics.

Segment	Within 3 days						Within 10 days						Within 30 days					
	≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
1	5	0	0.1	2	0	0.0	18	0	0.2	7	0	0.1	21	0	0.2	8	0	0.1
2	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0
3	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
4	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
5	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0
6	6	0	0.1	2	0	0.0	13	0	0.1	4	0	0.0	20	0	0.2	7	0	0.1
7	8	0	0.1	2	0	0.0	18	0	0.2	6	0	0.1	24	0	0.3	8	0	0.1
8	10	0	0.1	3	0	0.0	25	0	0.3	8	0	0.1	34	0	0.4	12	0	0.1
9	8	0	0.1	2	0	0.0	20	0	0.2	6	0	0.1	23	0	0.3	8	0	0.1
10	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0
11	1	0	0.0	n	0	0.0	8	0	0.1	2	0	0.0	10	0	0.1	3	0	0.0
12	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
13	13	0	0.1	3	0	0.0	25	0	0.3	7	0	0.1	29	0	0.3	9	0	0.1
14	7	0	0.1	2	0	0.0	12	0	0.1	4	0	0.0	13	0	0.1	4	0	0.0
15	7	0	0.1	2	0	0.0	10	0	0.1	3	0	0.0	12	0	0.1	3	0	0.0
16	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0
17	13	0	0.1	3	0	0.0	18	0	0.2	5	0	0.1	19	0	0.2	6	0	0.1
18	15	0	0.2	4	0	0.0	19	0	0.2	5	0	0.1	20	0	0.2	6	0	0.1
19	8	0	0.1	2	0	0.0	10	0	0.1	3	0	0.0	14	0	0.2	4	0	0.0
20	15	0	0.2	4	0	0.0	20	0	0.2	6	0	0.1	22	0	0.2	6	0	0.1
21	5	0	0.1	1	0	0.0	7	0	0.1	2	0	0.0	8	0	0.1	2	0	0.0
22	5	0	0.1	1	0	0.0	13	0	0.1	4	0	0.0	13	0	0.1	4	0	0.0
23	n	0	0.0	n	0	0.0	6	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
24	1	0	0.0	n	0	0.0	2	0	0.0	n	0	0.0	2	0	0.0	n	0	0.0
27	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
28	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
29	3	0	0.0	1	0	0.0	5	0	0.1	1	0	0.0	6	0	0.1	2	0	0.0
30	4	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
31	16	0	0.2	5	0	0.0	19	0	0.2	6	0	0.1	24	0	0.3	7	0	0.1
32	7	0	0.1	2	0	0.0	12	0	0.1	3	0	0.0	14	0	0.1	4	0	0.0
33	28	0	0.3	8	0	0.1	33	0	0.4	10	0	0.1	33	0	0.4	10	0	0.1
34	5	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
35	5	0	0.1	1	0	0.0	6	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
36	1	0	0.0	n	0	0.0	2	0	0.0	n	0	0.0	2	0	0.0	n	0	0.0
37	1	0	0.0	n	0	0.0	2	0	0.0	n	0	0.0	2	0	0.0	n	0	0.0
38	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
39	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
40	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
41	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
42	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
43	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
44	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
50	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
52	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
56	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
57	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
58	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
60	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
61	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
67	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
68	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
69	2	0	0.0	1	0	0.0	5	0	0.1	2	0	0.0	5	0	0.1	2	0	0.0
70	9	0	0.1	3	0	0.0	17	0	0.2	6	0	0.1	19	0	0.2	7	0	0.1
71	9	0	0.1	3	0	0.0	21	0	0.2	8	0	0.1	25	0	0.3	9	0	0.1

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 land or boundary segments over the expected production life of the lease area, Simpson deletion alternative. Probabilities calculated using Prudhoe Bay oilspill statistics.

Segment	Within 3 days						Within 10 days						Within 30 days					
	≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
1	5	0	0.1	2	0	0.0	17	0	0.2	6	0	0.1	19	0	0.2	7	0	0.1
2	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
3	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
4	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
5	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0
6	6	0	0.1	2	0	0.0	12	0	0.1	4	0	0.0	18	0	0.2	6	0	0.1
7	8	0	0.1	2	0	0.0	16	0	0.2	5	0	0.1	22	0	0.2	7	0	0.1
8	9	0	0.1	3	0	0.0	22	0	0.3	7	0	0.1	27	0	0.3	9	0	0.1
9	8	0	0.1	2	0	0.0	12	0	0.1	3	0	0.0	15	0	0.2	5	0	0.0
10	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0
11	2	0	0.0	n	0	0.0	4	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0
12	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	2	0	0.0	n	0	0.0
13	13	0	0.1	4	0	0.0	21	0	0.2	6	0	0.1	23	0	0.3	7	0	0.1
14	7	0	0.1	2	0	0.0	9	0	0.1	2	0	0.0	10	0	0.1	3	0	0.0
15	7	0	0.1	2	0	0.0	10	0	0.1	3	0	0.0	12	0	0.1	3	0	0.0
16	3	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0
17	13	0	0.1	4	0	0.0	17	0	0.2	5	0	0.0	17	0	0.2	5	0	0.1
18	14	0	0.2	4	0	0.0	17	0	0.2	5	0	0.0	17	0	0.2	5	0	0.0
19	5	0	0.1	1	0	0.0	6	0	0.1	2	0	0.0	8	0	0.1	2	0	0.0
20	9	0	0.1	2	0	0.0	11	0	0.1	3	0	0.0	12	0	0.1	3	0	0.0
21	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
22	3	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
23	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
24	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	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
29	2	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
30	2	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
31	8	0	0.1	2	0	0.0	9	0	0.1	2	0	0.0	11	0	0.1	3	0	0.0
32	4	0	0.0	1	0	0.0	5	0	0.0	1	0	0.0	5	0	0.1	1	0	0.0
33	17	0	0.2	5	0	0.0	19	0	0.2	5	0	0.1	19	0	0.2	5	0	0.1
34	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
35	3	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0
36	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
39	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
40	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
41	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
42	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
43	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
44	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	2	0	0.0	n	0	0.0
56	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
57	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
58	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
60	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
61	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
67	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
68	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
69	2	0	0.0	1	0	0.0	5	0	0.1	2	0	0.0	5	0	0.1	2	0	0.0
70	9	0	0.1	3	0	0.0	16	0	0.2	6	0	0.1	18	0	0.2	7	0	0.1
71	9	0	0.1	3	0	0.0	20	0	0.2	7	0	0.1	24	0	0.3	9	0	0.1

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

The overall probabilities are also shown graphically in appendices C and D. Figures C-1 through C-8 are histograms which show probabilities of 1, 2, ... N spills occurring and contacting specific targets within periods of 3, 10, and 30 days. Figures D-1 through D-12 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 the proposed action and the three deletion alternatives. The data shown in appendices C and D were calculated using the platform spill rate for the U.S. OCS.

Discussion of Results

Assuming that oil is spilled in the lease area, the probability of a spill contacting land within 3 days (the times mentioned in this discussion do not include time trapped under ice) relates directly to the distance of spill launch points from shore. For example, launch points P1 to P9, which lie along the offshore tanker route, are associated with oilspill contact possibilities that range from less than 0.5 percent to 13 percent (see table 3), whereas launch points P23 to P26, which lie along the proposed pipeline located nearshore, are associated with contact probabilities ranging from 43 to 91 percent. If oilspills are tracked for 30 days, their probability of contacting land increases greatly even for offshore launch points. The 30-day contact probability to land for launch points P1 to P9 varies between 1 and 92 percent. Bowhead whale feeding area B has relatively high contact probabilities (30-day travel time) partially because launch points P10, P11, and P23 are located within this area.

The distribution of oilspill contact probabilities (from individual launch points) along the shore reflects a general pattern of highest risk to the segment adjacent to the launch point and decreasing risk to neighboring segments. For example, oilspills launched from point P23, located just offshore of segment 7 have only a 13-percent chance of contacting that segment with in 3 days. Segments 5 and 8 have only a 9- and 8-percent chance, respectively, of being contacted, and segments 4 and 9 have less than 0.5-percent chance.

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 travel time) is greater than 99.5 percent (using U.S. OCS oilspill statistics) and 99.0 percent (using Prudhoe Bay oilspill statistics). Because the estimate of oil resources is so high, it is very likely that a spill will occur and contact land, even if the lower spill rates of Prudhoe Bay are used. If spills of 10,000 barrels and larger are considered, these probabilities are reduced to 92 percent and 76 percent, respectively. The offshore islands in the Beaufort Sea, represented

by segments 29 to 42, have a 1- to 38-percent chance (U.S. OCS statistics) of being hit by one or more spills of 1,000 barrels and larger traveling for at most 30 days. This range is reduced to between 1 and 34 percent if Prudhoe Bay statistics are used. The coastal areas most likely to be contacted are Cape Simpson (segment 1), 42 percent; Cape Halkett (segments 6 to 9), 37 to 53 percent; and Atigaru Point (segment 13), 42 percent. These probabilities were all calculated using U.S. OCS oilspill statistics. If Prudhoe Bay oilspill statistics are used, these probabilities are reduced to 21 percent, 20 to 35 percent, and 31 percent, respectively. There is only a 1- to 6-percent chance that spills of 1,000 barrels and larger, (U.S. OCS oilspill statistics) will be transported to the east of the study area, however, the probability that oilspills will be transported to the west of the study area is somewhat higher 1 to 49 percent. Very little chance exists that spills in this size range(U.S. OCS oilspill statistics) will be transported in a northerly direction (less than 0.5 percent to 3 percent). On the basis of U.S. OCS oilspill statistics, it was determined that all of the targets have a relatively high chance of being hit by one or more spills of 1,000 barrels and larger traveling for at most 30 days. The range is between 16 percent (boulder patches) to 96 percent (seabird area 2 and Bowhead whale feeding area B). The 12 impact zones (figure 4) show lower probabilities of contact than the targets (in the range of less than 0.5 percent to 48 percent). If Prudhoe Bay oilspill statistics are used, these probabilities are 14 percent (boulder patches), 92 percent (seabird area 2), 77 percent (Bowhead whale feeding area B) and less than 0.5 percent to 24 percent (range for the 12 impact zones).

The three deletion alternatives do not reduce the risks to land appreciably, however, some statistical differences are apparent in the targets. For example, if U.S. OCS oilspill statistics are used, the Simpson deletion alternative lowers the risks from the proposed action by 14 and 22 percent, respectively, to marine mammal areas A and B. The Halkett deletion alternative lowers the risks (from the proposed action) to Bowhead whale feeding areas A and B by the greatest amount as compared to the other deletion alternatives (12 and 15 percent, respectively).

The cumulative analysis showed that several offshore islands and land segments adjacent to the Federal and State leases (area I) could have a high probability of being contacted by one or more oilspills of 1,000 barrels and larger traveling for at most 30 days. If U.S. OCS oilspill statistics are used, the two areas most likely to be contacted are segment 33 (an offshore island), 52 percent; and segment 23, 38 percent. If Prudhoe Bay oilspill statistics are used, these probabilities are reduced to 44 percent and 27 percent, respectively. When tanker transportation of oil is

included in the cumulative analysis, several targets show increased oilspill contact probabilities. If U.S. OCS oilspill statistics are used, the targets most affected are marine mammal area A, 16-percent increase; marine mammal area B, 26-percent increase; boulder patches 50-percent increase; and all of the impact zones for marine mammals and seabirds (the percent increase is variable depending on the location of the impact zone).

Several uncertainties exist in this analysis. Modeled oilspill trajectories do not account for the possibility of large-scale ice movements. Although the present analysis is believed to represent the most likely circumstances, one must recognize that large-scale ice movements, if they occur, could distort the trajectory results in a manner not directly predictable. There is also no consideration of removing oil trapped under ice, though recent indications are that cleanup measures would be very effective in reducing the amount of oil dispersed to the marine environment. Because the model predicts only spill occurrences and contacts, cleanup measures would not affect the probabilities presented in this report. By reducing the size of a spill, however, cleanup measures could reduce its environmental impacts.

The risks described in this report are clearly quite substantial. However, in evaluating these risks, it should be kept in mind that they correspond to the production of a large amount of oil.

Conclusions

This analysis indicates that if oil exists in commercial quantities in the OCS Lease Sale 71 area (a 99.3-percent chance), 9.2 oilspills of 1,000 barrels or larger are expected to occur in the Beaufort Sea lease area. This estimate is based on U.S. OCS oilspill statistics for the conterminous 48 States. If oilspill statistics for Prudhoe Bay are used, it is estimated that only 5.6 oilspills of 1,000 barrels or larger will occur. Using U.S. OCS oilspill statistics, the probability that one or more oilspills of 1,000 barrels or larger will occur is greater than 99.5 percent; the probability of one or more spills occurring and contacting land within 30 days (not counting time trapped under ice) is also greater than 99.5 percent. For spills 10,000 barrels or larger, this probability is reduced to 92 percent. Using Prudhoe Bay oilspill statistics, the probability that one or more oilspills of 1,000 barrels and greater will occur is still greater than 99.5 percent. The probability that one or more oilspills will occur and contact land within 30 days is 99 percent. For spills 10,000 barrels and larger, this probability is reduced to 76 percent.

The three deletion alternatives do not reduce the risks to land appreciably; however, risks to some specific targets are decreased significantly. The Halkett deletion alternative poses the lowest risks to the Bowhead whale feeding areas.

Although the present analysis is believed to be based on the most likely circumstances, one must recognize that uncertainties exist regarding the movement of ice and the movement and behavior of oil under ice; these factors could affect the results of the model in a manner not predictable at the present time. Furthermore, analysts using the results of the model to predict environmental impacts should note that substantial cleanup of spilled oil was achieved in recent experimental oilspills under ice in Canadian arctic waters, with only 20 percent of the spilled oil being dispersed into the marine environment. Although such cleanup efforts would not change the probabilities in this report (which refer only to contacts, not impacts), they could reduce the environmental impacts of spills.

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Appendix A

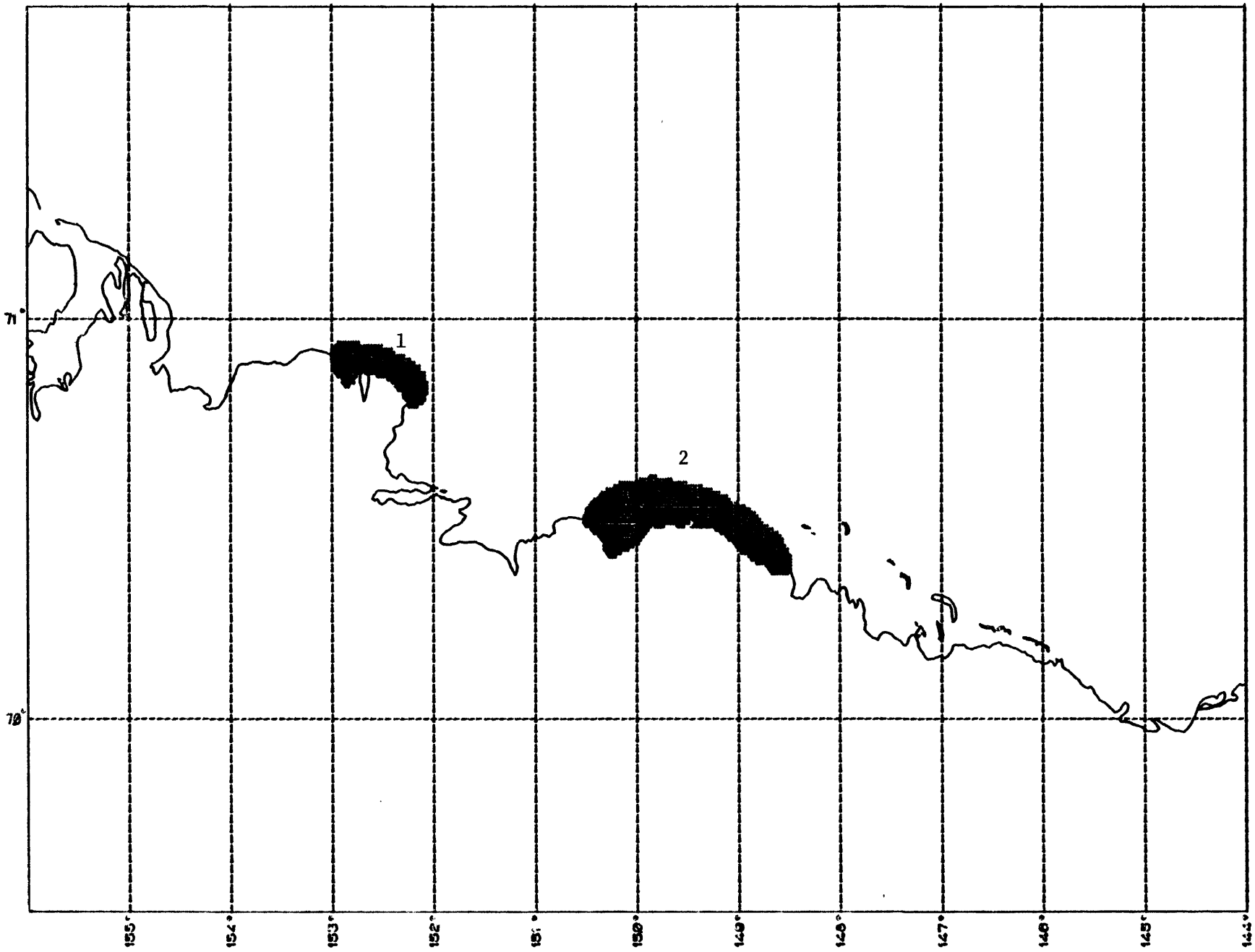

Figure A-1.--Map showing the location of seabird staging and feeding areas 1 and 2, Beaufort Sea OCS Lease Sale 71: cross hatching indicates areal extent.

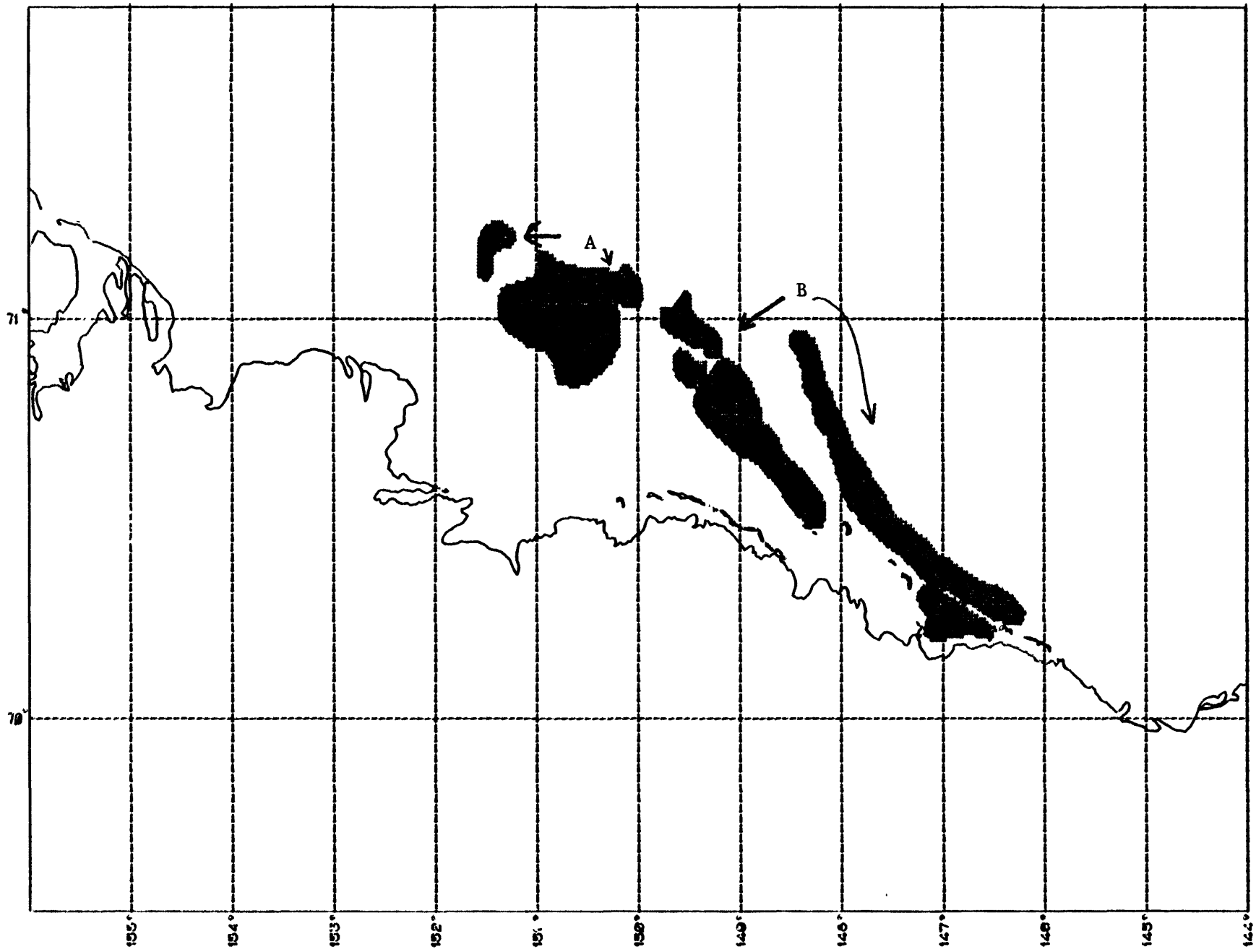

Figure A-2.--Map showing the location of selected marine mammal habitats A and B, Beaufort Sea OCS Sale 71: hatching indicates areal extent.

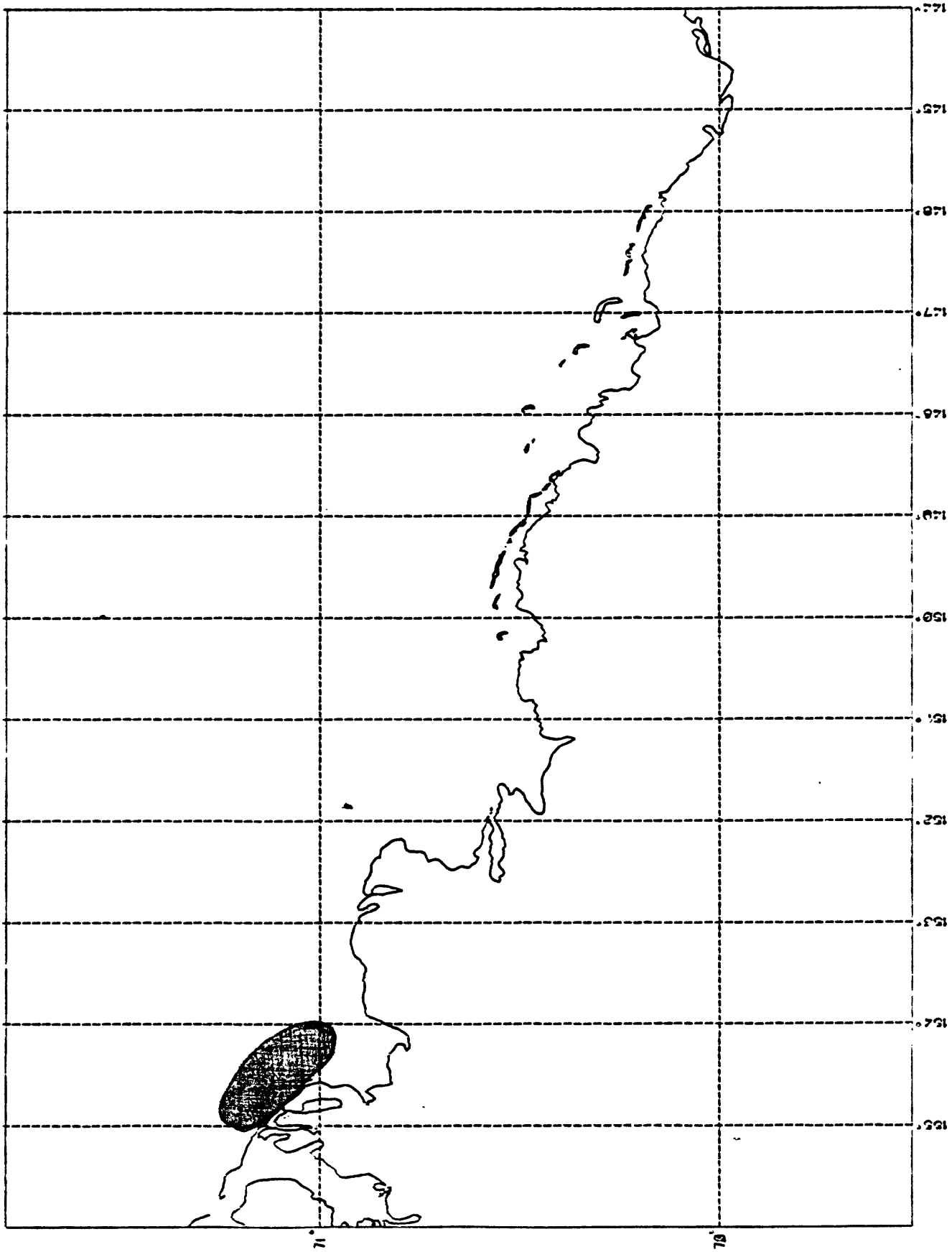

Figure A-3.--Map showing the location of potential Bowhead whale feeding area A (high-intensity use)

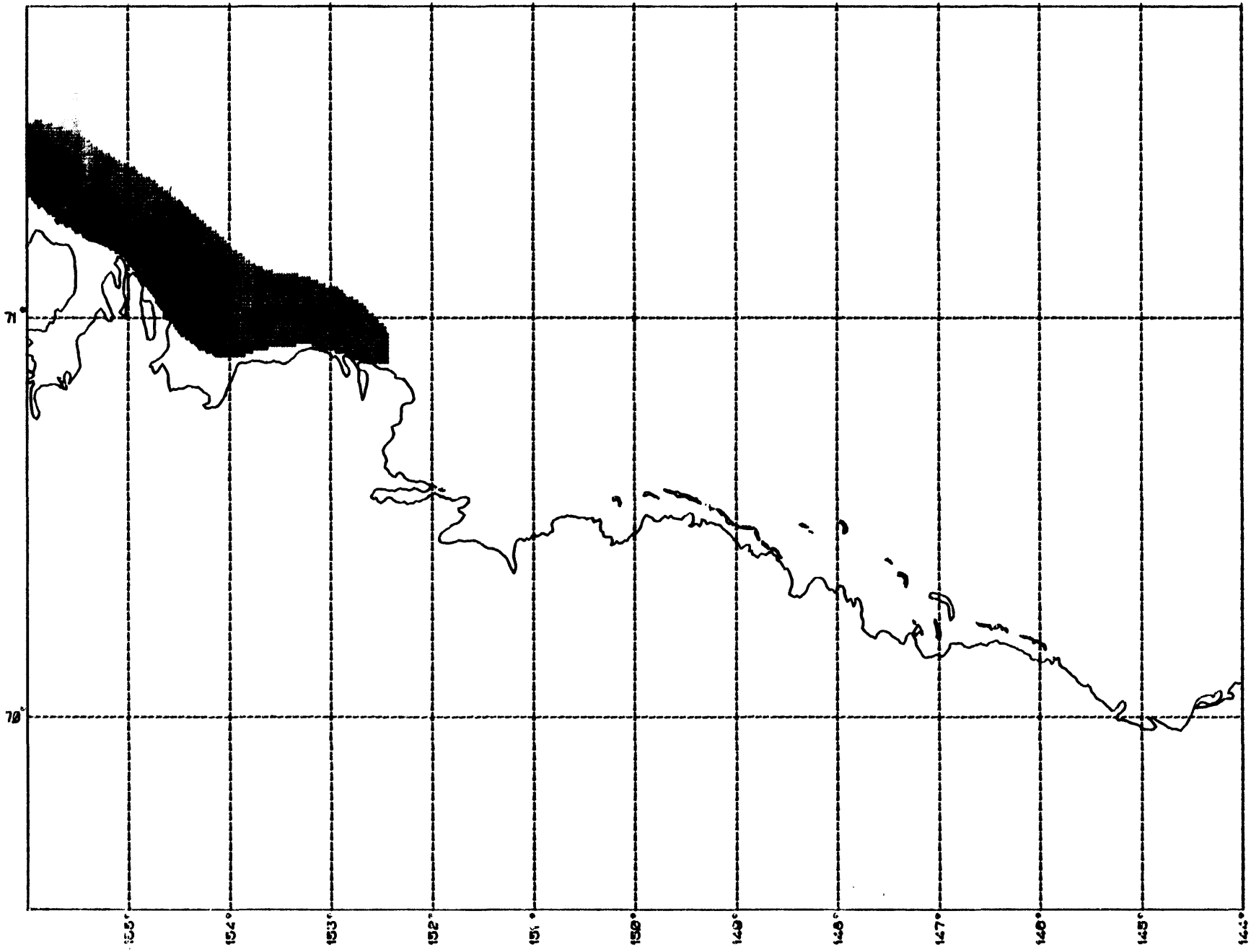

Figure A-4.--Map showing the location of potential Bowhead whale feeding area B (low-intensity use), Beaufort Sea OCS Lease Sale 71: cross hatching indicates areal extent.

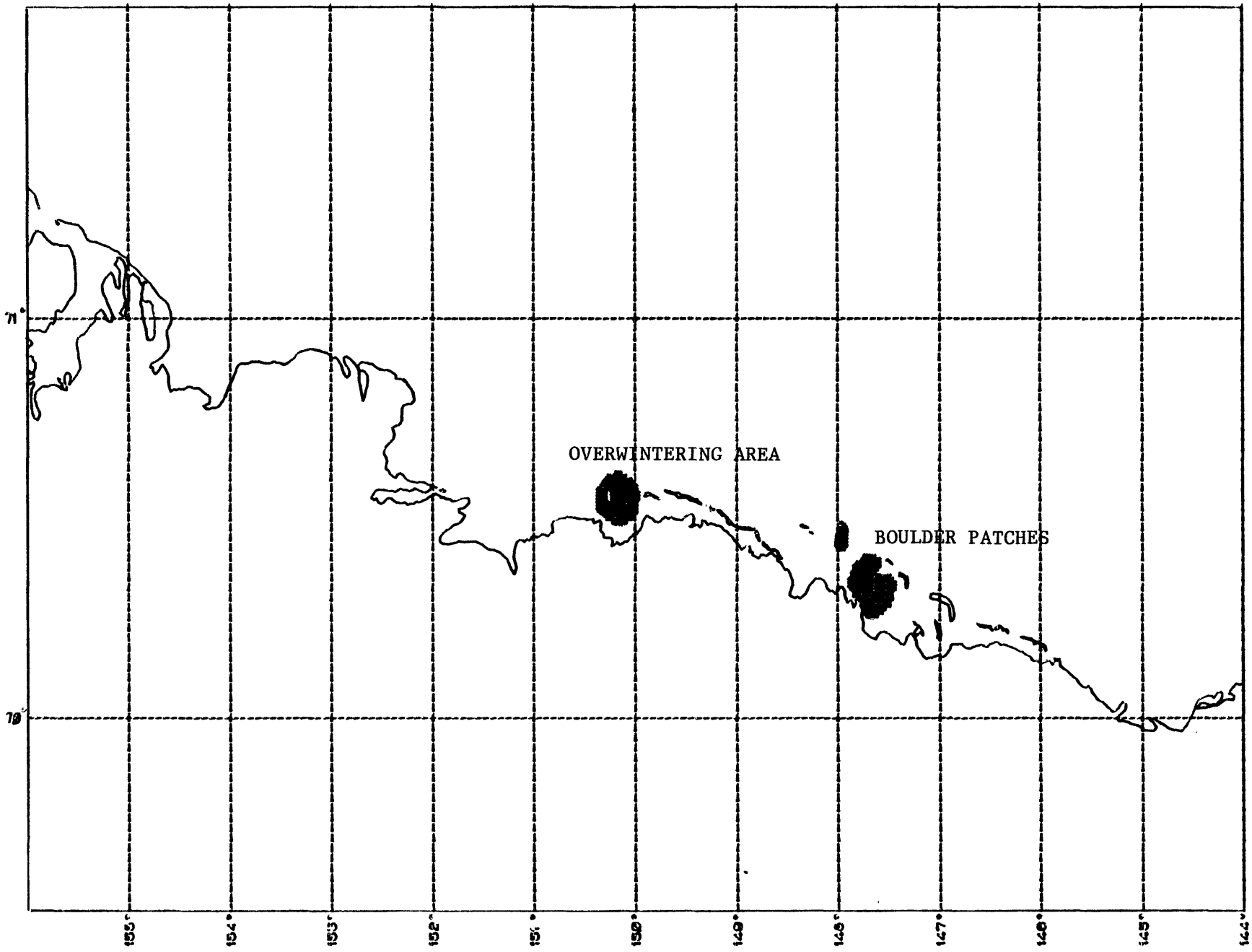

Figure A-5.--Map showing the location of boulder patches and overwintering area (boreal smelt, fourhorn sculpin), Beaufort Sea OCS Lease Sale 71: cross hatching indicates areal extent.

Appendix B

Table B-1. -- 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 expected production life of the lease area, proposed action plus existing Federal and State leases. Probabilities calculated using U.S. OCS oilspill statistics.

Target	Within 3 days						Within 10 days						Within 30 days					
	≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
Land	98	4	4.1	73	1	1.3	**	8	8.2	94	2	2.8	**	10	10.2	97	3	3.6
Seabird area 1	55	0	0.8	24	0	0.3	79	1	1.6	44	0	0.6	87	2	2.1	54	0	0.8
Seabird area 2	96	3	3.2	63	0	1.0	98	4	4.0	73	1	1.3	99	4	4.4	76	1	1.4
Marine mammal area A	27	0	0.3	12	0	0.1	49	0	0.7	23	0	0.3	51	0	0.7	24	0	0.3
Marine mammal area B	90	2	2.3	55	0	0.8	93	2	2.6	61	0	0.9	93	2	2.6	61	0	0.9
Bowhead feeding A	51	0	0.7	25	0	0.3	73	1	1.3	41	0	0.5	78	1	1.5	45	0	0.6
Bowhead feeding B	90	2	2.3	60	0	0.9	94	2	2.9	68	1	1.1	96	3	3.2	72	1	1.3
Overwintering area	61	0	0.9	26	0	0.3	71	1	1.3	34	0	0.4	76	1	1.4	37	0	0.5
Boulder patches	48	0	0.6	20	0	0.2	58	0	0.9	25	0	0.3	60	0	0.9	27	0	0.3
Impact zone A	28	0	0.3	13	0	0.1	46	0	0.6	22	0	0.2	48	0	0.7	23	0	0.3
Impact zone B	n	0	0.0	n	0	0.0	4	0	0.0	2	0	0.0	4	0	0.0	2	0	0.0
Impact zone C	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Impact zone D	5	0	0.1	2	0	0.0	11	0	0.1	5	0	0.0	13	0	0.1	6	0	0.1
Impact zone E	1	0	0.0	n	0	0.0	6	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
Impact zone F	5	0	0.1	2	0	0.0	21	0	0.2	8	0	0.1	21	0	0.2	9	0	0.1
Impact zone G	1	0	0.0	1	0	0.0	12	0	0.1	5	0	0.1	12	0	0.1	5	0	0.1
Impact zone H	13	0	0.1	5	0	0.0	25	0	0.3	10	0	0.1	25	0	0.3	10	0	0.1
Impact zone I	3	0	0.0	1	0	0.0	10	0	0.1	4	0	0.0	11	0	0.1	4	0	0.0
Impact zone J	14	0	0.1	5	0	0.1	18	0	0.2	7	0	0.1	18	0	0.2	7	0	0.1
Impact zone K	7	0	0.1	2	0	0.0	9	0	0.1	3	0	0.0	9	0	0.1	3	0	0.0
Impact zone L	3	0	0.0	1	0	0.0	10	0	0.1	4	0	0.0	11	0	0.1	4	0	0.0

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

Table B-2. -- 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 expected production life of the lease area, proposed action plus tanker transportation. Probabilities calculated using U.S. OCS oilspill statistics.

Target	Within 3 days						Within 10 days						Within 30 days					
	≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
Land	94	2	2.8	58	0	0.9	**	6	6.4	90	2	2.3	**	8	8.3	95	3	3.1
Seabird area 1	54	0	0.8	24	0	0.3	80	1	1.6	46	0	0.6	88	2	2.1	57	0	0.8
Seabird area 2	92	2	2.6	53	0	0.8	96	3	3.2	65	1	1.1	97	3	3.6	69	1	1.2
Marine mammal area A	47	0	0.6	27	0	0.3	64	1	1.0	38	0	0.5	65	1	1.1	39	0	0.5
Marine mammal area B	72	1	1.3	45	0	0.6	81	1	1.7	54	0	0.8	81	1	1.7	54	0	0.8
Bowhead feeding A	54	0	0.8	27	0	0.3	77	1	1.5	46	0	0.6	82	1	1.7	52	0	0.7
Bowhead feeding B	91	2	2.4	62	0	1.0	96	3	3.2	73	1	1.3	97	3	3.6	78	1	1.5
Overwintering area	58	0	0.9	24	0	0.3	68	1	1.1	32	0	0.4	73	1	1.3	37	0	0.5
Boulder patches	13	0	0.1	5	0	0.1	26	0	0.3	12	0	0.1	30	0	0.4	15	0	0.2
Impact zone A	46	0	0.6	26	0	0.3	63	0	1.0	38	0	0.5	67	1	1.1	41	0	0.5
Impact zone B	1	0	0.0	n	0	0.0	7	0	0.1	3	0	0.0	7	0	0.1	4	0	0.0
Impact zone C	1	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	2	0	0.0
Impact zone D	24	0	0.3	14	0	0.2	31	0	0.4	18	0	0.2	34	0	0.4	20	0	0.2
Impact zone E	2	0	0.0	1	0	0.0	8	0	0.1	4	0	0.0	8	0	0.1	4	0	0.0
Impact zone F	10	0	0.1	5	0	0.1	22	0	0.2	11	0	0.1	23	0	0.3	11	0	0.1
Impact zone G	4	0	0.0	2	0	0.0	16	0	0.2	8	0	0.1	17	0	0.2	8	0	0.1
Impact zone H	18	0	0.2	11	0	0.1	29	0	0.3	16	0	0.2	30	0	0.4	17	0	0.2
Impact zone I	13	0	0.1	8	0	0.1	18	0	0.2	10	0	0.1	19	0	0.2	10	0	0.1
Impact zone J	13	0	0.1	8	0	0.1	19	0	0.2	11	0	0.1	20	0	0.2	12	0	0.1
Impact zone K	14	0	0.1	8	0	0.1	17	0	0.2	10	0	0.1	18	0	0.2	10	0	0.1
Impact zone L	9	0	0.1	6	0	0.1	15	0	0.2	8	0	0.1	16	0	0.2	8	0	0.1

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

Table B-3. -- 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 expected production life of the lease area, proposed action plus existing Federal and State leases and tanker transportation. Probabilities calculated using U.S. OCS oilspill statistics.

Target	Within 3 days						Within 10 days						Within 30 days					
	≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
Land	98	4	4.2	74	1	1.3	**	8	8.7	95	3	3.1	**	11	11.1	98	4	4.1
Seabird area 1	55	0	0.8	24	0	0.3	81	1	1.7	47	0	0.6	89	2	2.2	58	0	0.9
Seabird area 2	96	3	3.2	63	1	1.0	98	4	4.2	75	1	1.4	99	4	4.6	79	1	1.6
Marine mammal area A	47	0	0.6	27	0	0.3	64	1	1.0	38	0	0.5	66	1	1.1	39	0	0.5
Marine mammal area B	94	2	2.8	69	1	1.2	96	3	3.3	74	1	1.4	97	3	3.4	75	1	1.4
Bowhead feeding A	54	0	0.8	27	0	0.3	77	1	1.5	47	0	0.6	82	1	1.7	52	0	0.7
Bowhead feeding B	91	2	2.4	62	0	1.0	96	3	3.2	73	1	1.3	97	3	3.7	79	1	1.5
Overwintering area	61	0	1.0	26	0	0.3	73	1	1.3	36	0	0.4	77	1	1.5	40	0	0.5
Boulder patches	49	0	0.7	22	0	0.2	63	0	1.0	31	0	0.4	66	1	1.1	34	0	0.4
Impact 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
Impact zone A	46	0	0.6	26	0	0.3	63	0	1.0	38	0	0.5	67	1	1.1	41	0	0.5
Impact zone B	1	0	0.0	n	0	0.0	7	0	0.1	3	0	0.0	7	0	0.1	4	0	0.0
Impact zone C	1	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	2	0	0.0
Impact zone D	24	0	0.3	14	0	0.2	31	0	0.4	18	0	0.2	34	0	0.4	20	0	0.2
Impact zone E	2	0	0.0	1	0	0.0	8	0	0.1	4	0	0.0	8	0	0.1	4	0	0.0
Impact zone F	10	0	0.1	5	0	0.1	27	0	0.3	13	0	0.1	28	0	0.3	13	0	0.1
Impact zone G	5	0	0.0	2	0	0.0	18	0	0.2	8	0	0.1	18	0	0.2	9	0	0.1
Impact zone H	26	0	0.3	14	0	0.2	39	0	0.5	20	0	0.2	40	0	0.5	21	0	0.2
Impact zone I	15	0	0.2	9	0	0.1	22	0	0.3	12	0	0.1	23	0	0.3	12	0	0.1
Impact zone J	24	0	0.3	12	0	0.1	31	0	0.4	16	0	0.2	32	0	0.4	17	0	0.2
Impact zone K	19	0	0.2	10	0	0.1	22	0	0.3	12	0	0.1	23	0	0.3	12	0	0.1
Impact zone L	12	0	0.1	7	0	0.1	20	0	0.2	10	0	0.1	21	0	0.2	10	0	0.1

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

Table B-4. -- 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 land or boundary segments over the expected production life of the lease area, proposed action plus existing Federal and State leases. Probabilities calculated using U.S. oilspill statistics.

Segment	Within 3 days						Within 10 days						Within 30 days					
	≥ 1000 bbls.			≥ 10,000 bbls.			≥ 1000 bbls.			≥ 10,000 bbls.			≥ 1000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
1	11	0	0.1	4	0	0.0	39	0	0.5	18	0	0.2	42	0	0.6	20	0	0.2
2	n	0	0.0	n	0	0.0	7	0	0.1	3	0	0.0	8	0	0.1	3	0	0.0
3	1	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
4	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0
5	2	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0	9	0	0.1	4	0	0.0
6	12	0	0.1	5	0	0.0	25	0	0.3	11	0	0.1	38	0	0.5	17	0	0.2
7	12	0	0.1	4	0	0.0	32	0	0.4	13	0	0.1	44	0	0.6	20	0	0.2
8	13	0	0.1	4	0	0.0	41	0	0.5	17	0	0.2	54	0	0.8	25	0	0.3
9	9	0	0.1	2	0	0.0	31	0	0.4	12	0	0.1	39	0	0.5	16	0	0.2
10	1	0	0.0	n	0	0.0	6	0	0.1	2	0	0.0	12	0	0.1	5	0	0.1
11	2	0	0.0	1	0	0.0	13	0	0.1	5	0	0.1	19	0	0.2	7	0	0.1
12	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
13	15	0	0.2	4	0	0.0	35	0	0.4	13	0	0.1	44	0	0.6	18	0	0.2
14	7	0	0.1	2	0	0.0	18	0	0.2	6	0	0.1	19	0	0.2	7	0	0.1
15	8	0	0.1	2	0	0.0	12	0	0.1	3	0	0.0	14	0	0.2	4	0	0.0
16	4	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0	10	0	0.1	3	0	0.0
17	16	0	0.2	5	0	0.1	25	0	0.3	8	0	0.1	29	0	0.3	10	0	0.1
18	17	0	0.2	5	0	0.1	23	0	0.3	7	0	0.1	26	0	0.3	9	0	0.1
19	9	0	0.1	3	0	0.0	13	0	0.1	4	0	0.0	19	0	0.2	6	0	0.1
20	22	0	0.2	7	0	0.1	31	0	0.4	11	0	0.1	37	0	0.5	14	0	0.1
21	7	0	0.1	2	0	0.0	12	0	0.1	4	0	0.0	15	0	0.2	5	0	0.1
22	19	0	0.2	7	0	0.1	33	0	0.4	12	0	0.1	37	0	0.5	14	0	0.2
23	23	0	0.3	9	0	0.1	36	0	0.4	14	0	0.2	38	0	0.5	15	0	0.2
24	15	0	0.2	6	0	0.1	22	0	0.2	8	0	0.1	23	0	0.3	9	0	0.1
25	1	0	0.0	n	0	0.0	7	0	0.1	3	0	0.0	8	0	0.1	3	0	0.0
26	2	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0	5	0	0.1	2	0	0.0
27	6	0	0.1	2	0	0.0	11	0	0.1	4	0	0.0	11	0	0.1	4	0	0.0
28	1	0	0.0	n	0	0.0	5	0	0.1	2	0	0.0	5	0	0.1	2	0	0.0
29	4	0	0.0	1	0	0.0	9	0	0.1	3	0	0.0	11	0	0.1	4	0	0.0
30	7	0	0.1	2	0	0.0	12	0	0.1	4	0	0.0	13	0	0.1	5	0	0.0
31	24	0	0.3	8	0	0.1	32	0	0.4	12	0	0.1	40	0	0.5	16	0	0.2
32	13	0	0.1	4	0	0.0	22	0	0.2	8	0	0.1	27	0	0.3	10	0	0.1
33	40	0	0.5	14	0	0.2	51	0	0.7	20	0	0.2	52	0	0.7	20	0	0.2
34	8	0	0.1	3	0	0.0	11	0	0.1	4	0	0.0	13	0	0.1	4	0	0.0
35	10	0	0.1	3	0	0.0	13	0	0.1	5	0	0.0	14	0	0.2	5	0	0.1
36	12	0	0.1	5	0	0.0	19	0	0.2	7	0	0.1	20	0	0.2	8	0	0.1
37	5	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
38	3	0	0.0	1	0	0.0	4	0	0.0	2	0	0.0	5	0	0.0	2	0	0.0
39	3	0	0.0	1	0	0.0	7	0	0.1	2	0	0.0	8	0	0.1	3	0	0.0
40	3	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
41	1	0	0.0	n	0	0.0	4	0	0.0	2	0	0.0	4	0	0.0	2	0	0.0
42	4	0	0.0	2	0	0.0	7	0	0.1	3	0	0.0	7	0	0.1	3	0	0.0
43	5	0	0.0	2	0	0.0	11	0	0.1	4	0	0.0	12	0	0.1	4	0	0.0
44	n	0	0.0	n	0	0.0	6	0	0.1	2	0	0.0	8	0	0.1	3	0	0.0
45	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
47	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
48	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
50	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
52	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
54	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
56	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
57	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
58	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
59	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
60	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0
61	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
62	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
67	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0
68	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
69	6	0	0.1	2	0	0.0	12	0	0.1	5	0	0.1	12	0	0.1	5	0	0.1
70	21	0	0.2	9	0	0.1	36	0	0.4	17	0	0.2	39	0	0.5	18	0	0.2
71	19	0	0.2	8	0	0.1	42	0	0.5	19	0	0.2	49	0	0.7	24	0	0.3

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 B-5. -- 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 land segments over the expected production life of the lease area, proposed action plus tanker transportation. Probabilities calculated using U.S. oilspill statistics.

Segment	Within 3 days						Within 10 days						Within 30 days					
	≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
1	11	0	0.1	4	0	0.0	40	0	0.5	19	0	0.2	45	0	0.6	22	0	0.3
2	n	0	0.0	n	0	0.0	7	0	0.1	3	0	0.0	10	0	0.1	4	0	0.0
3	1	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
4	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0
5	2	0	0.0	1	0	0.0	6	0	0.1	3	0	0.0	11	0	0.1	5	0	0.0
6	12	0	0.1	5	0	0.0	26	0	0.3	11	0	0.1	40	0	0.5	19	0	0.2
7	12	0	0.1	4	0	0.0	31	0	0.4	13	0	0.1	45	0	0.6	21	0	0.2
8	12	0	0.1	4	0	0.0	41	0	0.5	18	0	0.2	55	0	0.8	27	0	0.3
9	9	0	0.1	2	0	0.0	30	0	0.4	12	0	0.1	39	0	0.5	17	0	0.2
10	1	0	0.0	n	0	0.0	7	0	0.1	3	0	0.0	13	0	0.1	5	0	0.1
11	2	0	0.0	1	0	0.0	15	0	0.2	6	0	0.1	21	0	0.2	9	0	0.1
12	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	4	0	0.0	2	0	0.0
13	15	0	0.2	4	0	0.0	35	0	0.4	13	0	0.1	44	0	0.6	18	0	0.2
14	7	0	0.1	2	0	0.0	17	0	0.2	6	0	0.1	18	0	0.2	6	0	0.1
15	8	0	0.1	2	0	0.0	11	0	0.1	3	0	0.0	14	0	0.2	4	0	0.0
16	4	0	0.0	1	0	0.0	5	0	0.1	2	0	0.0	9	0	0.1	3	0	0.0
17	16	0	0.2	5	0	0.1	23	0	0.3	8	0	0.1	26	0	0.3	9	0	0.1
18	17	0	0.2	5	0	0.0	23	0	0.3	7	0	0.1	26	0	0.3	9	0	0.1
19	9	0	0.1	2	0	0.0	13	0	0.1	4	0	0.0	19	0	0.2	6	0	0.1
20	16	0	0.2	4	0	0.0	25	0	0.3	8	0	0.1	28	0	0.3	10	0	0.1
21	6	0	0.1	2	0	0.0	10	0	0.1	3	0	0.0	12	0	0.1	4	0	0.0
22	6	0	0.1	2	0	0.0	17	0	0.2	6	0	0.1	18	0	0.2	6	0	0.1
23	1	0	0.0	n	0	0.0	9	0	0.1	3	0	0.0	11	0	0.1	5	0	0.0
24	1	0	0.0	n	0	0.0	4	0	0.0	2	0	0.0	5	0	0.1	3	0	0.0
25	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0
26	1	0	0.0	n	0	0.0	4	0	0.0	2	0	0.0	4	0	0.0	2	0	0.0
27	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
28	n	0	0.0	n	0	0.0	3	0	0.0	2	0	0.0	4	0	0.0	2	0	0.0
29	4	0	0.0	1	0	0.0	8	0	0.1	3	0	0.0	11	0	0.1	4	0	0.0
30	7	0	0.1	2	0	0.0	10	0	0.1	4	0	0.0	11	0	0.1	4	0	0.0
31	20	0	0.2	7	0	0.1	26	0	0.3	10	0	0.1	33	0	0.4	13	0	0.1
32	9	0	0.1	3	0	0.0	17	0	0.2	6	0	0.1	22	0	0.2	8	0	0.1
33	31	0	0.4	9	0	0.1	38	0	0.5	13	0	0.1	40	0	0.5	14	0	0.2
34	6	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0	8	0	0.1	3	0	0.0
35	6	0	0.1	2	0	0.0	8	0	0.1	3	0	0.0	9	0	0.1	3	0	0.0
36	4	0	0.0	2	0	0.0	9	0	0.1	5	0	0.0	10	0	0.1	5	0	0.1
37	3	0	0.0	1	0	0.0	4	0	0.0	2	0	0.0	5	0	0.0	2	0	0.0
38	1	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
39	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
40	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	2	0	0.0
41	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	4	0	0.0	2	0	0.0
42	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
43	8	0	0.1	5	0	0.0	14	0	0.1	7	0	0.1	15	0	0.2	8	0	0.1
44	2	0	0.0	1	0	0.0	7	0	0.1	3	0	0.0	8	0	0.1	4	0	0.0
45	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
47	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
48	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0
50	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
52	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
53	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0
54	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
55	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
56	1	0	0.0	1	0	0.0	4	0	0.0	2	0	0.0	4	0	0.0	2	0	0.0
57	n	0	0.0	n	0	0.0	3	0	0.0	2	0	0.0	3	0	0.0	2	0	0.0
58	1	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
59	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
60	1	0	0.0	1	0	0.0	4	0	0.0	2	0	0.0	4	0	0.0	2	0	0.0
61	1	0	0.0	1	0	0.0	3	0	0.0	2	0	0.0	4	0	0.0	2	0	0.0
62	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
63	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0
65	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
67	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
68	6	0	0.1	3	0	0.0	7	0	0.1	4	0	0.0	8	0	0.1	4	0	0.0
69	16	0	0.2	9	0	0.1	26	0	0.3	15	0	0.2	28	0	0.3	16	0	0.2
70	25	0	0.3	12	0	0.1	43	0	0.6	22	0	0.3	48	0	0.7	26	0	0.3
71	19	0	0.2	8	0	0.1	46	0	0.6	23	0	0.3	53	0	0.8	28	0	0.3

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 B-6. -- 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 land segments over the expected production life of the lease area, proposed action plus existing Federal and State leases and tanker transportation. Probabilities calculated using U.S. OCS oilspill statistics.

Segment	Within 3 days						Within 10 days						Within 30 days					
	≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
1	11	0	0.1	4	0	0.0	41	0	0.5	19	0	0.2	46	0	0.6	23	0	0.3
2	n	0	0.0	n	0	0.0	7	0	0.1	3	0	0.0	10	0	0.1	4	0	0.0
3	1	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
4	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0
5	2	0	0.0	1	0	0.0	6	0	0.1	3	0	0.0	11	0	0.1	5	0	0.0
6	12	0	0.1	5	0	0.0	27	0	0.3	12	0	0.1	41	0	0.5	19	0	0.2
7	12	0	0.1	4	0	0.0	34	0	0.4	14	0	0.2	47	0	0.6	22	0	0.2
8	13	0	0.1	4	0	0.0	43	0	0.6	19	0	0.2	57	0	0.8	28	0	0.3
9	9	0	0.1	2	0	0.0	32	0	0.4	13	0	0.1	41	0	0.5	18	0	0.2
10	1	0	0.0	n	0	0.0	7	0	0.1	3	0	0.0	13	0	0.1	5	0	0.1
11	2	0	0.0	1	0	0.0	15	0	0.2	6	0	0.1	21	0	0.2	9	0	0.1
12	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	4	0	0.0	2	0	0.0
13	15	0	0.2	4	0	0.0	35	0	0.4	13	0	0.1	45	0	0.6	19	0	0.2
14	7	0	0.1	2	0	0.0	18	0	0.2	6	0	0.1	20	0	0.2	7	0	0.1
15	8	0	0.1	2	0	0.0	12	0	0.1	3	0	0.0	15	0	0.2	5	0	0.0
16	4	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0	10	0	0.1	3	0	0.0
17	16	0	0.2	5	0	0.1	25	0	0.3	8	0	0.1	29	0	0.3	10	0	0.1
18	17	0	0.2	5	0	0.1	23	0	0.3	7	0	0.1	27	0	0.3	9	0	0.1
19	9	0	0.1	3	0	0.0	13	0	0.1	4	0	0.0	20	0	0.2	7	0	0.1
20	22	0	0.2	7	0	0.1	31	0	0.4	11	0	0.1	38	0	0.5	15	0	0.2
21	7	0	0.1	2	0	0.0	12	0	0.1	4	0	0.0	16	0	0.2	6	0	0.1
22	19	0	0.2	7	0	0.1	34	0	0.4	13	0	0.1	38	0	0.5	15	0	0.2
23	23	0	0.3	9	0	0.1	37	0	0.5	15	0	0.2	41	0	0.5	17	0	0.2
24	15	0	0.2	6	0	0.1	24	0	0.3	9	0	0.1	26	0	0.3	11	0	0.1
25	2	0	0.0	1	0	0.0	8	0	0.1	3	0	0.0	9	0	0.1	3	0	0.0
26	2	0	0.0	1	0	0.0	7	0	0.1	3	0	0.0	8	0	0.1	4	0	0.0
27	7	0	0.1	2	0	0.0	11	0	0.1	4	0	0.0	12	0	0.1	5	0	0.0
28	1	0	0.0	n	0	0.0	7	0	0.1	3	0	0.0	8	0	0.1	4	0	0.0
29	4	0	0.0	1	0	0.0	9	0	0.1	3	0	0.0	12	0	0.1	5	0	0.0
30	7	0	0.1	2	0	0.0	12	0	0.1	5	0	0.0	14	0	0.1	5	0	0.1
31	24	0	0.3	8	0	0.1	33	0	0.4	13	0	0.1	42	0	0.5	17	0	0.2
32	13	0	0.1	4	0	0.0	22	0	0.3	8	0	0.1	28	0	0.3	11	0	0.1
33	40	0	0.5	14	0	0.2	52	0	0.7	20	0	0.2	53	0	0.8	22	0	0.2
34	8	0	0.1	3	0	0.0	11	0	0.1	4	0	0.0	14	0	0.1	5	0	0.1
35	11	0	0.1	4	0	0.0	14	0	0.1	5	0	0.1	15	0	0.2	6	0	0.1
36	15	0	0.2	6	0	0.1	24	0	0.3	11	0	0.1	25	0	0.3	11	0	0.1
37	5	0	0.1	2	0	0.0	8	0	0.1	3	0	0.0	8	0	0.1	3	0	0.0
38	3	0	0.0	1	0	0.0	4	0	0.0	2	0	0.0	5	0	0.1	2	0	0.0
39	4	0	0.0	1	0	0.0	8	0	0.1	3	0	0.0	9	0	0.1	4	0	0.0
40	3	0	0.0	1	0	0.0	7	0	0.1	3	0	0.0	7	0	0.1	3	0	0.0
41	2	0	0.0	1	0	0.0	5	0	0.1	2	0	0.0	6	0	0.1	3	0	0.0
42	4	0	0.0	2	0	0.0	8	0	0.1	3	0	0.0	8	0	0.1	3	0	0.0
43	12	0	0.1	6	0	0.1	20	0	0.2	10	0	0.1	21	0	0.2	10	0	0.1
44	2	0	0.0	1	0	0.0	9	0	0.1	4	0	0.0	11	0	0.1	5	0	0.0
45	n	0	0.0	n	0	0.0	4	0	0.0	2	0	0.0	4	0	0.0	2	0	0.0
46	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
47	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
48	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
50	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
52	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
53	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0
54	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
55	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
56	1	0	0.0	1	0	0.0	4	0	0.0	2	0	0.0	4	0	0.0	2	0	0.0
57	n	0	0.0	n	0	0.0	3	0	0.0	2	0	0.0	3	0	0.0	2	0	0.0
58	1	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
59	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
60	1	0	0.0	1	0	0.0	4	0	0.0	2	0	0.0	4	0	0.0	2	0	0.0
61	1	0	0.0	1	0	0.0	3	0	0.0	2	0	0.0	4	0	0.0	2	0	0.0
62	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
63	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0
65	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
67	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
68	6	0	0.1	3	0	0.0	7	0	0.1	4	0	0.0	8	0	0.1	4	0	0.0
69	16	0	0.2	9	0	0.1	26	0	0.3	15	0	0.2	28	0	0.3	16	0	0.2
70	25	0	0.3	12	0	0.1	43	0	0.6	22	0	0.3	48	0	0.7	25	0	0.3
71	19	0	0.2	3	0	0.1	46	0	0.6	23	0	0.3	53	0	0.8	28	0	0.3

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 B-7. -- 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 expected production life of the lease area, proposed action plus existing Federal and State leases. Probabilities calculated using Prudhoe Bay oilspill statistics.

Target	Within 3 days						Within 10 days						Within 30 days					
	≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
Land	96	3	3.1	58	0	0.9	**	5	5.5	79	1	1.6	**	6	6.5	85	1	1.9
Seabird area 1	41	0	0.5	14	0	0.2	58	0	0.9	23	0	0.3	67	1	1.1	29	0	0.3
Seabird area 2	92	2	2.5	50	0	0.7	95	2	3.0	56	0	0.8	96	3	3.2	59	0	0.9
Marine mammal area A	13	0	0.1	5	0	0.0	27	0	0.3	10	0	0.1	28	0	0.3	10	0	0.1
Marine mammal area B	74	1	1.4	33	0	0.4	79	1	1.6	37	0	0.5	79	1	1.6	37	0	0.5
Bowhead feeding A	27	0	0.3	10	0	0.1	43	0	0.6	18	0	0.2	48	0	0.6	20	0	0.2
Bowhead feeding B	66	1	1.1	30	0	0.4	73	1	1.3	35	0	0.4	77	1	1.5	39	0	0.5
Overwintering area	52	0	0.7	18	0	0.2	59	0	0.9	22	0	0.3	62	0	1.0	24	0	0.3
Boulder patches	34	0	0.4	11	0	0.1	43	0	0.6	15	0	0.2	45	0	0.6	16	0	0.2
Impact zone A	13	0	0.1	5	0	0.0	23	0	0.3	8	0	0.1	24	0	0.3	9	0	0.1
Impact zone B	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
Impact zone C	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Impact zone D	2	0	0.0	1	0	0.0	5	0	0.0	2	0	0.0	6	0	0.1	2	0	0.0
Impact zone E	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
Impact zone F	3	0	0.0	1	0	0.0	12	0	0.1	4	0	0.0	12	0	0.1	4	0	0.0
Impact zone G	1	0	0.0	n	0	0.0	6	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
Impact zone H	8	0	0.1	2	0	0.0	16	0	0.2	5	0	0.1	16	0	0.2	5	0	0.1
Impact zone I	2	0	0.0	1	0	0.0	7	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
Impact zone J	9	0	0.1	3	0	0.0	11	0	0.1	3	0	0.0	12	0	0.1	4	0	0.0
Impact zone K	4	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
Impact zone L	2	0	0.0	n	0	0.0	7	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0

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

Table B-8. -- 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 expected production life of the lease area, proposed action plus tanker transportation. Probabilities calculated using Prudhoe Bay oilspill statistics.

Target	Within 3 days						Within 10 days						Within 30 days					
	≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
Land	91	2	2.4	48	0	0.7	99	4	4.5	76	1	1.4	**	5	5.7	85	1	1.9
Seabird area 1	40	0	0.5	14	0	0.1	60	0	0.9	26	0	0.3	70	1	1.2	35	0	0.4
Seabird area 2	88	2	2.1	44	0	0.6	92	2	2.5	52	0	0.7	94	2	2.8	56	0	0.8
Marine mammal area A	36	0	0.4	21	0	0.2	48	0	0.7	27	0	0.3	49	0	0.7	28	0	0.3
Marine mammal area B	62	0	1.0	38	0	0.5	72	1	1.3	45	0	0.6	73	1	1.3	46	0	0.6
Bowhead feeding A	30	0	0.4	13	0	0.1	51	0	0.7	25	0	0.3	58	0	0.9	30	0	0.3
Bowhead feeding B	69	1	1.2	34	0	0.4	80	1	1.6	46	0	0.6	85	1	1.9	52	0	0.7
Overwintering area	50	0	0.7	17	0	0.2	58	0	0.9	22	0	0.3	62	0	1.0	26	0	0.3
Boulder patches	12	0	0.1	4	0	0.0	24	0	0.3	11	0	0.1	27	0	0.3	13	0	0.1
Impact zone A	34	0	0.4	19	0	0.2	47	0	0.6	27	0	0.3	51	0	0.7	30	0	0.4
Impact zone B	1	0	0.0	n	0	0.0	5	0	0.0	2	0	0.0	5	0	0.1	3	0	0.0
Impact zone C	1	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
Impact zone D	22	0	0.2	13	0	0.1	27	0	0.3	16	0	0.2	29	0	0.3	17	0	0.2
Impact zone E	1	0	0.0	1	0	0.0	5	0	0.0	2	0	0.0	5	0	0.0	2	0	0.0
Impact zone F	8	0	0.1	4	0	0.0	15	0	0.2	7	0	0.1	16	0	0.2	8	0	0.1
Impact zone G	4	0	0.0	2	0	0.0	11	0	0.1	5	0	0.1	12	0	0.1	6	0	0.1
Impact zone H	17	0	0.2	10	0	0.1	25	0	0.3	14	0	0.1	26	0	0.3	15	0	0.2
Impact zone I	12	0	0.1	8	0	0.1	17	0	0.2	9	0	0.1	17	0	0.2	9	0	0.1
Impact zone J	12	0	0.1	7	0	0.1	18	0	0.2	11	0	0.1	19	0	0.2	11	0	0.1
Impact zone K	14	0	0.1	8	0	0.1	16	0	0.2	10	0	0.1	17	0	0.2	10	0	0.1
Impact zone L	9	0	0.1	6	0	0.1	14	0	0.1	8	0	0.1	15	0	0.2	8	0	0.1

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

Table B-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 expected production life of the lease area, proposed action plus existing Federal and State leases and tanker transportation. Probabilities calculated using Prudhoe Bay oilspill statistics.

Target	Within 3 days						Within 10 days						Within 30 days					
	≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
Land	96	3	3.2	59	0	0.9	**	5	5.9	84	1	1.9	**	7	7.4	91	2	2.4
Seabird area 1	41	0	0.5	14	0	0.2	61	0	0.9	27	0	0.3	72	1	1.3	36	0	0.4
Seabird area 2	92	2	2.6	50	0	0.7	96	3	3.1	60	0	0.9	97	3	3.4	64	1	1.0
Marine mammal area A	36	0	0.4	21	0	0.2	48	0	0.7	27	0	0.3	50	0	0.7	28	0	0.3
Marine mammal area B	86	1	2.0	53	0	0.8	90	2	2.3	59	0	0.9	90	2	2.3	60	0	0.9
Bowhead feeding A	30	0	0.4	13	0	0.1	52	0	0.7	25	0	0.3	58	0	0.9	30	0	0.4
Bowhead feeding B	69	1	1.2	34	0	0.4	80	1	1.6	46	0	0.6	85	1	1.9	53	0	0.7
Overwintering area	52	0	0.7	19	0	0.2	61	0	1.0	25	0	0.3	65	1	1.1	28	0	0.3
Boulder patches	36	0	0.5	13	0	0.1	50	0	0.7	21	0	0.2	54	0	0.8	24	0	0.3
Impact zone A	34	0	0.4	19	0	0.2	47	0	0.6	27	0	0.3	51	0	0.7	30	0	0.4
Impact zone B	1	0	0.0	n	0	0.0	5	0	0.0	2	0	0.0	5	0	0.1	3	0	0.0
Impact zone C	1	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
Impact zone D	22	0	0.2	13	0	0.1	27	0	0.3	16	0	0.2	29	0	0.3	17	0	0.2
Impact zone E	1	0	0.0	1	0	0.0	5	0	0.0	2	0	0.0	5	0	0.0	2	0	0.0
Impact zone F	8	0	0.1	4	0	0.0	19	0	0.2	8	0	0.1	19	0	0.2	9	0	0.1
Impact zone G	4	0	0.0	2	0	0.0	12	0	0.1	6	0	0.1	12	0	0.1	6	0	0.1
Impact zone H	22	0	0.2	12	0	0.1	32	0	0.4	16	0	0.2	33	0	0.4	17	0	0.2
Impact zone I	14	0	0.2	8	0	0.1	19	0	0.2	10	0	0.1	20	0	0.2	10	0	0.1
Impact zone J	19	0	0.2	10	0	0.1	26	0	0.3	13	0	0.1	27	0	0.3	14	0	0.1
Impact zone K	17	0	0.2	9	0	0.1	20	0	0.2	11	0	0.1	21	0	0.2	11	0	0.1
Impact zone L	11	0	0.1	6	0	0.1	17	0	0.2	9	0	0.1	18	0	0.2	9	0	0.1

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

Table B-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 land or boundary segments over the expected production life of the lease area, proposed action plus existing Federal and State leases. Probabilities calculated using Prudhoe Bay oilspill statistics.

Segment	Within 3 days						Within 10 days						Within 30 days					
	≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
1	5	0	0.1	2	0	0.0	19	0	0.2	7	0	0.1	22	0	0.2	8	0	0.1
2	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0
3	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
4	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
5	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0
6	6	0	0.1	2	0	0.0	13	0	0.1	5	0	0.0	20	0	0.2	7	0	0.1
7	9	0	0.1	2	0	0.0	19	0	0.2	6	0	0.1	26	0	0.3	9	0	0.1
8	10	0	0.1	3	0	0.0	27	0	0.3	9	0	0.1	36	0	0.4	13	0	0.1
9	8	0	0.1	2	0	0.0	21	0	0.2	7	0	0.1	25	0	0.3	8	0	0.1
10	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0
11	2	0	0.0	n	0	0.0	8	0	0.1	3	0	0.0	11	0	0.1	3	0	0.0
12	1	0	0.0	n	0	0.0	2	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
13	14	0	0.1	4	0	0.0	26	0	0.3	8	0	0.1	32	0	0.4	10	0	0.1
14	7	0	0.1	2	0	0.0	14	0	0.1	4	0	0.0	15	0	0.2	4	0	0.0
15	7	0	0.1	2	0	0.0	11	0	0.1	3	0	0.0	13	0	0.1	4	0	0.0
16	3	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0	8	0	0.1	2	0	0.0
17	14	0	0.2	4	0	0.0	20	0	0.2	6	0	0.1	23	0	0.3	7	0	0.1
18	17	0	0.2	5	0	0.0	20	0	0.2	6	0	0.1	22	0	0.3	7	0	0.1
19	9	0	0.1	2	0	0.0	11	0	0.1	3	0	0.0	15	0	0.2	4	0	0.0
20	19	0	0.2	5	0	0.1	25	0	0.3	7	0	0.1	29	0	0.3	9	0	0.1
21	6	0	0.1	2	0	0.0	9	0	0.1	3	0	0.0	11	0	0.1	3	0	0.0
22	13	0	0.1	4	0	0.0	25	0	0.3	8	0	0.1	27	0	0.3	9	0	0.1
23	15	0	0.2	5	0	0.0	25	0	0.3	8	0	0.1	27	0	0.3	9	0	0.1
24	10	0	0.1	3	0	0.0	15	0	0.2	4	0	0.0	16	0	0.2	5	0	0.0
25	1	0	0.0	n	0	0.0	5	0	0.0	1	0	0.0	5	0	0.1	2	0	0.0
26	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
27	4	0	0.0	1	0	0.0	7	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
28	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
29	3	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
30	4	0	0.0	1	0	0.0	8	0	0.1	2	0	0.0	8	0	0.1	3	0	0.0
31	19	0	0.2	6	0	0.1	24	0	0.3	7	0	0.1	30	0	0.4	10	0	0.1
32	10	0	0.1	3	0	0.0	15	0	0.2	5	0	0.0	18	0	0.2	6	0	0.1
33	35	0	0.4	11	0	0.1	43	0	0.6	14	0	0.2	44	0	0.6	14	0	0.2
34	6	0	0.1	2	0	0.0	8	0	0.1	2	0	0.0	9	0	0.1	3	0	0.0
35	8	0	0.1	2	0	0.0	10	0	0.1	3	0	0.0	10	0	0.1	3	0	0.0
36	8	0	0.1	2	0	0.0	12	0	0.1	4	0	0.0	12	0	0.1	4	0	0.0
37	3	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0
38	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
39	2	0	0.0	1	0	0.0	5	0	0.0	1	0	0.0	5	0	0.1	2	0	0.0
40	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
41	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
42	3	0	0.0	1	0	0.0	5	0	0.1	1	0	0.0	5	0	0.1	1	0	0.0
43	3	0	0.0	1	0	0.0	7	0	0.1	2	0	0.0	8	0	0.1	2	0	0.0
44	n	0	0.0	n	0	0.0	4	0	0.0	1	0	0.0	5	0	0.1	1	0	0.0
45	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
47	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
48	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
50	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
52	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
56	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
57	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
58	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
60	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
61	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
67	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
68	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
69	2	0	0.0	1	0	0.0	5	0	0.1	2	0	0.0	5	0	0.1	2	0	0.0
70	9	0	0.1	3	0	0.0	17	0	0.2	6	0	0.1	19	0	0.2	7	0	0.1
71	9	0	0.1	3	0	0.0	21	0	0.2	8	0	0.1	25	0	0.3	9	0	0.1

te: 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 witnin 30 days are not shown

Table B-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 land or boundary segments over the expected production life of the lease area, proposed action plus tanker transportation. Probabilities calculated using Prudhoe Bay oilspill statistics.

Segment	Within 3 days						Within 10 days						Within 30 days					
	≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
1	5	0	0.1	2	0	0.0	21	0	0.2	9	0	0.1	25	0	0.3	11	0	0.1
2	n	0	0.0	n	0	0.0	4	0	0.0	1	0	0.0	5	0	0.1	2	0	0.0
3	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
4	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0
5	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	5	0	0.1	2	0	0.0
6	6	0	0.1	2	0	0.0	15	0	0.2	5	0	0.1	23	0	0.3	9	0	0.1
7	8	0	0.1	2	0	0.0	19	0	0.2	7	0	0.1	28	0	0.3	11	0	0.1
8	10	0	0.1	3	0	0.0	29	0	0.3	11	0	0.1	38	0	0.5	15	0	0.2
9	8	0	0.1	2	0	0.0	21	0	0.2	7	0	0.1	26	0	0.3	10	0	0.1
10	1	0	0.0	n	0	0.0	4	0	0.0	1	0	0.0	7	0	0.1	3	0	0.0
11	2	0	0.0	n	0	0.0	10	0	0.1	4	0	0.0	14	0	0.1	5	0	0.1
12	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
13	14	0	0.1	4	0	0.0	27	0	0.3	9	0	0.1	33	0	0.4	11	0	0.1
14	7	0	0.1	2	0	0.0	13	0	0.1	4	0	0.0	14	0	0.2	4	0	0.0
15	7	0	0.1	2	0	0.0	11	0	0.1	3	0	0.0	13	0	0.1	4	0	0.0
16	3	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0	8	0	0.1	2	0	0.0
17	14	0	0.2	4	0	0.0	19	0	0.2	6	0	0.1	21	0	0.2	6	0	0.1
18	16	0	0.2	4	0	0.0	20	0	0.2	6	0	0.1	22	0	0.3	7	0	0.1
19	8	0	0.1	2	0	0.0	11	0	0.1	3	0	0.0	15	0	0.2	5	0	0.0
20	15	0	0.2	4	0	0.0	21	0	0.2	6	0	0.1	24	0	0.3	8	0	0.1
21	5	0	0.1	1	0	0.0	7	0	0.1	2	0	0.0	10	0	0.1	3	0	0.0
22	6	0	0.1	1	0	0.0	14	0	0.2	4	0	0.0	15	0	0.2	5	0	0.1
23	1	0	0.0	n	0	0.0	8	0	0.1	3	0	0.0	10	0	0.1	4	0	0.0
24	1	0	0.0	n	0	0.0	4	0	0.0	2	0	0.0	5	0	0.1	3	0	0.0
25	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0
26	1	0	0.0	n	0	0.0	4	0	0.0	2	0	0.0	4	0	0.0	2	0	0.0
27	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
28	n	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	2	0	0.0
29	3	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
30	4	0	0.0	1	0	0.0	7	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
31	16	0	0.2	5	0	0.0	21	0	0.2	7	0	0.1	26	0	0.3	9	0	0.1
32	8	0	0.1	2	0	0.0	12	0	0.1	4	0	0.0	15	0	0.2	5	0	0.1
33	29	0	0.3	8	0	0.1	35	0	0.4	11	0	0.1	36	0	0.4	12	0	0.1
34	5	0	0.1	1	0	0.0	6	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
35	6	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
36	4	0	0.0	2	0	0.0	8	0	0.1	4	0	0.0	8	0	0.1	3	0	0.0
37	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	2	0	0.0
38	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0
39	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
40	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
41	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
42	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
43	7	0	0.1	5	0	0.0	12	0	0.1	6	0	0.1	13	0	0.1	7	0	0.1
44	2	0	0.0	1	0	0.0	5	0	0.1	3	0	0.0	7	0	0.1	3	0	0.0
45	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0
47	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
48	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
50	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
52	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
53	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
54	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
55	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
56	1	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
57	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
58	1	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
59	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
60	1	0	0.0	1	0	0.0	3	0	0.0	2	0	0.0	3	0	0.0	2	0	0.0
61	1	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	2	0	0.0
62	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0
63	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0
65	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
67	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0
68	5	0	0.1	3	0	0.0	6	0	0.1	3	0	0.0	6	0	0.1	4	0	0.0
69	13	0	0.1	8	0	0.1	21	0	0.2	12	0	0.1	22	0	0.3	13	0	0.1
70	14	0	0.2	6	0	0.1	26	0	0.3	13	0	0.1	30	0	0.4	15	0	0.2
71	9	0	0.1	3	0	0.0	26	0	0.3	11	0	0.1	32	0	0.4	14	0	0.2

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 B-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 land or boundary segments over the expected production life of the lease area, proposed action plus existing Federal and State leases and tanker transportation. Probabilities calculated using Prudhoe Bay oilspill statistics.

Segment	Within 3 days						Within 10 days						Within 30 days					
	≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.			≥ 1,000 bbls.			≥ 10,000 bbls.		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
1	5	0	0.1	2	0	0.0	22	0	0.2	9	0	0.1	26	0	0.3	11	0	0.1
2	n	0	0.0	n	0	0.0	4	0	0.0	1	0	0.0	5	0	0.1	2	0	0.0
3	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
4	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0
5	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	5	0	0.1	2	0	0.0
6	6	0	0.1	2	0	0.0	15	0	0.2	6	0	0.1	24	0	0.3	9	0	0.1
7	9	0	0.1	2	0	0.0	21	0	0.2	7	0	0.1	29	0	0.3	11	0	0.1
8	10	0	0.1	3	0	0.0	30	0	0.4	11	0	0.1	40	0	0.5	16	0	0.2
9	8	0	0.1	2	0	0.0	21	0	0.2	7	0	0.1	27	0	0.3	10	0	0.1
10	1	0	0.0	n	0	0.0	4	0	0.0	1	0	0.0	7	0	0.1	3	0	0.0
11	2	0	0.0	n	0	0.0	10	0	0.1	4	0	0.0	14	0	0.1	5	0	0.1
12	1	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
13	14	0	0.1	4	0	0.0	27	0	0.3	9	0	0.1	33	0	0.4	12	0	0.1
14	7	0	0.1	2	0	0.0	14	0	0.2	4	0	0.0	15	0	0.2	5	0	0.0
15	7	0	0.1	2	0	0.0	11	0	0.1	3	0	0.0	13	0	0.1	4	0	0.0
16	3	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0	8	0	0.1	2	0	0.0
17	14	0	0.2	4	0	0.0	20	0	0.2	6	0	0.1	23	0	0.3	7	0	0.1
18	17	0	0.2	5	0	0.0	21	0	0.2	6	0	0.1	23	0	0.3	7	0	0.1
19	9	0	0.1	2	0	0.0	11	0	0.1	3	0	0.0	16	0	0.2	5	0	0.1
20	19	0	0.2	5	0	0.1	25	0	0.3	8	0	0.1	30	0	0.4	10	0	0.1
21	6	0	0.1	2	0	0.0	9	0	0.1	3	0	0.0	12	0	0.1	4	0	0.0
22	13	0	0.1	4	0	0.0	26	0	0.3	8	0	0.1	29	0	0.3	10	0	0.1
23	15	0	0.2	5	0	0.0	27	0	0.3	9	0	0.1	30	0	0.4	11	0	0.1
24	10	0	0.1	3	0	0.0	17	0	0.2	6	0	0.1	19	0	0.2	7	0	0.1
25	1	0	0.0	n	0	0.0	5	0	0.1	2	0	0.0	6	0	0.1	2	0	0.0
26	1	0	0.0	n	0	0.0	5	0	0.1	3	0	0.0	7	0	0.1	3	0	0.0
27	4	0	0.0	1	0	0.0	7	0	0.1	2	0	0.0	8	0	0.1	3	0	0.0
28	1	0	0.0	n	0	0.0	5	0	0.1	2	0	0.0	6	0	0.1	3	0	0.0
29	3	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
30	4	0	0.0	1	0	0.0	8	0	0.1	3	0	0.0	9	0	0.1	3	0	0.0
31	19	0	0.2	6	0	0.1	25	0	0.3	8	0	0.1	32	0	0.4	11	0	0.1
32	10	0	0.1	3	0	0.0	16	0	0.2	5	0	0.1	20	0	0.2	7	0	0.1
33	35	0	0.4	11	0	0.1	44	0	0.6	15	0	0.2	45	0	0.6	16	0	0.2
34	6	0	0.1	2	0	0.0	9	0	0.1	3	0	0.0	10	0	0.1	3	0	0.0
35	8	0	0.1	3	0	0.0	10	0	0.1	3	0	0.0	12	0	0.1	4	0	0.0
36	10	0	0.1	4	0	0.0	17	0	0.2	7	0	0.1	19	0	0.2	8	0	0.1
37	3	0	0.0	1	0	0.0	5	0	0.1	2	0	0.0	5	0	0.1	2	0	0.0
38	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
39	3	0	0.0	1	0	0.0	5	0	0.1	2	0	0.0	7	0	0.1	2	0	0.0
40	2	0	0.0	1	0	0.0	4	0	0.0	1	0	0.0	4	0	0.0	2	0	0.0
41	1	0	0.0	n	0	0.0	3	0	0.0	1	0	0.0	4	0	0.0	2	0	0.0
42	3	0	0.0	1	0	0.0	5	0	0.1	2	0	0.0	5	0	0.1	2	0	0.0
43	10	0	0.1	5	0	0.1	15	0	0.2	8	0	0.1	17	0	0.2	8	0	0.1
44	2	0	0.0	1	0	0.0	7	0	0.1	3	0	0.0	8	0	0.1	4	0	0.0
45	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0
46	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
47	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
48	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0
50	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
52	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
53	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
54	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
55	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
56	1	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
57	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
58	1	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
59	n	0	0.0	n	0	0.0	2	0	0.0	1	0	0.0	2	0	0.0	1	0	0.0
60	1	0	0.0	1	0	0.0	3	0	0.0	2	0	0.0	3	0	0.0	2	0	0.0
61	1	0	0.0	1	0	0.0	3	0	0.0	1	0	0.0	3	0	0.0	2	0	0.0
62	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0
63	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0
65	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0
67	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0
68	5	0	0.1	3	0	0.0	6	0	0.1	3	0	0.0	6	0	0.1	4	0	0.0
69	13	0	0.1	3	0	0.1	21	0	0.2	12	0	0.1	22	0	0.3	13	0	0.1
70	14	0	0.2	5	0	0.1	26	0	0.3	13	0	0.1	30	0	0.4	15	0	0.2
71	9	0	0.1	3	0	0.0	26	0	0.3	11	0	0.1	32	0	0.4	14	0	0.2

e: 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

Appendix C

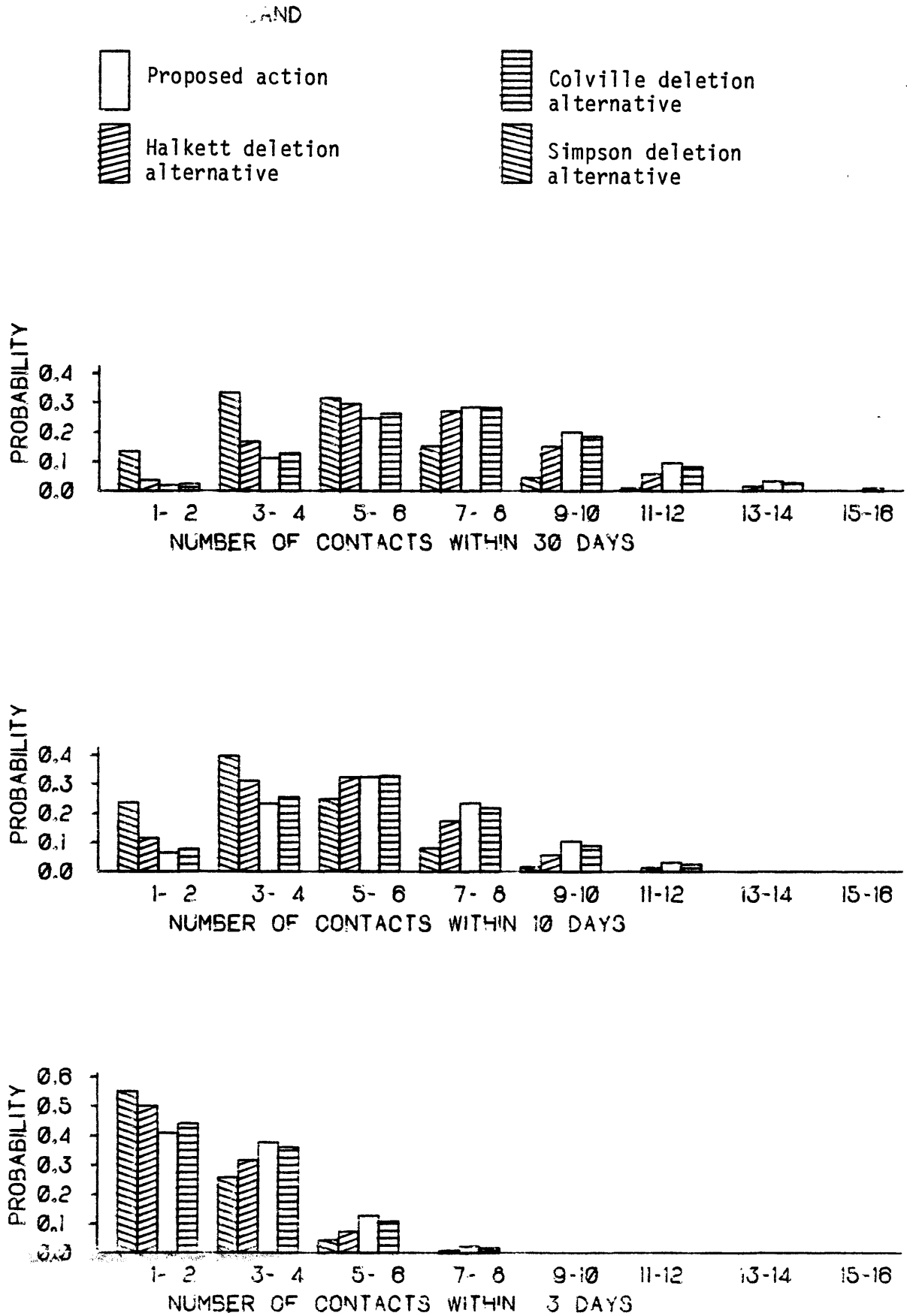

Figure C-1.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting land as a result of (1) the proposed action, (2) Halkett deletion alternative, (3) Colville deletion alternative, and (4) Simpson deletion alternative.

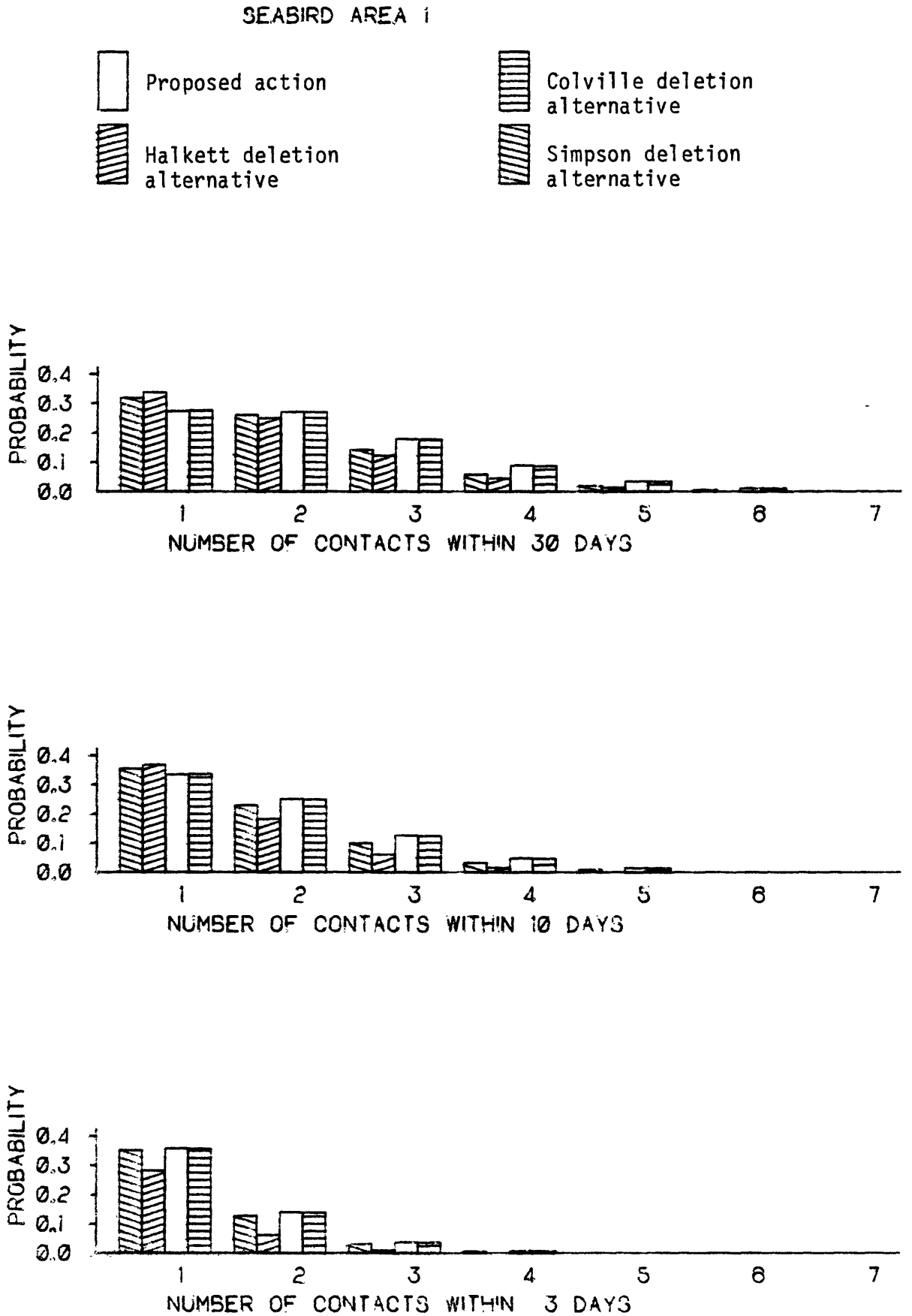

Figure C-2.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting seabird area 1 as a result of (1) the proposed action, (2) Halkett deletion alternative, (3) Colville deletion alternative, and (4) Simpson deletion alternative.

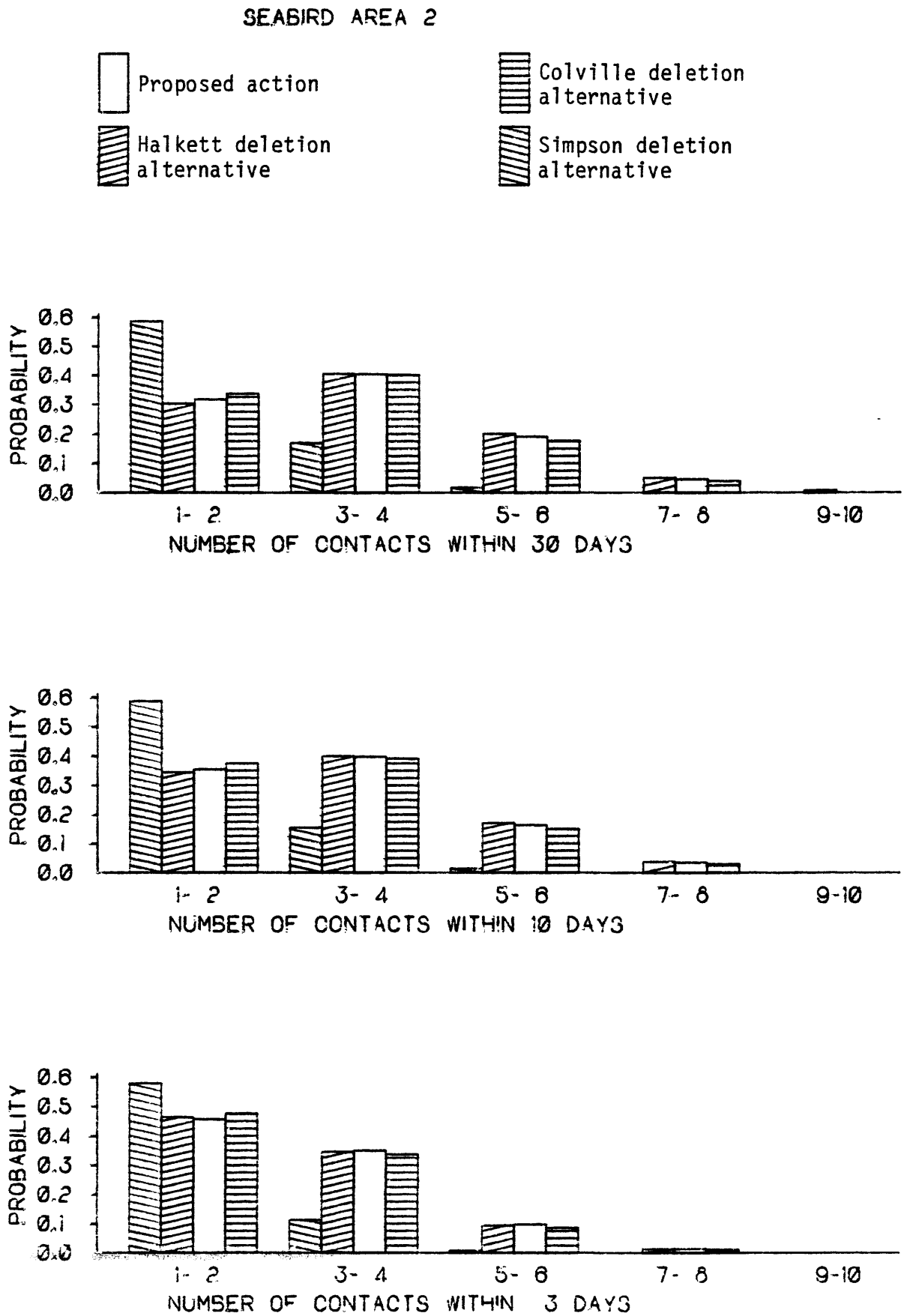

Figure C-3.--Histograms showing the probabilities of specific number of oilspills (1,000 barrels and greater) occurring and contacting seabird area 2 as a result of (1) the proposed action, (2) Halkett deletion alternative, (3) Colville deletion alternative, and (4) Simpson deletion alternative.

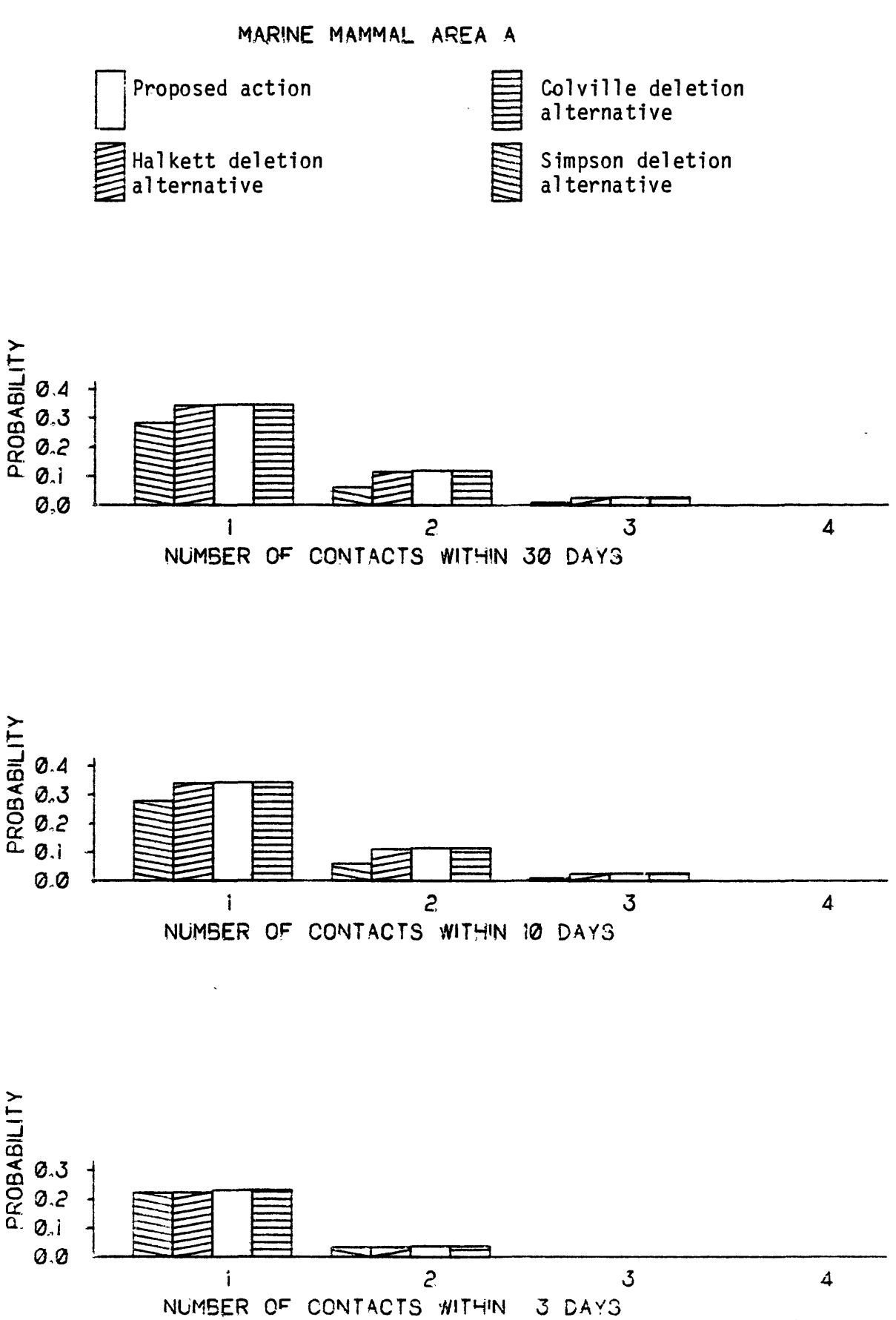

Figure C-4.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting marine mammal area A as a result of (1) the proposed action, (2) Halkett deletion alternative, (3) Colville deletion alternative, and (4) Simpson deletion alternative.

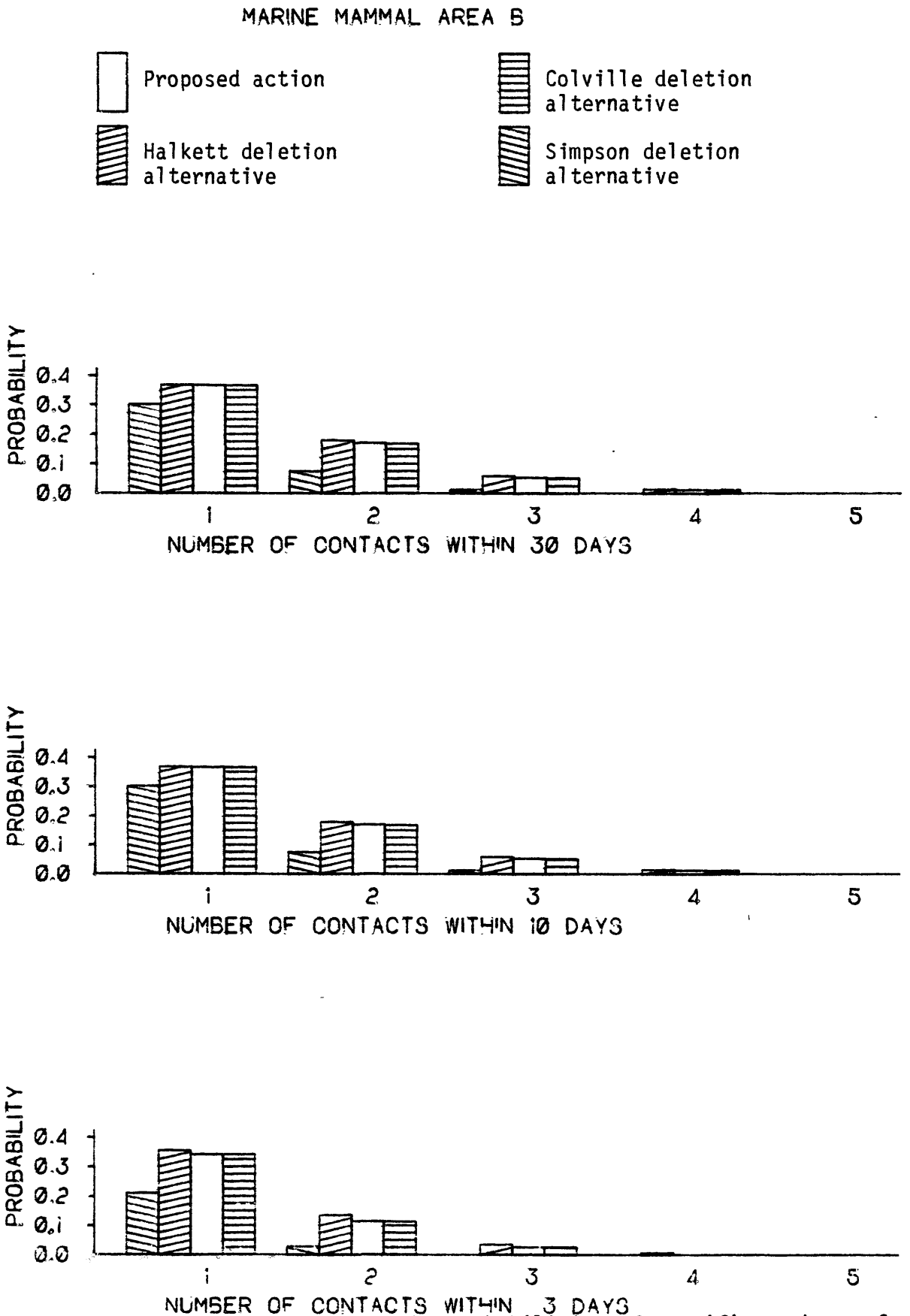

Figure C-5.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting marine mammal area B as a result of (1) the proposed action, (2) Halkett deletion alternative, (3) Colville deletion alternative, and (4) Simpson deletion alternative.

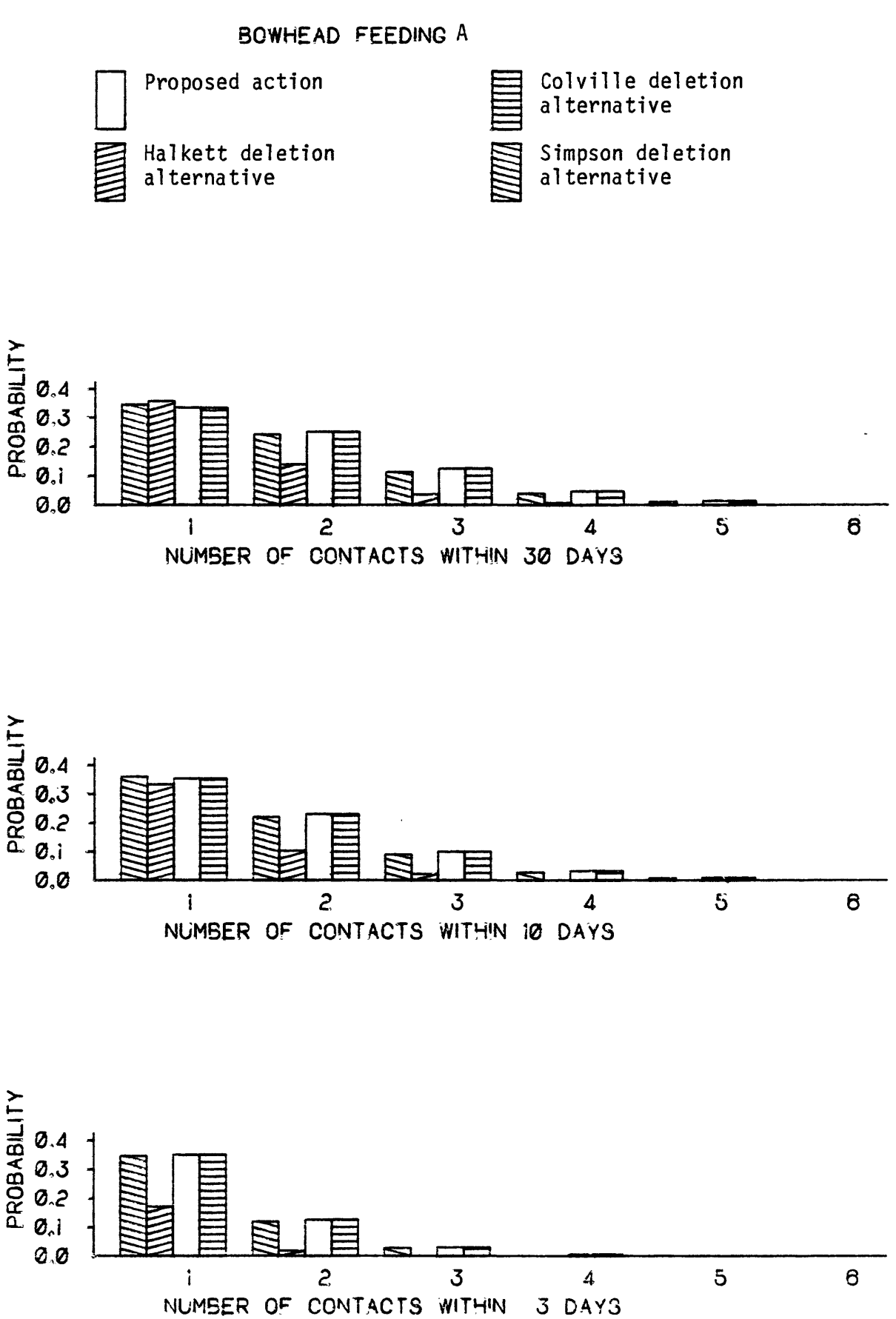

Figure C-6.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting Bowhead whale feeding area A as a result of (1) the proposed action, (2) Halkett deletion alternative, (3) Colville deletion alternative, and (4) Simpson deletion alternative.

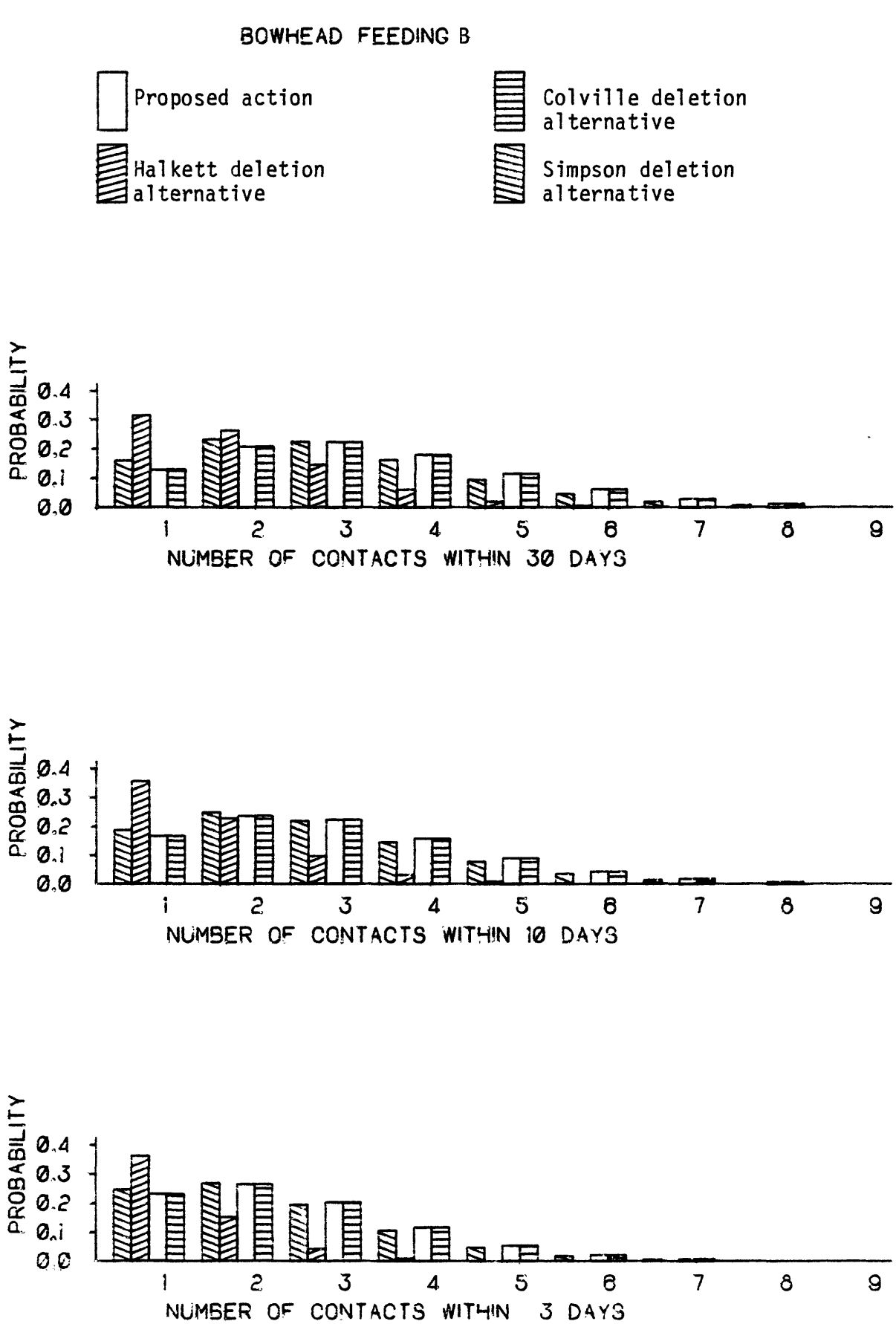

Figure C-7.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting Bowhead whale feeding area B as a result of (1) the proposed action, (2) Halkett deletion alternative, (3) Colville deletion alternative, and (4) Simpson deletion alternative.

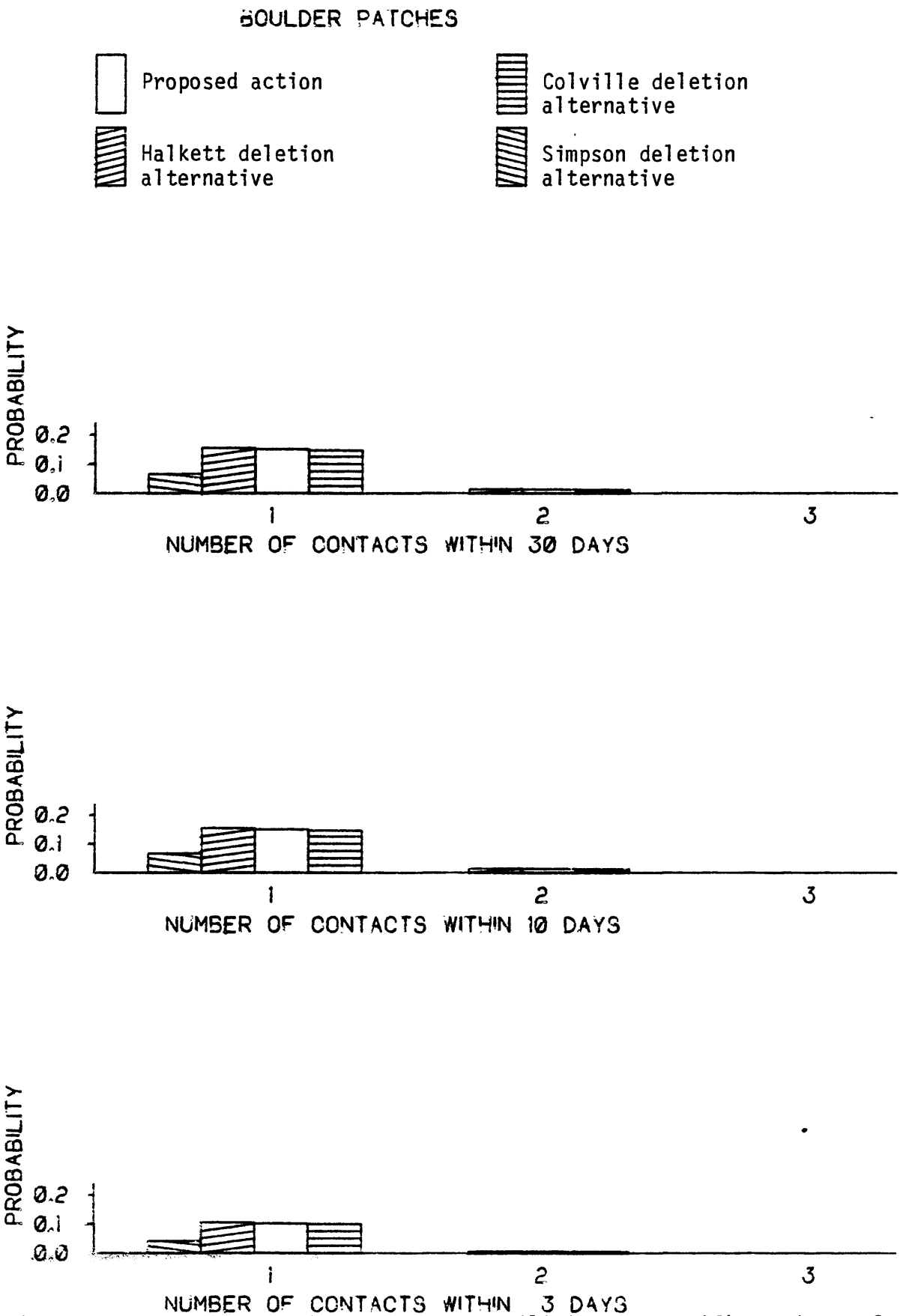

Figure C-8.--Histograms showing the probabilities of specific numbers of oilspills (1,000 barrels and greater) occurring and contacting boulder patches as a result of (1) the proposed action, (2) Halkett deletion alternative, (3) Colville deletion alternative, and (4) Simpson deletion alternative.

Appendix D

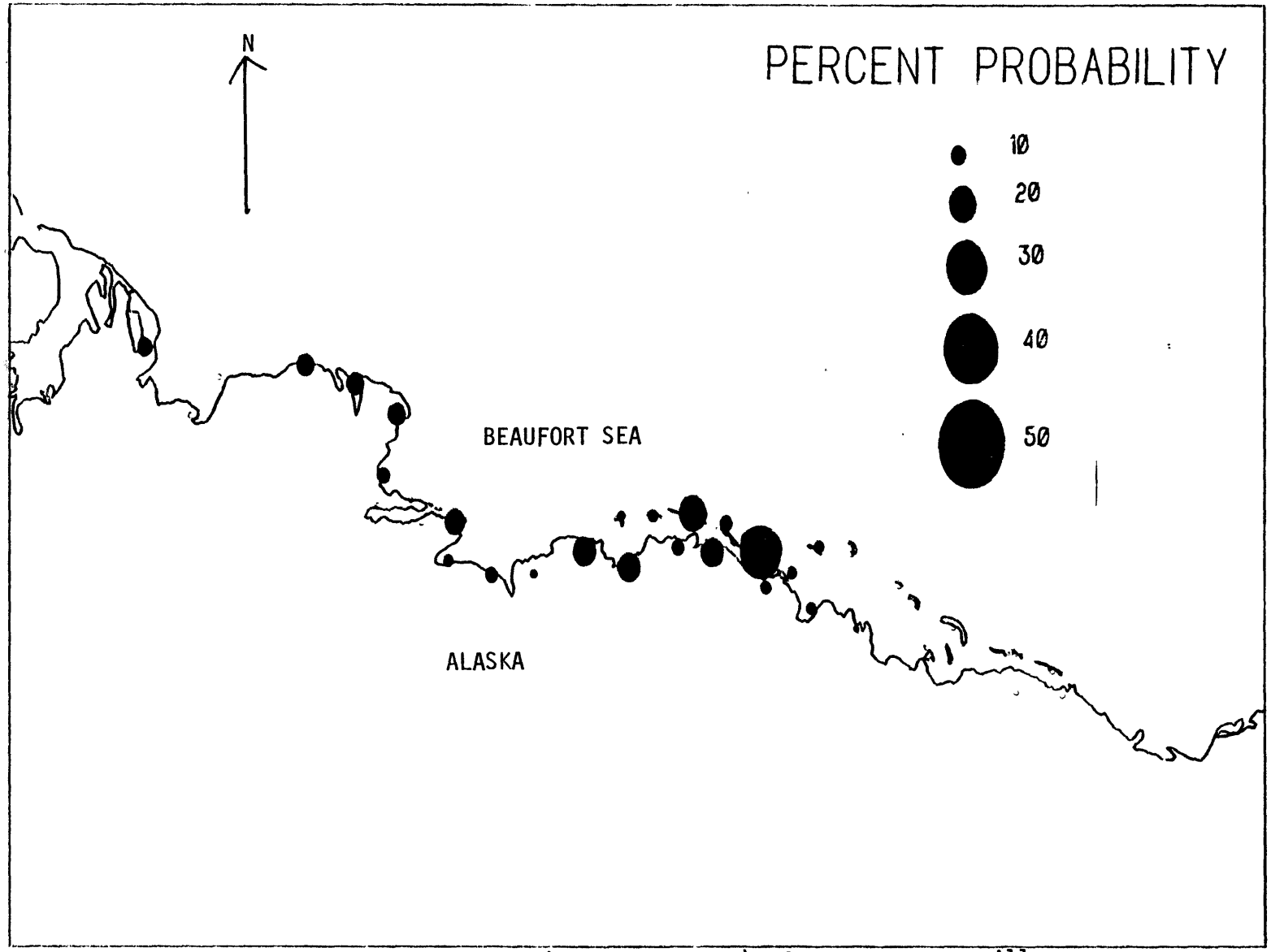

Figure D-1.--Map showing the probability (percent chance) of one or more spills (1,000 barrels and greater) occurring and contacting sections of the coastline within 3 days travel time, proposed action.

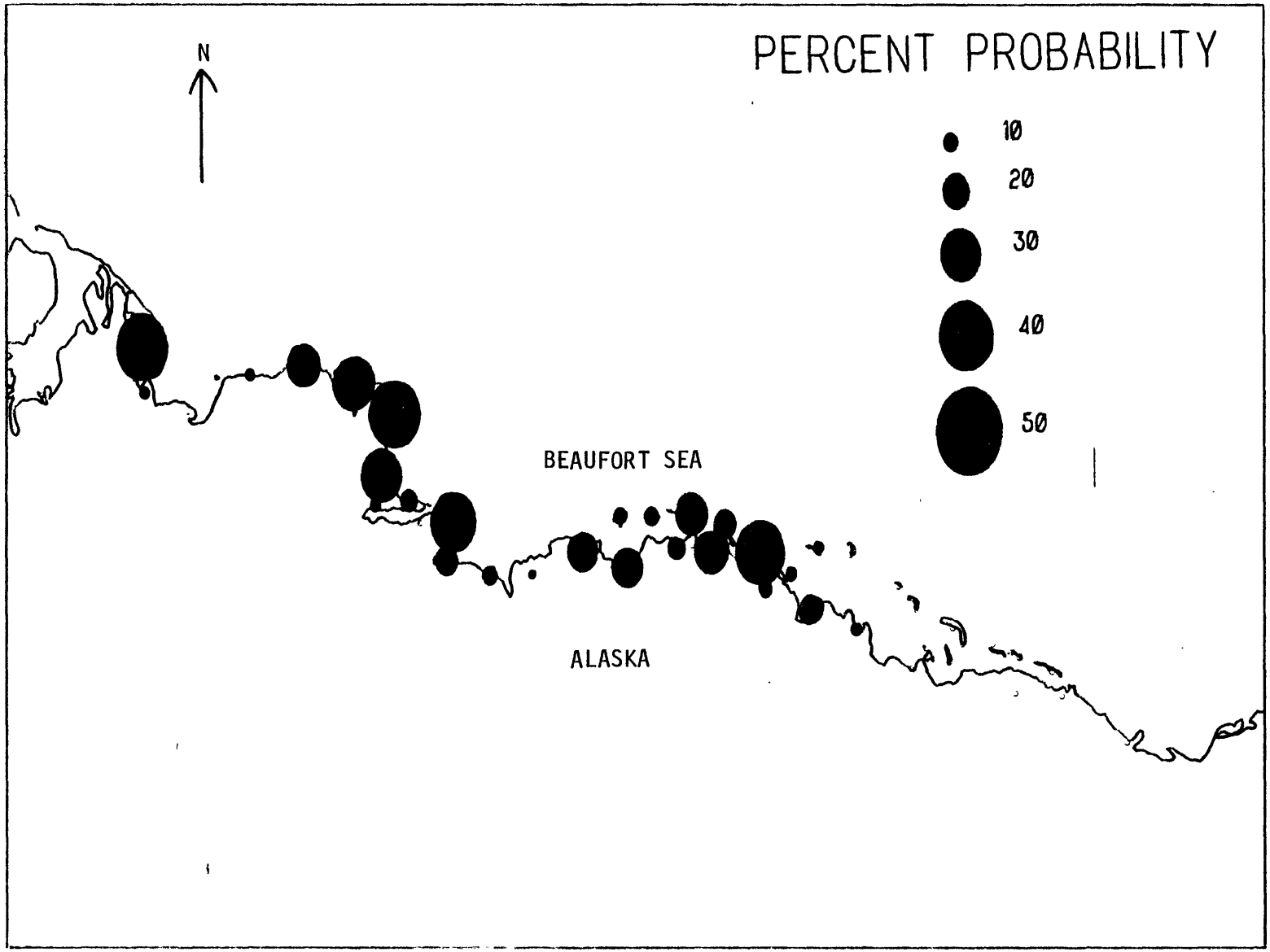

Figure D-2.--Map showing the probability (percent change) of one or more spills (1,000 barrels and greater) occurring and contacting sections of the coastline within 10 days travel time, proposed action.

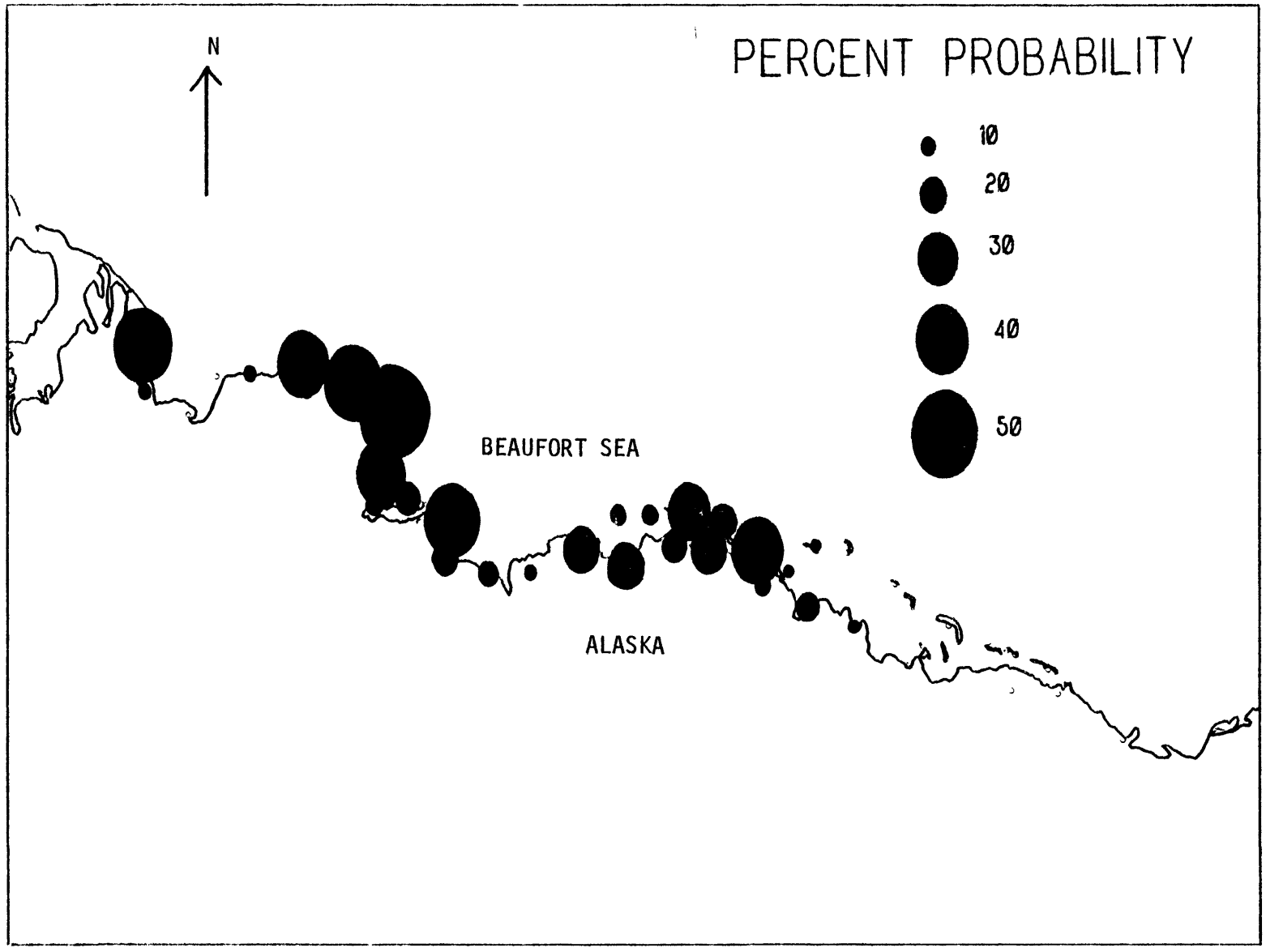

Figure D-3.--Map showing the probability (percent change) of one or more spills (1,000 barrels and greater) occurring and contacting sections of the coastline within 30 days travel time, proposed action.

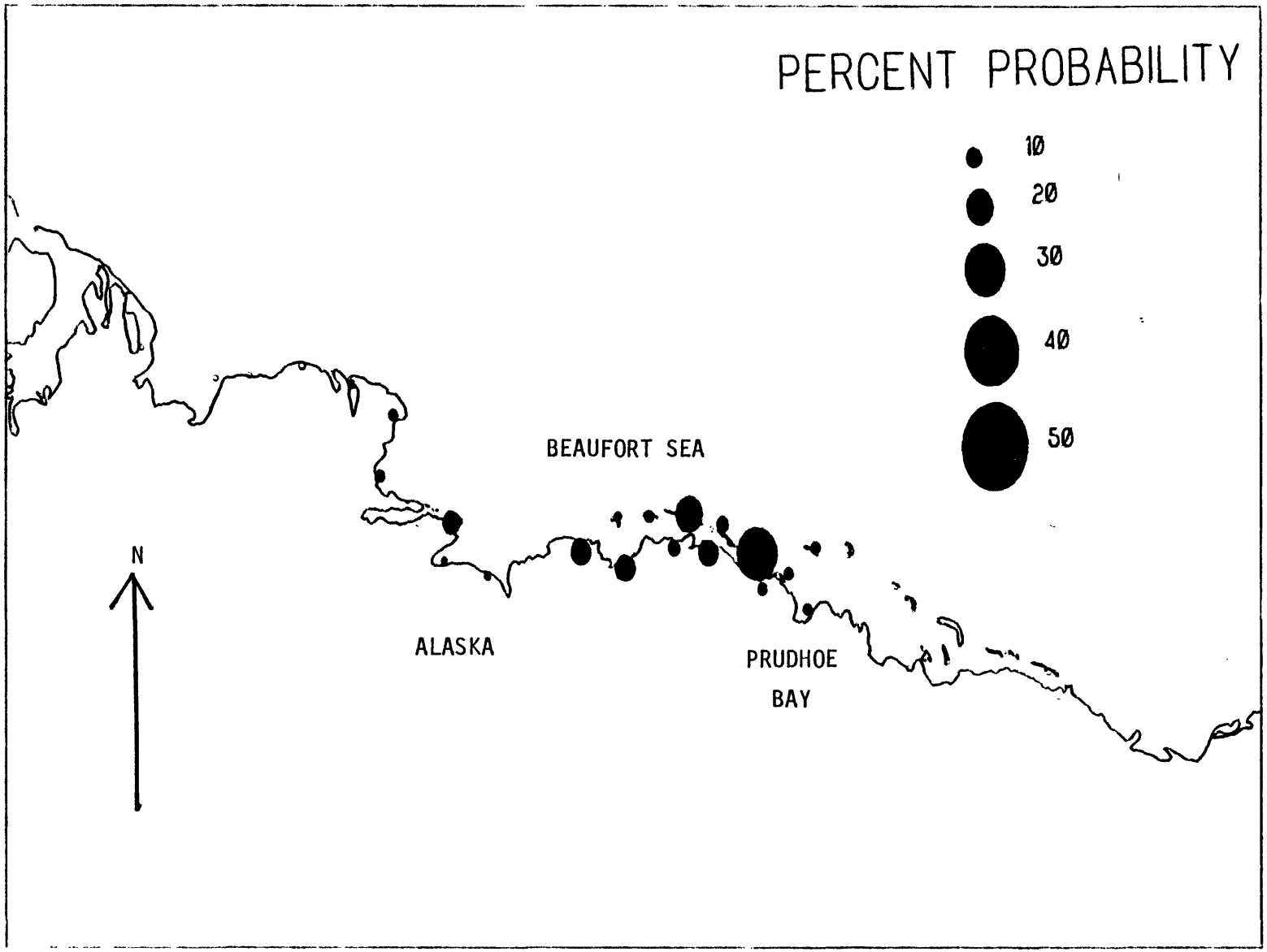

Figure D-4.--Map showing the probability (percent chance) of one or more spills (1,000 barrels and greater) occurring and contacting sections of the coastline within 3 days travel time, Halkett deletion alternative.

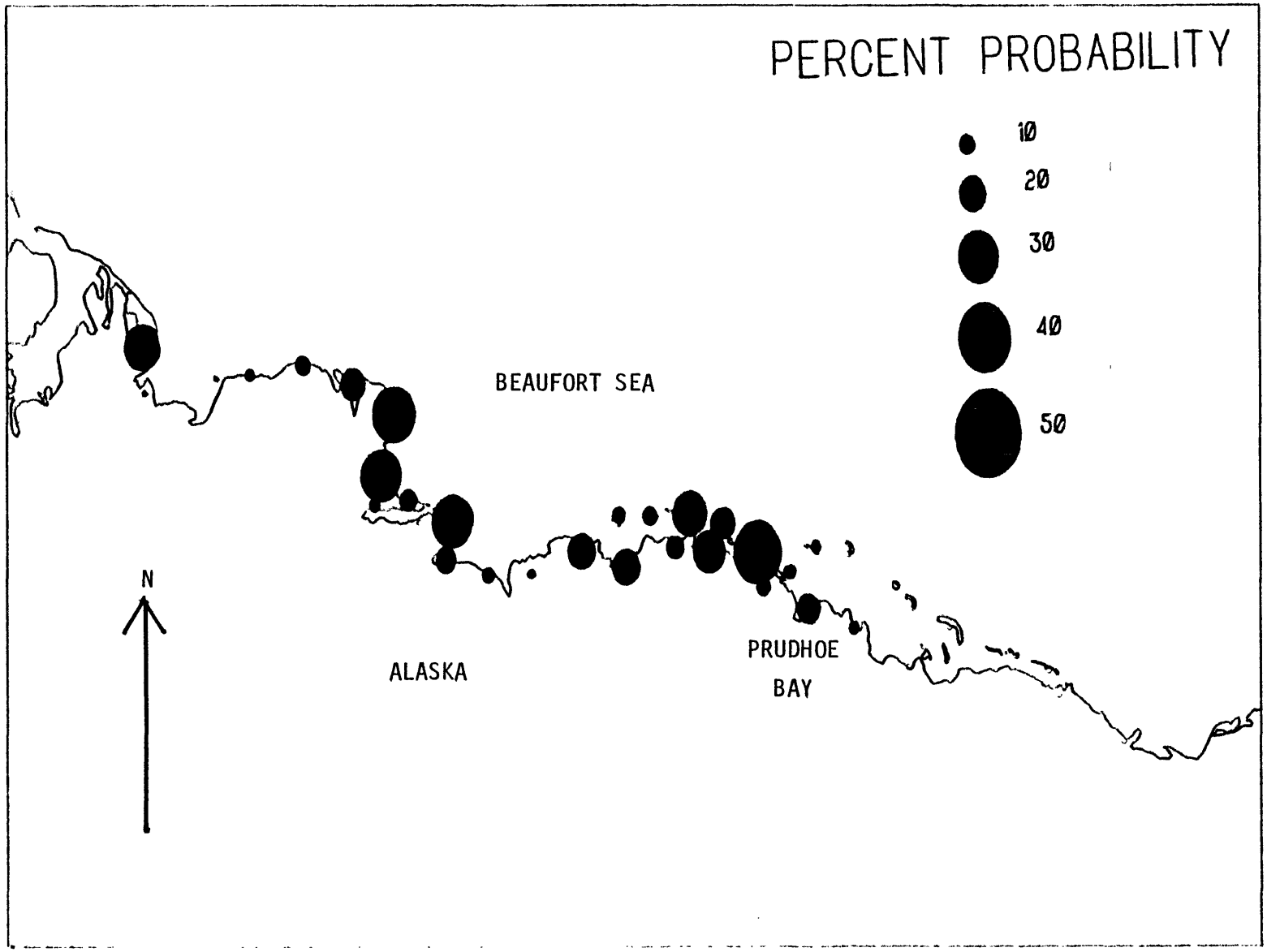

Figure D-5.--Map showing the probability (percent chance) of one or more spills (1,000 barrels and greater) occurring and contacting sections of the coastline within 10 days travel time, Halkett deletion alternative.

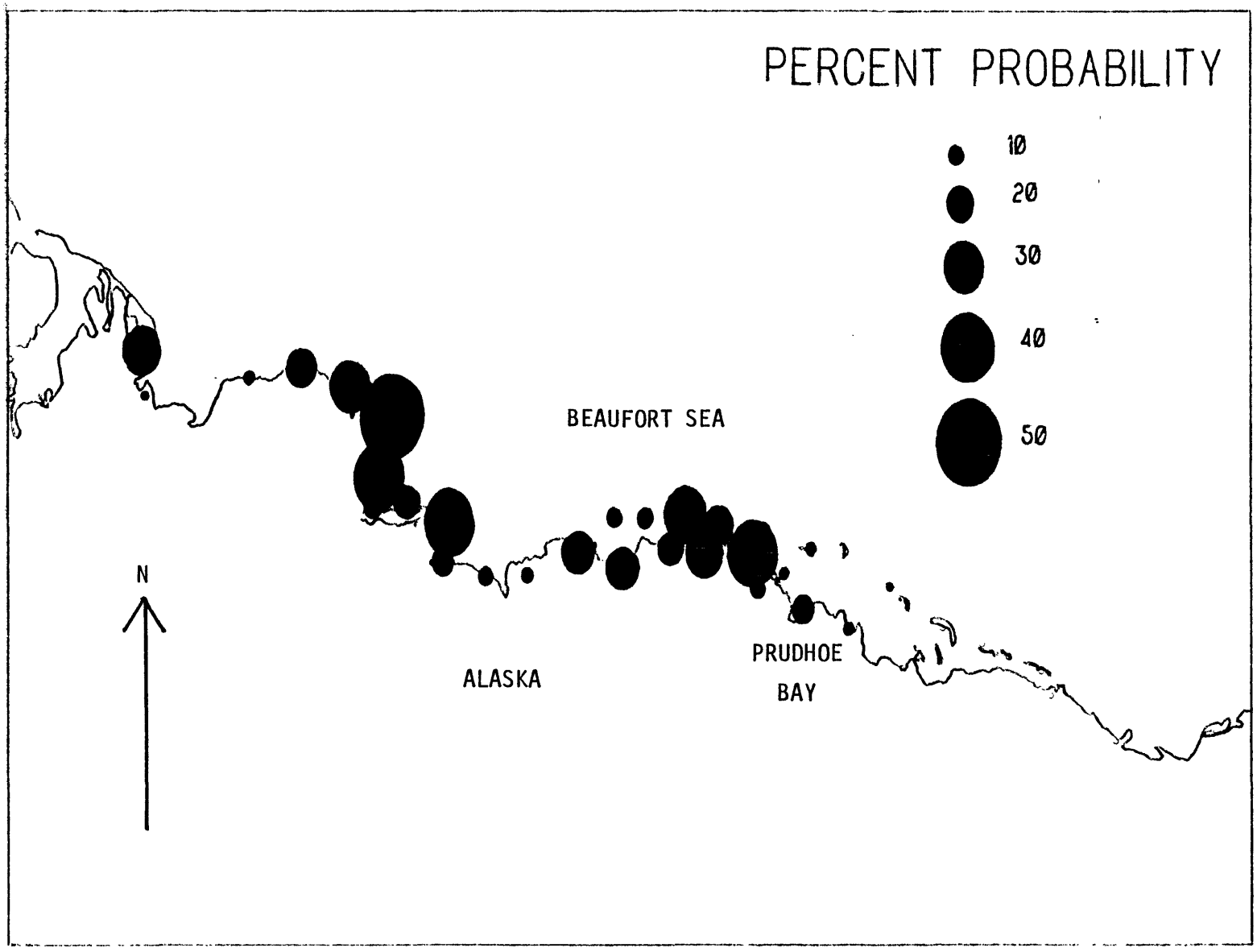

Figure D-6.--Map showing the probability (percent chance) of one or more spills (1,000 barrels and greater) occurring and contacting sections of the coastline within 30 days travel time, Halkett deletion alternative.

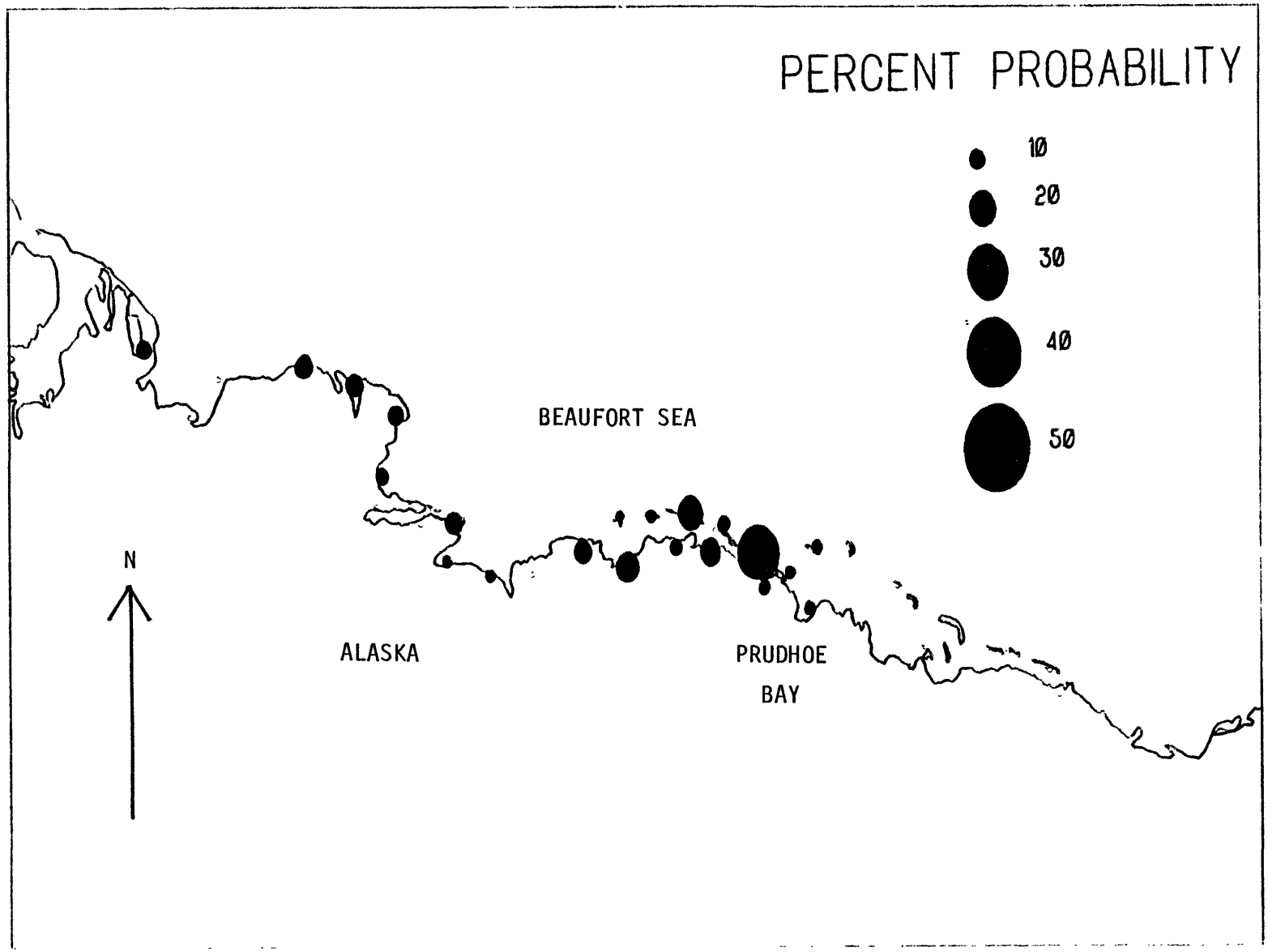

Figure D-7.--Map showing the probability (percent chance) of one or more spills (1,000 barrels and greater) occurring and contacting sections of the coastline within 3 days travel time, Colville deletion alternative.

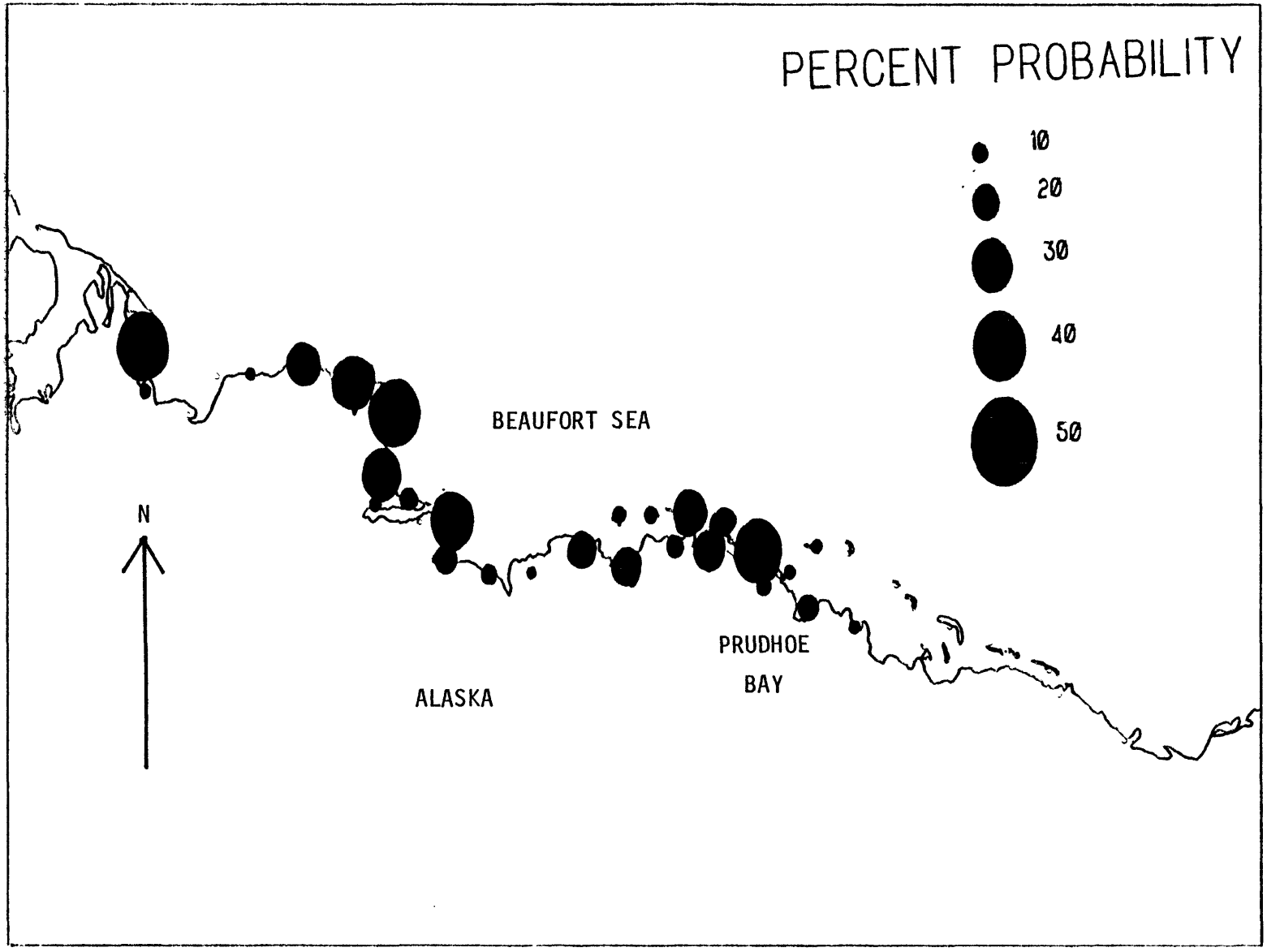

Figure D-8.--Map showing the probability (percent chance) of one or more spills (1,000 barrels and greater) occurring and contacting sections of the coastline within 10 days travel time, Colville deletion alternative.

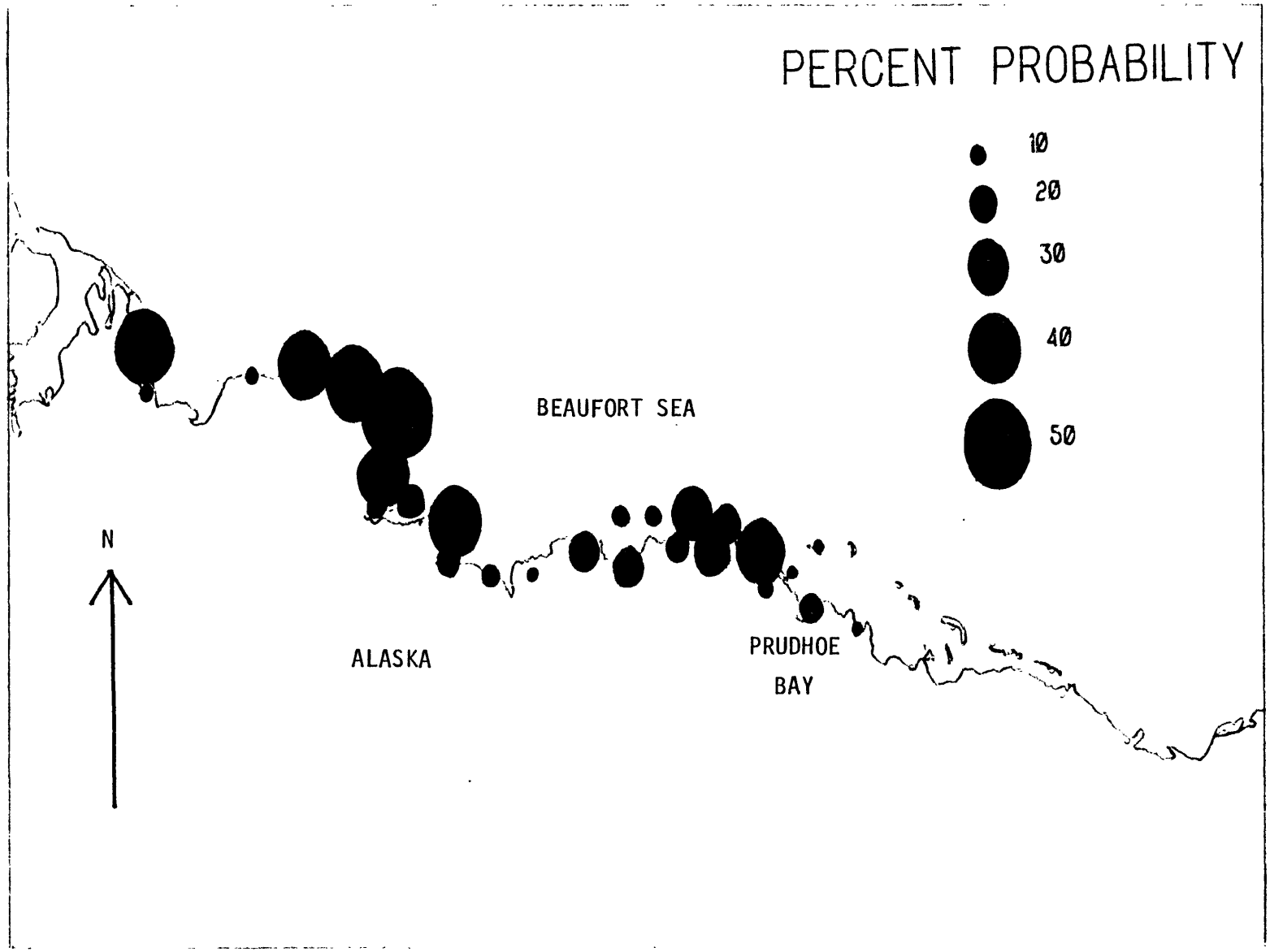

Figure D-9--Map showing the probability (percent chance) of one or more spills (1,000 barrels and greater) occurring and contacting sections of the coastline within 30 days travel time, Colville deletion alternative.

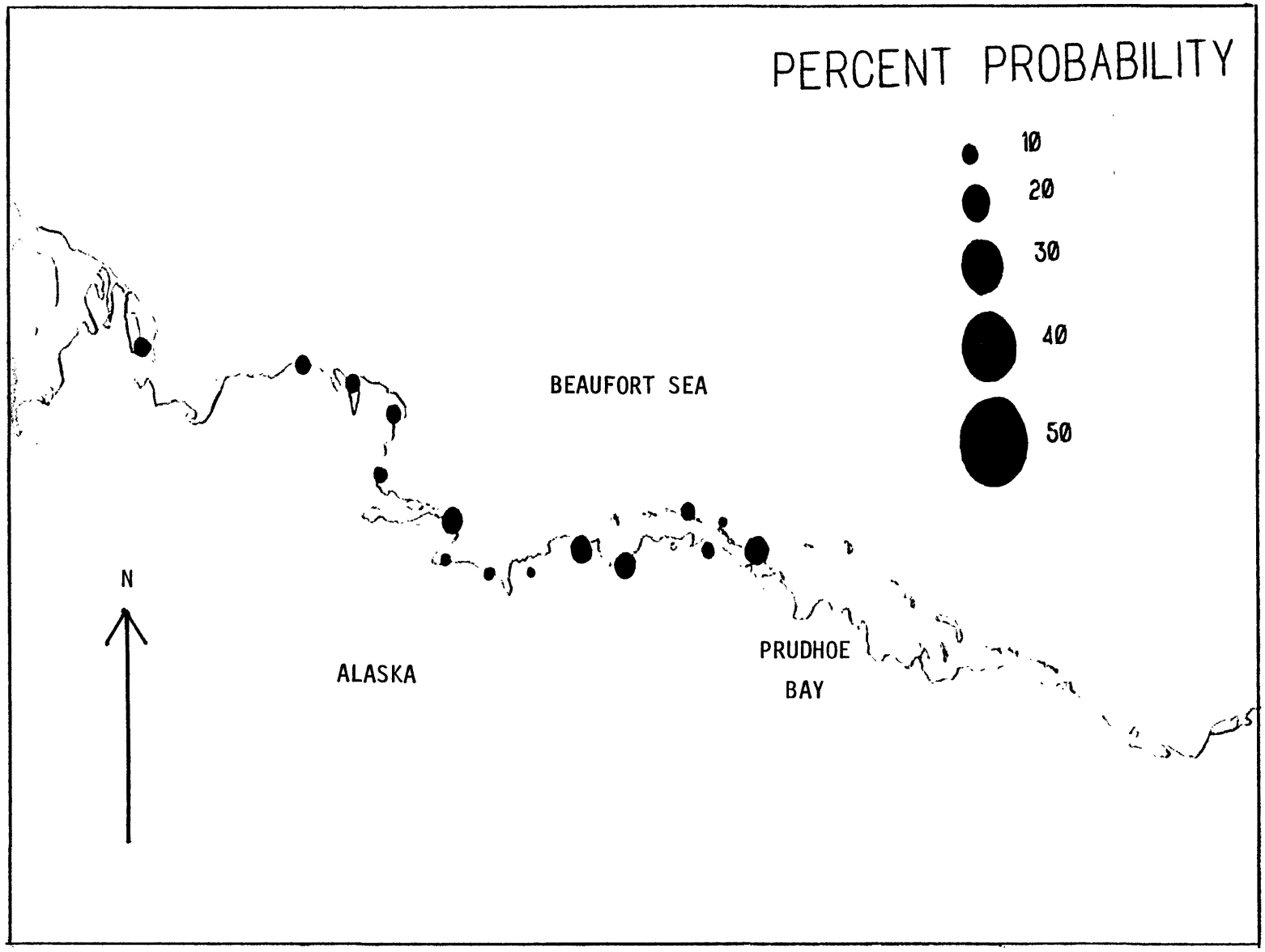

Figure D-10.--Map showing the probability (percent chance) of one or more spills (1,000 barrels and greater) occurring and contacting sections of the coastline within 3 days travel time, Simpson deletion alternative.

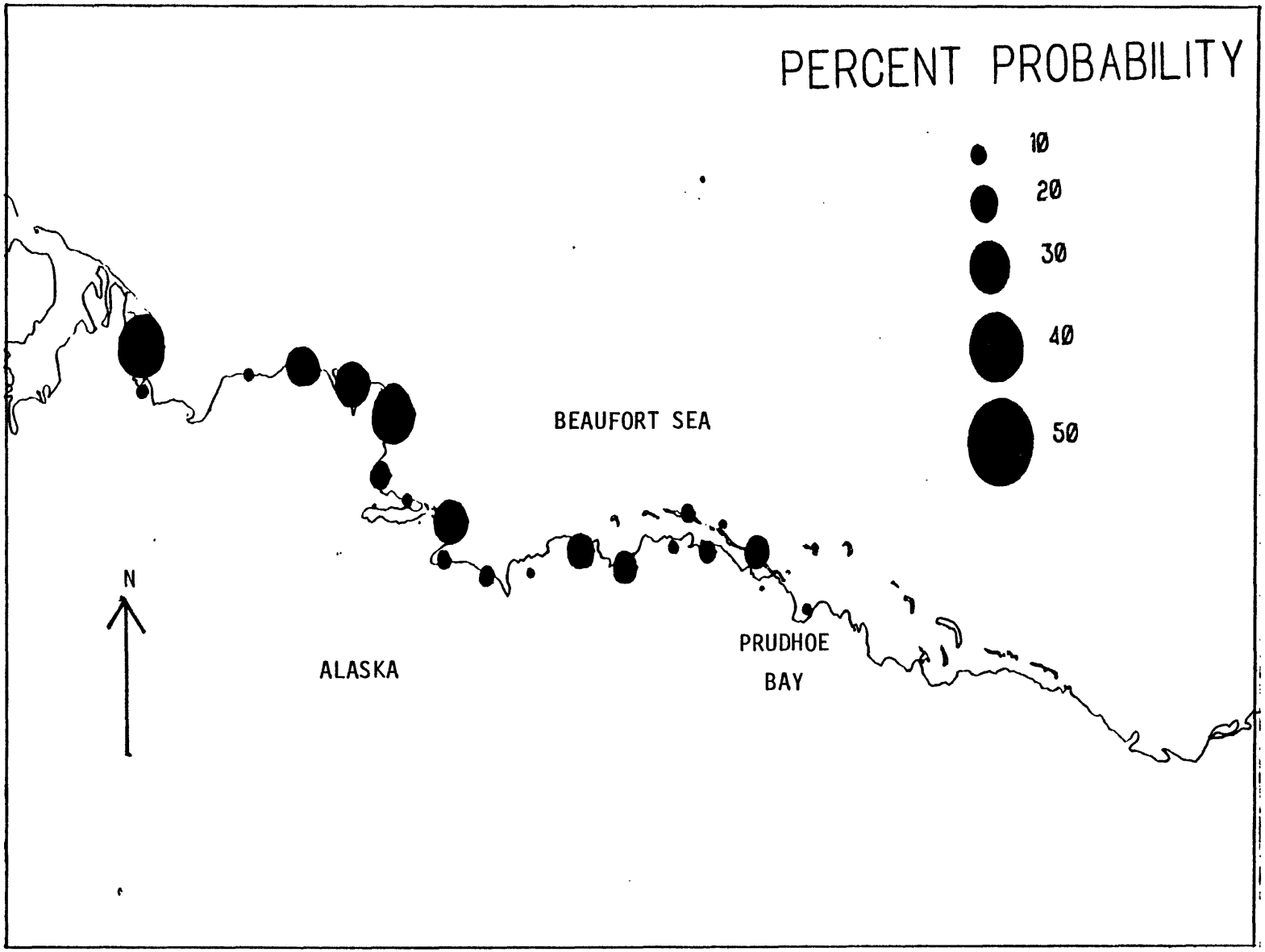

Figure D-11.--Map showing the probability (percent chance) of one or more spills (1,000 barrels and greater) occurring and contacting sections of the coastline within 10 days travel time, Simpson deletion alternative.

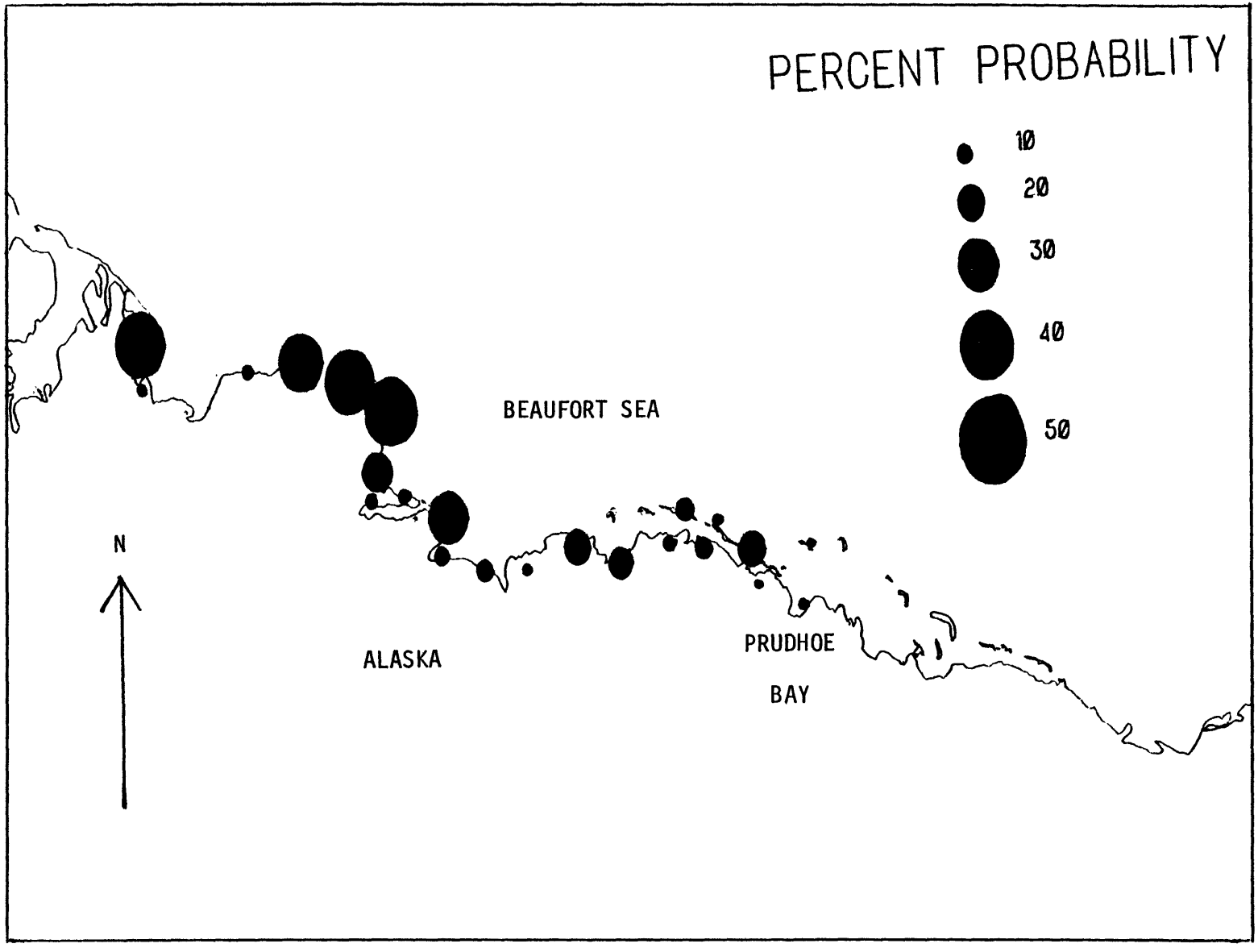

Figure D-12.--Map showing the probability (percent chance) of one or more spills (1,000 barrels and greater) occurring and contacting sections of the coastline within 30 days travel time, Simpson deletion alternative.