AN OILSPILL RISK ANALYSIS FOR THE SOUTHERN CALIFORNIA (PROPOSED SALE 48) OUTER CONTINENTAL SHELF LEASE AREA

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ABSTRACT

An oilspill risk analysis was conducted to determine the relative environmental hazards of developing oil in different regions of the Southern California Outer Continental Shelf lease area. The study analyzed the probability of spill occurrences, likely paths of the spilled oil, and locations in space and time of such objects as recreational and biological resources likely to be vulnerable. These results combined to yield estimates of the overall oilspill risks associated with development of the proposed lease area. The analysis implicitly includes estimates of weathering rates and slick dispersion and an indication of the possible mitigating effects of cleanups. The leasing of the tracts proposed for Sale 48 will increase the expected number of spills by about 50-55% over the number expected from the existing Federal leases. The probability that an object, such as land, will be contacted by a spill is increased by less than 17 percentage points; however, this increase varies greatly for the different objects.

INTRODUCTION

The Federal Government has proposed to offer about 1,142,000 acres of Outer Continental Shelf (OCS) lands off the Southern California coast (figure 1A) for oil and gas leasing. If there is an economically recoverable amount of petroleum to be found in the area, estimated recoverable petroleum resources for the proposed 217 tracts are on the order of 700 million barrels of crude oil. Contingent upon actual discovery of this quantity of oil, production is expected to span a period of about 22 years. There are 121 existing Federal leases in this area which, it is estimated, will yield on the order of 1300 million barrels of oil.

Oilspills are one of the major concerns associated with offshore oil production in the Southern California area. An important fact that

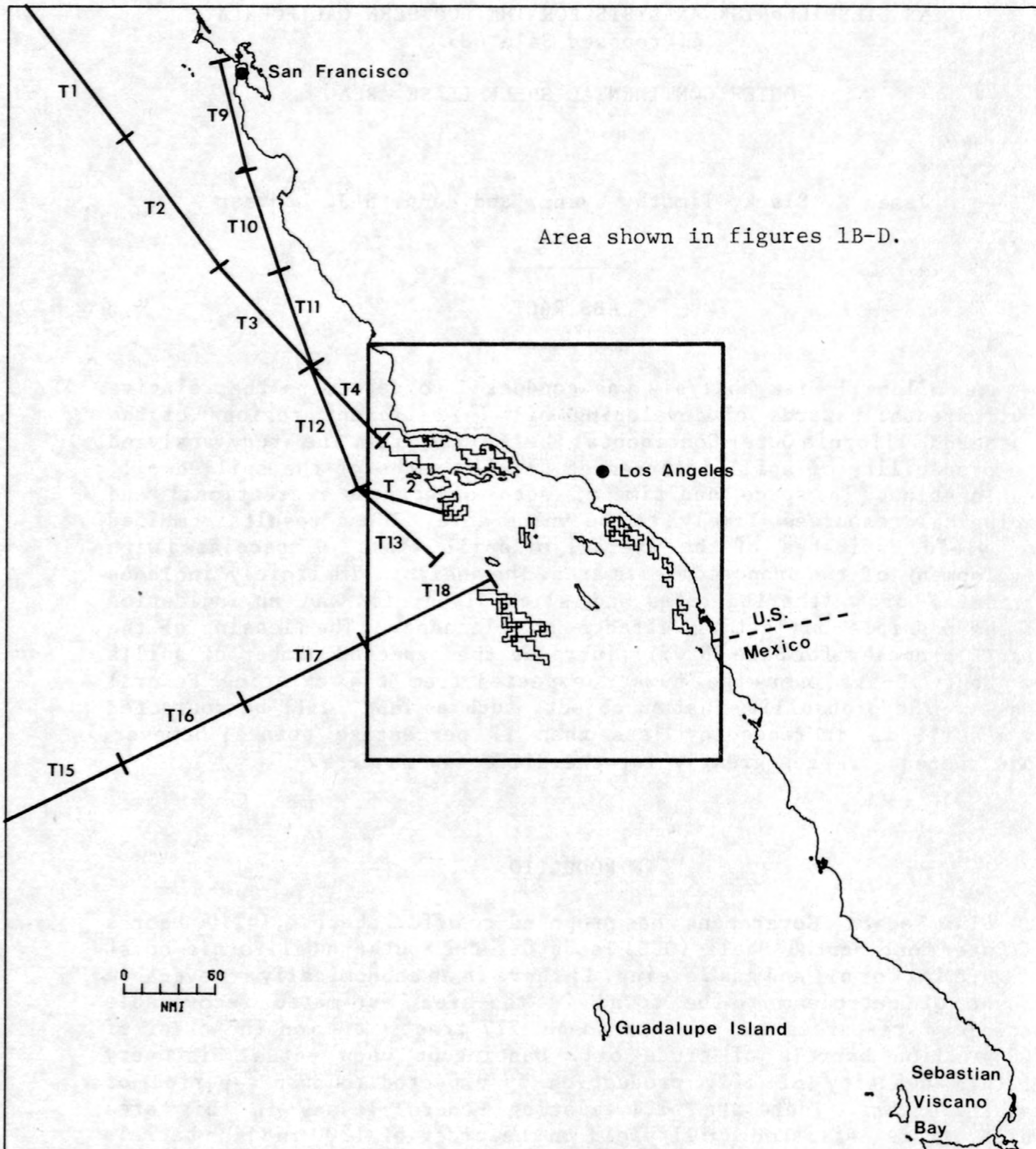

Figure 1-A.--Map showing the study area and the location of the long-distance transportation route segments.

stands out when one attempts to evaluate the significance of accidental oil spillage for this, or any proposed lease area, is that the problem is fundamentally probabilistic. A great deal of uncertainty exists, for example, about the number and size of spills that might occur during the life of production, as well as the wind and current conditions that would exist and give direction to the oil slick at the specific times spills do occur. While 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.

In view of this inability to predict with certainty future oilspill effects, it is important to consider the range of possible effects that could accompany oil and gas production. It is equally important, however, in attempting to maintain perspective on the problem, to associate these potential effects with quantitative estimates of the probability of their occurrence.

This report summarizes results of an oilspill risk analysis conducted for the proposed Southern California (Sale 48) OCS lease sale. The study had the objective of determining relative risks associated with additional oil and gas production in different regions of the proposed lease area and was undertaken for consideration in the draft Environmental Impact Statement (EIS) and to facilitate final selection of tracts to be offered for sale. The analysis was conducted in three more or less independent parts corresponding to different aspects of the overall problem. The first part dealt with the probability of spill occurrence, the second with likely spill trajectories for the times and places oilspills might occur, and the third part with the spatial and temporal location of specific objects, such as biological and recreational resources thought to be vulnerable to spilled oil. Results of the individual 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. This analysis was done separately for the proposed leases and the existing leases and the results combined to determine the cumulative or incremental risk due to the proposed sale.

Much of the data and information used in the analysis was compiled by the U.S. Bureau of Land Management (BLM) in the course of preparing the EIS for the proposed lease sale. These results thus represent synthesis and analysis of existing information rather than presentation of new material.

We would like to express special appreciation to David Amstutz and Thomas Cooke of BLM for their assistance in gathering the necessary data and information for the study; and to the Conservation Division of the Geological Survey for providing the estimates of petroleum quantities.

METHODS

Spill Frequency Estimates

Statistical distributions for estimating probabilities of oilspill occurrence were taken from Devanney and Stewart (1974) and Stewart (1975, 1976). In addition to the fundamental assumption that realistic estimates of future spill frequencies can be based on past OCS experience, use of these distributions requires the further specific assumptions that spills occur independently of each other (as a Poisson process), and that spill rate is dependent on volume of oil produced and handled. Each of these assumptions is open to dispute. The first assumption - that past spill rates are indicative of future spill rates - might be modified either by assuming a decrease in future spill rate because of experience and improved standards or by assuming an increase in future spill rate because of unknown conditions in new territory. The second assumption - that spills occur independently of each other - might be modified either by assuming a positive correlation (if a spill occurs, conditions are such that more will follow shortly) or by assuming a negative correlation (if a spill occurs, extra precautions are immediately thereafter taken). The third assumption - that the spill rate is solely a function of the volume of oil handled - might be modified on the basis of size, extent, frequency and duration of the handling. This analysis takes the middle ground through these assumptions. Any changes in the results due to variations of the assumptions apply uniformly to parameters for all lease subareas so that relative merits of these subareas are not altered.

Spill frequency estimates were calculated separately for each of the 35 transportation route segments (figures 1A and 1B), the 23 subdivisions of the proposed lease area (figure 1C), and the 13 subdivisions of the existing leases (figure 1D) based on estimated oil resources for the areas [Conservation Division U.S. Geological Survey (proprietary data)]. Use of the Devanney and Stewart distributions permitted separate estimates of platform, pipeline, and tanker spill frequencies; which could then be combined to estimate the risk from production and the transport of the crude oil to shore by three different routes (described below). Spill frequency estimates (table 1) were made for oilspills greater than 1,000 barrels in size. The size choice is somewhat arbitrary but, as discussed below, is important in considering the significance of weathering in reducing oilspill impacts.

Oilspill Trajectory Simulations

An oilspill trajectory model was constructed and used to analyze movement of hypothetical oil slicks on a digital map of the Pacific Ocean between about latitude 28° to 38° N. and about longitude 114° to

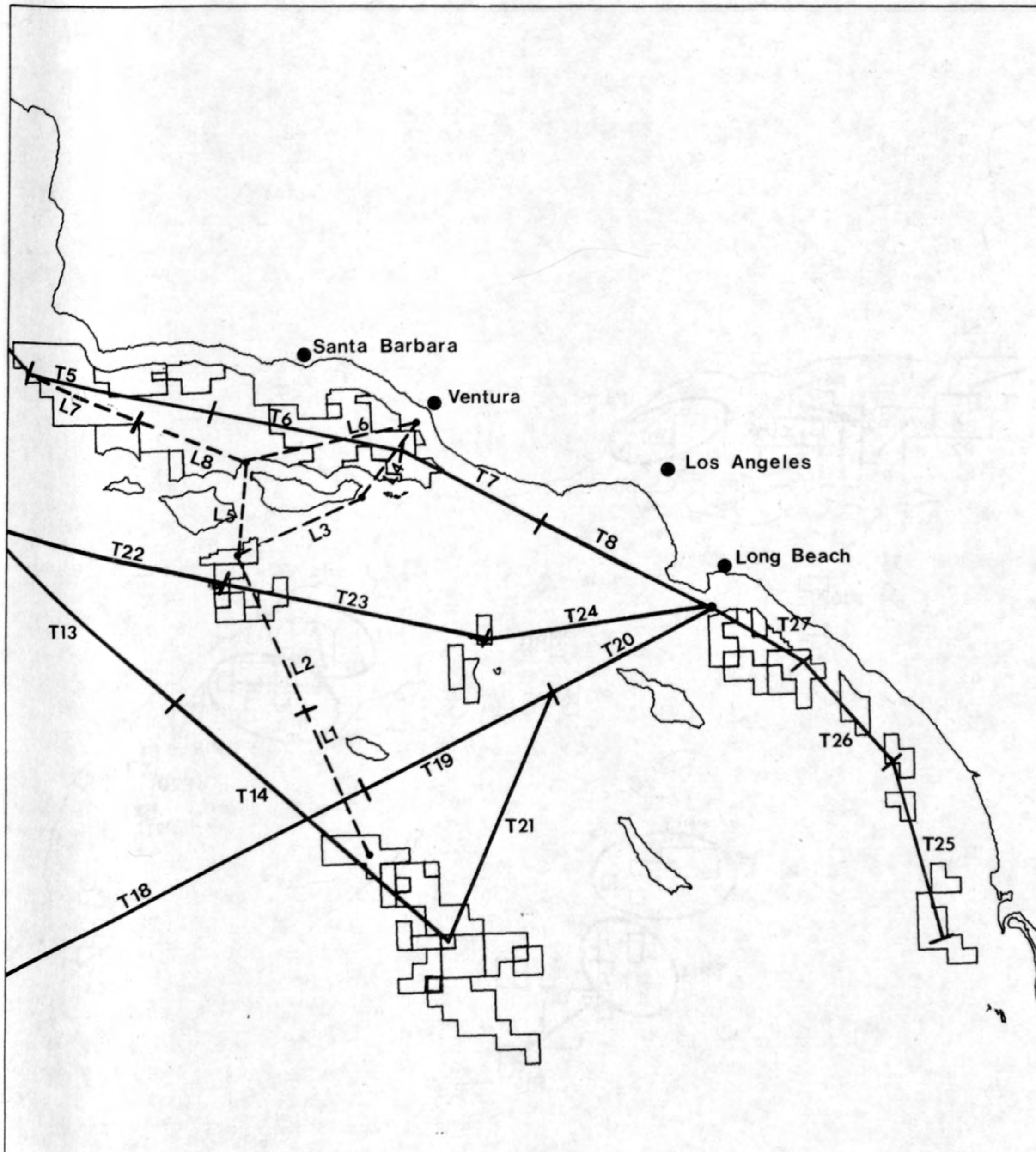

Figure 1-B.--Map showing the location of the local transportation route segments. (See Figure 1-A for location of area shown.)

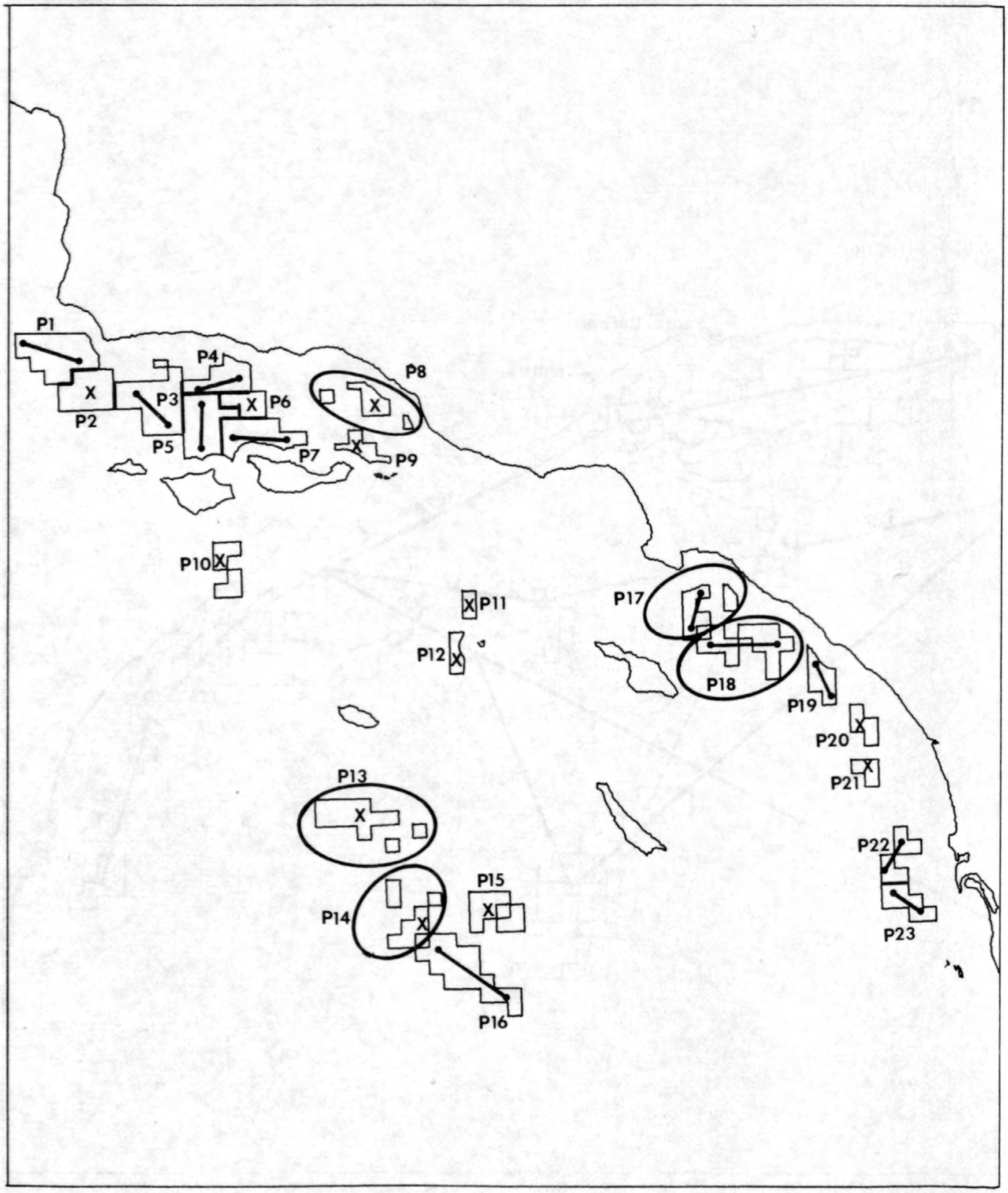

Figure 1-C.--Map showing the subdivisions of the proposed leases. (See Figure 1-A for location of area shown.)

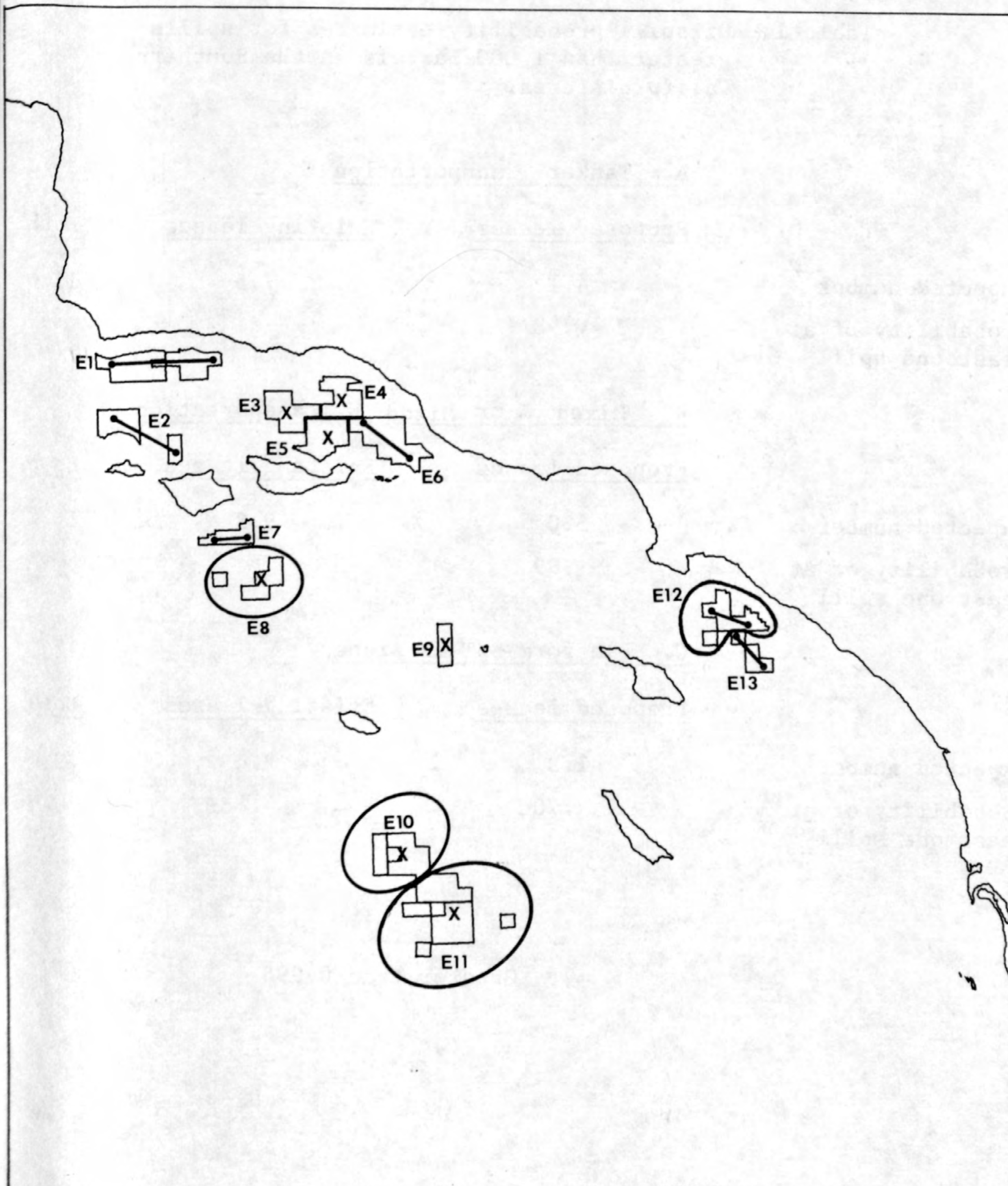

Figure 1-D.--Map showing the subdivisions of the existing leases. (See Figure 1-A for location of area shown.)

Table 1.--Oilspill probability estimates for spills greater than 1,000 barrels in the Southern California area.

A. Tanker Transportation

	Proposed leases	Existing leases	Both
Expected number	4.1	7.5	11.6
Probability of at least one spill	.98	*	*

B. Mixed A or Mixed B Transportation

	Proposed leases	Existing leases	Both
Expected number	5.0	9.3	14.2
Probability of at least one spill	.99	*	*

C. Platform Spills Alone

	Proposed leases	Existing leases	Both
Expected number	1.3	2.4	3.7
Probability of at least one spill	.70	.88	.96

* Greater than 0.995

125° W. The coordinate system for this area was established with a grid size of about 1.3 nautical mile (nmi). Representations of the monthly surface water velocity field were based upon the mean monthly geostrophic flow as reported in CalCOFI (1966) and, in the Santa Barbara Channel, upon the summarization of drift card data as reported by Kolpack (1971). Short-term patterns in wind variability were characterized by probability matrices for successive 3-hour velocity transitions. A first order Markov process with 41 wind velocity states (eight compass directions by five wind speed classes plus the calm condition) was assumed. Wind transition matrices were calculated from U.S. Weather Service records from the San Nicolas, Calif., Point Arguelo, Calif., Los Angeles, Calif., and San Diego, Calif., weather stations (at least 5 years continuous record each) for each of the four seasons of the year.

Trajectories of 500 hypothetical oilspills were simulated in Monte Carlo fashion for each of the four seasons for each of 71 locations (figures 1A-1D) in the lease area (representing potential starting locations for spills arising from both the production and the transportation of petroleum), yielding a total of 142,000 trajectories. Depending upon its shape, each potential spill source was represented as either a single point (e.g. a small lease area), or as a straight line with the potential spills uniformly distributed along the line (e.g. a transportation route). Surface transport of the oil slick for each spill was simulated as a series of straight-line displacements of a point under the joint influence of local and seasonal wind and current on the slick for a 3-hour period. The local wind transition probability matrix was randomly sampled each period for a new wind speed and direction, and the current velocity was updated as the spill changed location in the velocity field. The wind drift factor was taken to be 0.035 with a drift angle of 20 degrees.

The final product of trajectory model runs consists of a large number of simulated oilspill trajectories or pathways which collectively reflect both the general trend and variability of winds and currents, and which can be summarized in statistical terms. It should be emphasized that these trajectories represent only hypothetical pathways of oil slicks and do not involve any direct consideration of cleanup, dispersion, or weathering processes which would determine the quantity and quality of oil that may eventually come in contact with biological populations or other important resources. The significance of dispersion and weathering in mitigating oilspill effects is discussed in more detail below.

Locations of Biological and Recreational Resources

The locations of 31 categories of biological, recreational, and other resources were digitized in the same coordinate system as that used in trajectory simulations (see Appendix A, figures A1-31). The monthly sensitivity of these resources (for example spawning period or migration period) was also recorded. Resource groups were as follows:

Banks

1 Tanner and Cortez Banks
2 Ranger Bank

Commercial Fishing

3 Major marketfish: rockfish, flatfish, sablefish, white sea bass, and lingcod
4 Major commercial pelagic fish: anchovy, jack mackeral, sardine, and squid
5 Salmon
6 Albacore
7 Bonito
8 Tuna
9 Swordfish
10 Commercial shellfish

Seabirds

11 Seabirds (April-June)
12 Seabirds (July-September)
13 Seabirds (October-December)
14 Seabirds (January-March)

Sport fishing

15 Major sport fishing: rockfish, kelp bass, sea bass, barracuda, and bonito.
16 Sport fishing: striped-marlin, swordfish, bluefin tuna, and albacore
17 Sport fishing: Salmon

Shore based resources

18 Kelp
19 Pinnipeds: Major haulout and breeding areas
20 High intensity use beaches
21 Harbors and marinas
22 High density recreational boating
23 Shore-based sport fishing
24 Rare and endangered species
25 Areas of special biological significance, marine life refuges, ecological reserves, and national wildlife refuges.

Shore based resources--continued

27 Seabird breeding and nesting areas
28 Rocky intertidal areas
29 High use skin and scuba diving areas
30 Clam beaches
31 National monuments and cultural resource sites

Because the trajectory model simulates a spill essentially as a point, most land-based objects have been given an areal extent greater than they actually occupy. Object 28 (Rocky intertidal areas), for example, extends a short distance offshore. This allows the model to simulate a spill that approaches land, makes partial contact, withdraws, and continues on its way. That this happens will be seen in the tables which follow - where, for example, contact with Rocky intertidal areas may occur more frequently than contact with land.

RESULTS AND DISCUSSION

Spill Frequency Estimates

The probability distributions on the frequency of oilspills greater than 1,000 barrels in size during the production life of the proposed leases and the existing leases are given in figure 2. It is expected that the crude oil from the proposed leases (areas P1 through P23) will be transported to shore using essentially the same transportation routes as the existing leases (areas E1 through E13). Three transportation scenarios were postulated: "Tanker", whereby all oil would be brought directly to Long Beach or San Francisco by tanker; "Mixed A", whereby pipelines (in place of tankers) would bring oil from some of the leases to Ventura, where it would be transferred to tankers bound for Long Beach or San Francisco; and "Mixed B", which is similar to "Mixed A" except for some changes in pipeline routes. Details of the transportation scenarios are shown in Appendix B. Estimates of the number of large spills for the existing and proposed leases for the three transportation scenarios are given in Table 1. Because the probability distribution for spills is based only on volume of oil handled and not on the route traveled, the mixed scenarios both have the same calculated spill potential.

One of the advantages of making predictions about oil-spill frequency in the form of a probability distribution (figure 2) is that such data give not only an estimate of the most likely number of spills that would be expected to occur, but some measure of the uncertainty that exists about that prediction. Table 1, for example, indicates that the expected number

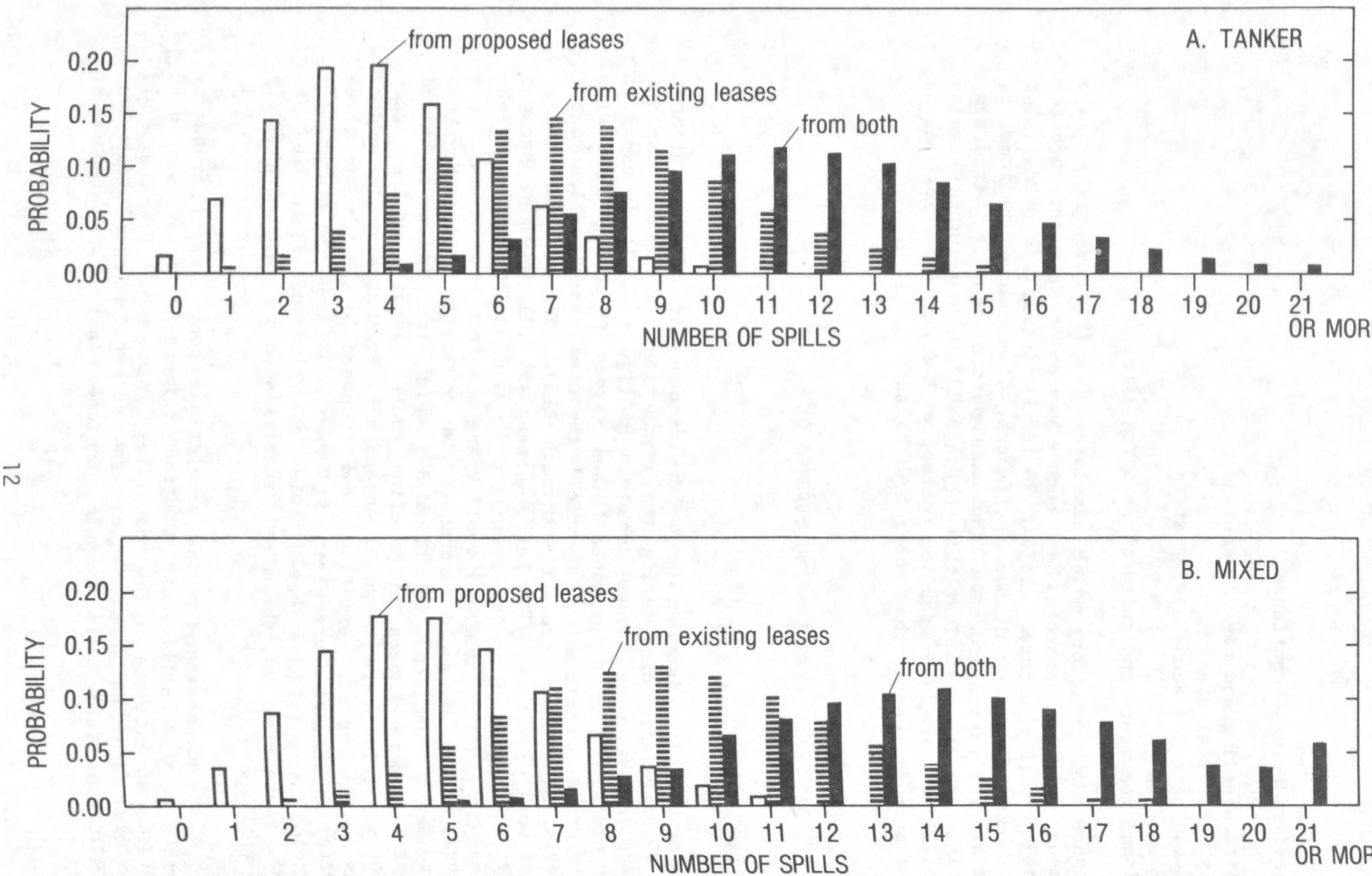

Figure 2.--Spill frequency distributions for spills greater than 1,000 barrels during the (remaining) production lives of the lease areas.

of spills greater than 1,000 barrels from the proposed leases using tanker transportation only is about 4.1 spills. From figure 2, the most likely number of spills that will occur (the mode of the distribution) is also four - with a probability of 20% of this being the case; however there is a nearly equal (19%) probability that only 3 spills will occur, and a 16% probability that 5 spills will occur. Or more simply, the odds are about even that 3 to 5 spills greater than 1,000 barrels will result from the proposed leasing (assuming tanker transportation). From table 1, the expected number of large spills from the existing leases (using tanker transportation) is 7.5 spills. The most likely number to occur (from figure 2) is 7 with a 15% chance of that being the case. A summing of the probabilities for 5, 6, 7, 8 or 9 spills arising from the existing leases gives a total of 64%. That is, the odds are almost 2-1 that somewhere from 5 to 9 large spills will result from the existing leases (assuming tanker transporation). Finally, while table 1 indicates that the expected number of large spills in the area will rise from 7.5 to 11.6 spills (about a 55% increase) as a result of the proposed leasing, figure 2 shows that the most likely number is 11, with an even chance of between 9 and 13 spills. In the event of mixed transportation, table 1 shows that the expected number of oilspills will increase by about 52% to 14.2 from 9.3 as a result of the proposed leasing. And figure 2 shows that the most likely number of oilspills will increase from 9 to 14. The majority of potential spills arises from transportation of the crude. Platform spills alone account for only about one-third of the potential for spills - as can be seen in table 1 part C.

How Big is Large?

In 1969, a blowout occurred at Union Oil's Platform A, in the Santa Barbara Channel, and resulted in a large oil slick fouling many miles of beaches. It appears that this large, well-publicized oilspill may become a baseline against which many of the impacts of potential oilspills in Southern California will be judged. Therefore, it may be helpful to place this accident in perspective with the oilspill statistics used in this report.

Although estimates vary, the size of Santa Barbara Channel oilspill was about 77,000 barrels (Allen, 1969), considerably larger than the arbitrary cutoff limit of 1000 barrels defining "large" oilspills. We may, therefore, conclude that not all "large" oilspills will exceed the size of the Santa Barbara Channel oilspill. Devanney and Stewart (1974) identified 194 "large" tanker spills through 1972; in 32 of these events, or 16 percent, the volume of oil spilled was greater than 77,000 barrels. Of 11 pipeline spills occurring between 1964 and 1974, only one exceeded 77,000 barrels in size (Devanney and Stewart, 1974). The Santa Barbara Channel oilspill was the largest of 12 platform spills occurring between 1964 and 1974 (Devanney and Stewart, 1974, and Stewart, 1975).

The above data shows that the Santa Barbara Channel oilspill was exceeded in size by about one out of six historic oilspills classified as "large." Therefore, the term "large" oilspill should not be interpreted as meaning equal in size to the Santa Barbara Channel oilspill.

Recent Trends in Spill Statistics

All of the above figures are subject, of course, to the validity of earlier stated assumptions, the most important of these being that accident rates per unit production of Southern California fields would be the same as those observed to date in other areas (particularly the Gulf of Mexico, but including the present area). One might question this assumption either from the point of view that safety records might be expected to improve with time, or from the standpoint that accident rates are not transferrable from one OCS area to another.

With regard to the question of improvement in accident rates, recent statistics from Coast Guard files show no clear trend in spill frequency for production platforms and pipelines during the period 1971-75. Spill frequency for platform and pipeline spills less than 1,000 barrels, based on United States spills for the years 1971 and 1972, was 3.6 incidents per million barrels produced and handled. The corresponding accident rates for the years 1973-75 were 3.9, 4.2 and 3.2 incidents per million barrels respectively. Geological Survey records for spills of 50 barrels and larger in the Gulf of Mexico OCS list 11, 2, 4, 8, and 2 incidents respectively for the years 1971 through 1975, a period during which offshore production gradually declined from 387 to 315 million barrels per year, (Danenberger, 1976).

It should also be pointed out that while the total volume of oil spilled in small OCS incidents (less than 50 barrels) declined quite steadily from about 1,500 barrels to about 700 barrels per year between 1971 and 1975, the total annual volume lost in the OCS spills of all sizes has been extremely variable and shows no decipherable trend. Total volume spilled increased from less than 3,000 barrels per year in 1971 and 1972 to more than 23,000 barrels per year in 1973 and 1974, then declined again to less than 1,000 barrels in 1975 (Danenberger, 1976).

There is evidence, however, of recent improvement in the incidence of tanker spills. Frequency estimates for tanker spills were based on world statistics for the years 1969-75 (spills over 1,000 barrels) and U.S. Coast Guard data for the years 1971-72 (spills under 1,000 barrels) for which the overall accident rate was 0.45 incidents per million barrels handled (all sizes; Devanney and Stewart, 1974). The corresponding rate for the years 1973-74 was only about 0.07

incidents per million barrels, although some of the apparent improvement is due to simply a change in the method of estimating volumes of crude handled in U.S. ports (Stewart, 1976).

Oilspill Trajectories

The trajectory simulation consists of a large number of hypothetical oilspill trajectories (142,000) which collectively reflect both the general trend and variability of winds and currents and which can be described in statistical terms. Ten trajectories based on wind and current conditions for each of the four seasons have been randomly selected as examples from a total of 2,000 trajectories released from location E7 and are shown in figures 3A-D. The patterns of spill movements in figures 3A-D demonstrate several features of trajectory movements in the Southern California area. Currents in the vicinty of the lease areas range between 0.1 and 0.3 knots, with occasional higher values. By comparison, the average wind speed recorded at San Nicolas Island is 9.1 knots, which, assuming a 0.035 drift factor, would induce an average speed in trajectories of 0.32 knots. Therefore, although wind exerts the strongest short-term influence on spill movement, current also plays an important part. The complex current circulation of the Southern California Bight causes spills originating in the lease area to exhibit a wide variety of trajectories, and it is difficult to define a "typical" path. Once spills are more than 40 or 50 miles from shore, however, they usually are driven south and southeast by the prevailing winds and currents. Because there is no "typical" trajectory pattern which applies to the whole lease area, caution should be used in inferring any conclusions from figures 3A-D, since the trajectories shown represent less than 0.03% of those run for this study.

The spatial disposition of the simulated trajectories is presented in table 2A-D. Each entry in the table represents the probability (in percent) that if a spill starts from a certain location, it will reach a particular segment of land within the time specified. Four time limits of 3 days, 10 days, 30 days and 60 days were selected as "milestones" in the life of a spill. The rationale for these time limits will be discussed further in a later section. Briefly, they represent: 3 days-toxicity greatly diminished; 10 days-containment and clean-up, if possible, accomplished; 30 days-major spills difficult to locate or track; and 60 days-very large spills mostly dissipated. Figure 4 shows the locations of the land segments referred to in table 2A-D.

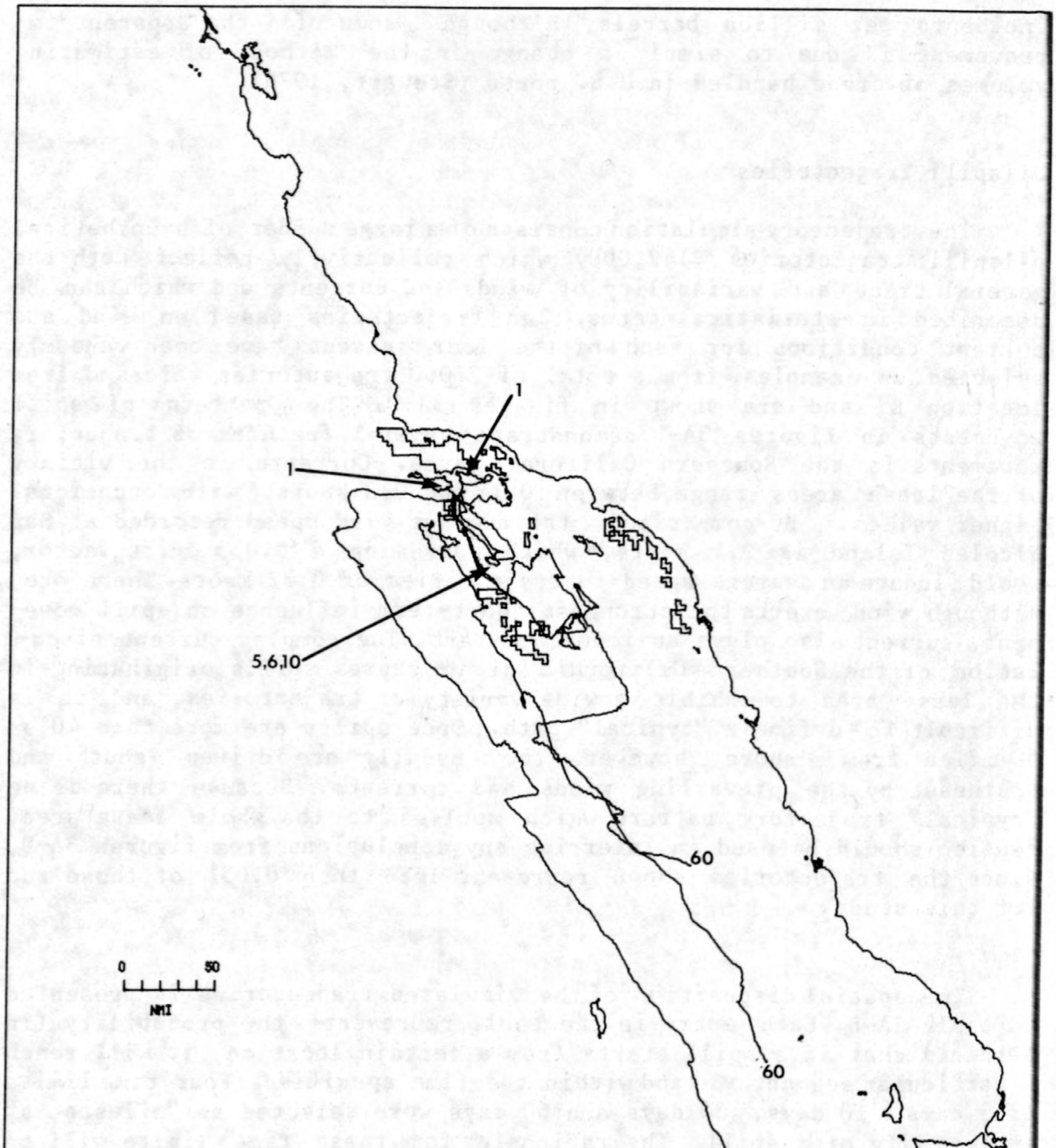

Figure 3-A.--Example oilspill trajectories for a spill site (E7) near the center of the proposed lease area: winter conditions. Number on trajectory is the time to the end point in days.

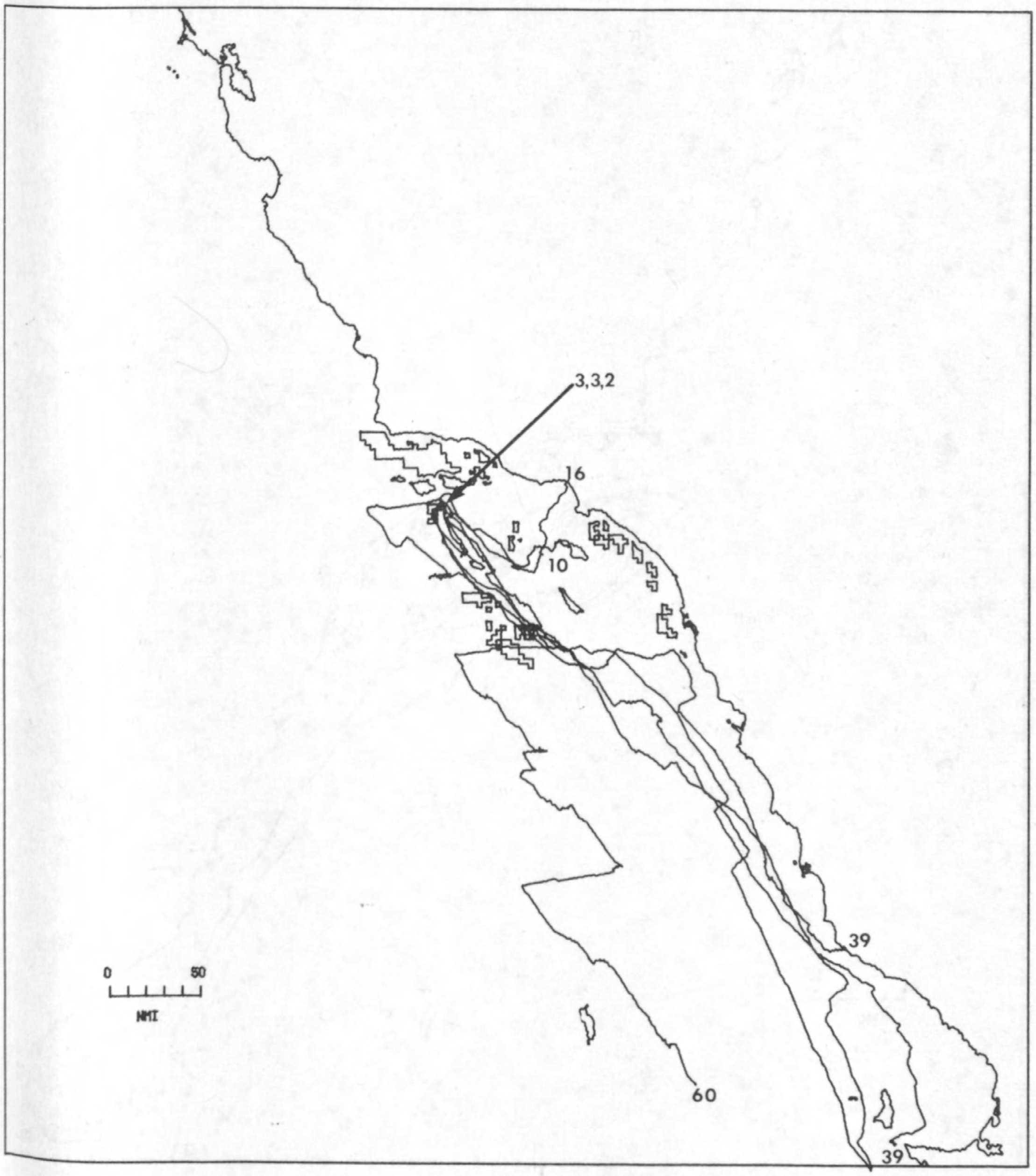

Figure 3-B.--Example oilspill trajectories for a spill site (E7) near the center of the proposed lease area: spring conditions. Number on trajectory is the time to the end point in days.

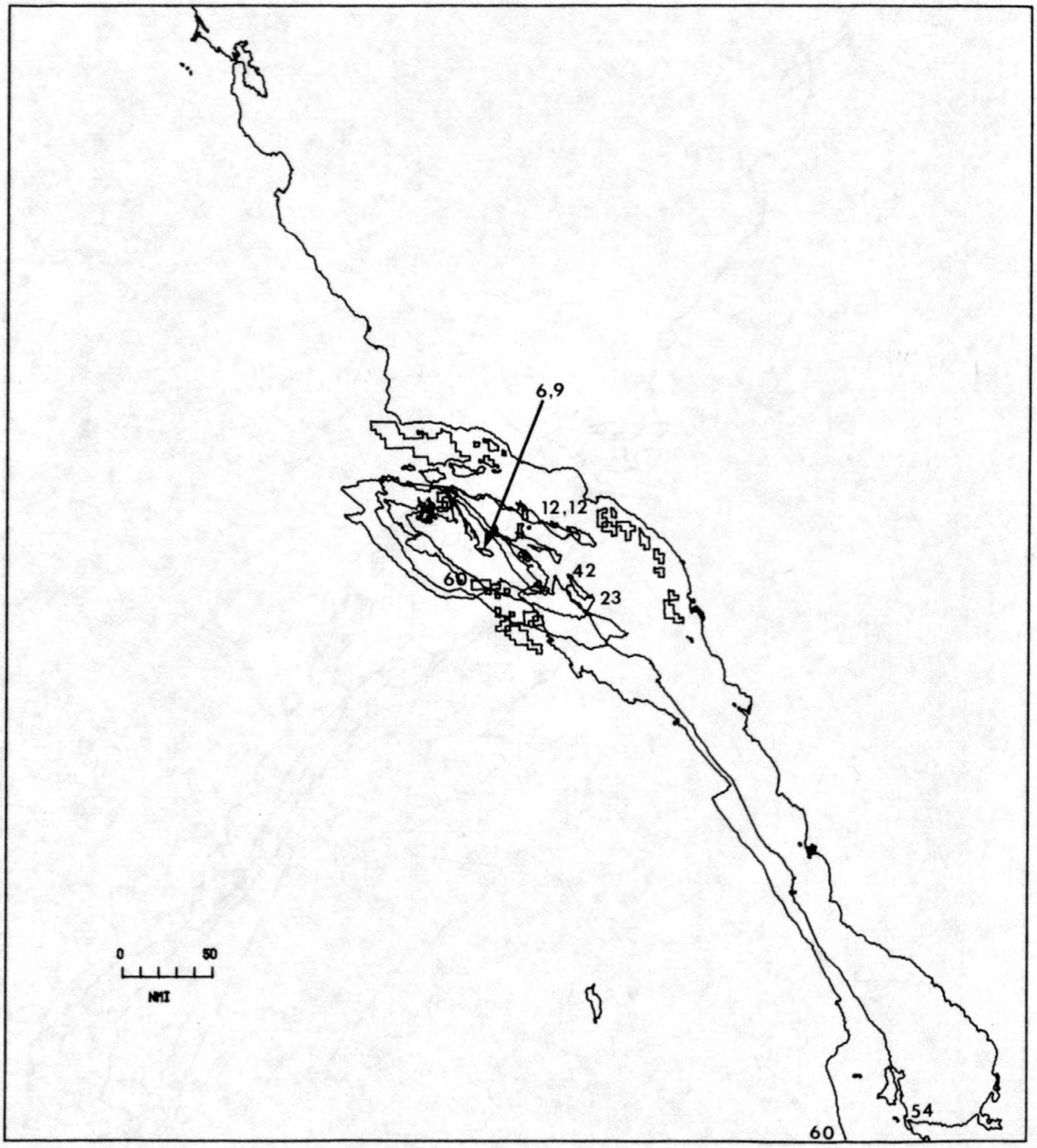

Figure 3-C.--Example oilspill trajectories for a spill site (E7) near the center of the proposed lease area: summer conditions. Number on trajectory is the time to the end point in days.

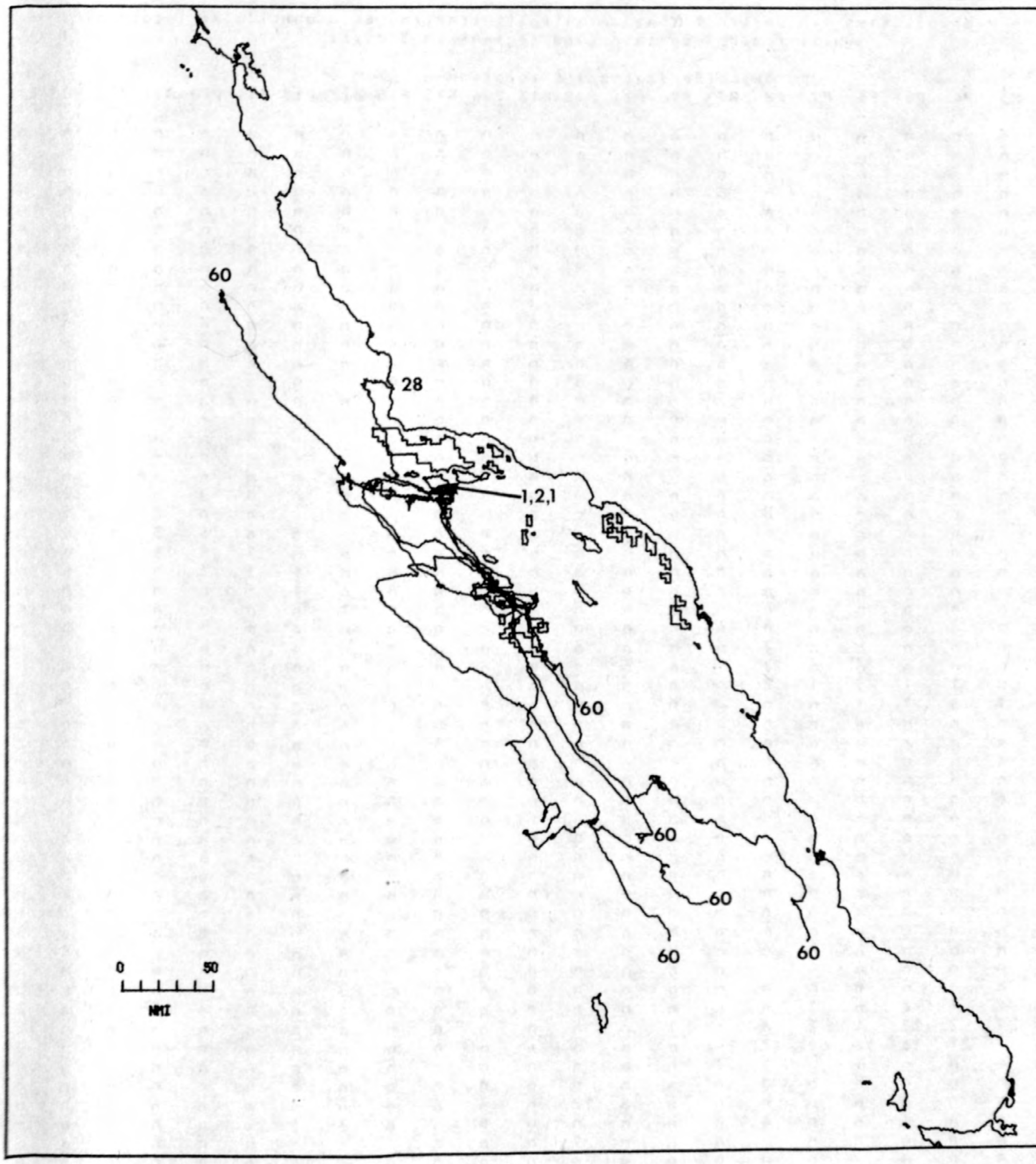

Figure 3-D.--Example oilspill trajectories for a spill site (E7) near the center of the proposed lease area: autumn conditions. Number on trajectory is the time to the end point in days.

Table 2A. -- Probabilities (in percent) that an oilspill starting at a particular location will reach a certain land segment in 3 days.

Land Segment	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	P23	E1
	Hypothetical spill location																							
1	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	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	n	n	n	n	n	n	n	n	n	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	n	n	n	n	n	n	n	n	n	n	n	n
5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
6	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
7	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
8	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
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21	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	2	7	5	n
22	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	5	5	n	n	n
23	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	5	28	15	n	n	n
24	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	3	1	n	n	n	n
25	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	6	1	n	n	n	n	n	n
26	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n
27	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
28	n	n	n	n	n	n	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
29	n	n	n	n	n	n	n	12	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
30	n	n	n	1	1	5	1	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
31	n	n	1	6	1	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	3
32	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	6
33	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
34	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
35	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
36	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
37	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
38	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
39	n	n	n	n	n	n	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	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
41	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
42	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
43	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
44	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
45	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
46	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
47	18	32	4	1	2	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	2
48	1	15	29	2	12	1	2	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	11
49	n	n	12	21	36	32	64	2	14	n	n	n	n	n	n	n	n	n	n	n	n	n	n	9
50	n	n	n	n	n	1	n	5	37	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
51	n	n	n	n	n	n	n	n	n	4	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	8	12	n	n	n	n	n	n	n	n	n	n	n	n
53	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	3	3	2	n	n	n	n	n
54	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n
55	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
56	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
57	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
58	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
59	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	5	19	n
60	n	n	n	n	n	n	n	n	n	4	n	n	n	n	n	n	n	n	n	n	n	n	n	n

n - less than 0.5 percent.

Table 2A. -- Probabilities (in percent) that an oilspill starting at a particular location will reach a certain land segment in 3 days. (Continued)

Land Segment	Hypothetical spill location E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12	E13	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12
1	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	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	n	n	n	n	n	n	n	n	n	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	n	n	n	n	n	n	n	n	n	n	n	n
5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
6	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
7	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
8	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
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
10	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
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
12	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
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
14	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
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
16	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
17	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
18	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
19	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
20	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
21	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
22	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
23	n	n	n	n	n	n	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	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n
25	n	n	n	n	n	n	n	n	n	n	6	1	n	n	n	n	n	n	n	2	n	n	n	n
26	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	14	n	n	n	n
27	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	4	8	n	n	n	n
28	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	7	1	n	n	n	n
29	n	n	4	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n
30	n	2	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n
31	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n
32	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
33	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
34	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
35	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
36	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
37	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
38	n	n	n	n	n	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	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	6	n	n
40	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	1	n	n
41	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	6	n	n	n
42	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	21	n	n	n
43	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	14	n	n	n
44	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n
45	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
46	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
47	20	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	12	n	n	n	n	n	n	n
48	48	n	n	n	n	5	n	n	n	n	n	n	n	n	n	n	14	1	n	n	n	n	n	n
49	2	44	9	58	9	n	n	n	n	n	n	n	n	n	n	n	7	37	5	n	n	n	n	n
50	n	6	19	15	21	n	n	n	n	n	n	n	n	n	n	n	n	11	7	n	n	n	n	n
51	n	n	n	n	n	2	7	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	9	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
53	n	n	n	n	n	n	n	n	n	n	1	3	n	n	n	n	n	n	n	1	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	n	n	n	n
55	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
56	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
57	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
58	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
59	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
60	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 - less than 0.5 percent.

Table 2A. -- Probabilities (in percent) that an oilspill starting at a particular location will reach a certain land segment in 3 days. (Continued)

Land Segment	Hypothetical spill location																						
	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27	L1	L2	L3	L4	L5	L6	L7	L8
1	n	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	n	n	n	n	n	n	n	n	n	n	n	n	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	n	n	n	n	n	n	n	n
4	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
6	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
7	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
8	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
9	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
10	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
11	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
12	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
13	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
14	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
15	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
16	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
17	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
18	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
19	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
20	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
21	n	n	n	n	n	n	n	n	n	n	n	n	9	n	n	n	n	n	n	n	n	n	n
22	n	n	n	n	n	n	n	n	n	n	n	n	4	1	n	n	n	n	n	n	n	n	n
23	n	n	n	n	n	n	n	n	n	n	n	n	4	4	n	n	n	n	n	n	n	n	n
24	n	n	n	n	n	n	n	n	n	n	n	n	n	2	1	n	n	n	n	n	n	n	n
25	n	n	n	n	n	n	n	1	n	n	n	1	n	n	6	n	n	n	n	n	n	n	n
26	n	n	n	n	n	n	n	2	n	n	n	1	n	n	1	n	n	n	n	n	n	n	n
27	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
28	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n
29	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	3	n	2	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
31	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
32	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
33	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
34	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
35	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
36	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
37	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
38	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
39	n	n	n	n	n	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	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
41	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
42	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
43	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
44	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
45	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
46	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
47	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	22	4
48	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	1	7	n	14	1	15	20
49	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	11	17	36	45	1	34
50	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	28	n	11	n	n
51	n	n	n	n	n	n	5	n	1	n	2	n	n	n	n	8	12	n	n	1	n	n	n
52	n	n	n	n	n	n	2	2	1	n	2	2	n	n	n	n	n	n	n	n	n	n	n
53	n	n	n	n	n	n	n	23	n	n	n	13	n	2	1	n	n	n	n	n	n	n	n
54	n	n	n	n	n	n	1	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n
55	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
56	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
57	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
58	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
59	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n
60	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	13	11	n	n	n	n	n	n

n - less than 0.5 percent.

Table 2B. -- Probabilities (in percent) that an oilspill starting at a particular location will reach a certain land segment in 10 days.

Land 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	E1
1	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	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	n	n	n	n	n	n	n	n	n	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	n	n	n	n	n	n	n	n	n	n	n	n
5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
6	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
7	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
8	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
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
10	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
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
12	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
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
14	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
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
16	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
17	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
18	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
19	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	2	n
20	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	14	11	n
21	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	3	5	4	4	16	17	18	n
22	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	3	10	15	13	13	9	n
23	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	4	17	39	28	4	1	n
24	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	2	5	3	n	n	n	n
25	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	9	4	2	n	n	n	n	n
26	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	5	2	n	n	n	n	n	n
27	n	n	n	n	n	n	n	1	1	n	3	1	n	n	n	n	1	1	n	n	n	n	n	n
28	n	n	n	n	n	n	n	3	2	n	1	n	n	n	n	n	1	n	n	n	n	n	n	n
29	n	n	n	n	n	n	n	14	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
30	n	n	1	2	2	6	1	5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
31	n	n	2	8	1	2	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	4
32	1	n	1	2	n	1	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	8
33	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
34	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
35	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
36	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
37	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
38	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
39	n	n	n	n	n	n	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	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
41	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
42	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
43	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
44	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
45	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
46	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
47	25	37	10	6	5	5	4	2	2	1	n	n	n	n	n	n	n	n	n	n	n	n	n	9
48	4	21	36	9	17	7	6	3	2	1	2	3	n	n	n	n	n	n	n	n	n	n	n	23
49	n	2	23	46	52	54	74	19	26	n	4	1	n	n	n	n	1	n	n	n	n	n	n	24
50	n	n	n	2	1	4	1	16	43	n	1	n	n	n	n	n	n	n	n	n	n	n	n	1
51	1	n	n	n	n	n	n	n	n	16	1	4	1	n	n	n	n	n	n	n	n	n	n	n
52	n	n	n	n	n	n	n	1	1	1	12	16	n	n	n	n	n	n	n	n	n	n	n	n
53	n	n	n	n	n	n	n	n	1	n	7	3	n	n	n	n	17	15	8	3	1	n	n	n
54	n	n	n	n	n	n	n	n	n	1	3	9	1	1	4	1	n	n	n	n	n	n	n	n
55	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
56	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
57	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
58	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
59	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	14	28	n
60	n	n	n	n	n	n	n	n	n	8	1	2	n	n	n	n	n	n	n	n	n	n	n	n

n - less than 0.5 percent.

Table 2B. -- Probabilities (in percent) that an oilspill starting at a particular location will reach a certain land segment in 10 days. (Continued)

Land Segment	Hypothetical spill location E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12	E13	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12
1	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	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	n	n	n	n	n	n	n	n	n	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	n	n	n	n	n	n	n	n	n	n	n	n
5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
6	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
7	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
8	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
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
10	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
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
12	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
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
14	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
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
16	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
17	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
18	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
19	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
20	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n
21	n	n	n	n	n	n	n	n	n	n	4	6	n	n	n	n	n	n	n	n	n	n	n	n
22	n	n	n	n	n	n	n	n	n	n	3	3	n	n	n	n	n	n	n	n	n	n	n	n
23	n	n	n	n	n	n	n	n	n	n	4	3	n	n	n	n	n	n	n	n	n	n	n	n
24	n	n	n	n	n	n	n	n	n	n	3	1	n	n	n	n	n	n	n	n	n	n	n	n
25	n	n	n	n	n	n	n	n	n	n	11	4	n	n	n	n	n	n	n	3	n	n	n	n
26	n	n	n	n	n	n	n	n	n	n	3	2	n	n	n	n	n	n	1	24	n	n	n	n
27	n	n	n	n	1	n	n	1	n	n	1	1	n	n	n	n	n	n	11	25	n	n	n	n
28	n	n	1	n	2	n	n	1	n	n	n	n	n	n	n	n	n	n	12	5	n	n	n	n
29	n	n	5	1	2	n	n	n	n	n	n	n	n	n	n	n	n	1	1	n	n	n	n	n
30	n	3	4	1	1	n	n	n	n	n	n	n	n	n	n	n	1	3	n	n	n	n	n	n
31	1	1	1	n	n	n	n	n	n	n	n	n	n	n	n	n	2	1	n	n	n	n	n	n
32	n	1	1	n	n	n	n	n	n	n	n	n	n	n	n	2	1	1	n	n	n	n	n	1
33	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	2	n	n	n	n	n	n	n	n
34	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
35	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
36	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
37	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	1	n
38	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	10	1	n
39	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	3	14	n	n
40	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	8	5	n	n
41	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	11	1	n	n
42	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	28	n	n	n
43	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	18	n	n	n
44	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	2	n	n	n
45	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n
46	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n
47	22	2	2	3	2	2	n	n	n	n	n	n	n	n	n	2	17	3	1	n	n	n	n	n
48	52	5	3	2	2	6	1	4	n	n	n	n	n	n	n	n	21	6	1	n	n	n	n	n
49	5	61	28	66	22	n	n	3	n	n	n	1	n	n	n	n	15	52	13	1	n	n	n	n
50	n	9	28	17	30	n	n	n	n	n	n	n	n	n	n	n	n	14	16	1	n	n	n	n
51	n	n	n	n	n	11	16	5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
52	n	n	n	n	1	1	2	13	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n
53	n	n	n	n	1	n	n	3	n	n	13	17	n	n	n	n	n	n	1	8	n	n	n	n
54	n	n	n	n	n	n	1	8	2	3	n	n	n	n	n	n	n	n	n	n	n	n	n	n
55	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
56	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
57	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
58	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
59	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
60	n	n	n	n	n	5	7	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n

n - less than 0.5 percent.

Table 2B. -- Probabilities (in percent) that an oilspill starting at a particular location will reach a certain land segment in 10 days. (Continued)

Land	Hypothetical spill location																					
Segment	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27	L1	L2	L3	L4	L5	L6	L7	L8
1	n	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	n	n	n	n	n	n	n	n	n	n	n	n	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	n	n	n	n	n	n	n	n
4	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
6	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
7	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
8	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
9	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
10	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
11	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
12	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
13	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
14	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
15	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
16	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
17	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
18	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
19	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
20	n	n	n	n	n	n	n	n	n	n	n	n	5	n	n	n	n	n	n	n	n	n	n
21	n	n	n	n	n	n	n	n	n	n	n	n	22	7	4	n	n	n	n	n	n	n	n
22	n	n	n	n	n	n	n	n	n	n	n	n	14	9	3	n	n	n	n	n	n	n	n
23	n	n	n	n	n	n	n	n	n	n	n	n	13	16	3	n	n	n	n	n	n	n	n
24	n	n	n	n	n	n	n	n	n	n	n	n	n	4	2	n	n	n	n	n	n	n	n
25	n	n	n	n	n	n	n	2	n	n	n	1	n	1	9	n	n	n	n	n	n	n	n
26	n	n	n	n	n	n	n	4	n	n	n	4	n	1	4	n	n	n	n	n	n	n	n
27	n	n	n	n	n	n	n	2	n	n	1	4	n	n	1	n	n	n	1	n	n	n	n
28	n	n	n	n	n	n	n	1	n	n	n	1	n	n	n	n	n	n	2	n	1	n	n
29	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	4	n	2	n	n
30	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	2	n	1
31	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	1
32	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	1
33	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
34	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
35	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
36	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
37	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
38	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
39	n	n	n	n	n	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	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
41	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
42	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
43	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
44	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
45	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
46	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
47	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	1	2	2	27	8
48	n	n	n	n	n	n	n	n	n	1	3	1	n	n	n	n	1	9	2	16	3	20	26
49	n	n	n	n	n	n	1	2	n	n	2	3	n	n	n	n	n	13	25	36	56	3	43
50	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	1	34	n	15	n	n
51	1	1	n	n	n	n	9	n	2	4	9	n	n	n	n	10	20	5	n	4	n	n	n
52	n	n	n	n	n	n	3	4	2	n	5	5	n	n	n	n	1	5	1	1	n	n	n
53	n	n	n	n	n	n	3	33	1	n	2	26	1	10	14	n	n	1	1	n	n	n	n
54	n	1	n	n	n	n	10	4	12	n	4	2	n	n	n	1	1	2	n	1	n	n	n
55	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
56	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
57	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
58	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
59	n	n	n	n	n	n	n	n	n	n	n	n	4	n	n	n	n	n	n	n	n	n	n
60	n	n	n	n	n	n	1	n	1	3	3	n	n	n	n	13	15	2	n	3	n	n	n

n - less than 0.5 percent.

Table 2C. -- Probabilities (in percent) that an oilspill starting at a particular location will reach a certain land segment in 30 days.

Land Segment	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	P23	E1
	Hypothetical spill location																							
1	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	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	n	n	n	n	n	n	n	n	n	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	n	n	n	n	n	n	n	n	n	n	n	n
5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
6	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
7	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
8	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
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
10	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
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
12	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
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
14	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	1	n
15	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	1	1	n
16	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	1	n
17	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	1	n
18	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	1	n
19	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	2	2	n
20	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	4	3	2	1	3	15	12	n
21	n	n	n	n	n	n	n	n	n	n	1	1	n	n	n	n	8	10	8	6	18	21	23	n
22	n	n	n	n	n	n	n	n	n	n	1	1	n	n	n	n	3	6	13	18	17	19	12	n
23	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	4	9	23	44	35	8	4	n
24	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	3	6	4	1	1	n	n
25	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	10	5	3	1	n	n	n	n
26	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	6	3	1	n	n	n	n	n
27	n	n	n	n	n	n	n	3	3	n	5	2	n	n	n	n	4	3	1	n	n	n	n	n
28	n	n	n	n	n	n	n	5	2	n	3	1	n	n	n	n	2	n	n	n	n	n	n	n
29	n	n	n	n	n	n	n	14	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
30	n	n	1	2	2	7	2	5	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
31	n	n	2	8	1	2	1	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	4
32	4	1	2	2	1	2	1	1	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	9
33	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1
34	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
35	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
36	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
37	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
38	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
39	n	n	n	n	n	n	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	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
41	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
42	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
43	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
44	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
45	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
46	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
47	26	38	10	7	6	6	4	3	2	1	n	n	n	n	n	n	n	n	n	n	n	n	n	11
48	5	21	37	11	17	9	6	4	3	2	3	4	n	n	n	n	1	1	1	n	n	n	n	23
49	n	2	24	48	53	57	76	23	28	n	6	2	n	n	n	n	2	2	1	1	1	n	n	25
50	n	n	n	2	1	4	2	18	43	n	2	1	n	n	n	n	1	1	1	n	n	n	n	1
51	3	1	1	1	1	n	n	1	1	18	5	9	2	n	1	n	1	1	n	n	n	n	n	1
52	n	n	1	n	1	n	n	2	1	2	14	18	n	n	n	n	1	1	1	n	n	n	n	n
53	n	n	n	n	n	n	n	3	2	2	11	6	n	n	n	n	25	24	17	9	6	3	1	n
54	1	1	1	n	1	n	n	2	1	6	10	16	8	8	9	5	4	3	2	1	1	n	n	1
55	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
56	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	1	n	n	n	n	n	n	n	n
57	n	n	n	n	n	n	n	n	n	n	n	n	1	1	1	1	n	n	n	n	n	n	n	n
58	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
59	n	n	n	n	n	n	n	n	n	n	1	1	n	n	n	n	3	3	2	2	3	15	29	n
60	1	2	1	n	n	n	n	1	n	10	3	4	n	n	n	n	1	n	n	n	n	n	n	1

n - less than 0.5 percent.

Table 2C. -- Probabilities (in percent) that an oilspill starting at a particular location will reach a certain land segment in 30 days. (Continued)

Land Segment	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12	E13	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12
	Hypothetical spill location																							
1	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	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	n	n	n	n	n	n	n	n	n	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	n	n	n	n	n	n	n	n	n	n	n	n
5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
6	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
7	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
8	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
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
10	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
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
12	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
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
14	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
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
16	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
17	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
18	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
19	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n
20	n	n	n	n	n	n	n	1	n	n	3	3	n	n	n	n	n	n	n	1	n	n	n	n
21	n	n	n	n	n	n	n	1	n	n	9	12	n	n	n	n	n	n	n	2	n	n	n	n
22	n	n	n	n	n	n	n	n	n	n	6	6	n	n	n	n	n	n	n	1	n	n	n	n
23	n	n	n	n	n	n	n	1	n	n	8	7	n	n	n	n	n	n	n	1	n	n	n	n
24	n	n	n	n	n	n	n	n	n	n	3	1	n	n	n	n	n	n	n	n	n	n	n	n
25	n	n	n	n	n	n	n	n	n	n	12	5	n	n	n	n	n	n	n	3	n	n	n	n
26	n	n	n	n	1	n	n	1	n	n	5	3	n	n	n	n	n	n	2	26	n	n	n	n
27	n	n	1	n	4	n	n	2	n	n	4	2	n	n	n	n	n	1	15	30	n	n	n	n
28	n	n	2	n	3	n	n	1	n	n	1	1	n	n	n	n	n	1	14	7	n	n	n	n
29	n	n	5	1	2	n	n	n	n	n	n	n	n	n	n	n	n	1	1	n	n	n	n	n
30	n	4	4	1	1	n	n	n	n	n	n	n	n	n	n	n	1	3	n	n	n	n	n	n
31	1	1	1	n	n	n	n	n	n	n	n	n	n	n	n	n	2	1	n	n	n	n	n	n
32	1	1	1	1	1	n	n	n	n	n	n	n	n	1	2	5	2	1	n	n	n	4	4	2
33	n	n	n	n	n	n	n	n	n	n	n	n	n	1	2	5	1	n	n	n	n	2	6	2
34	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	1	n	n	n	n	n	1	2	1
35	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	1	1	n
36	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	1	n
37	n	n	n	n	n	n	n	n	n	n	n	n	n	1	1	n	n	n	n	n	n	4	4	n
38	n	n	n	n	n	n	n	n	n	n	n	n	1	3	1	n	n	n	n	n	n	14	2	n
39	n	n	n	n	n	n	n	n	n	n	n	n	2	1	n	n	n	n	n	n	6	15	n	n
40	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	10	6	n	n
41	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	12	2	n	n
42	n	n	n	n	n	n	n	n	n	n	n	n	7	1	n	n	n	n	n	n	30	1	n	n
43	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	20	n	n	n
44	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	2	n	n	n
45	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n
46	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	3	1	n	n
47	22	4	4	3	3	2	n	n	n	n	n	n	n	n	1	4	18	4	1	n	n	4	3	1
48	53	6	5	3	4	7	2	5	n	n	1	1	n	n	n	1	22	7	2	1	n	1	n	n
49	5	63	31	67	25	1	1	4	n	n	3	3	n	n	n	n	17	54	16	4	n	n	n	n
50	n	9	29	17	32	n	n	1	n	n	1	1	n	n	n	n	n	15	17	3	n	n	n	n
51	1	n	1	n	1	14	20	9	1	1	1	1	n	n	n	1	1	1	2	n	n	n	1	1
52	n	n	1	n	2	2	3	15	n	n	1	1	n	n	n	n	n	n	3	n	n	n	n	n
53	n	n	1	n	4	1	3	6	n	n	20	25	n	n	n	n	n	n	5	9	n	n	n	n
54	1	n	1	n	2	6	7	17	9	9	2	3	n	n	n	1	1	n	3	1	n	n	n	n
55	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
56	n	n	n	n	n	n	n	n	1	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n
57	n	n	n	n	n	n	n	n	1	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n
58	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
59	n	n	n	n	n	n	n	1	n	n	2	4	n	n	n	n	n	n	n	1	n	n	n	n
60	1	n	1	n	1	7	9	3	1	n	n	n	n	n	n	1	1	n	1	n	n	n	n	1

n - Less than 0.5 percent.

Table 2C. -- Probabilities (in percent) that an oilspill starting at a particular location will reach a certain land segment in 30 days. (Continued)

Land	Hypothetical spill location																					
Segment	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27	L1	L2	L3	L4	L5	L6	L7	L8
1	n	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	n	n	n	n	n	n	n	n	n	n	n	n	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	n	n	n	n	n	n	n	n
4	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
6	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
7	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
8	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
9	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
10	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
11	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
12	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
13	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
14	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
15	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n
16	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n
17	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
18	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n
19	n	n	n	n	n	n	n	n	n	n	n	n	1	1	n	n	n	n	n	n	n	n	n
20	n	n	n	n	n	n	n	2	1	n	n	1	7	2	3	n	n	n	n	n	n	n	n
21	n	n	n	n	n	n	n	3	n	n	1	2	25	10	9	n	n	1	n	n	n	n	n
22	n	n	n	n	n	n	n	1	n	n	n	1	19	12	6	n	n	n	n	n	n	n	n
23	n	n	n	n	n	n	1	1	n	n	n	1	19	21	7	n	n	n	n	n	n	n	n
24	n	n	n	n	n	n	n	n	n	n	n	n	2	5	3	n	n	n	n	n	n	n	n
25	n	n	n	n	n	n	n	2	n	n	n	1	n	2	10	n	n	n	n	n	n	n	n
26	n	n	n	n	n	n	1	5	n	n	n	5	1	1	4	n	n	n	n	n	n	n	n
27	n	n	n	n	n	n	1	4	1	n	2	7	n	1	3	n	n	2	3	n	1	n	n
28	n	n	n	n	n	n	n	1	n	n	1	2	n	n	1	n	n	1	3	n	1	n	n
29	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	4	n	2	n	n
30	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	2	n	1
31	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	1
32	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	1	1
33	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n
34	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
35	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
36	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
37	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
38	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
39	n	n	n	n	n	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	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
41	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
42	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
43	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
44	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
45	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
46	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
47	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	1	2	2	3	29	9
48	n	n	n	n	n	n	1	2	1	1	4	2	n	1	1	n	1	10	3	16	4	20	26
49	n	n	n	n	n	n	1	3	1	n	3	5	n	1	2	n	n	14	27	37	58	3	44
50	n	n	n	n	n	n	n	1	n	n	1	3	n	n	1	n	n	2	34	1	16	n	n
51	2	1	n	n	n	1	12	2	5	6	13	4	n	n	1	11	23	9	1	6	1	2	1
52	n	n	n	n	n	n	4	6	3	1	7	6	n	n	1	n	2	8	2	3	1	n	n
53	n	n	n	n	n	n	4	36	3	n	6	29	6	20	21	1	2	4	3	2	1	n	n
54	2	7	n	n	n	2	20	7	21	2	10	6	1	2	3	6	5	7	2	4	n	n	1
55	n	n	n	n	3	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
56	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
57	n	n	n	n	n	n	1	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n
58	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
59	n	n	n	n	n	n	1	1	1	n	n	2	6	2	3	n	n	1	n	n	n	n	n
60	1	1	n	n	n	n	3	1	2	4	6	1	n	n	n	14	17	4	1	3	n	1	1

n - less than 0.5 percent.

Table 2D. -- Probabilities (in percent) that an oilspill starting at a particular location will reach a certain land segment in 60 days.

Land Segment	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	P23	E1
	Hypothetical spill location																							
1	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	n	n	n	n	n	n	n	n	n	n	n	n	1	n	1	1	1	n	n	n	n	1	n	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	n
4	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	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
6	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
7	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
8	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
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
10	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
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
12	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n
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
14	n	n	n	n	n	n	n	n	n	n	n	n	1	n	1	1	1	1	1	n	1	1	2	n
15	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	1	1	n	1	1	1	n
16	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	1	1	n
17	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	1	1	1	n
18	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	1	n
19	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	1	n	n	2	2	n
20	n	n	n	n	n	n	n	n	n	n	1	1	n	n	n	1	4	3	2	2	3	16	12	n
21	n	n	n	n	n	n	n	n	n	n	1	1	n	1	1	1	9	11	9	6	18	22	24	n
22	n	n	n	n	n	n	n	n	n	1	1	1	1	1	1	1	3	7	14	18	18	20	13	n
23	n	n	n	n	n	n	n	n	n	n	1	1	n	1	1	1	4	10	24	45	35	8	5	n
24	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	3	6	4	1	1	n	n
25	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	10	5	3	1	n	n	n	n
26	n	n	n	n	n	n	n	n	n	n	1	1	n	n	n	n	6	3	1	1	n	n	n	n
27	n	n	n	n	n	n	n	3	3	n	6	3	n	n	n	n	4	3	2	1	1	n	n	n
28	n	n	n	n	n	n	n	5	2	n	3	1	n	n	n	n	2	n	n	n	n	n	n	n
29	n	n	n	n	n	n	n	14	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
30	n	n	1	2	2	7	2	5	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
31	n	n	2	8	1	2	1	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	4
32	4	1	3	3	2	2	1	1	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	10
33	3	1	1	1	1	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1
34	1	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
35	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
36	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
37	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
38	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
39	n	n	n	n	n	n	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	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
41	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
42	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
43	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
44	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
45	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
46	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
47	27	38	10	8	7	6	4	3	2	1	n	n	n	n	n	n	n	n	n	n	n	n	n	11
48	5	21	37	11	17	9	6	4	3	2	3	4	n	n	1	n	1	1	1	n	n	n	n	23
49	1	2	24	48	53	57	76	23	28	n	6	3	n	n	n	n	3	2	2	1	1	n	n	25
50	n	n	n	2	1	4	2	18	43	n	3	1	n	n	n	n	1	1	1	n	n	n	n	1
51	4	2	2	1	1	1	n	2	1	19	7	10	3	1	1	n	2	1	1	n	1	n	n	1
52	n	n	1	n	1	n	n	2	1	2	14	18	1	1	1	n	2	1	1	n	n	n	n	n
53	n	n	n	n	n	n	n	3	2	2	12	6	1	1	1	1	25	25	18	11	7	4	1	n
54	2	2	1	1	1	n	n	3	2	8	12	18	10	9	12	7	5	4	4	2	2	1	n	1
55	n	n	n	n	n	n	n	n	n	1	n	n	1	1	n	1	n	n	n	n	n	n	n	n
56	1	n	n	n	n	n	n	n	n	1	n	1	2	2	3	3	n	n	n	n	n	n	n	n
57	n	n	n	n	n	n	n	n	n	2	1	1	3	3	6	4	1	1	n	n	n	1	1	n
58	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
59	n	n	n	n	n	n	n	n	n	1	1	1	n	n	1	n	3	4	3	3	3	15	29	n
60	2	2	1	n	1	1	n	1	1	11	3	4	1	n	1	1	1	1	n	n	n	n	n	1

n - less than 0.5 percent.

Table 2D. -- Probabilities (in percent) that an oilspill starting at a particular location will reach a certain land segment in 60 days. (Continued)

Land Segment	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12	E13	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12
1	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	n	n	n	n	n	n	n	n	1	1	n	n	n	n	n	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	n	n	n	n	n	n	n	n	n
4	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	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
6	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
7	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
8	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
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
10	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
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
12	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
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
14	n	n	n	n	n	n	n	1	n	1	1	1	n	n	n	n	n	n	n	n	n	n	n	n
15	n	n	n	n	n	n	n	n	n	1	1	1	n	n	n	n	n	n	n	n	n	n	n	n
16	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n
17	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n
18	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
19	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n
20	n	n	n	n	n	n	n	1	n	n	3	4	n	n	n	n	n	n	n	1	n	n	n	n
21	n	n	n	n	n	1	n	1	1	1	10	13	n	n	n	n	n	n	n	2	n	n	n	n
22	n	n	n	n	n	n	n	1	n	n	6	6	n	n	n	n	n	n	n	1	n	n	n	n
23	n	n	n	n	n	1	n	1	1	1	8	8	n	n	n	n	n	n	n	1	n	n	n	n
24	n	n	n	n	n	n	n	n	n	n	3	2	n	n	n	n	n	n	n	n	n	n	n	n
25	n	n	n	n	n	n	n	n	n	n	12	5	n	n	n	n	n	n	n	3	n	n	n	n
26	n	n	n	n	1	n	n	1	n	n	5	3	n	n	n	n	n	n	2	26	n	n	n	n
27	n	n	1	n	5	n	n	2	n	n	4	3	n	n	n	n	n	1	15	30	n	n	n	n
28	n	n	2	n	3	n	n	1	n	n	1	1	n	n	n	n	n	1	14	7	n	n	n	n
29	n	n	5	1	2	n	n	n	n	n	n	n	n	n	n	n	n	1	1	n	n	n	n	n
30	n	4	4	1	1	n	n	n	n	n	n	n	n	n	n	n	1	3	n	n	n	n	n	n
31	1	1	1	n	n	n	n	n	n	n	n	n	n	n	n	n	2	1	n	n	n	n	n	n
32	1	2	1	1	1	n	n	n	n	n	n	n	3	2	3	6	2	1	n	n	1	5	6	2
33	n	1	1	n	n	n	n	n	n	n	n	n	3	2	2	5	2	1	n	n	n	3	8	2
34	n	n	n	n	n	n	n	n	n	n	n	n	1	1	1	2	n	n	n	n	n	2	2	1
35	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	1	1	n
36	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	2	1	n
37	n	n	n	n	n	n	n	n	n	n	n	n	2	3	2	n	n	n	n	n	1	4	4	n
38	n	n	n	n	n	n	n	n	n	n	n	n	2	5	1	n	n	n	n	n	1	17	3	n
39	n	n	n	n	n	n	n	n	n	n	n	n	2	1	n	n	n	n	n	n	6	15	n	n
40	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	10	6	n	n
41	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	12	2	n	n
42	n	n	n	n	n	n	n	n	n	n	n	n	8	1	n	n	n	n	n	n	30	1	n	n
43	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	20	n	n	n
44	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	2	n	n	n
45	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n
46	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	3	1	n	n
47	22	4	4	3	3	3	n	n	n	n	n	n	1	1	2	5	18	4	1	n	1	5	4	1
48	53	6	5	3	4	7	2	5	n	1	1	1	n	n	n	1	22	7	3	1	n	1	1	1
49	5	63	31	67	25	1	1	4	1	n	3	3	n	n	n	n	17	54	16	4	n	n	n	n
50	n	9	29	17	32	n	n	1	n	n	1	1	n	n	n	n	n	15	18	3	n	n	n	n
51	1	n	1	n	2	15	21	11	2	1	1	1	n	1	1	2	2	1	3	1	n	n	1	2
52	n	n	1	n	2	2	3	16	1	n	1	2	n	n	n	n	1	n	3	1	n	n	n	n
53	n	n	1	n	4	2	3	6	1	1	21	26	n	n	n	n	n	n	5	10	n	n	n	n
54	1	n	1	n	3	8	9	19	12	11	3	4	n	1	2	3	2	1	4	1	n	n	1	3
55	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
56	n	n	n	n	n	1	1	n	3	3	n	n	n	n	n	1	n	n	n	n	n	n	1	1
57	n	n	n	n	n	2	2	1	4	3	1	1	n	n	1	1	n	n	n	n	n	n	1	1
58	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
59	n	n	n	n	1	n	n	1	1	n	3	4	n	n	n	n	n	n	1	1	n	n	n	n
60	1	n	1	n	1	7	10	4	1	n	1	1	n	1	1	2	2	n	1	1	n	n	1	1

n - less than 0.5 percent.

Table 2D. -- Probabilities (in percent) that an oilspill starting at a particular location will reach a certain land segment in 60 days. (Continued)

Land Segment	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27	L1	L2	L3	L4	L5	L6	L7	L8
	Hypothetical spill location																						
1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
2	n	1	n	n	n	n	1	n	1	n	n	n	n	n	n	1	n	1	n	n	n	n	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
4	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
6	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
7	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
8	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
9	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
10	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
11	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
12	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
13	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
14	n	1	n	n	n	n	1	1	1	n	n	1	1	1	1	n	n	n	n	n	n	n	n
15	n	n	n	n	n	n	n	n	n	n	n	n	1	1	1	n	n	n	n	n	n	n	n
16	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n
17	n	n	n	n	n	n	n	n	n	n	n	n	1	1	n	n	n	n	n	n	n	n	n
18	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n
19	n	n	n	n	n	n	n	n	n	n	n	n	1	1	n	n	n	n	n	n	n	n	n
20	n	n	n	n	n	n	n	2	1	n	n	1	7	2	3	n	n	n	n	n	n	n	n
21	n	n	n	n	n	n	1	3	1	n	1	2	25	11	10	n	n	1	n	1	n	n	n
22	n	n	n	n	n	n	1	1	1	n	n	1	20	13	7	n	n	n	n	n	n	n	n
23	n	n	n	n	n	n	1	1	1	n	1	1	20	23	8	n	n	n	n	n	n	n	n
24	n	n	n	n	n	n	n	n	n	n	n	n	2	5	3	n	n	n	n	n	n	n	n
25	n	n	n	n	n	n	n	2	n	n	n	1	n	2	10	n	n	n	n	n	n	n	n
26	n	n	n	n	n	n	1	5	n	n	n	5	1	1	4	n	n	n	n	n	n	n	n
27	n	n	n	n	n	n	1	4	1	n	3	8	n	1	4	n	n	3	4	n	1	n	n
28	n	n	n	n	n	n	1	1	n	n	1	2	n	n	1	n	n	1	3	n	1	n	n
29	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	4	n	2	n	n
30	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	2	n	1
31	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	1
32	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	2	2
33	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	2	1
34	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n
35	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
36	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
37	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
38	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
39	n	n	n	n	n	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	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
41	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
42	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
43	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
44	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
45	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
46	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
47	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	1	2	2	4	29	9
48	n	n	n	n	n	n	1	2	1	1	4	2	n	1	1	n	1	10	3	16	4	20	27
49	n	n	n	n	n	n	1	4	1	n	3	6	n	2	2	n	1	14	27	37	58	3	44
50	n	n	n	n	n	n	1	2	n	n	1	3	n	1	1	n	1	2	34	1	16	n	n
51	3	2	n	n	n	1	13	4	6	7	14	5	n	1	2	12	24	9	2	6	1	2	1
52	n	n	n	n	n	n	5	6	3	1	8	6	n	1	1	1	2	8	2	3	1	n	1
53	n	1	n	n	n	n	5	37	3	n	6	29	7	21	22	1	2	5	3	2	1	n	n
54	4	9	n	n	n	3	22	9	24	5	13	7	1	3	4	8	7	9	2	5	1	2	1
55	1	1	n	1	10	4	n	n	n	1	n	n	n	n	n	1	n	n	n	n	n	n	n
56	2	2	n	n	n	1	1	n	1	2	1	n	n	n	n	2	1	n	n	n	n	n	n
57	2	3	n	n	n	1	3	1	4	2	1	1	n	n	1	3	2	2	n	1	n	n	n
58	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
59	n	n	n	n	n	n	1	2	1	n	1	2	7	3	3	n	n	1	n	1	n	n	n
60	2	1	n	n	n	n	3	2	2	5	6	2	n	n	1	14	17	4	1	4	n	1	1

n - less than 0.5 percent.

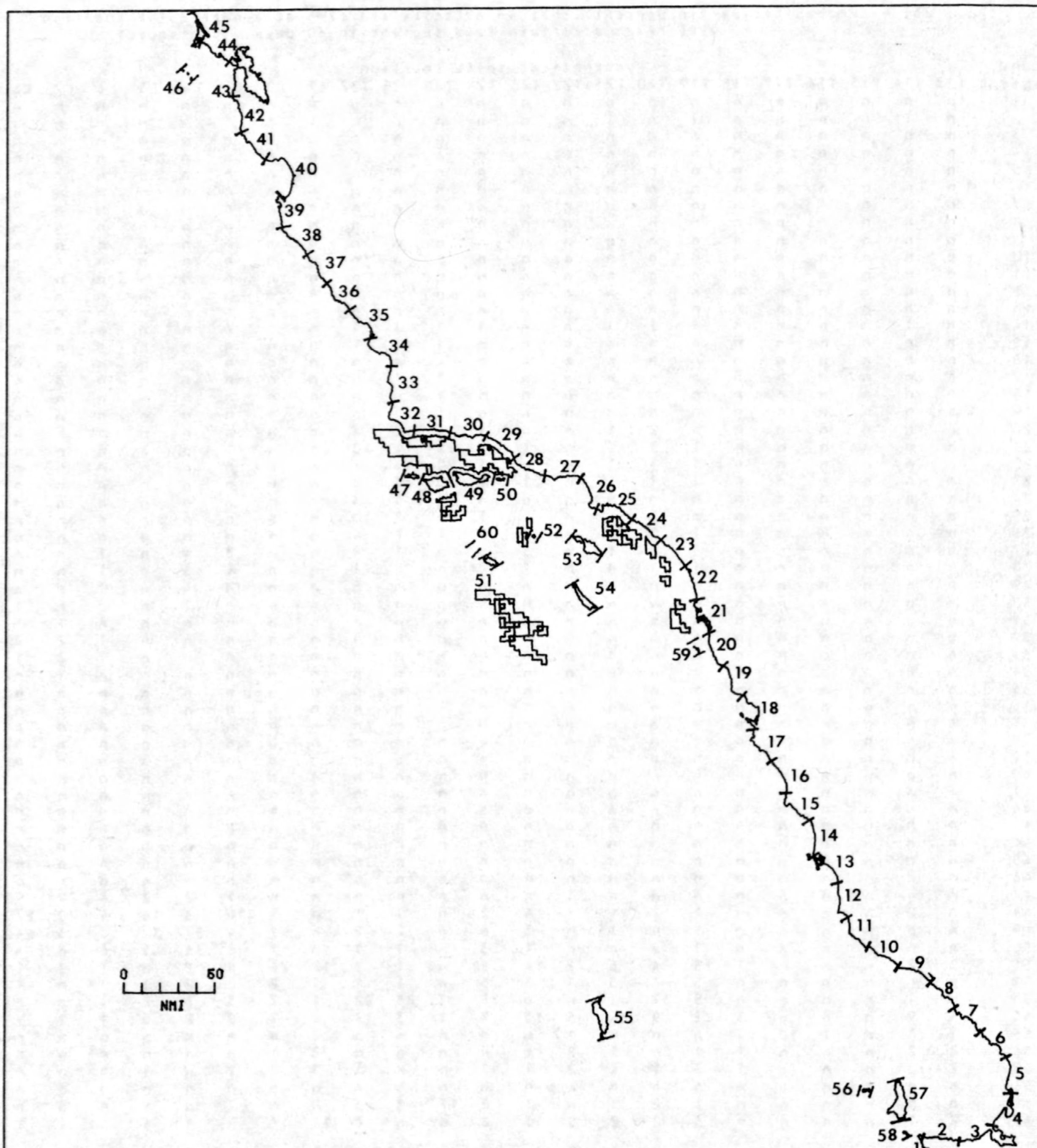

Figure 4.--Map of land segment numbers.

Oilspill Trajectories in Relation to Biological Resources, Recreation Areas, and Other Objects

Oilspill trajectory simulations were conducted keeping track of the frequency in time with which trajectories intersected the locations of biological, recreational and other objects of interest. Trajectories were recorded as contacting an object only in cases where the object was listed as being vulnerable to oilspills in the month the contact took place. Table 3A-D give the probability of contact on each of the 31 categories of biological resources, recreation areas, and other objects (see Appendix A, figures A1-31) for a spill originating at the 71 spill sites within the lease area (see figure 1). Once again, the conditional probabilities are given for the four time limits stated above.

Estimates of Weathering Rates and Slick Dispersion

It must be emphasized that up to this point the analysis has dealt only with trajectories for the transport of surface oil by winds and currents and has not involved any direct consideration of dispersion or weathering processes which would progressively reduce the quantity of oil contained in the slick as it traveled towards shore. The probabilities given in tables 2A-D and 3A-D, therefore, present a worst-case picture in the sense that some fraction of the spills occurring offshore in the lease area would be expected to deteriorate to the point of insignificance before reaching either land or an object. Some attempt at quantifying weathering and dispersive effects and accounting for them in damage probability estimates for each resource is thus in order.

One important factor determining the significance of weathering in reducing oilspill effects is the time required for spills to reach an object. Times to land, segments, or objects for the simulated trajectories, in fact, cover a very wide range, and it is therefore particularly important to consider this factor in interpreting results of the spill trajectory analysis. The change with time of the likelihood of a spill (once it occurs) coming in contact with an object is shown in tables 2A-D and 3A-D.

Also in the list of factors which would determine the potency of spills at the time of contact would be spill size and the quality or composition of the oil (since lighter weight crudes evaporate at a much more rapid rate than those with a large proportion of high molecular weight hydrocarbons). This latter factor is hard to predict in advance and the significance of weathering is therefore difficult to quantify

Table 3A. -- Probabilities (in percent) that an oilspill starting at a particular location will reach a certain object in 3 days.

Object	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	P23	E1
	Hypothetical spill location																							
Land	19	48	46	30	51	39	68	22	52	9	9	13	n	n	n	n	10	5	11	33	22	13	26	30
1	n	n	n	n	n	n	n	n	n	n	n	n	40	*	21	86	n	n	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	n	n	n	n	n	n
3	50	*	32	59	47	81	97	*	*	17	40	*	74	*	18	77	8	28	49	94	43	*	*	73
4	n	n	8	74	30	*	53	*	*	7	20	50	27	89	18	77	*	*	38	5	8	18	42	14
5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
6	n	n	n	n	n	n	n	n	n	n	n	n	1	16	1	28	n	n	n	n	n	1	9	n
7	n	n	2	7	3	6	1	11	4	3	2	n	n	n	n	n	n	n	n	2	9	6	6	50
8	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	2	9	n
9	n	n	n	n	n	n	n	1	1	n	4	6	n	n	n	n	9	14	7	1	n	2	25	n
10	27	60	72	58	80	63	*	61	95	5	11	27	4	42	2	51	16	5	14	56	32	23	36	95
11	15	23	25	20	24	6	5	9	21	10	12	22	n	n	n	n	24	19	3	1	n	n	n	21
12	1	24	4	4	1	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	14
13	n	n	n	n	n	1	n	27	7	n	1	n	n	n	n	n	25	10	1	n	n	n	n	n
14	n	n	1	4	2	13	10	25	16	25	n	n	26	5	25	2	n	n	n	n	n	n	n	n
15	23	52	57	39	63	45	70	57	74	12	19	60	12	47	6	55	91	53	41	66	38	45	64	46
16	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	14	28	33	8	34	34	n
17	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
18	23	52	50	25	47	38	47	28	71	7	15	31	n	n	n	n	6	4	11	34	24	19	23	33
19	13	8	26	4	30	10	11	16	63	3	13	22	n	n	n	n	n	n	n	n	n	4	17	10
20	n	n	1	5	1	5	1	17	1	n	n	n	n	n	n	n	6	2	7	23	14	6	4	2
21	n	n	n	n	n	n	n	4	n	n	n	n	n	n	n	n	3	1	2	2	1	n	n	n
22	2	20	83	*	89	*	92	*	*	2	11	2	n	n	n	n	*	*	*	*	*	*	*	*
23	23	53	57	37	62	44	70	58	73	9	28	55	15	48	9	63	*	87	92	*	48	*	*	43
24	19	48	45	23	51	33	68	5	42	6	1	1	n	n	n	n	4	3	2	3	3	1	3	22
25	28	58	59	29	65	39	77	19	78	16	32	63	n	n	n	n	8	4	8	9	5	1	n	29
26	n	n	n	2	1	3	n	13	1	n	n	n	43	*	20	89	n	n	5	30	18	2	3	6
27	26	46	28	7	13	17	17	14	68	3	24	52	n	n	n	n	1	1	n	n	n	5	11	10
28	17	39	45	23	50	30	61	15	64	4	13	22	n	n	n	n	10	4	5	1	2	8	3	29
29	8	35	28	17	30	22	34	19	62	3	14	29	n	n	n	n	9	4	6	11	13	16	29	17
30	n	n	n	4	n	1	n	n	n	n	n	n	n	n	n	n	1	2	2	13	10	1	3	1
31	n	n	1	5	n	3	1	10	50	5	13	24	n	n	n	n	n	n	1	1	3	5	7	7

n - less than 0.5 percent
* - greater than 99.5 percent

Table 3A. -- Probabilities (in percent) that an oilspill starting at a particular location will reach a certain object in 3 days. (Continued)

	Hypothetical spill location																							
Object	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12	E13	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12
Land	71	52	35	74	31	8	9	10	n	n	9	5	n	n	n	1	35	51	24	26	43	9	n	n
1	n	n	n	n	n	n	n	n	59	*	n	n	n	n	n	n	n	n	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	n	n	n	n	n	n
3	38	*	*	*	*	56	17	49	72	*	42	39	n	n	n	4	70	92	48	1	68	51	n	n
4	2	*	*	*	*	3	12	39	53	*	*	*	n	n	n	n	9	99	*	*	2	4	n	n
5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	20	5	n	n
6	n	n	n	n	n	n	n	n	1	2	n	n	3	3	1	n	n	n	n	n	2	2	n	13
7	n	5	10	4	2	45	2	n	n	n	n	n	n	n	n	n	1	3	1	1	n	n	n	n
8	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
9	n	n	n	n	3	n	n	4	n	n	6	17	n	n	n	n	n	n	6	2	n	n	n	n
10	90	74	67	99	73	11	7	23	2	7	19	3	n	n	n	2	54	78	38	66	41	5	n	n
11	25	7	13	7	20	11	22	21	1	n	23	21	n	n	n	3	22	11	10	3	n	n	n	n
12	n	1	1	n	n	n	n	n	n	n	n	n	n	n	n	n	10	1	n	n	n	n	n	n
13	n	1	24	1	16	n	n	n	n	n	15	10	n	n	n	n	n	5	10	13	n	n	n	n
14	n	24	26	25	15	26	27	n	11	20	n	n	n	n	n	n	n	20	3	n	n	n	n	n
15	76	59	51	79	58	14	13	43	29	37	99	66	n	n	n	2	42	58	55	70	61	18	n	n
16	n	n	n	n	n	n	n	n	n	n	8	23	n	n	n	n	n	n	n	n	n	n	n	n
17	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	6	n	n	n
18	76	53	43	75	54	10	9	26	n	n	3	4	n	n	n	1	37	51	32	18	24	11	n	n
19	8	23	34	55	49	2	2	18	n	n	n	n	n	n	n	1	15	28	21	n	31	3	n	n
20	n	2	8	n	1	n	n	n	n	n	6	1	n	n	n	n	1	2	10	17	22	2	n	n
21	n	n	1	n	1	n	n	n	n	n	4	1	n	n	n	n	n	n	3	5	1	n	n	n
22	61	*	*	95	*	20	1	2	n	n	*	*	n	n	n	n	61	96	*	*	n	n	n	n
23	76	58	52	78	58	13	14	43	33	88	99	96	n	n	1	2	42	58	61	68	72	21	34	n
24	71	51	26	74	23	8	9	1	n	n	1	3	n	n	n	1	34	47	11	2	3	17	n	n
25	81	57	40	81	67	17	17	44	n	n	5	3	n	n	n	2	44	60	45	12	13	14	n	n
26	n	2	7	n	1	n	n	n	59	*	n	n	n	n	n	n	1	1	2	3	10	n	n	n
27	46	40	35	70	52	2	3	37	n	n	1	2	n	n	n	2	25	39	22	1	9	6	n	n
28	67	46	36	73	44	7	3	18	n	n	5	4	n	n	n	n	32	49	23	18	45	11	n	n
29	44	33	33	50	49	5	2	25	n	n	4	4	n	n	n	n	20	35	26	19	1	4	n	n
30	n	n	n	n	n	n	n	n	n	n	6	1	n	n	n	n	1	n	6	7	2	1	n	n
31	n	7	25	17	33	3	8	20	n	n	n	n	n	n	n	n	1	15	18	4	5	3	n	n

n - less than 0.5 percent
* - greater than 99.5 percent

Table 3A. -- Probabilities (in percent) that an oilspill starting at a particular location will reach a certain object in 3 days. (Continued)

	Hypothetical spill location																						
Object	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27	L1	L2	L3	L4	L5	L6	L7	L8
Land	n	n	n	n	n	n	8	28	4	2	5	17	19	9	9	21	23	20	48	51	59	38	58
1	1	39	n	n	n	5	2	n	21	n	n	n	n	n	n	14	n	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	n	n	n	n	n
3	1	48	n	n	n	8	20	25	26	5	19	18	55	39	23	62	36	43	66	51	92	58	31
4	n	28	n	n	n	4	27	81	29	1	11	69	17	56	*	33	17	3	*	2	84	n	16
5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
6	n	2	n	n	n	2	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n
7	n	n	n	n	n	n	n	n	n	n	4	n	10	n	n	n	3	36	16	25	3	n	2
8	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
9	n	n	n	n	n	n	6	18	3	n	2	12	1	9	6	n	n	20	5	n	1	n	n
10	n	6	n	n	n	1	10	20	6	2	7	14	27	13	17	13	13	28	77	66	85	51	84
11	n	n	n	n	n	n	13	17	13	1	18	14	n	3	20	11	15	14	18	9	8	21	22
12	n	n	n	n	n	n	1	n	6	n	n	n	n	n	n	n	n	n	n	n	n	12	1
13	n	n	n	n	n	n	n	3	n	n	n	4	n	1	16	n	n	n	9	n	10	n	n
14	1	9	n	n	n	3	3	n	6	4	9	n	n	n	n	17	19	11	14	10	18	n	1
15	n	11	n	n	n	2	26	53	20	3	13	34	41	36	87	38	30	38	85	71	73	44	69
16	n	n	n	n	n	n	n	n	n	n	n	n	19	23	8	n	n	n	n	n	n	n	n
17	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
18	n	n	n	n	n	n	11	32	6	1	9	20	21	10	4	20	16	29	62	60	52	43	55
19	n	n	n	n	n	n	6	5	3	1	5	3	1	n	n	12	7	7	50	26	26	14	32
20	n	n	n	n	n	n	n	2	n	n	n	2	15	6	7	n	n	n	4	n	2	n	n
21	n	n	n	n	n	n	n	2	n	n	n	1	n	2	3	n	n	n	2	n	1	n	n
22	n	n	n	n	n	n	2	84	2	1	4	66	98	*	*	n	2	74	*	88	98	22	79
23	n	14	n	n	n	2	30	54	23	2	16	38	69	75	96	29	20	78	81	74	72	44	68
24	n	n	n	n	n	n	7	9	3	1	3	6	4	2	1	10	13	20	43	53	55	38	58
25	n	1	n	n	n	n	22	42	9	4	16	24	4	6	6	43	35	50	73	80	68	49	71
26	1	42	n	n	n	6	2	n	20	n	n	n	9	4	n	14	n	n	3	n	2	n	n
27	n	n	n	n	n	n	7	15	5	1	9	12	1	n	n	10	7	11	51	5	39	36	23
28	n	n	n	n	n	n	4	31	5	1	6	18	10	4	7	9	7	25	55	57	57	34	58
29	n	n	n	n	n	n	5	25	4	1	7	14	15	5	6	17	6	16	53	30	39	21	40
30	n	n	n	n	n	n	n	n	n	n	n	n	3	2	4	n	n	n	n	n	n	n	n
31	n	n	n	n	n	n	8	5	2	n	7	3	5	1	n	12	13	1	36	1	13	n	n

n - less than 0.5 percent
* - greater than 99.5 percent

Table 3B. -- Probabilities (in percent) that an oilspill starting at a particular location will reach a certain object in 10 days.

Object	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	E1
Land	31	61	73	74	79	79	87	65	78	27	36	41	2	1	4	1	40	38	48	64	60	63	71	69
1	1	n	n	n	n	n	n	n	n	6	n	n	72	*	28	87	n	n	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	n	n	n	n	n	n
3	64	*	44	80	60	91	97	*	*	54	60	*	88	*	30	79	29	51	72	97	78	*	*	82
4	2	2	13	77	34	*	55	*	*	32	55	69	65	91	31	79	*	*	62	33	38	56	70	20
5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
6	2	3	1	1	1	1	1	n	n	1	n	n	11	23	11	33	n	n	n	n	n	1	9	1
7	n	n	3	10	4	9	4	17	8	3	8	5	n	n	n	n	2	2	2	4	17	31	24	50
8	n	n	n	n	n	n	n	n	n	n	n	n	1	1	4	2	n	n	n	n	n	2	9	n
9	n	n	n	n	n	n	n	2	2	n	10	10	n	n	1	n	18	22	16	6	4	3	25	n
10	41	68	85	87	93	91	*	91	99	21	39	50	19	48	10	53	35	30	42	75	67	69	74	97
11	20	24	26	22	25	10	6	16	22	17	18	24	n	n	n	n	25	20	6	2	1	n	n	23
12	1	24	4	5	1	2	n	2	1	n	n	1	2	n	1	n	n	n	n	n	n	n	n	15
13	n	n	n	n	1	1	1	27	7	n	3	1	n	n	n	n	26	13	4	1	n	n	n	n
14	1	1	3	7	5	15	12	25	16	26	2	2	26	7	25	2	n	n	n	n	n	n	n	3
15	36	65	80	77	85	81	86	89	92	41	55	78	37	54	15	57	96	80	77	82	74	83	89	78
16	n	n	n	n	n	n	n	n	n	n	n	1	n	2	1	3	5	18	32	34	16	34	35	n
17	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
18	33	64	74	64	68	72	63	70	87	24	43	55	2	1	5	1	32	33	43	60	56	56	51	66
19	19	13	36	18	39	25	17	43	71	11	23	35	2	1	3	1	2	1	1	n	n	11	27	24
20	n	n	2	7	2	7	2	24	4	n	4	2	n	n	n	n	17	18	32	46	42	31	28	4
21	n	n	n	n	n	n	n	6	1	n	1	n	n	n	n	n	11	8	8	5	3	1	1	n
22	5	26	87	*	93	*	95	*	*	4	41	21	n	n	n	n	*	*	*	*	*	*	*	*
23	37	65	80	76	85	80	86	90	91	38	63	76	45	58	29	66	*	97	98	*	86	*	*	76
24	29	60	70	63	75	69	85	35	62	20	15	18	2	1	4	1	18	18	15	12	12	12	13	57
25	40	69	80	68	85	74	90	61	92	49	61	80	3	2	6	2	29	25	25	19	19	6	4	63
26	1	n	2	5	2	6	2	18	2	6	1	1	72	*	27	89	2	8	24	48	37	17	16	8
27	37	55	43	29	26	39	26	45	80	12	37	61	n	n	n	n	7	5	2	1	1	16	18	31
28	26	50	66	59	70	63	74	52	81	13	37	44	1	1	5	1	34	25	18	9	18	18	17	60
29	14	42	43	41	44	46	44	50	74	12	35	46	n	1	2	n	31	27	27	26	36	42	50	37
30	n	n	1	5	1	1	n	1	1	n	2	1	n	n	n	n	5	5	9	18	17	10	8	1
31	1	1	4	9	3	8	3	28	55	19	22	34	1	n	n	n	3	4	5	6	9	15	15	10

n - less than 0.5 percent
* - greater than 99.5 percent

Table 3B. -- Probabilities (in percent) that an oilspill starting at a particular location will reach a certain object in 10 days. (Continued)

	Hypothetical spill location																						
Object	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12	E13	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12
Land	81	82	74	90	65	26	28	39	2	3	42	38	n	n	n	6	57	80	61	68	71	30	3	1
1	n	n	n	n	n	5	3	n	76	*	n	n	n	n	n	1	1	n	n	n	n	n	n	2
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
3	44	*	*	*	*	76	51	71	82	*	57	54	1	1	1	19	77	95	57	10	71	60	3	5
4	4	*	*	*	*	28	36	61	73	*	*	*	n	n	n	1	13	99	*	*	10	8	n	1
5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	2	n	n	n	n	22	7	n	n
6	2	1	n	n	n	1	1	n	10	9	n	n	14	10	9	4	2	n	n	n	6	3	n	20
7	n	8	13	6	8	45	4	8	n	n	1	3	n	n	n	n	1	7	6	3	n	n	n	n
8	n	n	n	n	n	n	n	n	1	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n
9	n	n	1	n	4	n	n	9	n	n	16	23	n	n	n	n	n	1	10	6	n	n	n	n
10	91	93	93	*	90	27	23	48	14	16	41	28	n	n	n	10	67	94	65	80	49	12	2	2
11	25	11	17	8	22	20	25	23	1	n	24	22	n	n	n	5	23	13	12	4	n	n	n	n
12	n	2	3	1	1	1	n	1	2	1	n	n	n	n	n	n	10	1	1	n	n	n	n	n
13	n	1	24	2	16	n	n	2	n	n	18	13	n	n	n	n	n	5	15	18	n	n	n	n
14	1	24	26	25	16	26	27	1	19	22	n	n	n	n	n	1	2	21	5	n	n	n	n	n
15	84	86	86	93	85	42	42	68	46	45	*	86	1	1	n	6	63	85	81	93	81	31	n	1
16	n	n	n	n	n	n	n	1	n	1	12	24	n	n	n	n	n	n	n	1	n	n	n	n
17	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	10	2	n	n
18	83	79	77	88	79	27	27	52	3	3	29	33	n	n	n	4	56	76	62	47	36	29	3	n
19	12	34	55	60	64	11	11	32	2	2	1	1	n	n	n	3	23	39	35	3	44	9	n	n
20	1	4	11	1	5	n	n	2	n	n	23	15	n	n	n	n	2	4	23	48	34	8	1	n
21	n	n	2	n	2	n	n	n	n	n	11	7	n	n	n	n	n	n	6	16	4	1	n	n
22	65	*	*	98	*	22	7	23	n	n	*	*	n	n	n	n	63	98	*	*	n	n	n	n
23	84	85	86	92	87	41	42	69	53	91	*	99	2	4	10	10	63	84	87	95	83	38	45	3
24	80	78	58	88	47	22	21	20	2	2	14	19	n	n	n	3	53	72	28	10	12	34	4	n
25	88	82	74	93	88	49	48	70	4	4	27	25	n	1	n	7	63	82	74	35	23	29	4	n
26	n	4	9	1	3	5	3	1	75	*	6	6	n	n	n	2	2	3	4	10	16	2	n	2
27	50	57	60	78	71	12	12	50	n	n	4	7	n	n	n	6	38	54	39	5	15	15	1	n
28	75	71	70	85	70	17	14	41	3	3	27	27	n	n	n	4	50	72	49	38	62	28	3	1
29	49	49	59	59	69	15	12	42	n	1	25	29	n	n	n	2	31	51	49	40	6	9	n	n
30	n	n	1	n	2	n	n	1	n	n	11	5	n	n	n	n	1	1	12	20	8	3	n	n
31	1	12	38	19	45	15	21	32	n	n	3	4	n	n	n	n	3	20	35	12	15	8	n	n

n - less than 0.5 percent
* - greater than 99.5 percent

Table 38. -- Probabilities (in percent) that an oilspill starting at a particular location will reach a certain object in 10 days. (Continued)

Object	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27	L1	L2	L3	L4	L5	L6	L7	L8
	Hypothetical spill location																						
Land	1	1	n	n	n	1	27	53	19	9	30	49	60	48	43	24	39	40	72	62	83	52	80
1	17	70	n	n	n	21	8	n	25	12	1	n	n	n	n	38	4	1	n	2	n	1	n
2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
3	23	75	n	n	n	22	48	42	49	33	53	38	80	69	45	79	64	67	70	55	92	66	41
4	15	60	n	n	n	18	54	90	52	18	41	84	49	72	*	56	38	31	*	16	84	4	19
5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
6	11	16	n	n	n	10	2	n	4	6	1	n	n	n	n	6	1	n	n	1	n	3	1
7	n	n	n	n	n	n	1	3	1	n	6	5	25	2	2	n	4	36	20	26	6	n	4
8	n	1	n	n	n	n	1	n	1	n	n	n	n	n	n	1	n	n	n	n	n	n	n
9	n	n	n	n	n	n	7	21	4	n	4	18	3	16	17	n	n	20	5	1	1	n	n
10	7	21	n	n	n	7	31	39	25	11	31	37	67	42	39	22	25	49	91	73	97	62	93
11	n	n	n	n	n	1	17	19	15	5	24	17	n	5	20	11	18	20	21	13	10	23	22
12	n	1	n	n	n	n	4	n	8	n	n	n	n	n	n	2	n	n	1	n	1	12	1
13	n	n	n	n	n	n	n	5	n	n	1	6	n	3	18	n	n	n	9	n	10	n	n
14	7	15	n	n	n	4	6	n	9	11	11	1	n	n	n	19	20	13	15	11	18	1	4
15	9	31	n	n	n	9	51	78	41	18	46	68	78	75	96	53	53	63	95	81	90	59	86
16	n	1	n	n	n	n	1	1	1	n	n	1	24	30	13	n	n	n	n	n	n	n	n
17	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
18	2	2	n	n	n	1	32	55	22	9	35	50	56	43	32	22	30	50	81	68	72	56	73
19	1	1	n	n	n	1	17	10	14	5	17	12	3	n	2	15	15	20	63	31	37	20	40
20	n	n	n	n	n	n	1	7	n	n	1	9	43	32	23	n	n	n	7	n	5	1	2
21	n	n	n	n	n	n	n	4	n	n	n	4	2	6	11	n	n	n	2	n	1	n	n
22	n	n	n	n	n	n	11	89	8	2	17	79	99	*	*	n	4	76	*	89	99	28	86
23	12	39	n	n	n	13	54	82	47	18	49	76	91	95	99	47	42	85	95	83	90	59	87
24	1	1	n	n	n	n	20	22	13	6	20	20	15	17	16	13	24	33	58	60	73	51	77
25	4	3	n	n	n	1	48	62	30	19	50	52	14	23	26	46	60	72	87	87	86	62	86
26	19	71	n	n	n	22	8	1	24	12	2	2	26	23	7	38	4	1	4	1	4	2	1
27	1	n	n	n	n	n	17	24	12	5	22	23	6	2	5	11	15	27	65	12	52	47	34
28	1	1	n	n	n	n	21	53	19	5	25	44	23	21	30	10	15	43	73	63	75	46	74
29	1	1	n	n	n	n	17	45	13	6	21	37	38	27	28	18	14	32	69	37	53	29	52
30	n	n	n	n	n	n	n	2	n	n	n	3	9	8	8	n	n	n	1	n	n	n	1
31	1	1	n	n	n	n	16	9	6	5	21	11	13	5	4	14	24	16	45	7	20	1	2

n - less than 0.5 percent
* - greater than 99.5 percent

Table 3C. -- Probabilities (in percent) that an oilspill starting at a particular location will reach a certain object in 30 days.

Object	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	E1
Land	42	67	80	83	86	87	92	85	90	42	67	67	13	10	16	10	81	80	82	88	88	89	91	76
1	12	8	4	3	3	2	2	2	1	21	5	6	78	*	32	87	1	n	n	n	n	n	n	5
2	n	n	n	n	n	n	n	n	n	n	n	n	1	1	3	2	n	n	n	n	n	n	n	n
3	76	*	47	82	61	93	97	*	*	77	78	*	92	*	49	82	50	69	85	98	87	*	*	84
4	14	10	19	79	39	*	56	*	*	57	76	82	77	94	46	81	*	*	69	42	53	69	79	26
5	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
6	11	8	5	4	2	3	2	2	2	13	3	4	25	36	27	43	1	1	1	n	n	2	10	5
7	n	n	3	11	5	9	4	19	9	4	10	7	1	n	1	1	8	9	7	8	22	35	27	50
8	1	n	n	n	n	n	n	n	n	3	1	1	5	8	12	9	1	1	1	n	1	2	9	n
9	n	n	n	n	n	n	n	3	2	1	10	12	3	4	4	3	20	24	20	10	8	7	26	n
10	52	73	88	91	95	93	*	95	*	40	65	70	34	56	26	59	62	61	66	87	86	85	87	97
11	20	24	26	22	25	10	6	17	22	18	19	24	n	n	n	n	25	21	7	3	1	1	n	24
12	2	24	4	6	1	2	n	2	1	1	1	2	3	1	2	n	n	n	n	n	n	n	n	15
13	n	n	n	n	1	1	1	27	7	n	4	3	n	n	n	n	26	13	5	2	1	1	n	n
14	5	3	4	8	6	16	12	26	17	27	5	4	26	7	25	3	1	n	n	n	n	n	n	4
15	48	73	85	83	89	86	90	95	96	62	84	89	51	63	31	62	99	95	94	90	91	96	95	83
16	n	n	n	n	n	n	n	1	n	1	2	3	4	9	9	11	8	21	35	36	20	35	35	n
17	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
18	40	67	77	70	72	78	66	80	90	38	68	72	13	10	14	8	64	65	70	79	77	73	65	71
19	25	16	39	22	42	28	18	49	73	20	35	47	9	6	12	7	10	10	6	4	5	14	29	26
20	1	n	2	8	2	7	2	27	6	1	9	5	n	n	n	1	31	33	45	56	53	43	37	4
21	n	n	n	n	n	n	n	6	2	n	3	1	n	n	n	n	15	12	12	9	7	3	2	n
22	6	27	87	*	93	*	95	*	*	10	52	30	2	2	4	3	*	*	*	*	*	*	*	*
23	53	73	86	84	90	87	90	95	95	61	87	88	65	70	55	74	*	99	*	*	95	*	*	82
24	36	64	74	70	80	75	88	45	68	29	31	34	10	8	9	6	33	33	29	21	22	18	16	62
25	48	74	84	75	89	80	93	70	94	63	82	90	15	10	14	8	50	45	42	32	31	14	9	68
26	14	8	7	9	5	9	4	20	4	22	8	9	77	*	33	90	10	17	31	54	46	27	24	13
27	42	58	46	33	29	42	28	51	82	19	46	66	4	3	7	5	17	14	10	6	6	20	22	34
28	34	53	70	65	75	68	78	64	86	23	57	60	10	9	12	7	56	48	37	22	29	28	26	64
29	16	44	45	45	47	50	46	58	77	20	52	56	5	5	6	3	54	52	47	42	51	54	59	40
30	n	n	1	6	1	2	n	3	2	n	5	2	n	n	n	n	10	11	13	22	21	12	10	1
31	3	2	5	11	5	9	3	34	57	24	33	42	3	n	1	1	12	10	11	9	13	19	17	11

n - less than 0.5 percent
* - greater than 99.5 percent

Table 3C. -- Probabilities (in percent) that an oilspill starting at a particular location will reach a certain object in 30 days. (Continued)

Object	Hypothetical spill location E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12	E13	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12
Land	85	90	87	94	86	43	48	67	15	14	81	80	12	11	9	19	65	88	85	90	84	56	25	7
1	4	1	2	1	2	21	17	6	81	*	1	1	n	4	12	21	8	1	2	n	n	3	15	21
2	n	n	n	n	n	n	n	n	1	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n
3	46	*	*	*	*	89	76	86	90	*	69	71	13	16	22	48	82	96	65	19	72	78	45	31
4	9	*	*	*	*	54	61	77	84	*	*	*	1	5	10	20	22	99	*	*	12	12	14	20
5	n	n	n	n	n	n	n	n	n	n	n	n	3	3	n	2	n	n	n	n	22	11	6	1
6	5	2	2	1	2	15	13	3	25	26	1	1	31	19	19	16	8	3	2	n	8	5	9	31
7	1	9	15	6	10	45	4	10	n	1	7	9	n	n	n	n	2	8	9	5	n	n	n	n
8	n	n	n	n	n	3	3	1	7	8	1	1	n	n	n	1	1	n	n	n	n	n	n	1
9	n	n	1	n	5	n	1	10	3	4	20	25	n	n	n	n	n	1	11	7	n	n	n	n
10	93	96	95	*	96	45	45	70	31	31	67	60	6	7	10	24	73	96	78	87	54	35	27	13
11	25	11	18	8	22	20	25	24	1	n	24	22	n	2	1	6	23	13	14	4	n	7	4	n
12	n	2	3	1	1	2	1	2	3	1	n	n	n	n	n	n	10	2	1	n	n	n	n	n
13	n	1	24	2	16	n	1	3	n	n	19	14	n	n	n	n	n	5	15	19	n	n	n	n
14	2	24	27	25	17	27	28	5	20	22	n	n	n	n	1	4	5	21	6	1	n	n	2	4
15	88	91	92	95	95	63	65	86	58	54	*	97	13	9	8	23	71	90	94	98	89	51	20	15
16	n	n	n	n	1	2	2	2	5	8	15	28	n	n	n	n	1	n	n	1	n	n	n	1
17	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	11	4	1	n
18	85	84	84	90	88	41	45	71	14	13	61	67	5	8	5	9	61	81	79	63	43	49	15	3
19	14	36	58	61	68	20	22	44	11	10	8	10	7	3	3	9	27	42	42	8	50	20	9	3
20	1	4	13	2	10	1	1	5	n	n	38	30	3	2	1	2	2	5	29	58	38	14	4	1
21	n	n	3	n	3	n	n	1	n	n	16	11	n	n	n	n	n	n	9	19	5	2	n	n
22	65	*	*	98	*	27	13	33	3	3	*	*	n	n	n	1	63	98	*	*	n	1	n	1
23	88	91	92	94	96	64	66	87	70	94	*	*	23	25	25	36	72	90	97	*	90	58	56	22
24	82	83	66	91	57	31	33	38	10	10	30	34	4	9	5	8	59	78	41	17	18	51	15	3
25	90	87	80	96	93	64	66	86	16	14	48	44	5	9	6	14	70	87	88	45	31	49	17	5
26	4	6	12	2	6	21	17	8	80	*	15	15	1	6	13	23	10	5	8	14	18	6	18	23
27	51	61	64	80	76	20	21	57	5	5	14	17	3	5	4	10	41	57	47	11	22	31	12	2
28	77	76	77	88	82	28	28	59	12	11	49	50	10	10	7	13	56	77	65	50	70	49	20	5
29	50	52	63	61	76	23	23	55	6	5	50	55	1	1	1	5	34	55	62	52	9	14	3	2
30	n	1	2	n	4	1	1	2	n	n	16	10	n	1	n	1	1	1	15	24	10	5	1	n
31	2	13	41	20	49	21	28	40	2	1	11	12	1	1	n	2	5	21	42	18	18	10	2	1

n - less than 0.5 percent
* - greater than 99.5 percent

Table 3C. -- Probabilities (in percent) that an oilspill starting at a particular location will reach a certain object in 30 days. (Continued)

	Hypothetical spill location																						
Object	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27	L1	L2	L3	L4	L5	L6	L7	L8
Land	6	10	n	n	3	4	51	81	41	17	56	79	89	84	82	34	52	64	87	75	92	59	87
1	38	76	n	n	n	25	16	2	31	35	12	2	n	n	n	47	18	9	2	8	1	10	3
2	n	1	n	n	n	n	1	n	1	n	n	n	n	n	n	1	n	n	n	n	n	n	n
3	45	81	n	n	n	26	71	57	72	58	78	56	89	82	61	88	82	78	73	57	92	73	44
4	39	70	n	n	n	23	73	95	73	45	67	92	65	78	*	69	59	54	*	31	84	14	23
5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
6	32	31	n	n	14	33	7	2	13	27	8	2	1	n	1	18	10	6	1	6	1	11	4
7	n	n	n	n	n	n	3	7	2	n	7	9	29	8	7	n	5	37	21	26	7	n	4
8	2	6	n	n	1	2	3	1	5	2	2	1	1	1	1	5	2	2	n	1	n	n	n
9	1	3	n	n	n	1	8	22	6	n	4	20	8	20	20	2	1	20	6	1	1	n	n
10	20	34	n	n	1	11	54	61	47	26	55	62	86	66	66	35	41	68	95	82	98	69	95
11	n	n	n	n	n	1	17	20	15	5	25	18	1	6	20	11	19	22	22	13	10	23	22
12	n	2	n	n	n	n	4	n	9	1	1	1	n	n	n	3	1	1	1	1	1	13	1
13	n	n	n	n	n	n	1	6	1	n	1	7	1	5	19	n	1	1	10	n	10	n	n
14	12	16	n	n	n	5	8	1	10	16	14	2	n	n	n	19	21	15	16	12	18	4	4
15	25	44	n	n	n	14	71	95	62	39	73	90	95	93	99	65	72	81	98	89	94	67	90
16	2	6	n	n	n	2	3	3	4	1	2	2	27	32	15	3	2	2	n	1	n	n	n
17	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
18	6	10	n	n	n	4	52	77	42	16	56	74	75	72	63	31	41	67	87	76	78	60	76
19	4	7	n	n	4	3	30	19	27	10	30	22	6	7	9	21	22	31	67	38	40	23	42
20	n	n	n	n	n	n	3	13	2	n	4	17	56	44	38	n	1	4	11	1	6	1	3
21	n	n	n	n	n	n	n	6	n	n	1	6	5	11	15	n	n	1	4	n	2	n	n
22	1	2	n	n	n	1	18	90	13	3	27	84	*	*	*	3	9	79	*	90	99	29	86
23	32	55	n	n	n	20	79	96	72	42	76	94	98	99	*	63	61	91	97	90	94	69	91
24	5	8	n	n	n	3	34	34	26	11	34	34	23	32	32	20	32	45	65	67	79	55	81
25	11	12	n	n	n	4	64	75	48	29	73	71	25	41	47	53	72	83	91	92	91	67	89
26	40	77	n	n	2	26	17	6	31	36	14	7	36	31	15	47	18	10	7	8	6	11	5
27	3	3	n	n	4	2	25	33	20	8	33	33	11	10	15	15	21	37	69	17	55	50	37
28	4	8	n	n	3	3	38	70	34	10	43	63	34	40	52	18	25	57	81	71	81	50	78
29	3	4	n	n	n	1	29	59	23	9	37	54	53	49	52	22	21	45	74	44	57	31	55
30	n	n	n	n	n	n	1	4	n	n	2	7	13	14	14	n	n	2	3	n	1	1	1
31	3	2	n	n	n	1	22	16	11	9	30	20	17	10	12	16	29	25	50	11	22	4	3

n - less than 0.5 percent
* - greater than 99.5 percent

Table 3D. -- Probabilities (in percent) that an oilspill starting at a particular location will reach a certain object in 60 days.

Object	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	P23	E1
	Hypothetical spill location																							
Land	51	71	83	86	89	90	93	90	93	54	79	77	28	25	34	23	90	91	95	97	97	96	97	80
1	18	12	7	5	5	4	3	4	3	27	9	10	79	*	33	87	2	1	1	1	n	n	n	9
2	1	1	n	n	n	n	n	n	n	2	1	1	4	4	7	5	1	n	n	n	n	1	n	n
3	81	*	48	82	62	93	97	*	*	83	82	*	93	*	68	87	55	73	88	99	89	*	*	84
4	22	16	23	81	41	*	57	*	*	65	81	86	82	95	59	84	*	*	70	43	55	72	80	30
5	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
6	19	13	8	7	5	5	3	4	3	22	7	7	31	39	31	46	2	2	2	1	1	2	10	9
7	1	n	3	11	5	9	4	19	10	5	11	8	2	2	3	2	8	10	9	9	23	36	27	50
8	4	2	1	1	1	1	n	1	n	7	2	2	12	14	17	15	1	2	2	1	1	3	9	1
9	1	1	1	n	n	n	n	3	2	2	11	13	4	6	6	5	21	25	20	11	8	7	26	n
10	59	77	90	93	96	94	*	97	*	51	75	77	50	67	47	68	68	69	73	91	92	90	90	98
11	20	24	26	22	25	10	6	17	22	18	20	24	n	n	n	n	25	21	7	3	1	1	n	24
12	2	24	4	6	1	2	n	3	1	2	1	2	3	1	2	n	n	n	n	n	n	n	n	15
13	n	n	n	n	1	1	1	27	7	n	5	3	n	n	n	n	26	14	6	2	1	1	n	n
14	7	5	4	9	6	17	12	26	17	27	6	5	26	7	25	3	1	1	n	n	n	n	n	5
15	58	78	88	86	91	88	90	96	97	70	90	92	60	70	42	67	*	97	97	91	94	98	96	86
16	2	2	1	1	1	1	n	2	1	5	3	4	9	13	13	15	9	22	36	37	21	35	35	1
17	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
18	46	70	79	71	73	79	66	82	91	45	76	77	23	19	24	16	71	73	78	84	82	78	68	72
19	31	19	40	24	43	29	19	50	73	28	40	51	22	17	24	17	14	13	10	6	8	16	30	29
20	1	1	2	8	3	8	2	28	6	2	11	6	1	2	2	2	33	35	48	58	55	46	39	4
21	n	n	n	n	n	n	n	7	2	n	3	1	n	n	n	n	15	13	13	9	7	3	2	n
22	7	28	87	*	93	*	95	*	*	12	54	31	5	6	7	5	*	*	*	*	*	*	*	*
23	65	79	89	87	92	89	91	97	96	68	92	92	72	75	66	77	*	*	*	*	96	*	*	87
24	41	66	75	71	81	76	89	47	69	33	36	38	14	12	14	9	37	37	33	24	26	20	17	63
25	54	76	85	76	89	81	94	70	95	66	86	92	20	15	19	11	53	48	47	35	34	16	10	70
26	20	13	10	11	7	10	5	23	6	30	14	14	80	*	39	91	14	20	35	56	48	29	26	18
27	47	59	47	34	30	43	29	52	82	26	49	68	15	14	18	15	21	17	13	8	9	23	23	36
28	40	56	71	67	77	70	78	67	87	29	64	64	17	15	20	12	61	52	43	26	33	31	28	66
29	19	46	45	46	48	50	46	59	77	24	57	60	9	10	10	7	57	57	52	46	55	58	62	41
30	n	n	1	6	1	2	n	3	3	n	5	3	n	1	1	1	11	12	14	23	22	13	11	2
31	5	3	6	11	5	10	4	34	57	26	36	44	5	3	3	2	14	12	13	11	14	20	18	12

n - less than 0.5 percent
* - greater than 99.5 percent

Table 3D. -- Probabilities (in percent) that an oilspill starting at a particular location will reach a certain object in 60 days. (Continued)

	Hypothetical spill location																							
Object	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12	E13	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12
Land	86	92	90	95	91	54	59	77	31	29	91	91	26	20	18	30	70	90	90	95	89	66	35	17
1	6	3	5	2	4	26	21	10	81	*	2	2	7	14	21	27	12	3	4	1	1	6	21	28
2	n	n	n	n	n	2	2	1	4	5	1	n	n	1	1	1	n	n	n	n	n	n	1	2
3	47	*	*	*	*	93	84	90	94	*	71	73	29	32	40	61	83	96	66	22	72	80	56	46
4	11	*	*	*	*	62	69	82	87	*	*	*	7	15	21	29	28	99	*	*	14	15	21	30
5	n	n	n	n	n	n	n	n	n	n	n	n	7	3	n	2	n	n	n	n	22	11	6	1
6	7	4	5	2	4	22	19	6	30	30	2	2	41	32	35	28	12	4	4	1	9	8	23	42
7	1	9	15	6	11	45	5	10	2	2	8	10	n	n	n	n	2	8	9	5	n	n	n	n
8	1	n	n	n	1	7	6	1	14	14	1	1	1	3	6	7	2	n	n	n	n	2	6	8
9	n	n	2	n	5	2	1	11	5	6	20	25	n	n	1	1	1	1	12	7	n	n	1	2
10	93	96	96	*	97	56	56	77	49	49	74	67	18	16	21	35	77	97	81	88	57	40	36	27
11	25	11	18	8	22	20	25	24	1	n	24	22	1	2	1	6	23	13	14	4	2	9	4	n
12	n	2	3	1	1	2	1	2	3	2	n	n	n	n	1	1	10	2	1	n	n	n	1	1
13	n	1	24	2	16	n	1	3	1	1	19	14	n	n	n	n	n	5	15	19	n	n	n	n
14	2	24	27	26	17	28	29	6	20	22	1	n	n	n	3	6	6	22	7	2	n	1	3	6
15	90	92	94	96	96	71	73	90	65	60	*	98	23	18	20	33	76	91	97	99	91	57	29	25
16	1	n	1	n	2	5	5	4	10	13	16	29	n	1	2	3	3	n	1	1	n	n	2	5
17	n	n	n	n	n	n	n	n	n	n	n	n	1	1	n	1	n	n	n	n	11	4	2	n
18	86	85	85	90	90	48	50	76	24	23	68	74	13	14	13	17	64	82	82	65	46	56	21	10
19	15	37	59	62	69	28	29	49	23	21	12	14	11	7	9	17	29	43	44	10	52	23	14	10
20	1	4	13	2	11	2	2	6	1	2	40	33	5	4	1	2	2	5	29	58	39	16	5	1
21	n	n	3	n	3	n	n	1	n	n	16	12	1	n	n	n	n	1	9	19	5	2	n	n
22	65	*	*	98	*	29	15	35	7	8	*	*	n	n	1	2	63	98	*	*	n	1	1	2
23	91	92	94	95	97	72	72	90	76	95	*	*	36	34	40	49	79	92	98	*	93	67	65	36
24	83	84	67	91	59	35	36	42	15	15	33	36	11	14	11	14	61	79	43	19	21	57	20	9
25	90	88	81	96	93	68	70	89	21	19	51	47	13	16	14	22	72	88	89	47	34	56	23	12
26	7	7	15	3	9	28	24	13	81	*	19	19	10	17	23	30	15	6	11	16	19	10	25	31
27	52	62	65	80	77	27	28	60	17	16	18	20	9	8	9	17	43	58	49	14	25	36	18	9
28	78	77	78	88	83	34	33	63	19	19	53	55	21	16	13	21	59	79	67	52	73	57	26	11
29	51	53	64	61	77	27	26	58	10	10	54	59	2	2	4	7	36	56	63	53	10	16	5	5
30	n	1	2	1	5	1	1	3	n	1	17	11	1	1	1	1	1	1	15	24	10	5	1	1
31	2	13	41	20	50	22	30	42	4	3	12	14	2	2	2	4	6	22	44	19	19	11	2	3

n - less than 0.5 percent
* - greater than 99.5 percent

Table 3D. -- Probabilities (in percent) that an oilspill starting at a particular location will reach a certain object in 60 days. (Continued)

	Hypothetical spill location																						
Object	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27	L1	L2	L3	L4	L5	L6	L7	L8
Land	17	25	n	1	10	13	63	89	55	28	67	87	97	94	92	46	61	73	90	81	94	65	89
1	41	77	n	n	n	25	19	4	33	40	16	5	n	1	2	49	22	13	4	10	3	14	5
2	3	4	n	n	n	2	3	1	4	2	1	n	n	n	n	4	2	1	n	1	n	1	n
3	53	84	n	n	1	31	82	60	82	67	84	59	90	85	65	92	87	81	73	58	92	76	44
4	46	75	n	n	n	27	80	96	80	53	74	93	66	79	*	73	65	61	*	34	84	20	26
5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
6	44	36	n	1	25	43	11	3	17	36	13	3	1	1	2	23	17	11	4	8	3	16	6
7	1	2	n	n	n	n	3	7	3	1	8	9	30	9	9	1	5	37	22	26	7	1	4
8	12	14	n	n	1	8	6	1	9	10	4	1	1	1	1	11	4	4	1	3	n	2	1
9	2	5	n	n	n	2	9	23	7	2	5	21	8	20	20	3	2	20	6	1	1	1	n
10	32	47	n	n	6	21	67	67	61	39	66	68	90	73	73	48	50	76	96	87	99	74	95
11	n	n	n	n	n	1	17	20	15	5	25	18	1	6	20	11	19	22	22	13	10	23	22
12	1	2	n	n	n	n	5	n	9	1	1	1	n	n	n	3	2	1	1	1	1	13	1
13	n	n	n	n	n	n	1	6	1	n	2	8	1	5	19	n	1	1	10	n	10	n	n
14	13	16	n	n	n	5	9	2	10	18	14	3	n	n	1	20	22	15	16	12	18	5	4
15	33	51	n	n	n	19	77	97	70	49	79	94	97	95	99	71	78	87	98	92	95	72	92
16	8	10	n	n	n	5	6	4	7	6	4	3	27	33	16	7	4	3	1	2	n	3	n
17	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
18	11	19	n	n	n	8	59	81	51	22	63	79	80	79	70	37	47	72	88	79	79	63	77
19	13	18	n	1	12	12	38	22	36	18	37	25	8	10	13	30	28	36	67	42	41	27	43
20	1	1	n	n	n	n	4	14	3	1	5	18	58	47	40	1	2	5	11	1	7	2	3
21	n	n	n	n	n	n	1	6	1	n	2	6	5	12	15	n	n	2	4	n	2	n	n
22	3	5	n	n	n	2	20	90	16	5	29	84	*	*	*	6	11	79	*	90	99	30	86
23	41	62	n	n	n	25	85	98	80	52	81	97	99	*	*	70	67	94	98	92	95	76	93
24	8	12	n	n	2	5	38	37	31	16	38	37	25	35	35	23	36	48	66	69	80	58	82
25	13	17	n	h	n	6	67	77	52	33	76	74	27	44	51	56	75	86	91	93	91	70	90
26	44	78	n	n	6	28	23	9	36	42	21	11	38	35	19	50	23	15	10	11	8	16	7
27	12	13	n	1	14	11	33	36	29	17	38	36	13	13	18	24	27	42	70	21	56	52	38
28	9	15	n	1	10	9	43	73	41	16	48	67	38	45	56	24	29	62	82	73	83	53	79
29	5	9	n	n	n	3	32	62	28	12	40	57	57	53	56	25	24	49	75	46	57	33	56
30	n	n	n	n	n	n	1	5	1	n	2	7	14	14	14	n	1	3	4	1	2	1	1
31	4	3	n	n	n	2	23	18	13	10	33	22	18	12	13	17	31	27	50	12	22	5	4

n - less than 0.5 percent
* - greater than 99.5 percent

despite its obvious importance in interpreting these results. Also, the dispersion of a spill and the likelihood that it would contact an object are potentially reduced by cleanup efforts, but this mitigating factor is not directly incorporated in the probability analysis.

An important conclusion to be inferred from the data in tables 2A-D and 3A-D is that travel times to objects and land segments for spills emanating from the proposed leases vary greatly. Spills from a particular lease could hit some objects almost immediately upon release, but take a fairly long time to hit other objects. In cases where the travel time is long, the spills will no longer exist as an identifiable slick but rather will have fragmented into a large number of discrete particles or "blobs" by the time any oil arrives at an object. Observations by Jeffery (1973) of actual spills in the North Atlantic indicate breakup of the slick can be expected within about 4 days, and that the particles of residual oil typically consist of spongy emulsions of oil of widely varying sizes. Moreover, it is generally agreed that large fractions of the original volume of oil will evaporate in the first few days of weathering and that further loss to the atmosphere occurs at a very slow rate. Data from Nelson (1958) for crude oil of API gravity 40°, for example, indicate that about 50 percent of the original spill volume would be lost to evaporation.

Thus for some oilspills originating from the proposed leases it would appear that an important consideration is the extent to which fragments of the slick are dispersed in time. Using lateral dispersion coefficients from Csanady (1974), estimates of slick dispersion were made for various travel times and for two spill sizes, 1,000 barrels and 50 barrels, assuming 50 percent loss of the original volume by evaporation. The resulting distribution of oil along an assumed straight shoreline or object is given in figure 5 part A. It is important to note that the profiles will flatten considerably relative to a shoreline or object as the outline of the object becomes more irregular. Even for straight objects it appears that residual oil from a single spill as small as 50 barrels would not be easily detected after 30 days at sea. Figure 5 part B shows the profile of a medium large spill after 30 days at sea.

The action of wind and waves will further disperse a spill. After 30 days, due to high winds it was difficult to locate the oilspill resulting from the breakup of the Argo Merchant (about 180,000 barrels of No. 6 fuel oil spilled). In contrast, the Torrey Canyon went ashore on 18 March 1967 in the Scilly Isles southwest of England and spilled some 700,000 barrels of crude oil. Oil from this wreck came ashore in Brittany as late as 60 days later (Wardley-Smith, 1976).

Shellfish and finfish can be distinguished from other biological

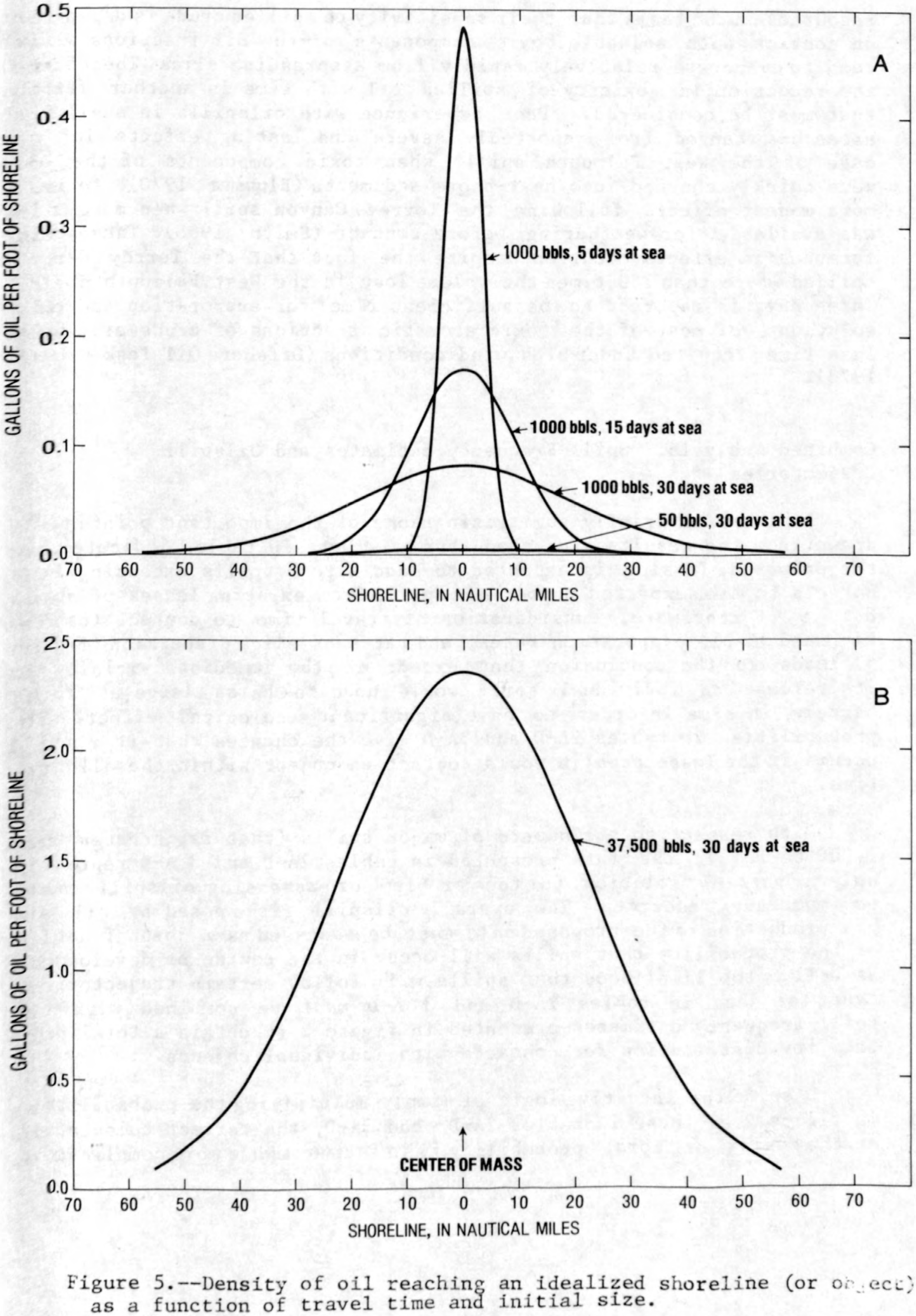

Figure 5.--Density of oil reaching an idealized shoreline (or object) as a function of travel time and initial size.

resources on the basis that their sensitivity to spilled crude is dependent on contact with soluable toxic components of the oil fractions which tend to evaporate relatively rapidly from a spreading slick. Therefore, the reduction in toxicity of spilled oil with time is another factor that must be considered. Past experience with oilspills in shellfish areas has ranged from reportedly severe and lasting effects in the case of the West Falmouth spill, when toxic components of the oil were quickly churned into near-shore sediments (Blummer, 1970), to much more modest effects following the Torrey Canyon spill when more time was available for weathering before contact (Smith, 1968). These differences in effects occurred despite the fact that the Torrey Canyon spilled more than 150 times the volume lost in the West Falmouth spill. Three days is reported to be sufficient time for evaporation and dissolution of most of the toxic aromatic fractions of crude oil, with less time required under high wind conditions (Offshore Oil Task Group, 1973).

Combined Analysis: Spill Frequency Estimates and Oilspill Trajectories

It is worth briefly summarizing some of the important points to be drawn from the results presented thus far. Data in table 1 indicate that the proposed leasing is expected to add 4 to 5 spills exceeding 1000 barrels to the expected number of spills from existing leases of about 8 to 9. Furthermore, consideration of travel time to contact (tables 2A-D and 3A-D), evaporation rates, and rates of slick dispersion (figure 5) leads to the conclusion that except in the immediate vicinity at its release an individual spill would need to be as large as 1,000 barrels in size in order to have significant ecological effect. The probabilities in tables 2A-D and 3A-D give the chances that if a spill occurs in the lease area it would contact an object within the allotted time.

With respect to the hazard of major spills (that is, greater than 1,000 barrels), the data presented in tables 2A-D and 3 A-D represent only a partial solution to the problem of assessing oilspill risks to important resources. The overall oilspill risk posed by oil and gas production in the proposed sale must be assessed as a joint function of the probability that spills will occur in the course of development as well as the likelihood that spills will follow certain trajectories. Thus, the data in tables 2A-D and 3 A-D must be combined with the spill frequency estimates presented in figure 2 to obtain a total probability distribution for contacts with individual objects.

Despite the intuitive logic of simply multiplying the probabilities in figure 2 by those in tables 2A-D and 3A-D, the correct computation of the overall or "total" probability is in fact somewhat more complicated.

This results from the fact that the probabilities presented in tables 2A-D and 3A-D are actually conditional probabilities and refer to the probabilities of contact on objects "conditioned" on the chance of spills occurring in the first place. The overall probability that oilspills will contact a particular object exactly k times during the production life of the area, P(k), is given by

$$P(k) = \sum_{n=k}^{\infty} P(k|n)\ P(n) \qquad (1)$$

where P(k n) is the probability of k contacts with the resource given the occurrence of n spills, and P(n) is the probability of n spills occurring. The conditional probability P(k n) can be assumed to be distributed bionomially and is given by

$$P(k|n) = \binom{n}{k} p^{k} (1-p)^{n-k} \qquad (2)$$

where p is the probability of contact with the object given the occurrence of a spill (tables 2 and 3).

The resulting probabilities of an object being contacted one or more times by an oilspill and the most likely number of contacts are presented in tables 4A-C. Similar numbers for land segments are presented in tables 5A-C.

It can be seen from tables 4A-C that the three transportation scenarios distribute risks differently. For example, although the mixed scenarios present a greater risk of oilspills contacting land than the tanker scenario, they pose a lesser risk to certain objects, such as the Tanner and Cortez Banks. Thus, it would be inappropriate for this study to identify any alternative as "worse" than another. Rather, this risk analysis simply presents the risk posed to each object and land segment by each alternative, and leaves the judgement of "worst case" to subsequent evaluators.

It is emphasized that probability estimates refer only to the chances that oil in some form or another, from a spill originally larger than 1,000 barrels will come in contact with some portion of an object. The mitigating effects of weathering processes and clean-up efforts are only indirectly reflected in the probabilities in tables 4A-C and 5A-C by virtue of the fact that estimates apply only to large spills. Figure 5 provides a rough description of the likely effects of evaporation and dispersion on spills of various sizes as a function of time. To this must be added the likelihood of at least some, and perhaps

Table 4A. -- Probabilities (in percent) of one or more spills and most likely number of spills greater than 1,000 barrels occurring and contacting objects over the production life of the lease area.
Tanker transportation.

Object	Within 3 days: Proposed Leases Prob	Within 3 days: Proposed Leases Mode	Within 3 days: Existing Leases Prob	Within 3 days: Existing Leases Mode	Within 3 days: Both Prob	Within 3 days: Both Mode	Within 10 days: Proposed Leases Prob	Within 10 days: Proposed Leases Mode	Within 10 days: Existing Leases Prob	Within 10 days: Existing Leases Mode	Within 10 days: Both Prob	Within 10 days: Both Mode	Within 30 days: Proposed Leases Prob	Within 30 days: Proposed Leases Mode	Within 30 days: Existing Leases Prob	Within 30 days: Existing Leases Mode	Within 30 days: Both Prob	Within 30 days: Both Mode	Within 60 days: Proposed Leases Prob	Within 60 days: Proposed Leases Mode	Within 60 days: Existing Leases Prob	Within 60 days: Existing Leases Mode	Within 60 days: Both Prob	Within 60 days: Both Mode
Land	52	0	74	1	88	2	80	1	96	3	99	4	91	2	99	4	*	6	94	2	99	5	*	7
1	37	0	64	1	77	1	46	0	70	1	84	1	54	0	78	1	90	2	58	0	82	1	92	2
2	n	0	n	0	n	0	n	0	n	0	n	0	1	0	2	0	3	0	6	0	10	0	16	0
3	81	1	98	3	*	5	89	2	99	4	*	6	93	2	*	5	*	8	94	2	*	5	*	8
4	88	2	99	4	*	6	92	2	99	4	*	7	94	2	99	5	*	8	95	2	*	5	*	8
5	3	0	6	0	9	0	4	0	7	0	11	0	5	0	10	0	15	0	5	0	10	0	15	0
6	8	0	4	0	12	0	17	0	21	0	35	0	34	0	49	0	66	1	43	0	61	0	78	1
7	4	0	35	0	38	0	11	0	42	0	48	0	17	0	49	0	57	0	19	0	51	0	61	0
8	n	0	n	0	n	0	2	0	2	0	4	0	8	0	14	0	21	0	17	0	28	0	41	0
9	13	0	21	0	31	0	20	0	33	0	47	0	25	0	40	0	55	0	27	0	43	0	58	0
10	71	1	92	2	98	3	85	1	97	3	*	5	92	2	99	4	*	7	94	2	99	5	*	7
11	33	0	56	0	71	1	36	0	61	0	75	1	38	0	62	0	77	1	38	0	63	0	77	1
12	4	0	18	0	21	0	5	0	21	0	25	0	6	0	23	0	28	0	7	0	24	0	29	0
13	17	0	29	0	42	0	21	0	35	0	49	0	22	0	37	0	51	0	22	0	38	0	52	0
14	19	0	33	0	45	0	23	0	41	0	54	0	26	0	46	0	60	0	27	0	48	0	62	0
15	83	1	97	3	99	5	92	2	99	4	*	7	95	2	*	5	*	8	96	3	*	5	*	9
16	6	0	7	0	13	0	10	0	12	0	21	0	18	0	24	0	37	0	23	0	34	0	49	0
17	1	0	2	0	3	0	2	0	3	0	5	0	2	0	4	0	6	0	2	0	4	0	7	0
18	51	0	75	1	88	2	76	1	94	2	99	4	87	2	98	3	*	5	90	2	99	4	*	6
19	29	0	47	0	62	0	45	0	69	1	83	1	58	0	81	1	92	2	66	1	87	2	96	3
20	15	0	27	0	38	0	36	0	55	0	71	1	47	0	67	1	83	1	49	0	69	1	85	1
21	5	0	9	0	13	0	13	0	23	0	33	0	17	0	29	0	41	0	18	0	30	0	42	0
22	87	2	98	4	*	6	88	2	98	4	*	6	89	2	99	4	*	6	89	2	99	4	*	6
23	86	1	98	3	*	5	94	2	*	5	*	8	96	3	*	6	*	9	97	3	*	6	*	9
24	36	0	54	0	71	1	61	0	84	1	94	2	73	1	92	2	98	3	77	1	94	2	99	4
25	57	0	79	1	91	2	78	1	95	2	99	4	86	1	98	3	*	5	88	2	98	4	*	6
26	40	0	68	1	81	1	53	0	77	1	89	2	64	1	86	1	95	2	69	1	89	2	97	3
27	31	0	54	0	69	1	49	0	76	1	88	2	61	0	85	1	94	2	68	1	90	2	97	3
28	50	0	73	1	86	2	73	1	93	2	98	3	83	1	97	3	*	5	86	1	98	3	*	5
29	39	0	61	0	76	1	63	0	85	1	95	2	74	1	93	2	98	3	77	1	94	2	99	4
30	6	0	12	0	17	0	14	0	26	0	37	0	21	0	35	0	49	0	22	0	37	0	51	0
31	13	0	32	0	41	0	28	0	52	0	65	1	39	0	64	1	78	1	42	0	68	1	81	1

Notes: Prob is the probability (in percent) of one or more spills contacting the object.
Mode is the most likely number of contacts.
n - less than 0.5 percent.
* - greater than 99.5 percent

Table 48. -- Probabilities (in percent) of one or more spills and most likely number of spills greater than 1,000 barrels occurring and contacting objects over the production life of the lease area. Mixed A transportation.

	Within 3 days						Within 10 days						Within 30 days						Within 60 days					
	Proposed Leases		Existing Leases		Both		Proposed Leases		Existing Leases		Both		Proposed Leases		Existing Leases		Both		Proposed Leases		Existing Leases		Both	
Object	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode
Land	72	1	90	2	97	3	92	2	99	4	*	7	97	3	*	6	*	9	98	3	*	7	*	10
1	31	0	59	0	72	1	38	0	66	1	79	1	48	0	75	1	87	2	53	0	80	1	91	2
2	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	2	0	5	0	9	0	13	0
3	89	2	99	4	*	6	94	2	*	5	*	8	96	3	*	6	*	9	96	3	*	6	*	9
4	95	3	*	5	*	8	96	3	*	6	*	9	97	3	*	6	*	10	97	3	*	6	*	10
5	4	0	7	0	10	0	4	0	8	0	12	0	6	0	11	0	16	0	6	0	11	0	16	0
6	7	0	3	0	9	0	14	0	17	0	28	0	30	0	45	0	62	0	40	0	59	0	75	1
7	9	0	43	0	48	0	18	0	52	0	60	0	24	0	57	0	68	1	26	0	59	0	70	1
8	n	0	n	0	n	0	1	0	1	0	3	0	7	0	11	0	17	0	14	0	24	0	35	0
9	10	0	15	0	24	0	19	0	30	0	43	0	24	0	36	0	51	0	26	0	40	0	55	0
10	88	2	99	4	*	6	95	2	*	5	*	8	97	3	*	6	*	9	98	3	*	6	*	10
11	35	0	58	0	73	1	40	0	63	1	78	1	42	0	65	1	80	1	42	0	66	1	80	1
12	2	0	14	0	16	0	4	0	18	0	21	0	5	0	20	0	24	0	6	0	21	0	25	0
13	27	0	45	0	59	0	32	0	53	0	68	1	33	0	54	0	70	1	34	0	55	0	70	1
14	28	0	47	0	61	0	30	0	53	0	67	1	33	0	57	0	71	1	35	0	59	0	73	1
15	92	2	99	4	*	7	97	3	*	6	*	10	98	3	*	7	*	11	98	4	*	7	*	11
16	6	0	5	0	11	0	9	0	9	0	17	0	15	0	19	0	31	0	20	0	29	0	43	0
17	1	0	2	0	3	0	2	0	3	0	5	0	2	0	4	0	7	0	2	0	5	0	7	0
18	70	1	90	2	97	3	89	2	98	4	*	6	94	2	*	5	*	8	95	3	*	5	*	8
19	45	0	67	1	82	1	60	0	84	1	94	2	70	1	90	2	97	3	76	1	93	2	98	4
20	26	0	43	0	58	0	54	0	75	1	89	2	63	1	84	1	94	2	65	1	85	1	95	2
21	8	0	14	0	21	0	20	0	35	0	48	0	25	0	42	0	56	0	26	0	42	0	57	0
22	96	3	*	6	*	9	96	3	*	6	*	9	96	3	*	6	*	9	96	3	*	6	*	9
23	94	2	99	5	*	8	98	3	*	7	*	10	98	4	*	7	*	12	99	4	*	8	*	12
24	56	0	77	1	90	2	76	1	94	2	98	4	84	1	97	3	*	5	86	1	98	3	*	5
25	77	1	93	2	98	4	90	2	99	4	*	6	94	2	*	5	*	8	95	2	*	5	*	8
26	37	0	66	1	78	1	51	0	78	1	89	2	63	1	87	2	95	3	68	1	90	2	97	3
27	46	0	71	1	84	1	64	1	88	2	96	3	74	1	93	2	98	3	78	1	95	2	99	4
28	67	1	88	2	96	3	85	1	98	3	*	5	91	2	99	4	*	7	93	2	99	5	*	7
29	57	0	81	1	92	2	78	1	95	2	99	4	86	1	98	3	*	5	87	2	98	3	*	5
30	11	0	20	0	29	0	26	0	43	0	57	0	33	0	52	0	68	1	34	0	54	0	69	1
31	27	0	52	0	65	1	47	0	74	1	86	1	56	0	82	1	92	2	59	0	83	1	93	2

Notes: Prob is the probability (in percent) of one or more spills contacting the object.
Mode is the most likely number of contacts.
n - less than 0.5 percent.
* - greater than 99.5 percent

Table 4C. -- Probabilities (in percent) of one or more spills and most likely number of spills greater than 1,000 barrels occurring and contacting objects over the production life of the lease area.
Mixed B transportation.

Object	Within 3 days Proposed Leases		Within 3 days Existing Leases		Within 3 days Both		Within 10 days Proposed Leases		Within 10 days Existing Leases		Within 10 days Both		Within 30 days Proposed Leases		Within 30 days Existing Leases		Within 30 days Both		Within 60 days Proposed Leases		Within 60 days Existing Leases		Within 60 days Both	
	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode
Land	70	1	89	2	97	3	91	2	99	4	*	7	96	3	*	6	*	9	98	3	*	6	*	10
1	31	0	59	0	72	1	39	0	66	1	80	1	49	0	76	1	88	2	54	0	81	1	91	2
2	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	2	0	5	0	9	0	14	0
3	89	2	99	4	*	6	93	2	*	5	*	8	96	3	*	6	*	9	96	3	*	6	*	9
4	95	2	*	5	*	8	96	3	*	6	*	9	97	3	*	6	*	10	97	3	*	6	*	10
5	4	0	7	0	10	0	4	0	8	0	12	0	6	0	11	0	16	0	6	0	11	0	16	0
6	7	0	3	0	9	0	14	0	17	0	28	0	31	0	46	0	63	0	41	0	60	0	76	1
7	12	0	47	0	53	0	21	0	55	0	65	1	27	0	60	0	71	1	29	0	62	0	73	1
8	n	0	n	0	n	0	1	0	1	0	3	0	7	0	12	0	18	0	15	0	25	0	36	0
9	13	0	20	0	31	0	22	0	34	0	48	0	26	0	40	0	56	0	28	0	43	0	59	0
10	87	2	98	4	*	6	94	2	*	5	*	8	97	3	*	6	*	9	97	3	*	6	*	10
11	37	0	59	0	74	1	42	0	65	1	80	1	44	0	67	1	81	1	44	0	67	1	82	1
12	2	0	14	0	16	0	4	0	18	0	21	0	5	0	20	0	24	0	6	0	21	0	25	0
13	26	0	44	0	58	0	32	0	52	0	67	1	33	0	54	0	69	1	33	0	54	0	70	1
14	27	0	46	0	60	0	30	0	52	0	67	1	33	0	57	0	71	1	35	0	59	0	73	1
15	92	2	99	4	*	7	97	3	*	6	*	10	98	3	*	7	*	11	98	4	*	7	*	11
16	6	0	5	0	11	0	9	0	9	0	17	0	15	0	20	0	32	0	20	0	29	0	44	0
17	1	0	2	0	3	0	2	0	3	0	5	0	2	0	4	0	7	0	2	0	5	0	7	0
18	68	1	89	2	97	3	88	2	98	4	*	6	94	2	99	5	*	8	95	2	*	5	*	8
19	44	0	67	1	82	1	61	0	84	1	94	2	71	1	91	2	97	3	76	1	94	2	98	4
20	26	0	43	0	58	0	54	0	75	1	89	2	64	1	84	1	94	2	65	1	85	1	95	2
21	8	0	14	0	21	0	20	0	35	0	48	0	26	0	42	0	57	0	26	0	43	0	58	0
22	96	3	*	6	*	9	96	3	*	6	*	9	96	3	*	6	*	9	96	3	*	6	*	9
23	94	2	*	5	*	8	98	3	*	7	*	10	98	4	*	7	*	12	99	4	*	8	*	12
24	53	0	73	1	87	2	74	1	93	2	98	3	83	1	97	3	99	5	85	1	97	3	*	5
25	76	1	93	2	98	4	90	2	99	4	*	6	94	2	*	5	*	8	95	2	*	5	*	8
26	37	0	66	1	79	1	52	0	78	1	89	2	64	1	87	2	95	3	69	1	90	2	97	3
27	46	0	71	1	84	1	65	1	88	2	96	3	74	1	93	2	98	4	79	1	95	3	99	4
28	65	1	86	1	95	3	85	1	97	3	*	5	91	2	99	4	*	7	93	2	99	5	*	7
29	57	0	80	1	91	2	78	1	95	2	99	4	86	1	98	3	*	5	87	2	98	3	*	5
30	11	0	20	0	29	0	26	0	43	0	58	0	33	0	53	0	68	1	34	0	54	0	70	1
31	28	0	53	0	67	1	49	0	75	1	87	2	58	0	83	1	93	2	61	0	85	1	94	2

Notes: Prob is the probability (in percent) of one or more spills contacting the object.
Mode is the most likely number of contacts.
n - less than 0.5 percent.
* - greater than 99.5 percent

Table 5A. -- Probabilities (in percent) of one or more spills and most likely number of spills greater than 1,000 barrels occurring and contacting land segments over the production life of the lease area. Tanker transportation.

Land Segment	Within 3 days Proposed Leases		Existing Leases		Both		Within 10 days Proposed Leases		Existing Leases		Both		Within 30 days Proposed Leases		Existing Leases		Both		Within 60 days Proposed Leases		Existing Leases		Both	
	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode
1	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0
2	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	2	0	4	0
3	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0
4	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0
5	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0
6	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0
7	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0
8	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0
9	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0
10	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0
11	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0
12	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0
13	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0
14	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	2	0	3	0	4	0
15	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	1	0	2	0	3	0
16	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0
17	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	1	0	2	0
18	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0
19	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	1	0	1	0	2	0
20	n	0	n	0	n	0	1	0	n	0	1	0	4	0	5	0	8	0	4	0	5	0	9	0
21	1	0	n	0	1	0	4	0	3	0	7	0	8	0	11	0	18	0	9	0	12	0	20	0
22	n	0	n	0	n	0	3	0	2	0	5	0	5	0	6	0	10	0	6	0	7	0	13	0
23	1	0	n	0	1	0	3	0	3	0	6	0	6	0	7	0	13	0	7	0	9	0	16	0
24	n	0	1	0	1	0	1	0	2	0	3	0	2	0	3	0	4	0	2	0	3	0	4	0
25	3	0	6	0	9	0	5	0	11	0	16	0	6	0	12	0	17	0	6	0	12	0	17	0
26	5	0	9	0	13	0	10	0	18	0	26	0	11	0	20	0	29	0	11	0	20	0	29	0
27	3	0	6	0	9	0	11	0	19	0	28	0	15	0	26	0	37	0	15	0	27	0	38	0
28	2	0	4	0	5	0	5	0	9	0	13	0	6	0	12	0	17	0	7	0	12	0	18	0
29	1	0	1	0	2	0	1	0	2	0	3	0	1	0	2	0	3	0	1	0	2	0	3	0
30	1	0	1	0	2	0	2	0	2	0	4	0	2	0	3	0	4	0	2	0	3	0	4	0
31	n	0	3	0	3	0	1	0	4	0	5	0	1	0	5	0	5	0	1	0	5	0	5	0
32	n	0	4	0	5	0	1	0	7	0	8	0	3	0	11	0	13	0	4	0	13	0	16	0
33	n	0	n	0	n	0	n	0	n	0	n	0	2	0	4	0	6	0	3	0	5	0	8	0
34	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	2	0	1	0	2	0	2	0
35	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	n	0	1	0	1	0
36	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	n	0	1	0	1	0
37	n	0	n	0	n	0	n	0	1	0	1	0	1	0	2	0	3	0	1	0	2	0	3	0
38	n	0	n	0	1	0	1	0	3	0	4	0	2	0	4	0	6	0	3	0	5	0	7	0
39	1	0	1	0	2	0	2	0	4	0	6	0	3	0	5	0	8	0	3	0	5	0	8	0
40	n	0	n	0	1	0	2	0	3	0	5	0	2	0	4	0	6	0	2	0	4	0	6	0
41	1	0	2	0	3	0	2	0	3	0	4	0	2	0	4	0	5	0	2	0	4	0	6	0
42	3	0	5	0	8	0	4	0	7	0	11	0	4	0	8	0	12	0	4	0	8	0	12	0
43	2	0	4	0	6	0	3	0	5	0	7	0	3	0	5	0	8	0	3	0	5	0	8	0
44	n	0	n	0	n	0	n	0	n	0	1	0	n	0	1	0	1	0	n	0	1	0	1	0
45	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0
46	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	n	0	1	0	1	0
47	4	0	6	0	10	0	8	0	15	0	22	0	10	0	20	0	28	0	11	0	21	0	30	0
48	6	0	14	0	20	0	11	0	27	0	35	0	13	0	30	0	39	0	14	0	31	0	41	0
49	19	0	25	0	40	0	30	0	45	0	62	0	33	0	50	0	67	1	33	0	51	0	67	1
50	5	0	13	0	18	0	9	0	21	0	28	0	11	0	24	0	32	0	11	0	25	0	33	0
51	n	0	1	0	1	0	2	0	3	0	5	0	6	0	11	0	16	0	8	0	14	0	22	0
52	1	0	2	0	4	0	3	0	6	0	9	0	5	0	9	0	14	0	6	0	11	0	16	0
53	8	0	15	0	21	0	19	0	32	0	45	0	25	0	40	0	55	0	26	0	42	0	57	0
54	1	0	2	0	3	0	7	0	14	0	20	0	17	0	31	0	43	0	22	0	38	0	51	0
55	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	2	0
56	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	2	0	3	0	6	0	9	0
57	n	0	n	0	n	0	n	0	n	0	n	0	1	0	2	0	2	0	5	0	9	0	14	0
58	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0
59	n	0	n	0	n	0	1	0	n	0	1	0	4	0	5	0	9	0	5	0	6	0	10	0
60	n	0	n	0	n	0	1	0	1	0	2	0	3	0	5	0	8	0	4	0	7	0	11	0

Notes: Prob is the probability (in percent) of one or more spills contacting the object.
Mode is the most likely number of contacts.
n - less than 0.5 percent.

Table 5B. -- Probabilities (in percent) of one or more spills and most likely number of spills greater than 1,000 barrels occurring and contacting land segments over the production life of the lease area.
Mixed A transportation.

Land Segment	Within 3 days Proposed Leases Prob	Mode	Within 3 days Existing Leases Prob	Mode	Within 3 days Both Prob	Mode	Within 10 days Proposed Leases Prob	Mode	Within 10 days Existing Leases Prob	Mode	Within 10 days Both Prob	Mode	Within 30 days Proposed Leases Prob	Mode	Within 30 days Existing Leases Prob	Mode	Within 30 days Both Prob	Mode	Within 60 days Proposed Leases Prob	Mode	Within 60 days Existing Leases Prob	Mode	Within 60 days Both Prob	Mode
1	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0
2	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	2	0	3	0
3	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0
4	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0
5	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0
6	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0
7	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0
8	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0
9	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0
10	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0
11	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0
12	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0
13	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0
14	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	2	0	3	0
15	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	1	0	2	0
16	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0
17	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	1	0	2	0
18	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	n	0	n	0	1	0
19	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	1	0	1	0	2	0
20	n	0	n	0	n	0	1	0	n	0	1	0	3	0	4	0	8	0	4	0	5	0	9	0
21	1	0	n	0	1	0	3	0	3	0	6	0	7	0	9	0	16	0	8	0	10	0	17	0
22	n	0	n	0	n	0	2	0	2	0	4	0	4	0	5	0	9	0	5	0	6	0	11	0
23	1	0	n	0	1	0	3	0	2	0	5	0	5	0	6	0	11	0	6	0	7	0	13	0
24	n	0	1	0	1	0	1	0	2	0	2	0	1	0	2	0	3	0	1	0	2	0	4	0
25	3	0	6	0	9	0	5	0	10	0	14	0	6	0	11	0	16	0	6	0	11	0	16	0
26	11	0	20	0	28	0	20	0	34	0	47	0	22	0	37	0	50	0	22	0	37	0	51	0
27	9	0	16	0	23	0	25	0	42	0	56	0	31	0	51	0	66	1	31	0	51	0	66	1
28	5	0	10	0	15	0	12	0	22	0	32	0	15	0	26	0	37	0	15	0	26	0	37	0
29	2	0	3	0	5	0	3	0	5	0	8	0	3	0	5	0	8	0	3	0	5	0	8	0
30	1	0	1	0	2	0	2	0	4	0	6	0	3	0	4	0	7	0	3	0	4	0	7	0
31	n	0	3	0	3	0	1	0	4	0	5	0	1	0	5	0	6	0	1	0	5	0	6	0
32	n	0	5	0	5	0	1	0	8	0	9	0	4	0	12	0	15	0	5	0	15	0	19	0
33	n	0	n	0	n	0	n	0	n	0	1	0	2	0	4	0	6	0	3	0	6	0	9	0
34	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	2	0	1	0	2	0	3	0
35	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	n	0	1	0	1	0
36	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	n	0	1	0	1	0
37	n	0	n	0	n	0	n	0	1	0	1	0	1	0	2	0	3	0	1	0	2	0	4	0
38	n	0	1	0	1	0	1	0	3	0	4	0	2	0	4	0	6	0	3	0	5	0	8	0
39	1	0	2	0	2	0	2	0	4	0	6	0	3	0	5	0	8	0	3	0	6	0	8	0
40	n	0	n	0	1	0	2	0	3	0	5	0	2	0	4	0	6	0	2	0	4	0	7	0
41	1	0	2	0	3	0	2	0	3	0	5	0	2	0	4	0	6	0	2	0	4	0	6	0
42	3	0	6	0	9	0	4	0	8	0	11	0	4	0	8	0	12	0	5	0	8	0	13	0
43	2	0	4	0	6	0	3	0	5	0	7	0	3	0	5	0	8	0	3	0	5	0	8	0
44	n	0	n	0	n	0	n	0	1	0	1	0	n	0	1	0	1	0	n	0	1	0	1	0
45	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	n	0	n	0	1	0
46	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	n	0	1	0	1	0
47	6	0	6	0	12	0	11	0	18	0	27	0	14	0	23	0	34	0	14	0	25	0	36	0
48	10	0	20	0	27	0	15	0	33	0	44	0	18	0	37	0	48	0	19	0	38	0	50	0
49	37	0	53	0	71	1	50	0	71	1	86	1	53	0	75	1	88	2	53	0	75	1	88	2
50	12	0	25	0	34	0	20	0	40	0	52	0	23	0	43	0	56	0	23	0	44	0	56	0
51	3	0	6	0	9	0	6	0	10	0	16	0	10	0	18	0	26	0	12	0	21	0	31	0
52	n	0	n	0	1	0	2	0	4	0	6	0	4	0	8	0	12	0	5	0	9	0	14	0
53	2	0	3	0	6	0	13	0	21	0	32	0	20	0	32	0	45	0	22	0	33	0	48	0
54	n	0	n	0	n	0	2	0	4	0	6	0	11	0	21	0	30	0	16	0	28	0	40	0
55	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	2	0
56	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	2	0	3	0	5	0	8	0
57	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	2	0	4	0	7	0	11	0
58	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0
59	n	0	n	0	n	0	1	0	n	0	1	0	4	0	4	0	8	0	4	0	5	0	9	0
60	4	0	7	0	11	0	5	0	9	0	14	0	7	0	14	0	20	0	8	0	15	0	23	0

Notes: Prob is the probability (in percent) of one or more spills contacting the object.
Mode is the most likely number of contacts.
n - less than 0.5 percent.

occurring and contacting land segments over the production life of the lease area. Mixed B transportation.

Land Segment	Within 3 days Proposed Leases		Existing Leases		Both		Within 10 days Proposed Leases		Existing Leases		Both		Within 30 days Proposed Leases		Existing Leases		Both		Within 60 days Proposed Leases		Existing Leases		Both	
	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode
1	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0
2	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	2	0	3	0
3	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0
4	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0
5	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0
6	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0
7	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0
8	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0
9	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0
10	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0
11	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0
12	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0
13	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0
14	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	2	0	3	0
15	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	1	0	2	0
16	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0
17	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	1	0	2	0
18	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0
19	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	1	0	1	0	2	0
20	n	0	n	0	n	0	1	0	n	0	1	0	3	0	5	0	8	0	4	0	5	0	9	0
21	1	0	n	0	1	0	3	0	3	0	6	0	7	0	9	0	16	0	8	0	10	0	17	0
22	n	0	n	0	n	0	2	0	2	0	4	0	4	0	5	0	9	0	5	0	6	0	11	0
23	1	0	n	0	1	0	3	0	2	0	5	0	5	0	6	0	11	0	6	0	7	0	13	0
24	n	0	1	0	1	0	1	0	2	0	2	0	1	0	2	0	3	0	1	0	2	0	4	0
25	3	0	6	0	9	0	5	0	10	0	14	0	6	0	11	0	16	0	6	0	11	0	16	0
26	11	0	20	0	28	0	20	0	34	0	47	0	22	0	37	0	51	0	22	0	37	0	51	0
27	9	0	16	0	23	0	25	0	42	0	56	0	31	0	51	0	66	1	31	0	52	0	67	1
28	5	0	10	0	15	0	12	0	22	0	32	0	15	0	26	0	37	0	15	0	27	0	38	0
29	2	0	3	0	5	0	3	0	5	0	8	0	3	0	5	0	8	0	3	0	5	0	8	0
30	1	0	1	0	2	0	2	0	3	0	5	0	2	0	4	0	6	0	2	0	4	0	6	0
31	n	0	3	0	3	0	1	0	4	0	5	0	1	0	5	0	6	0	1	0	5	0	6	0
32	n	0	5	0	5	0	1	0	8	0	9	0	3	0	12	0	15	0	5	0	14	0	18	0
33	n	0	n	0	n	0	n	0	n	0	1	0	2	0	4	0	6	0	3	0	6	0	9	0
34	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	2	0	1	0	2	0	3	0
35	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	n	0	1	0	1	0
36	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	n	0	1	0	1	0
37	n	0	n	0	n	0	n	0	1	0	1	0	1	0	2	0	3	0	1	0	2	0	4	0
38	n	0	1	0	1	0	1	0	3	0	4	0	2	0	4	0	6	0	3	0	5	0	8	0
39	1	0	2	0	2	0	2	0	4	0	6	0	3	0	5	0	8	0	3	0	6	0	3	0
40	n	0	n	0	1	0	2	0	3	0	5	0	2	0	4	0	6	0	2	0	4	0	7	0
41	1	0	2	0	3	0	2	0	3	0	5	0	2	0	4	0	6	0	2	0	4	0	5	0
42	3	0	6	0	9	0	4	0	8	0	11	0	4	0	8	0	12	0	5	0	8	0	13	0
43	2	0	4	0	6	0	3	0	5	0	7	0	3	0	5	0	8	0	3	0	5	0	8	0
44	n	0	n	0	n	0	n	0	1	0	1	0	n	0	1	0	1	0	n	0	1	0	1	0
45	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	n	0	n	0	1	0
46	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	n	0	1	0	1	0
47	6	0	6	0	11	0	10	0	18	0	26	0	13	0	23	0	33	0	14	0	24	0	35	0
48	9	0	19	0	26	0	15	0	33	0	43	0	17	0	37	0	48	0	18	0	38	0	47	0
49	32	0	46	0	63	0	45	0	66	1	81	1	49	0	70	1	85	1	49	0	70	1	85	1
50	13	0	27	0	36	0	21	0	41	0	53	0	24	0	44	0	57	0	24	0	45	0	53	0
51	3	0	7	0	10	0	7	0	12	0	18	0	11	0	20	0	29	0	13	0	23	0	33	0
52	n	0	1	0	1	0	3	0	5	0	8	0	5	0	10	0	15	0	6	0	11	0	17	0
53	2	0	3	0	6	0	14	0	22	0	32	0	21	0	32	0	46	0	22	0	34	0	49	0
54	n	0	n	0	n	0	2	0	5	0	7	0	12	0	22	0	32	0	17	0	30	0	42	0
55	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	2	0
56	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	2	0	3	0	6	0	8	0
57	n	0	n	0	n	0	n	0	n	0	n	0	1	0	1	0	2	0	5	0	8	0	12	0
58	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	n	0	1	0	[illegible]	0
59	n	0	n	0	n	0	1	0	n	0	1	0	4	0	5	0	8	0	4	0	6	0	10	0
60	4	0	8	0	12	0	5	0	10	0	15	0	8	0	15	0	21	0	9	0	16	0	24	0

Notes: Prob is the probability (in percent) of one or more spills contacting the object.
Mode is the most likely number of contacts.
n - less than 0.5 percent.

considerable success in containing oil in the course of the days or weeks separating the occurrence of a spill on the OCS and its arrival at an object. The different probabilities of hits occurring within each of the four time periods (3, 10, 30 and 60 days) should be considered when evaluating impacts on biological and recreational resources. For example, the probability of a spill occurring and contacting Ranger Bank (Object Number 3) within 10 days is very small; thus, spills affecting Ranger Bank can be expected to first undergo considerable weathering. On the other hand, table 4 shows that most spills contacting Major Commercial Pelagic Fish (Object Number 4) will make first contact within 3 days. Finally, it is important to remember that oilspills can occur only if petroleum is produced from the area.

It is important that the distinction between the probabilities given in tables 2 and 3 and those in tables 4 and 5 be very clear. The data given in tables 2 and 3 refer only to the likelihood that spills would follow certain trajectories and have nothing to do with the chances that spills would occur in the first place. The probabilities in tables 4 and 5, by contrast, reflect both the expected frequency of spill occurrence given that petroleum production occurs as well as the likelihood of certain trajectories.

Other Sources of Risk

Other important sources of oilspill risk in the study area include tanker transport of Alaskan and foreign oil into the port of Long Beach. Tankers loaded with Alaskan oil would enter the study area from the northwest, and follow transport routes T1 through T8 through the Santa Barbara channel to Long Beach. Foreign oil would reach Long Beach from the southwest via transport routes T15 through T20. The probabilities that an oilspill starting along any of these transport route segments would reach certain objects or land segments is presented in tables 2A through 2D and 3A through 3D. It is estimated that, over a 22 year period, 5600 million barrels of oil will be shipped to Long Beach from Alaska and 2400 million barrels will arrive from foreign sources. This 8000 million barrels of oil can be expected to result in 31 oilspills over 1000 barrels in size distributed not only near California, but over much of the world.

The risk of spills of Alaskan or foreign oil occurring and contacting objects or land segments in the study area depends upon the nature of their release. One can assume either that there is an equal likelihood of a spill occurring anywhere along the transport route, or that spills are more likely to occur approaching or leaving port. If the former is assumed the risk to California would be very low because most spills would occur on the open ocean. On the other hand, the latter assumption results in a much higher assessment of risk. This study takes a middle path in assuming that half of the spills would occur within the study area; this includes a good portion of open ocean, as well as the approaches to Long Beach. The number of oilspills over 1,000 barrels in size of Alaskan or foreign oil expected to occur within the study area is, then, 16. Tables 6 and 7 show the probabilities of one or more spills, and the most likely number of spills, of Alaskan or foreign oil occurring and contacting objects or land segments, for travel times of 3, 10, 30, and 60 days. Comparing these to tables 4 and 5, it can be seen that, for most objects and land segments, risks are roughly comparable to the risks of the proposed leases, and somewhat less than that of the existing leases.

The California Tidelands hold an estimated 580 million barrels of oil reserves, but production has been declining in recent years. Most of these reserves are located in the Long Beach area, where the oil is transporated to shore by pipelines. Because of the close proximity of leases on State of California lands to the shoreline, any major oilspills occurring at these leases have a high probability of contacting the shore. Precise evaluation of the risk from these leases is beyond the present resolution capabilities of the model, but a rough estimate can be made by assuming that (1) all spills from platforms and pipelines hit land, and (2) 15 percent of the oil is transported to San Francisco or Long Beach via tanker, in a manner similar to the "Mixed" scenarios. With these assumptions, 2.7 oilspills 1,000 barrels or larger can be expected to occur and 2.6, or almost all, of these spills will hit land.

Relative Risks of Leasing

The risk due to the proposed leasing appears to be a moderate increase over the risk due to the existing leases. This increase, however should also be considered in relation to other oilspill risks, such as transport of Alaskan oil and importing of foreign oil.

Table 6. -- Probabilities (in percent) of one or more spills and most likely number of spills greater than 1,000 barrels occurring and contacting objects over the production life of the lease area. Alaskan and foreign oil tankers.

	Within 3 days		Within 10 days		Within 30 days		Within 60 days	
Object	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode
Land	72	1	92	2	98	4	99	5
1	6	0	23	0	64	1	82	1
2	n	0	n	0	n	0	9	0
3	86	1	94	2	99	4	*	5
4	94	2	96	3	98	4	99	4
5	n	0	3	0	15	0	23	0
6	15	0	57	0	89	2	97	3
7	5	0	15	0	20	0	22	0
8	n	0	n	0	7	0	35	0
9	15	0	22	0	25	0	29	0
10	87	2	95	2	98	4	99	5
11	42	0	48	0	52	0	53	0
12	9	0	11	0	12	0	15	0
13	21	0	28	0	29	0	30	0
14	21	0	26	0	36	0	41	0
15	89	2	96	3	99	4	*	5
16	n	0	1	0	7	0	21	0
17	n	0	n	0	4	0	7	0
18	73	1	90	2	96	3	98	4
19	43	0	62	0	79	1	90	2
20	22	0	47	0	61	0	66	1
21	7	0	18	0	23	0	24	0
22	96	3	96	3	96	3	96	3
23	89	2	98	3	*	5	*	6
24	57	0	78	1	90	2	95	2
25	79	1	92	2	97	3	98	4
26	11	0	35	0	75	1	90	2
27	56	0	74	1	85	1	93	2
28	68	1	87	2	96	3	98	4
29	60	0	81	1	88	2	90	2
30	11	0	24	0	33	0	35	0
31	29	0	48	0	60	0	65	1

Notes: Prob is the probability (in percent) of one or more spills contacting the object.
Mode is the most likely number of contacts.
n - less than 0.5 percent.
* - greater than 99.5 percent

Table 7. -- Probabilities (in percent) of one or more spills and most likely number of spills greater than 1,000 barrels occurring and contacting land segments over the production life of the lease area. Alaskan and foreign oil tankers.

Land Segment	Within 3 days		Within 10 days		Within 30 days		Within 60 days	
	Prob	Mode	Prob	Mode	Prob	Mode	Prob	Mode
1	n	0	n	0	n	0	1	0
2	n	0	n	0	n	0	1	0
3	n	0	n	0	n	0	n	0
4	n	0	n	0	n	0	n	0
5	n	0	n	0	n	0	n	0
6	n	0	n	0	n	0	n	0
7	n	0	n	0	n	0	n	0
8	n	0	n	0	n	0	n	0
9	n	0	n	0	n	0	n	0
10	n	0	n	0	n	0	n	0
11	n	0	n	0	n	0	1	0
12	n	0	n	0	n	0	n	0
13	n	0	n	0	n	0	n	0
14	n	0	n	0	n	0	1	0
15	n	0	n	0	n	0	1	0
16	n	0	n	0	n	0	n	0
17	n	0	n	0	n	0	1	0
18	n	0	n	0	n	0	1	0
19	n	0	n	0	n	0	1	0
20	n	0	n	0	2	0	3	0
21	n	0	n	0	3	0	4	0
22	n	0	n	0	1	0	2	0
23	n	0	n	0	1	0	2	0
24	n	0	n	0	n	0	n	0
25	2	0	3	0	3	0	3	0
26	12	0	21	0	23	0	23	0
27	9	0	26	0	32	0	32	0
28	5	0	13	0	15	0	16	0
29	1	0	1	0	1	0	1	0
30	1	0	3	0	3	0	3	0
31	1	0	2	0	2	0	2	0
32	n	0	4	0	15	0	24	0
33	n	0	2	0	13	0	22	0
34	n	0	n	0	4	0	7	0
35	n	0	n	0	2	0	3	0
36	n	0	n	0	1	0	4	0
37	n	0	n	0	5	0	13	0
38	n	0	n	0	10	0	16	0
39	n	0	n	0	6	0	7	0
40	n	0	n	0	1	0	2	0
41	n	0	n	0	2	0	3	0
42	n	0	n	0	15	0	17	0
43	n	0	n	0	2	0	2	0
44	n	0	n	0	2	0	2	0
45	n	0	n	0	n	0	n	0
46	n	0	n	0	1	0	1	0
47	10	0	18	0	24	0	29	0
48	12	0	22	0	24	0	26	0
49	33	0	48	0	52	0	52	0
50	13	0	21	0	24	0	24	0
51	2	0	5	0	12	0	18	0
52	2	0	4	0	7	0	8	0
53	11	0	21	0	25	0	27	0
54	1	0	7	0	17	0	27	0
55	n	0	n	0	3	0	14	0
56	n	0	n	0	n	0	4	0
57	n	0	n	0	n	0	7	0
58	n	0	n	0	n	0	n	0
59	n	0	n	0	2	0	3	0
60	n	0	1	0	6	0	10	0

Notes: Prob is the probability (in percent) of one or more spills contacting the segment.
Mode is the most likely number of contacts.
n - less than 0.5 percent.

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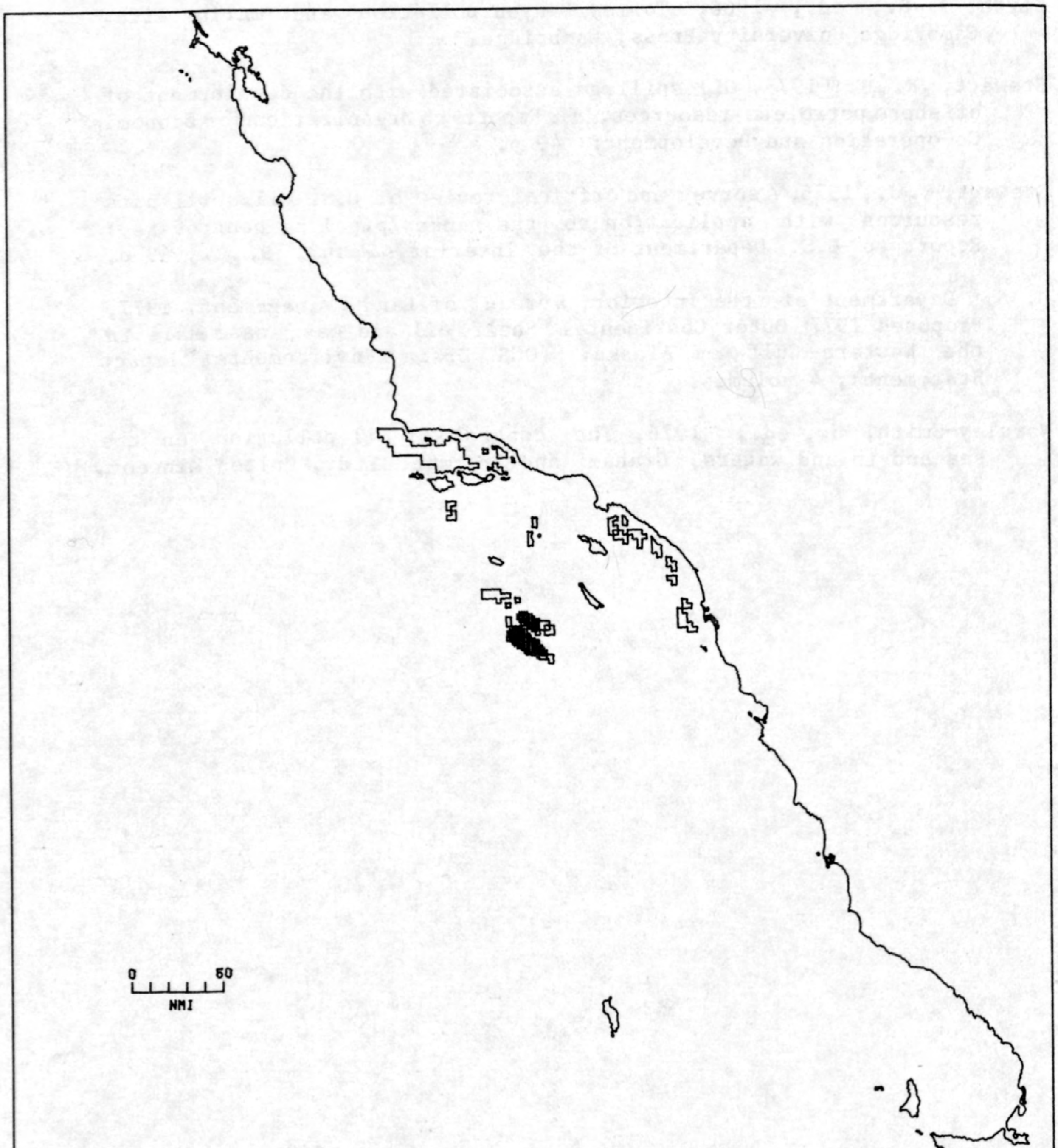

Figure A-1.--Hatched area indicates areal extent of Tanner and Cortez Banks.

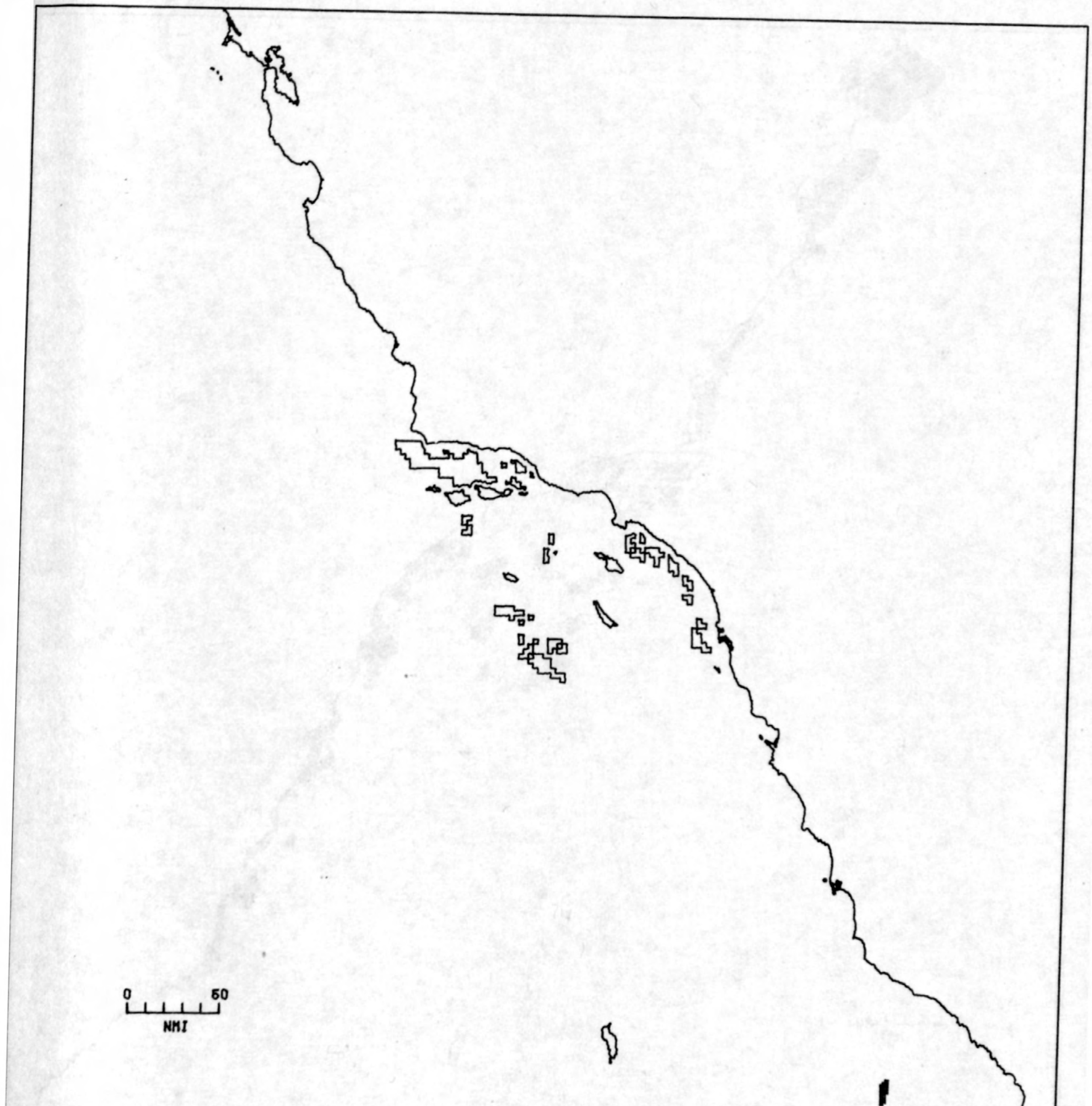

Figure A-2.--Hatched area indicates areal extent of Ranger Bank.

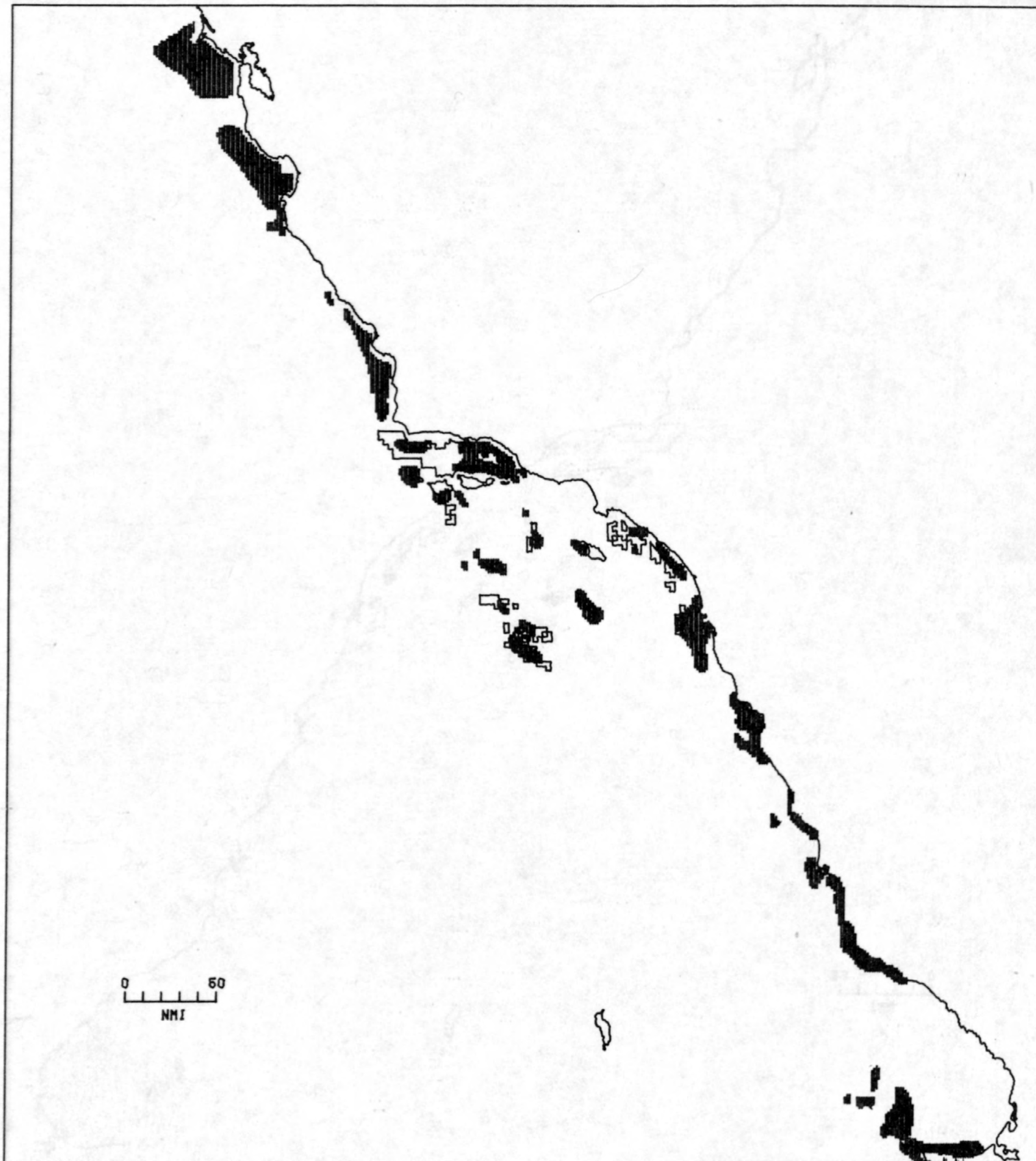

Figure A-3.--Hatched area indicates areal extent of major marketfish: Rockfish, flatfish, sablefish, white sea bass, and lingcod.

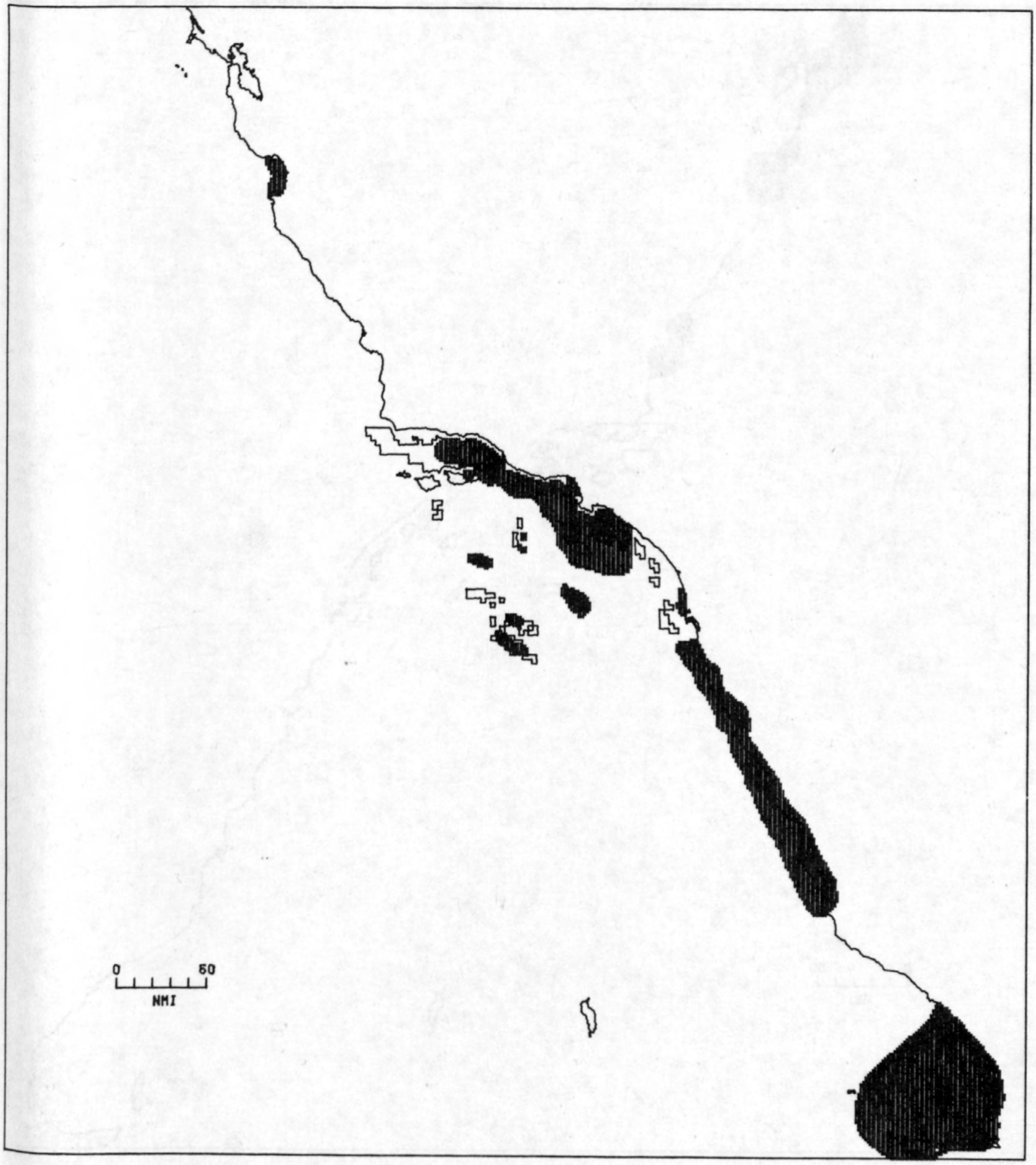

Figure A-4.--Hatched area indicates areal extent of major commercial pelagic fish: Anchovy, jack mackerel, sardine, and squid.

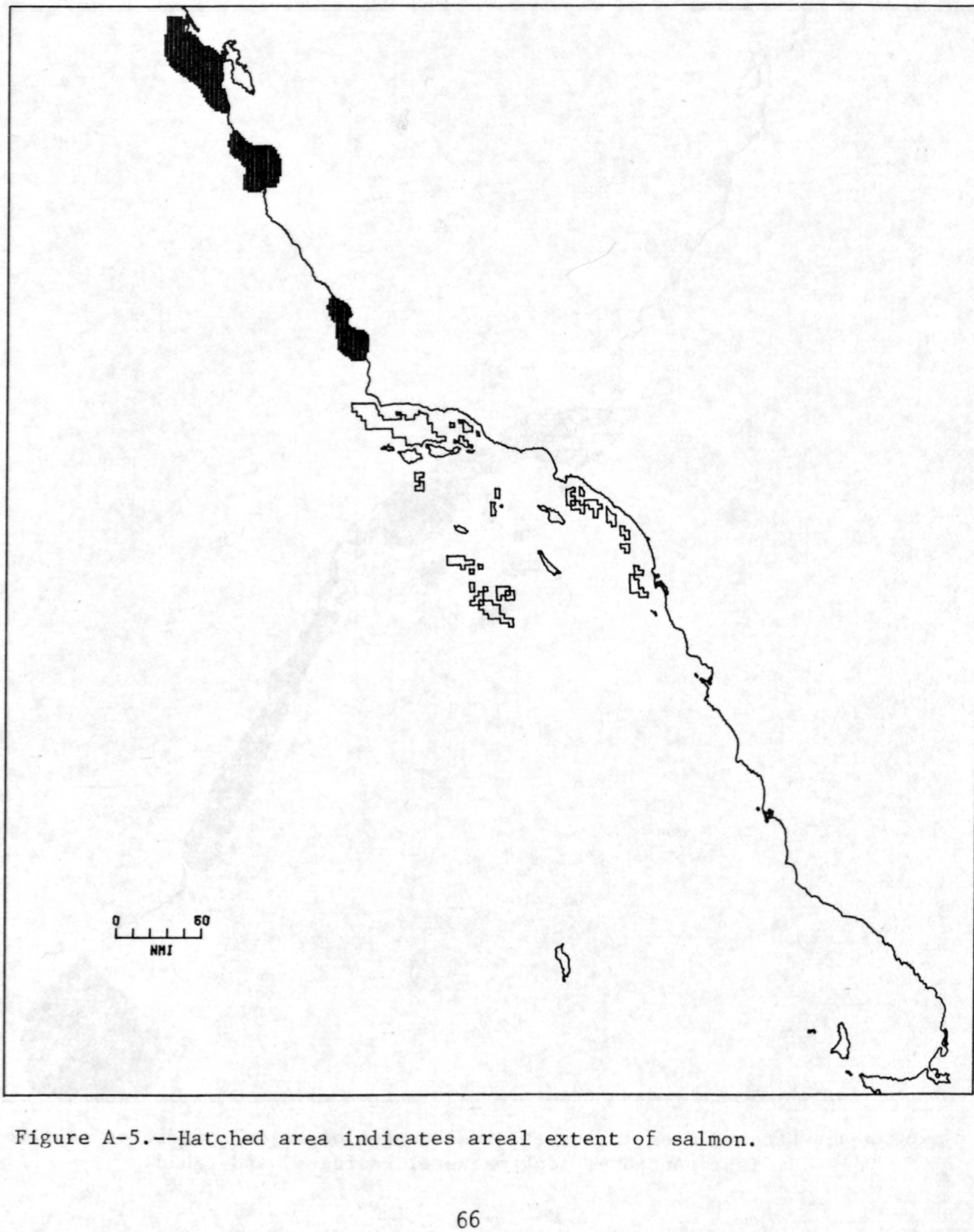

Figure A-5.--Hatched area indicates areal extent of salmon.

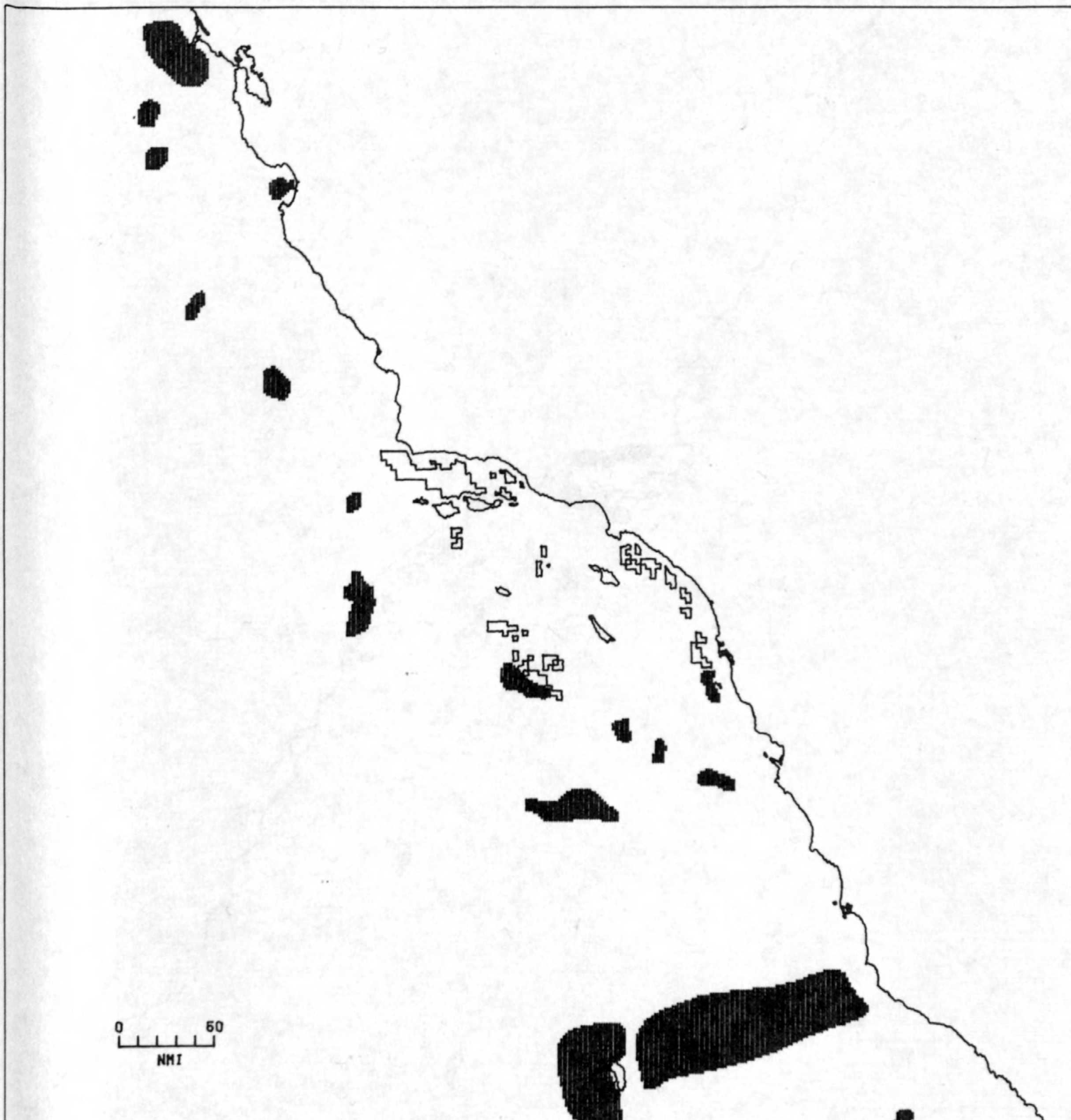

Figure A-6.--Hatched area indicates areal extent of albacore.

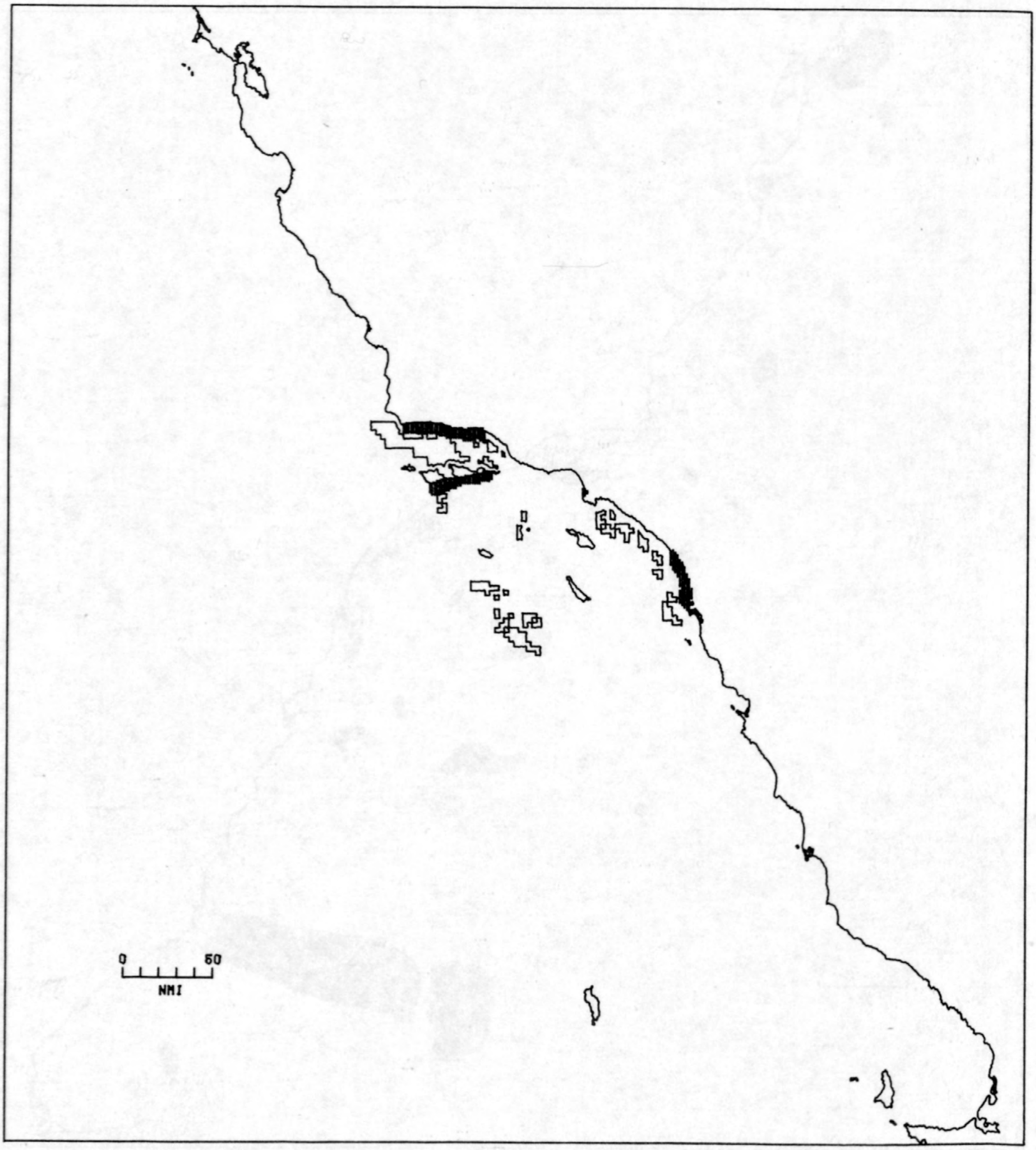

Figure A-7.--Hatched area indicates areal extent of bonito.

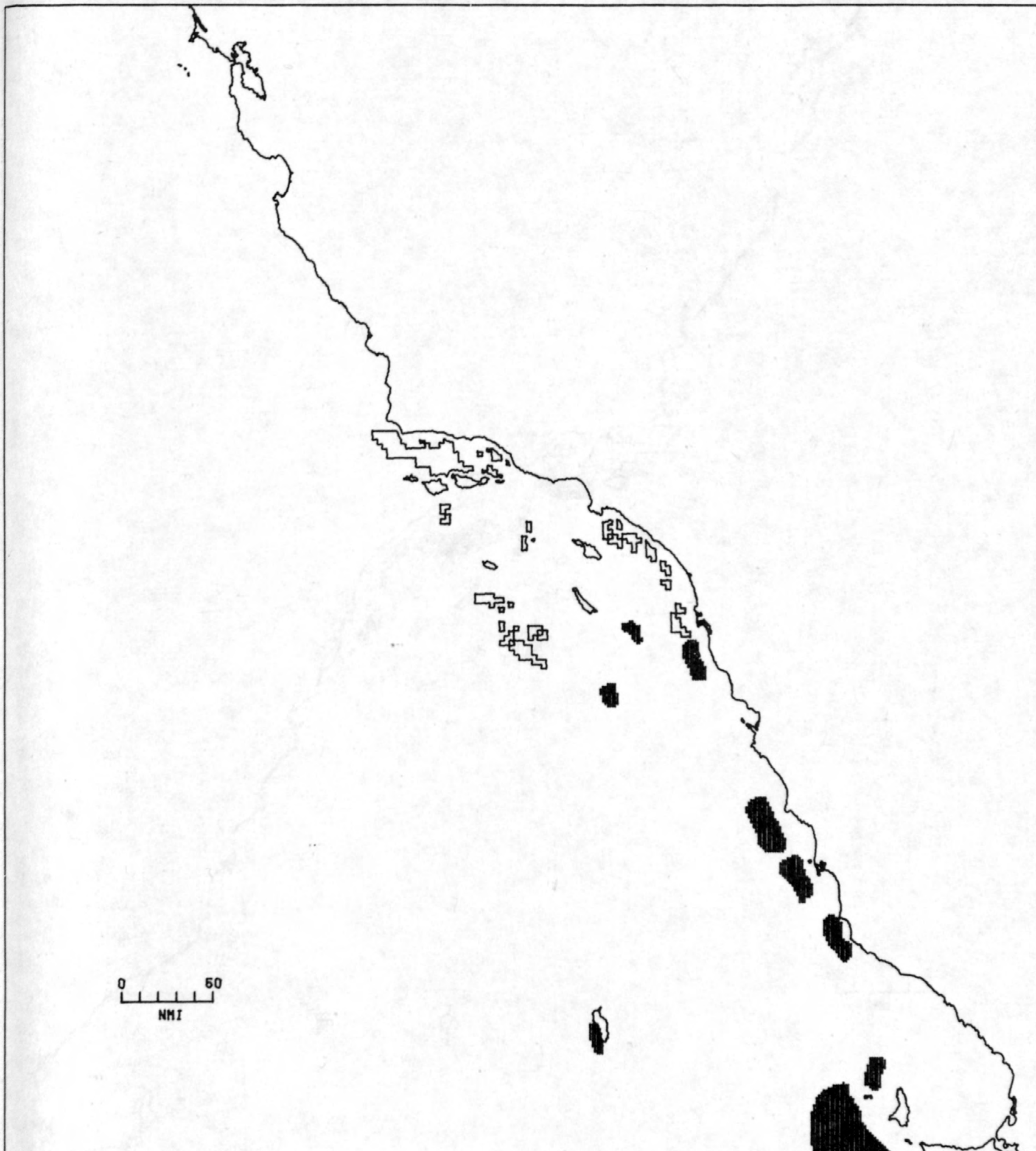

Figure A-8.--Hatched area indicates areal extent of tuna.

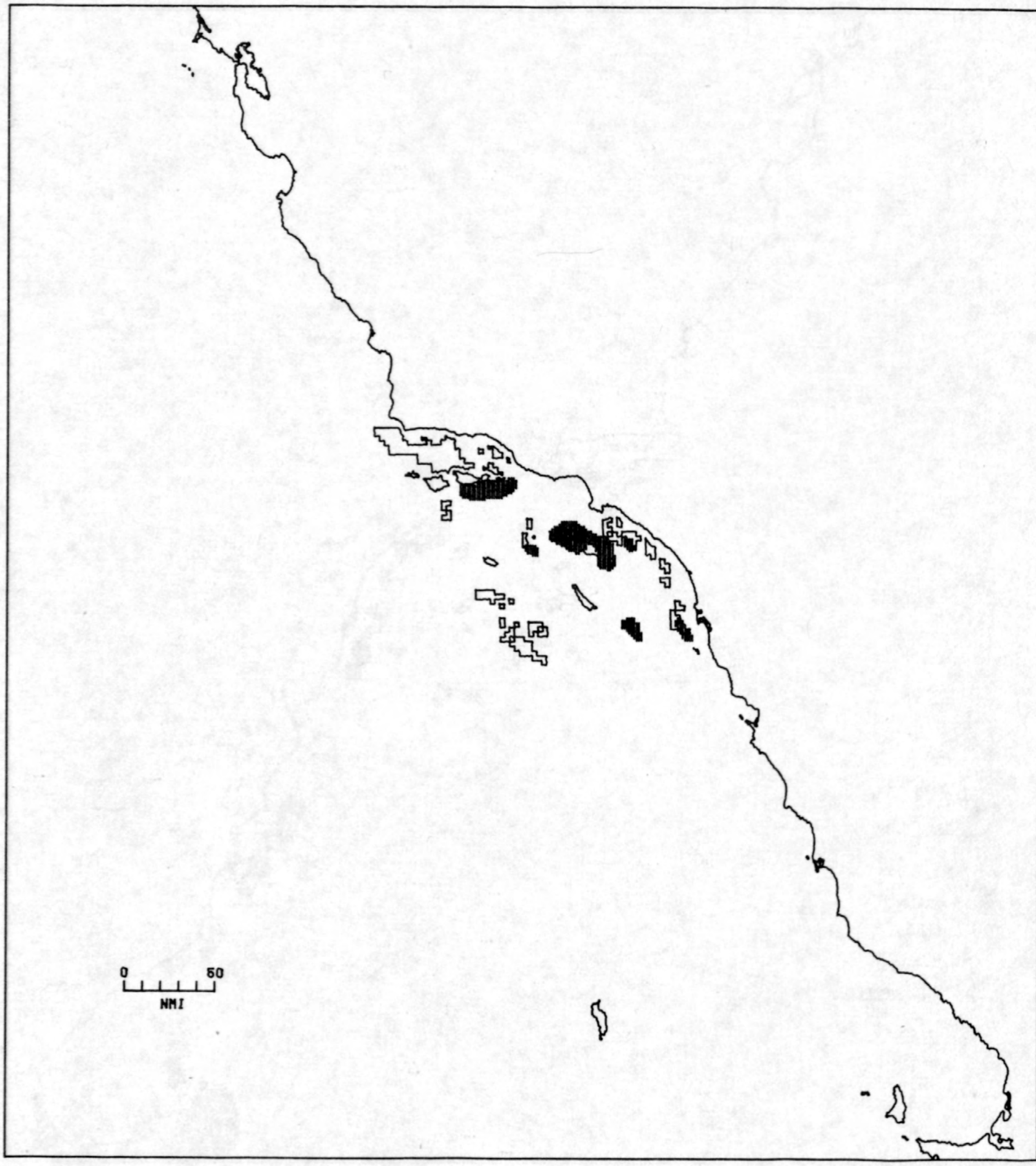

Figure A-9.--Hatched area indicates areal extent of swordfish.

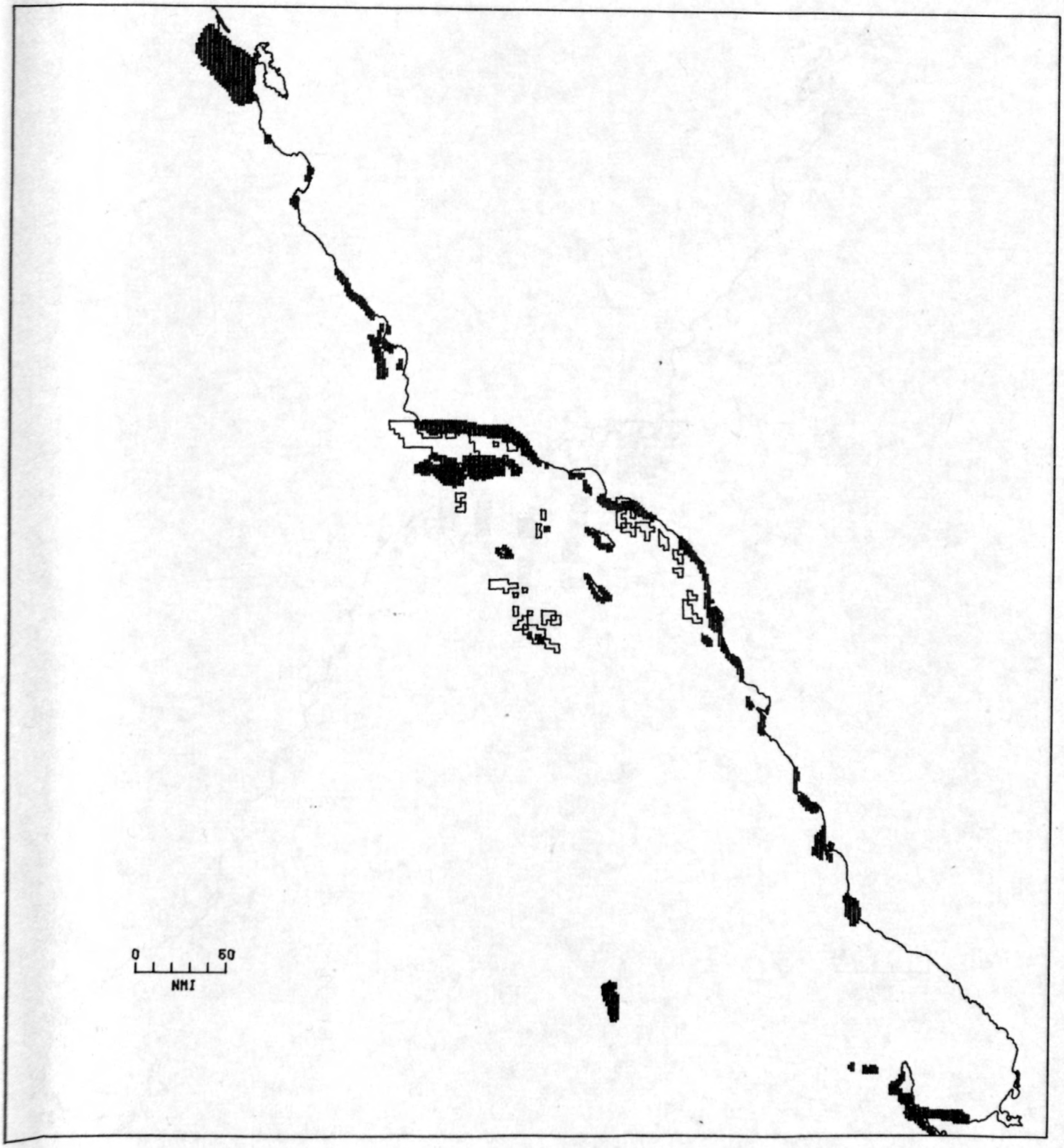

Figure A-10.--Hatched area indicates areal extent of commercial shellfish.

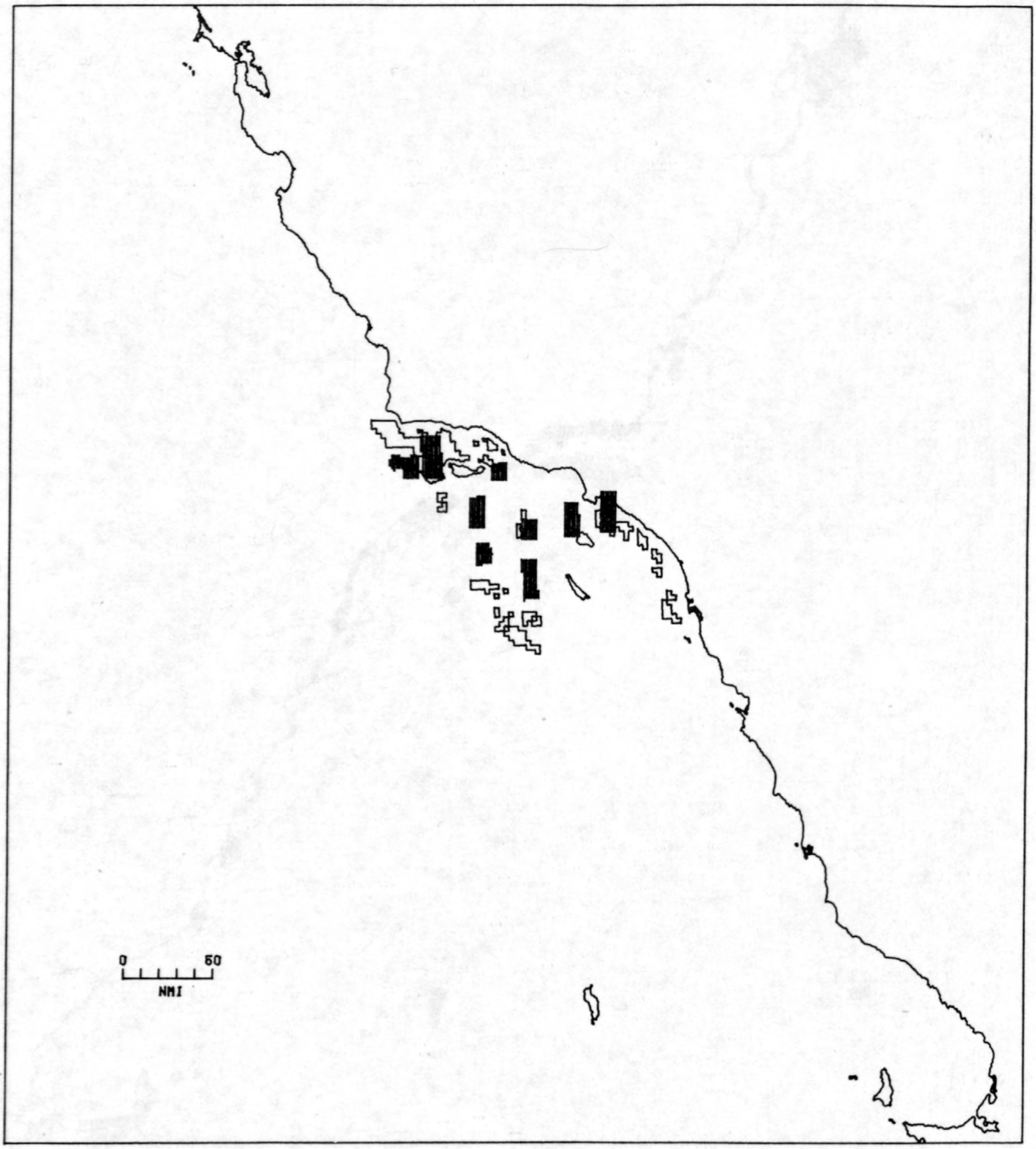

Figure A-11.--Hatched area indicates areal extent of seabirds (April-June).

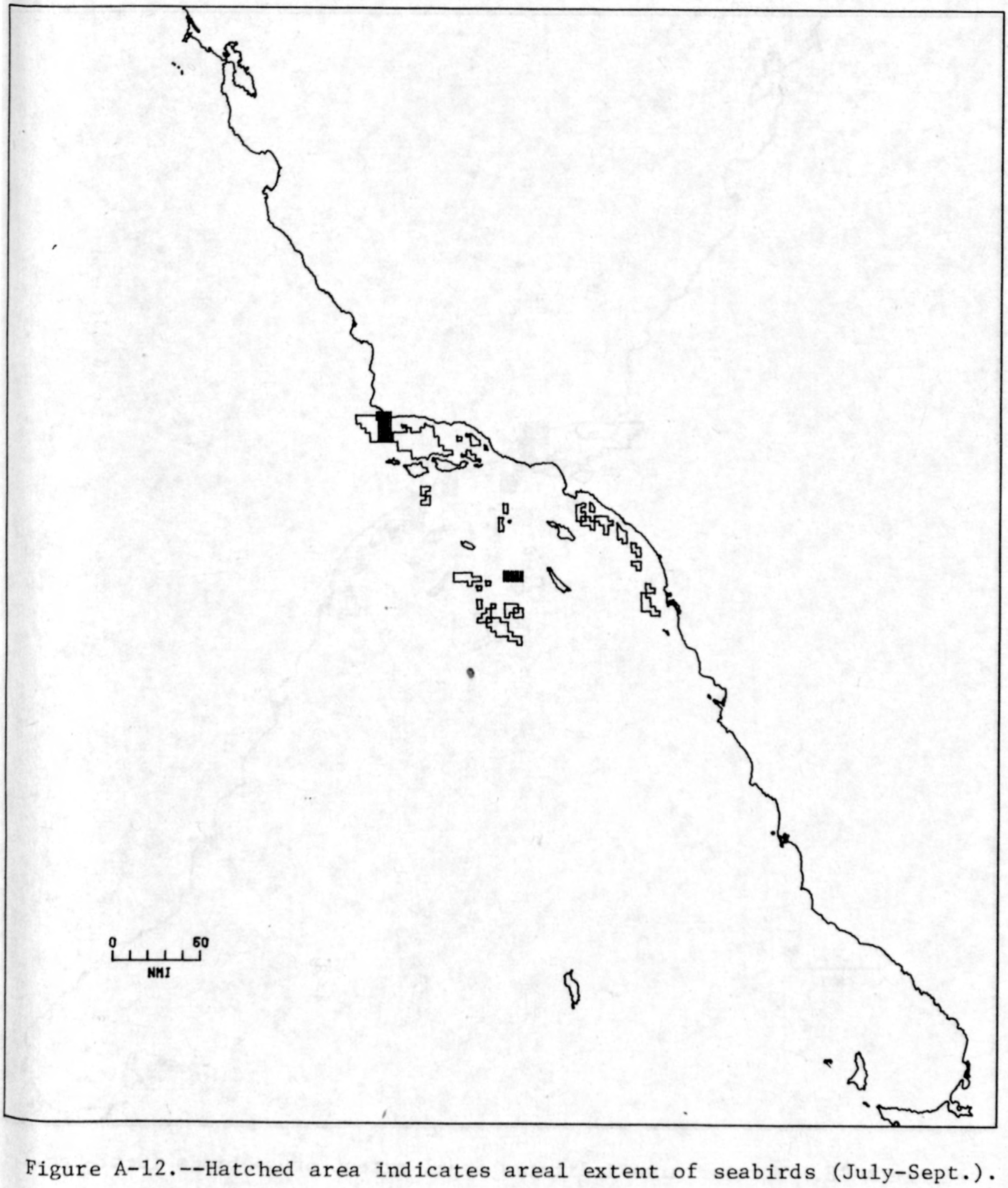

Figure A-12.--Hatched area indicates areal extent of seabirds (July-Sept.).

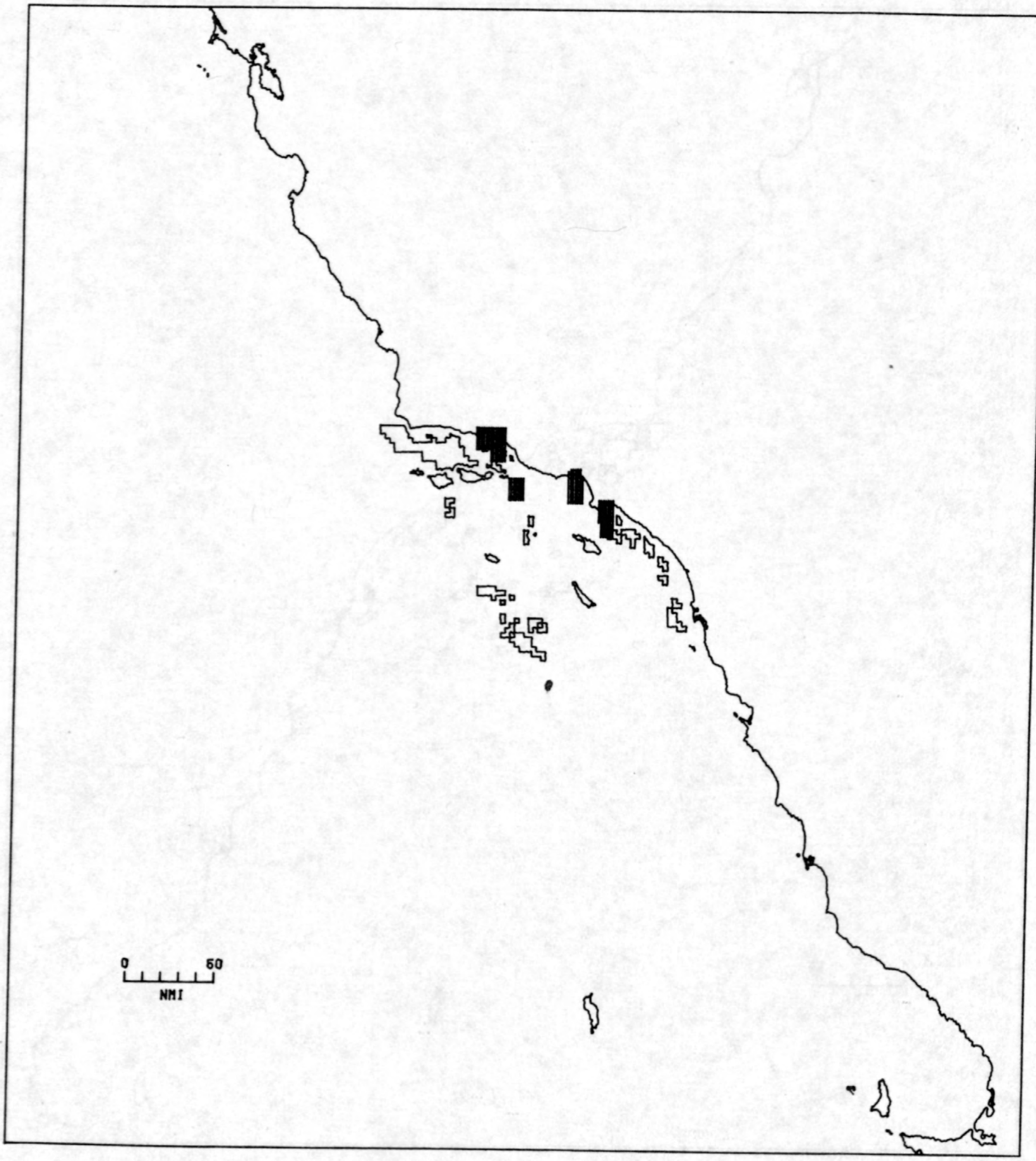

Figure A-13.--Hatched area indicates areal extent of seabirds (Oct.-Dec.)

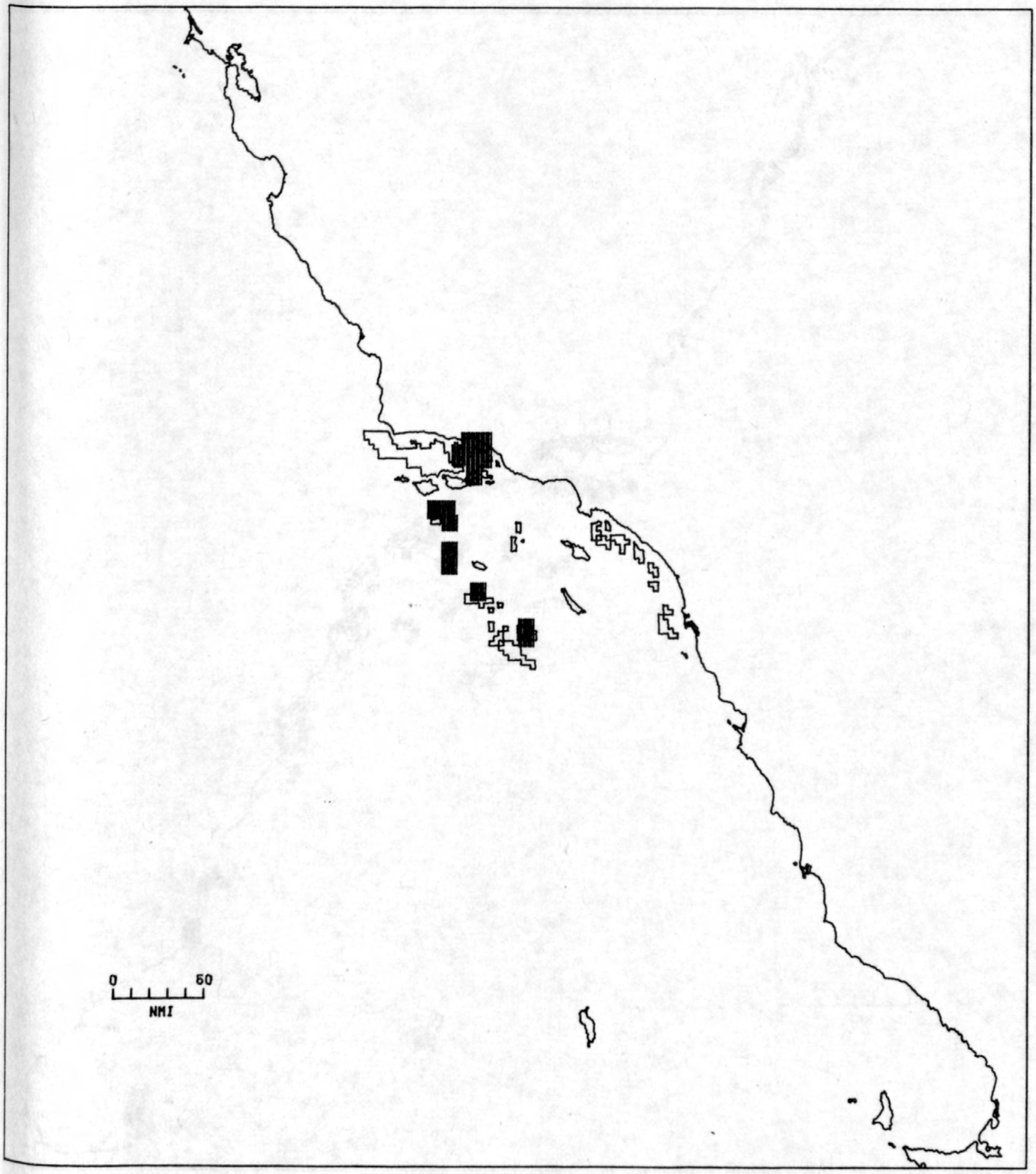

Figure A-14.--Hatched area indicates areal extent of seabirds (Jan.-March).

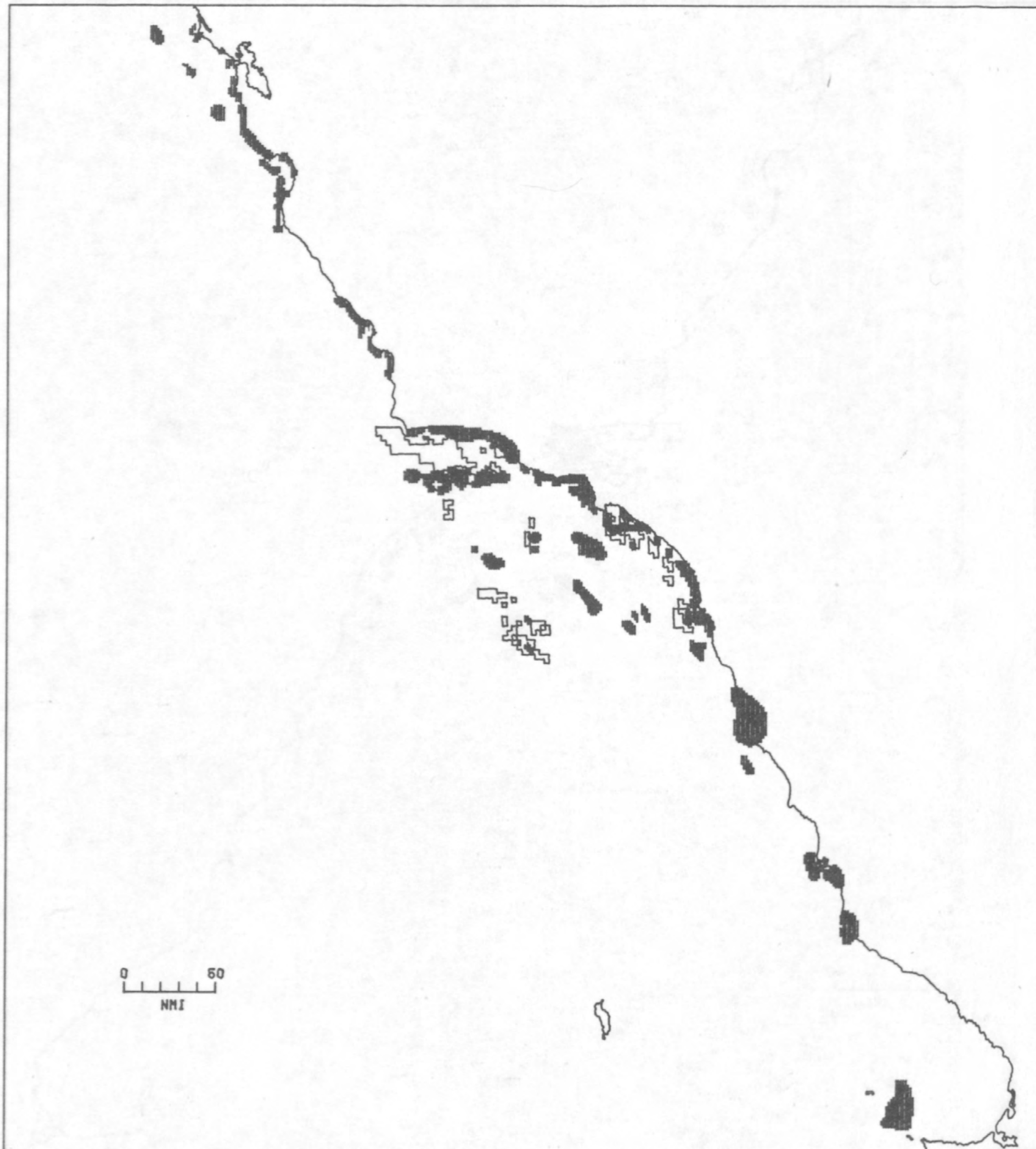

Figure A-15.--Hatched area indicates areal extent of major sportfishing: Rockfish, kelp bass, sea bass, barracuda, and bonito.

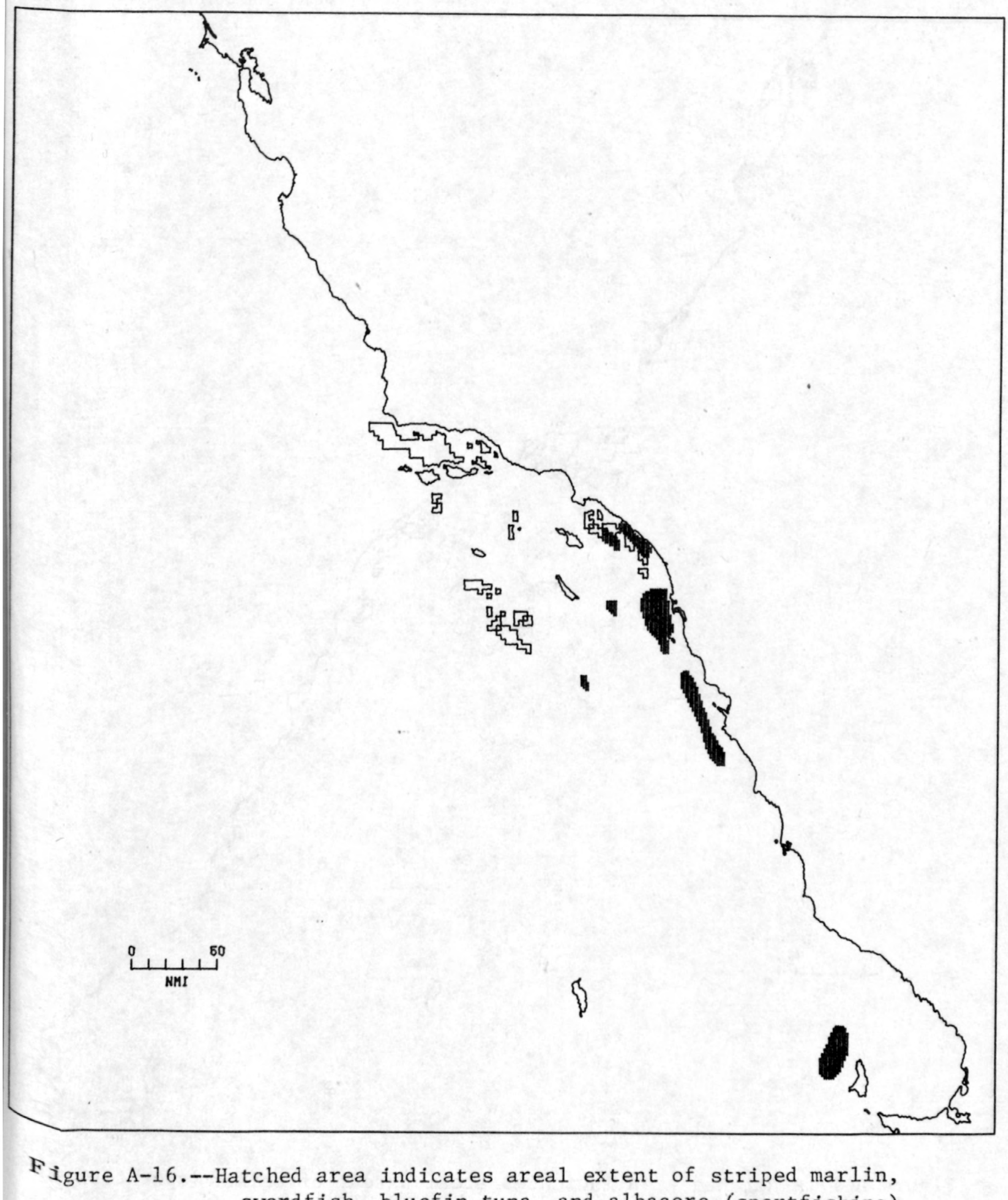

Figure A-16.--Hatched area indicates areal extent of striped marlin, swordfish, bluefin tuna, and albacore (sportfishing).

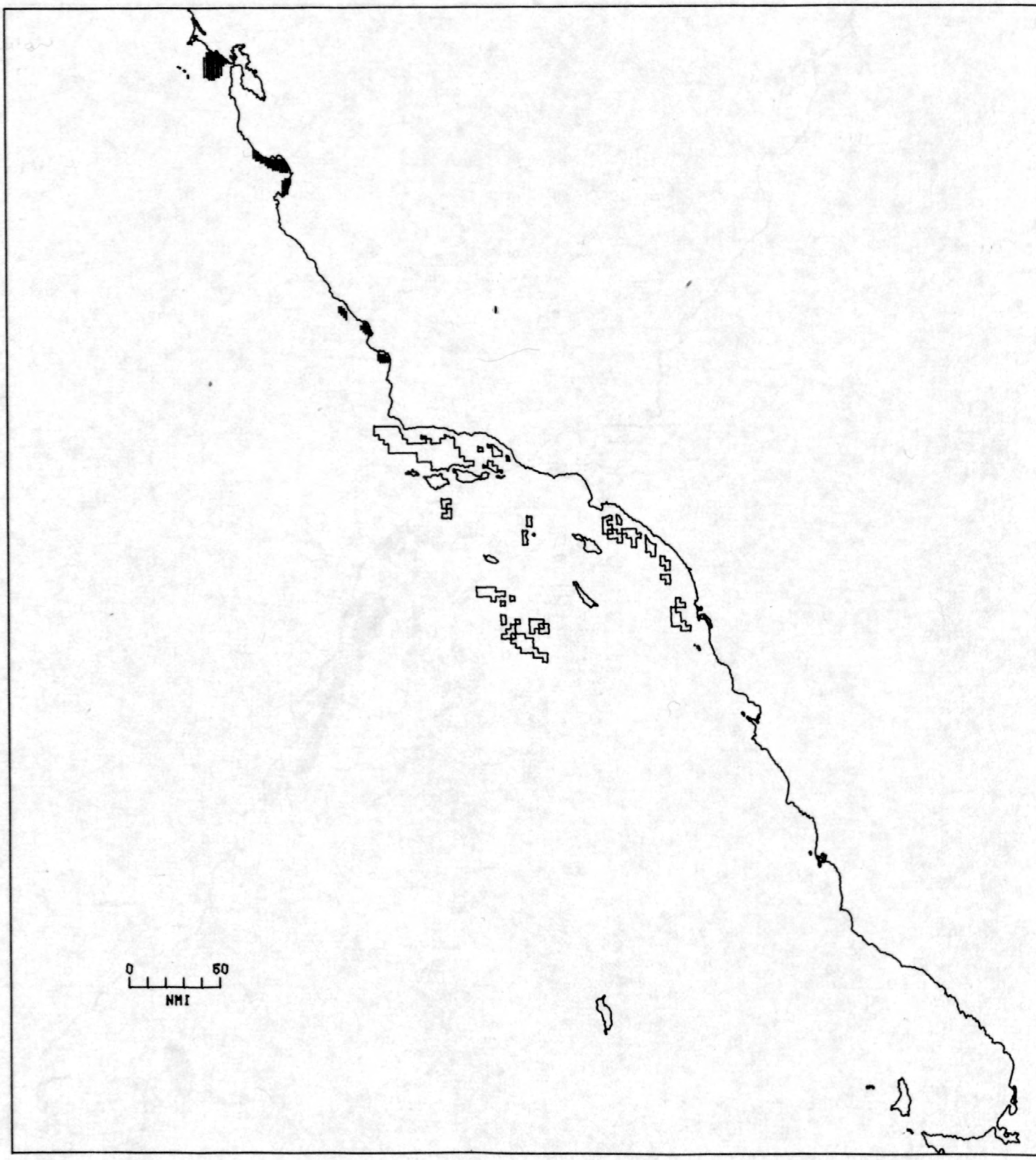

Figure A-17.--Hatched area indicates areal extent of salmon (sportfishing).

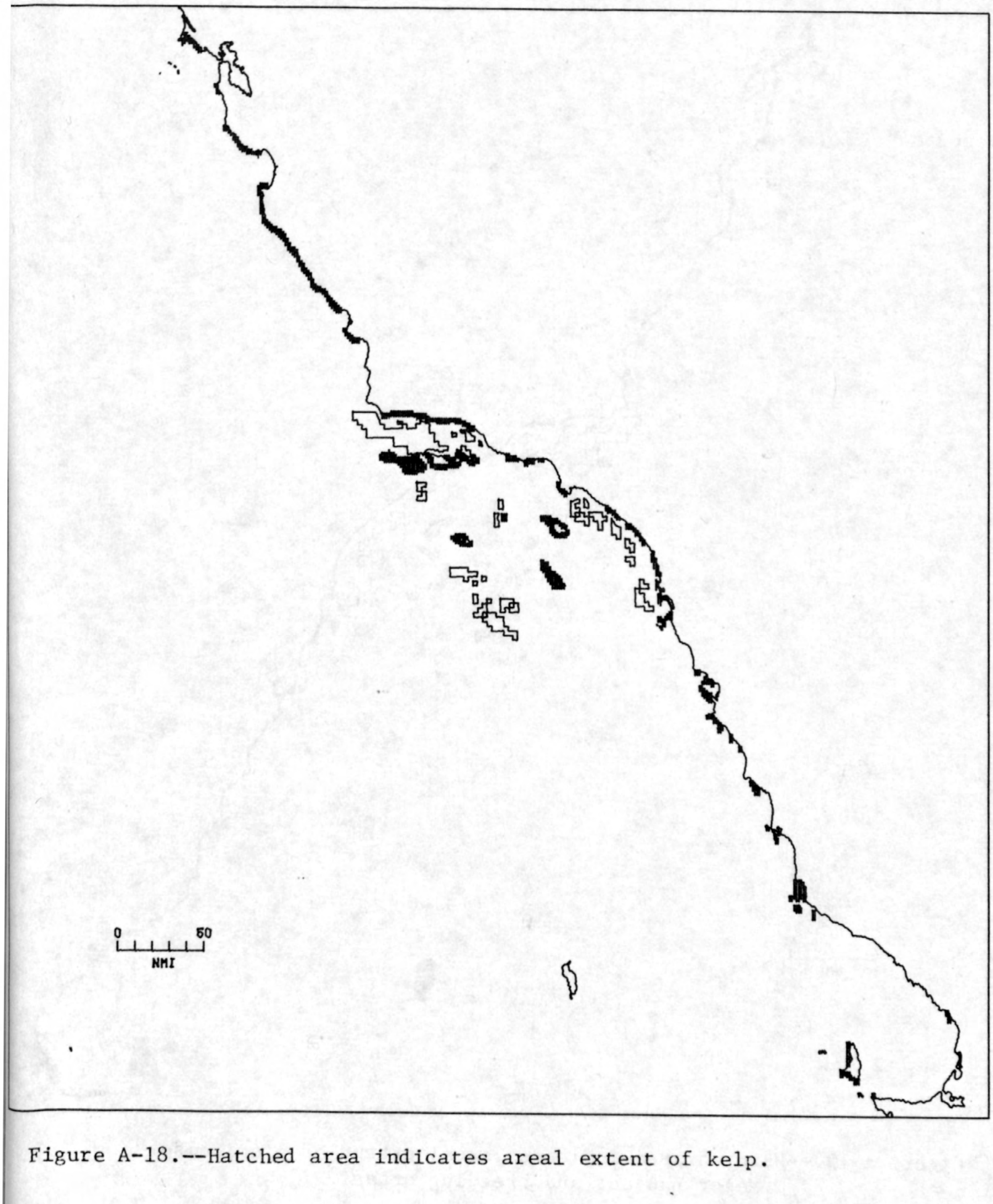

Figure A-18.--Hatched area indicates areal extent of kelp.

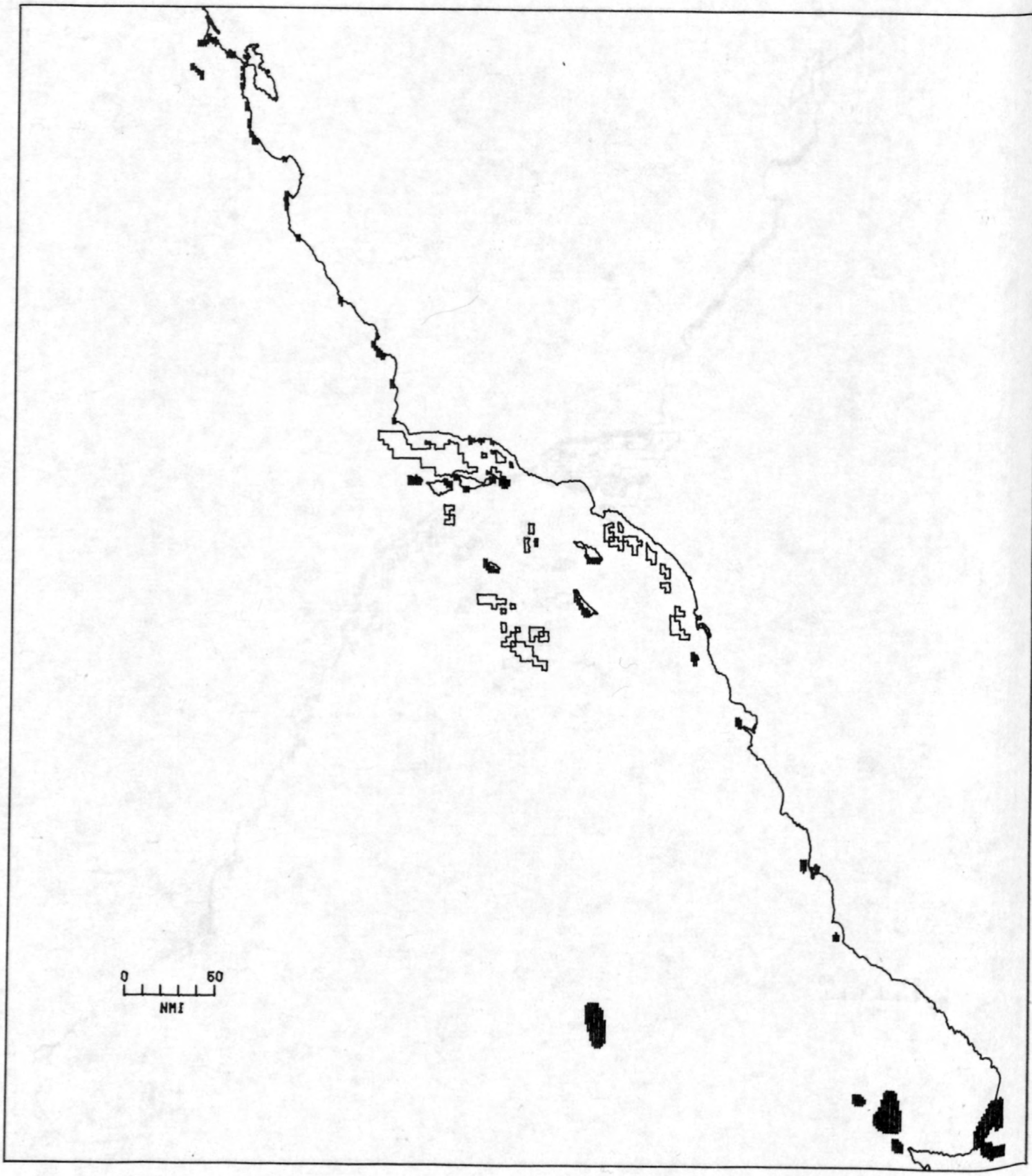

Figure A-19.--Hatched area indicates areal extent of pinnipeds--
Major haulout and breeding areas.

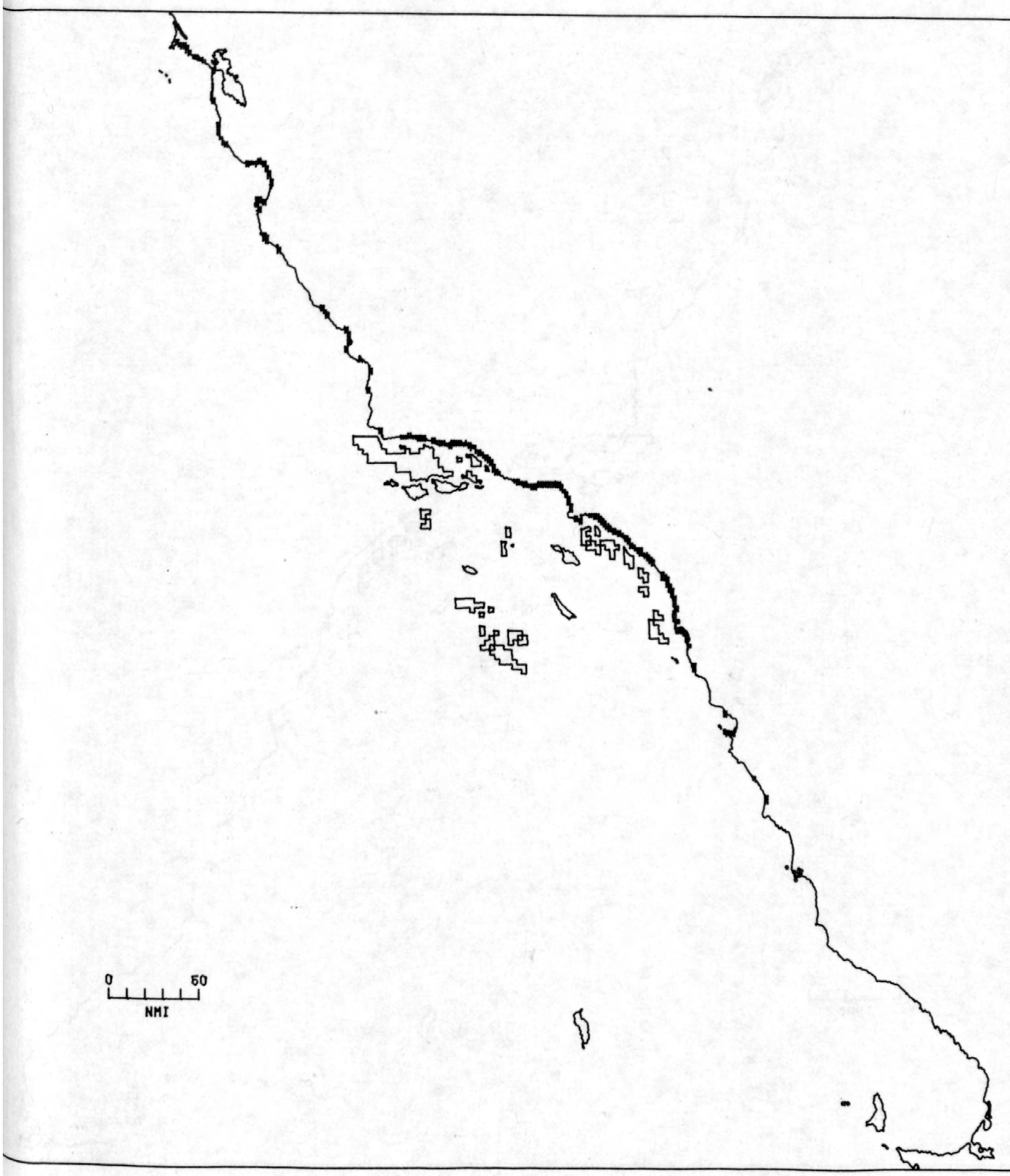

Figure A-20.--Hatched area indicates areal extent of high intensity use beaches.

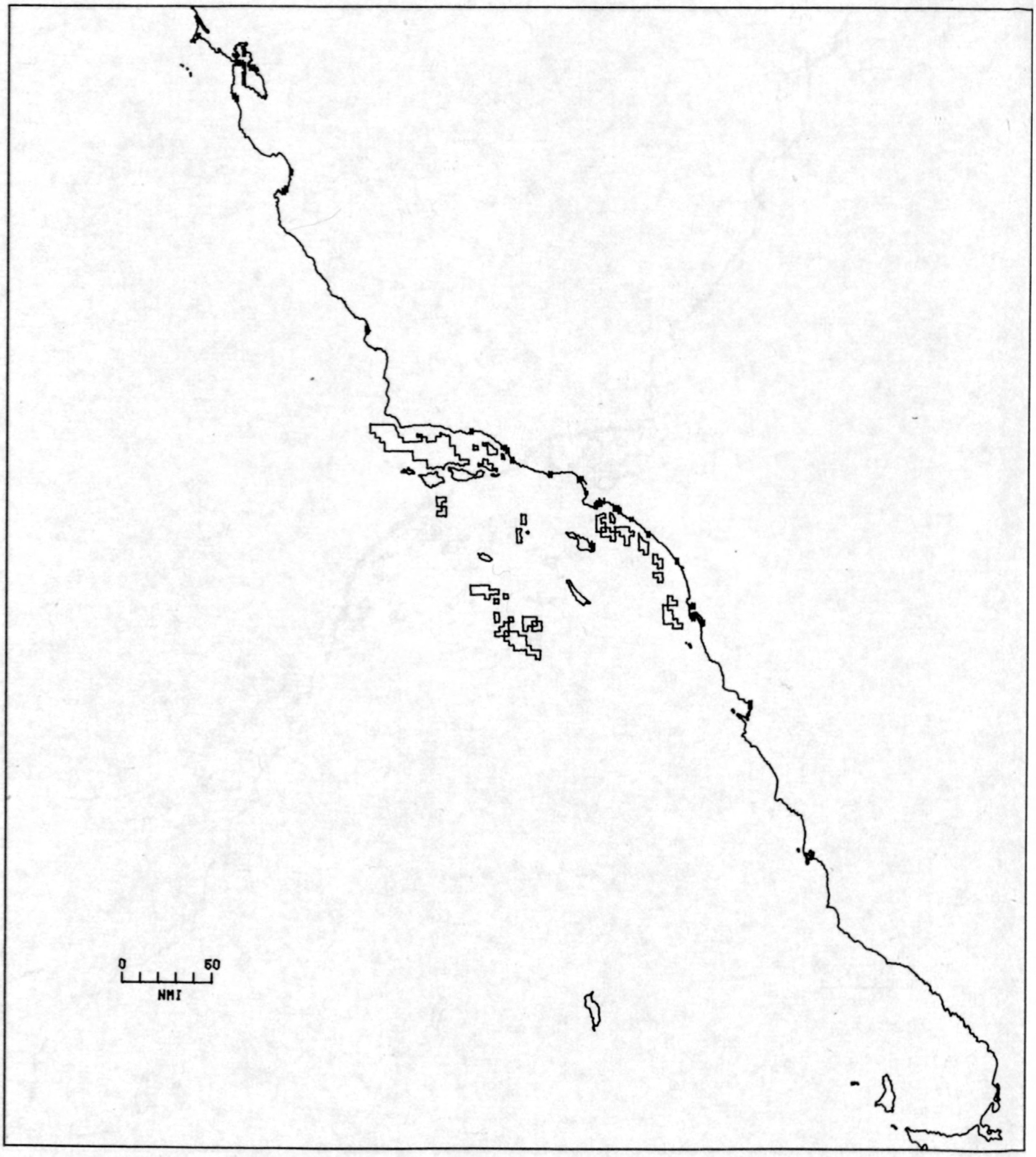

Figure A-21.--Hatched area indicates areal extent of harbors and marinas.

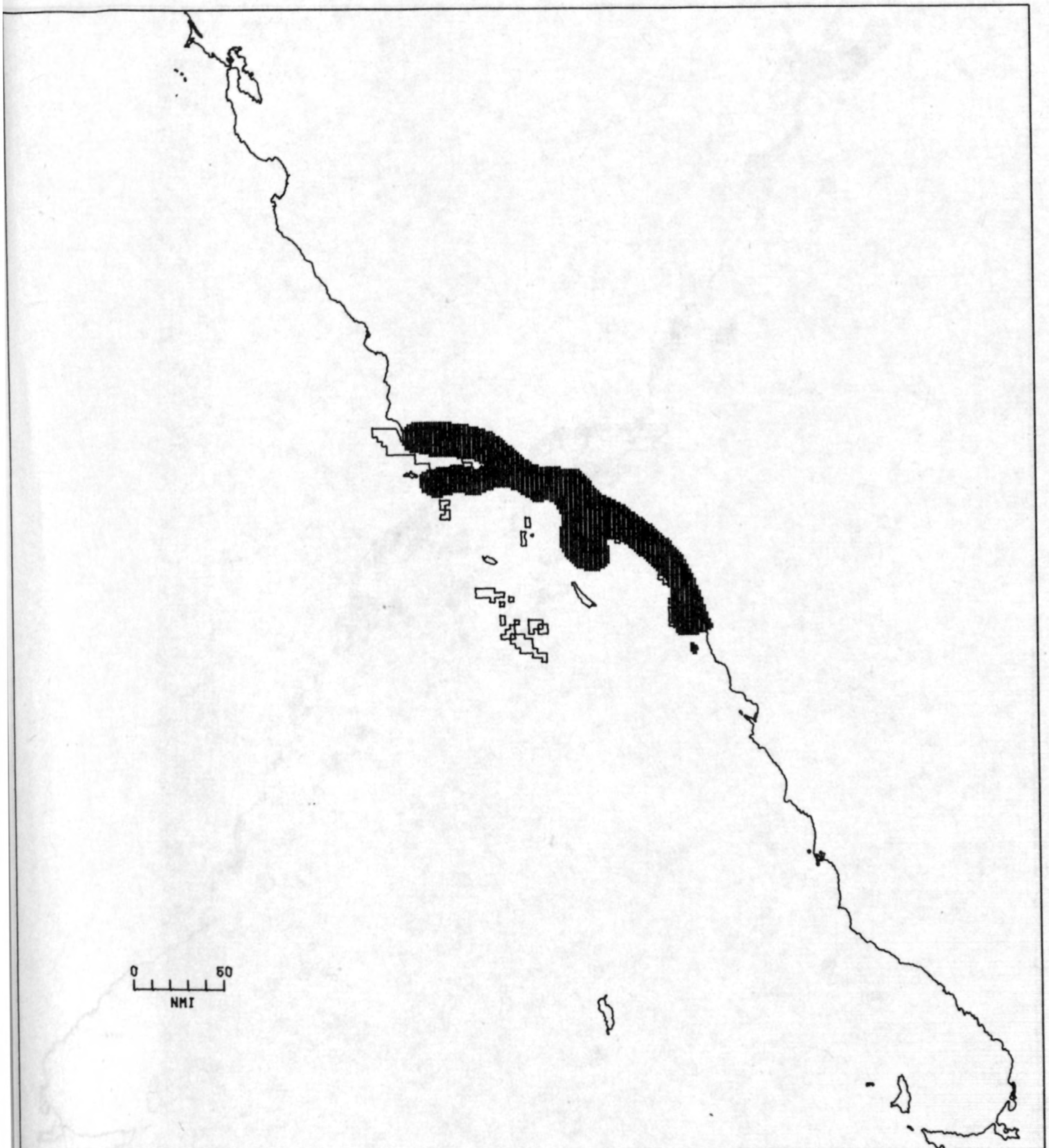

Figure A-22.--Hatched area indicates areal extent of high density recreational boating areas.

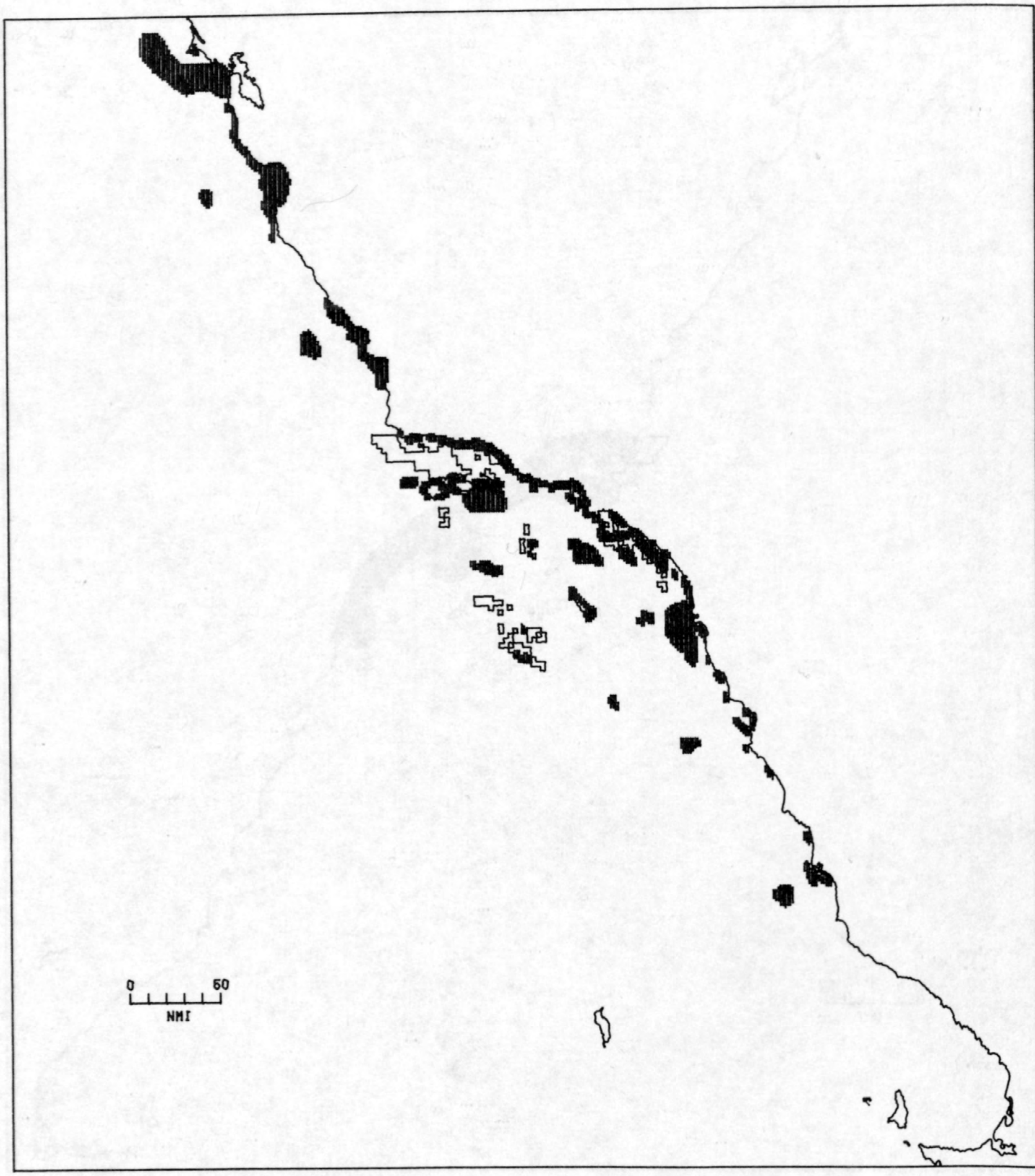

Figure A-23.--Hatched area indicates areal extent of shore based sportfishing.

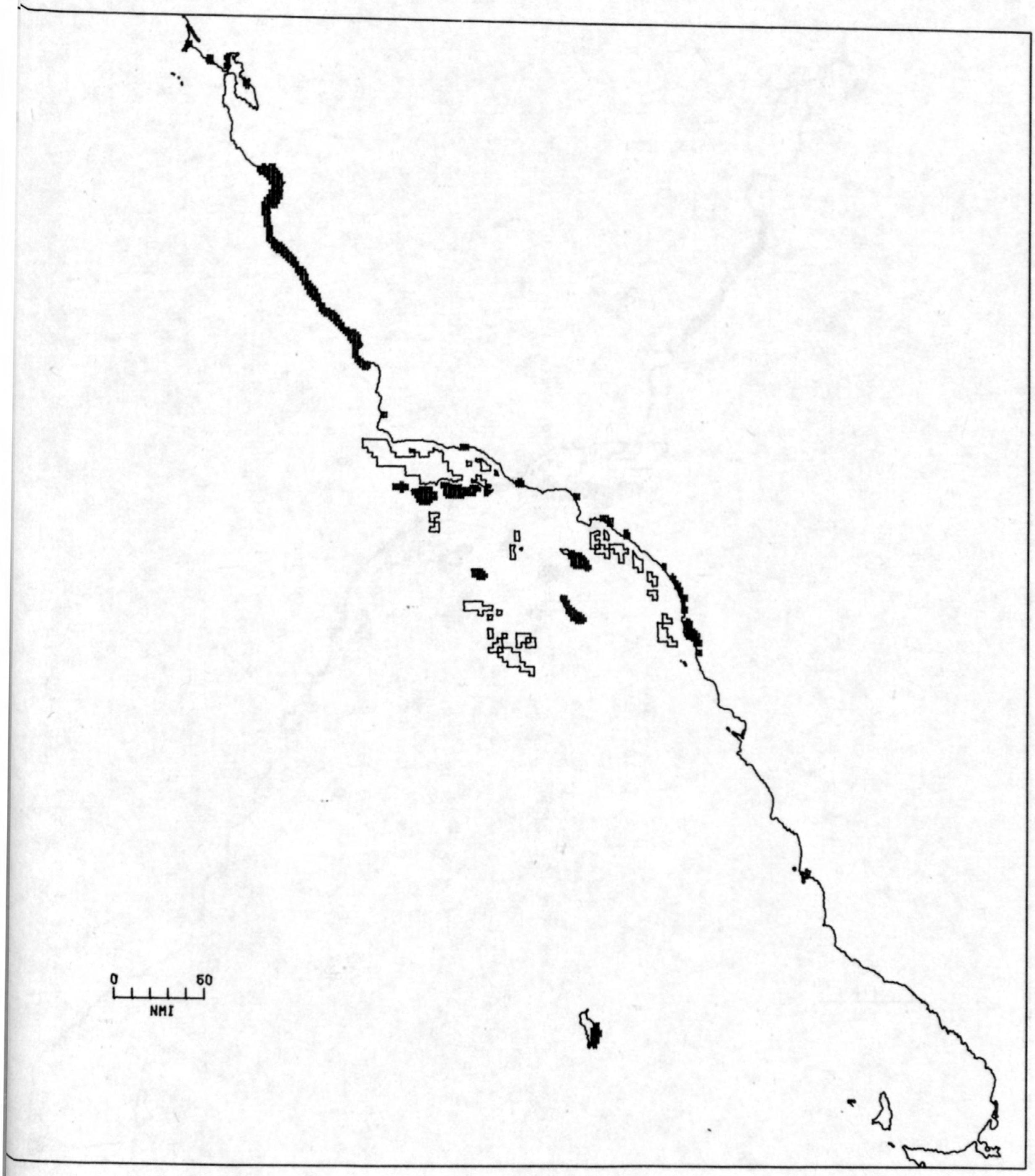

Figure A-24.--Hatched area indicates areal extent of rare and endangered species.

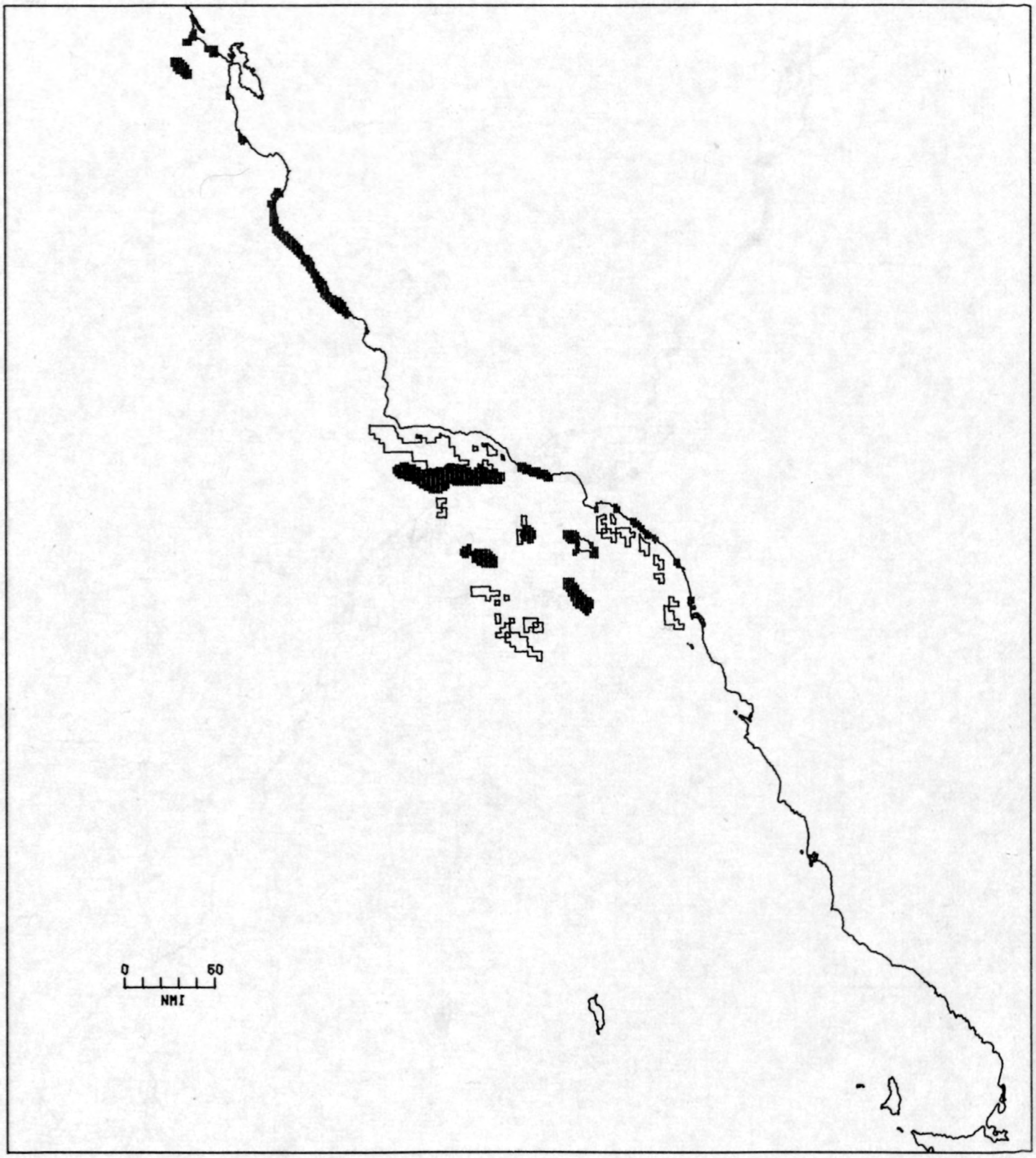

Figure A-25.--Hatched area indicates areal extent of areas of special biological significance, marine life refuges, ecological reserves, and national wildlife refuges.

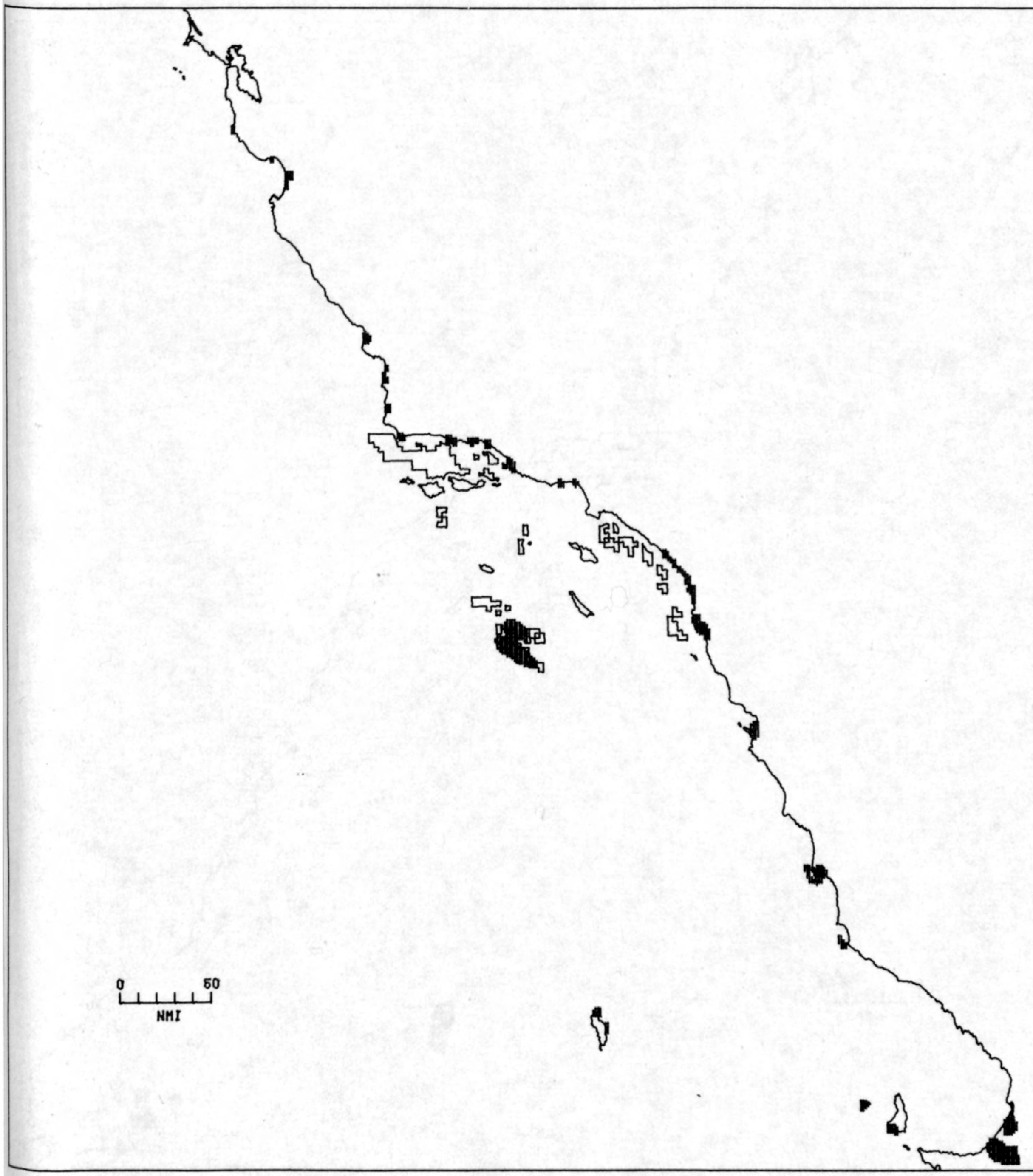

Figure A-26.--Hatched area indicates areal extent of sensitive biological areas.

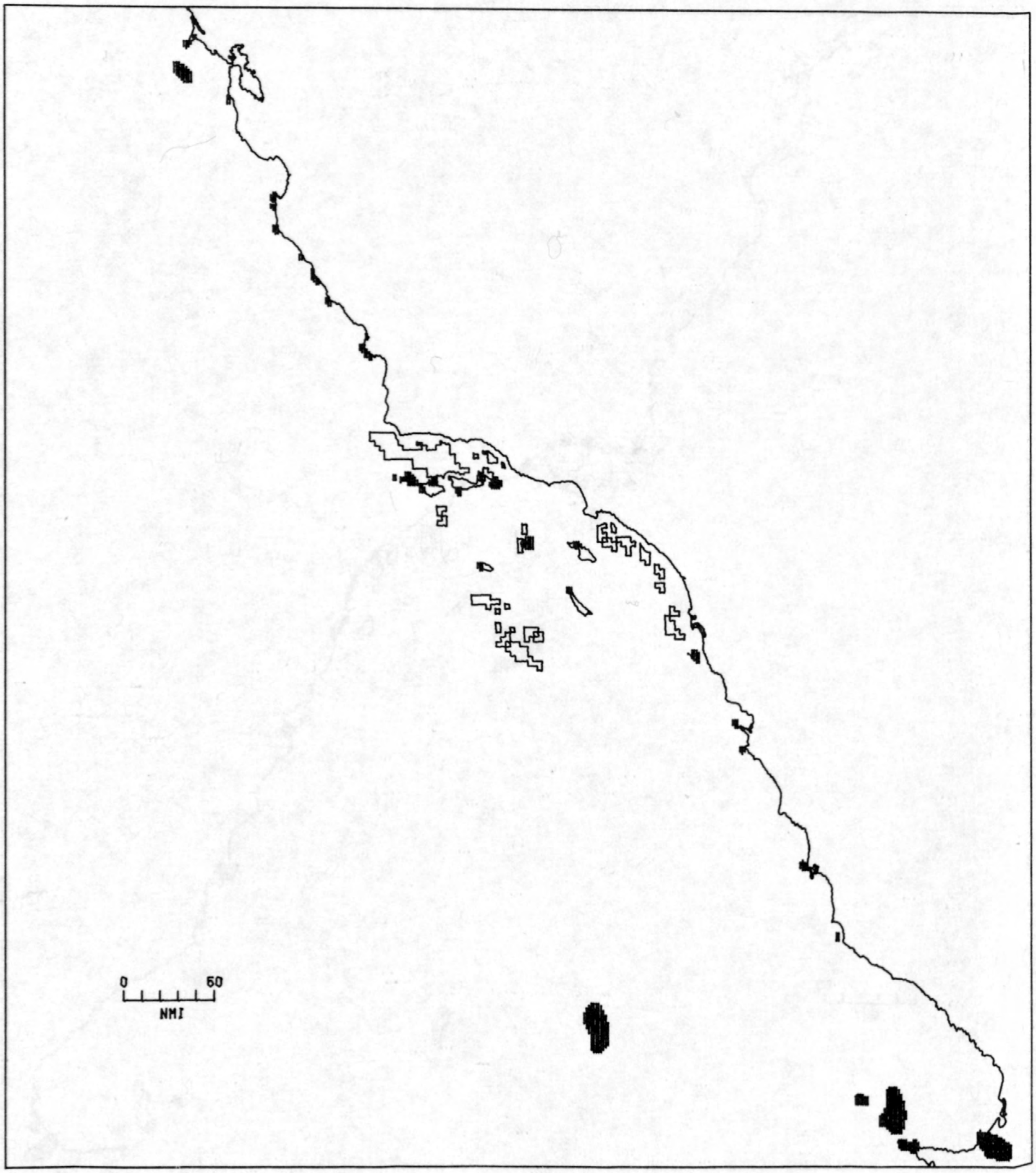

Figure A-27.--Hatched area indicates areal extent of seabird breeding and nesting areas.

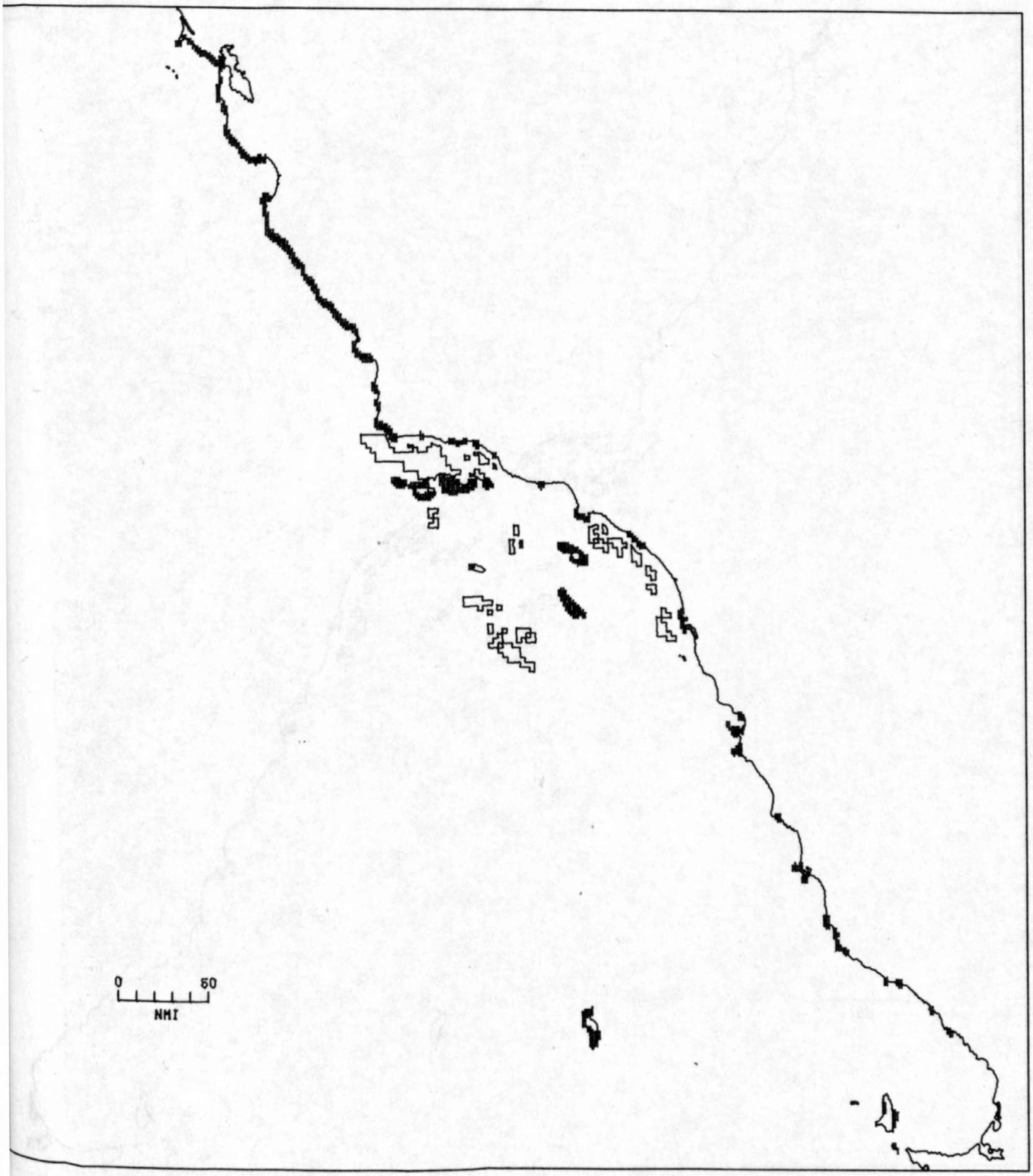

Figure A-28.--Hatched area indicates areal extent of rocky intertidal areas.

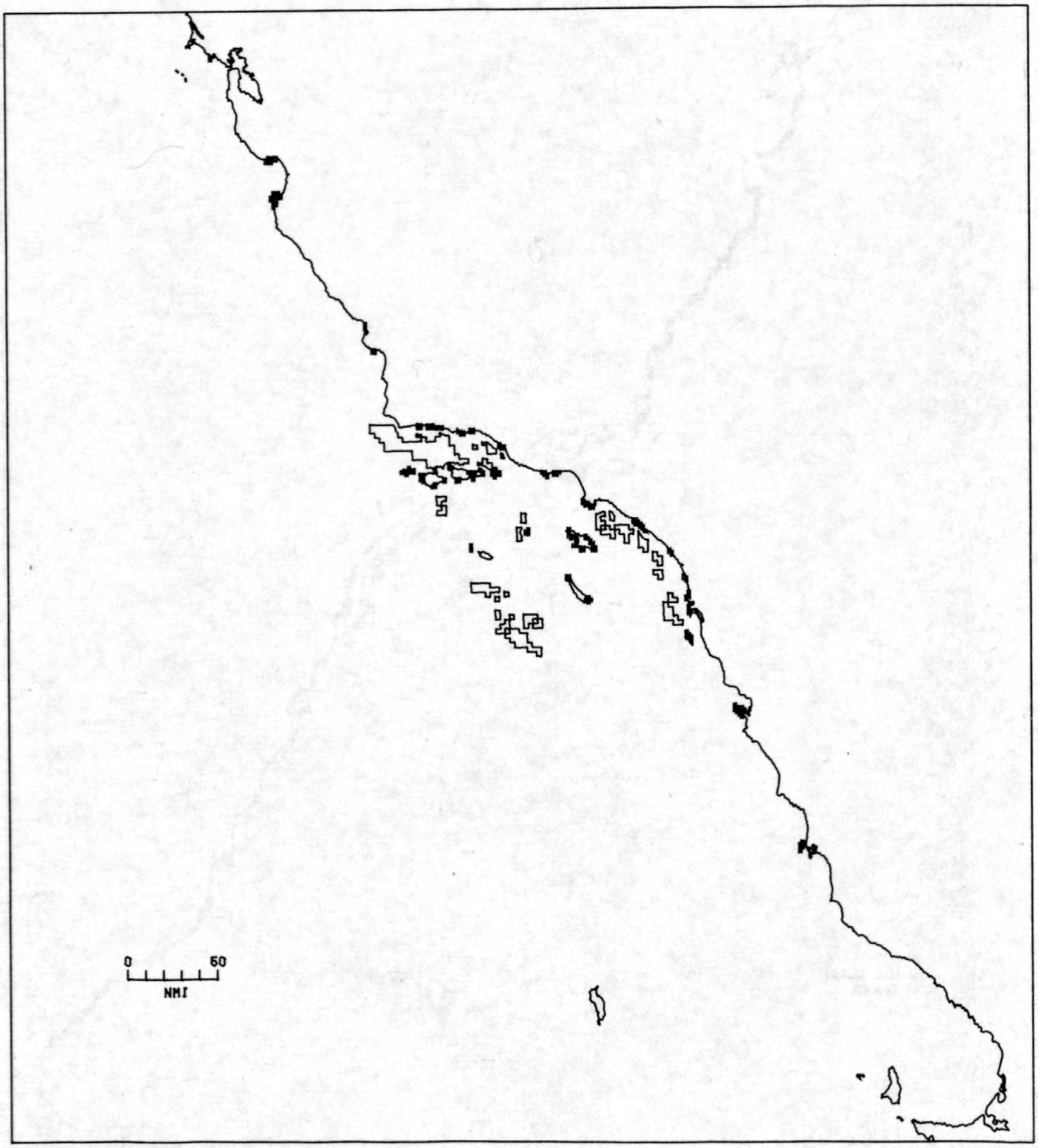

Figure A-29.--Hatched area indicates areal extent of high use skin and scuba diving areas.

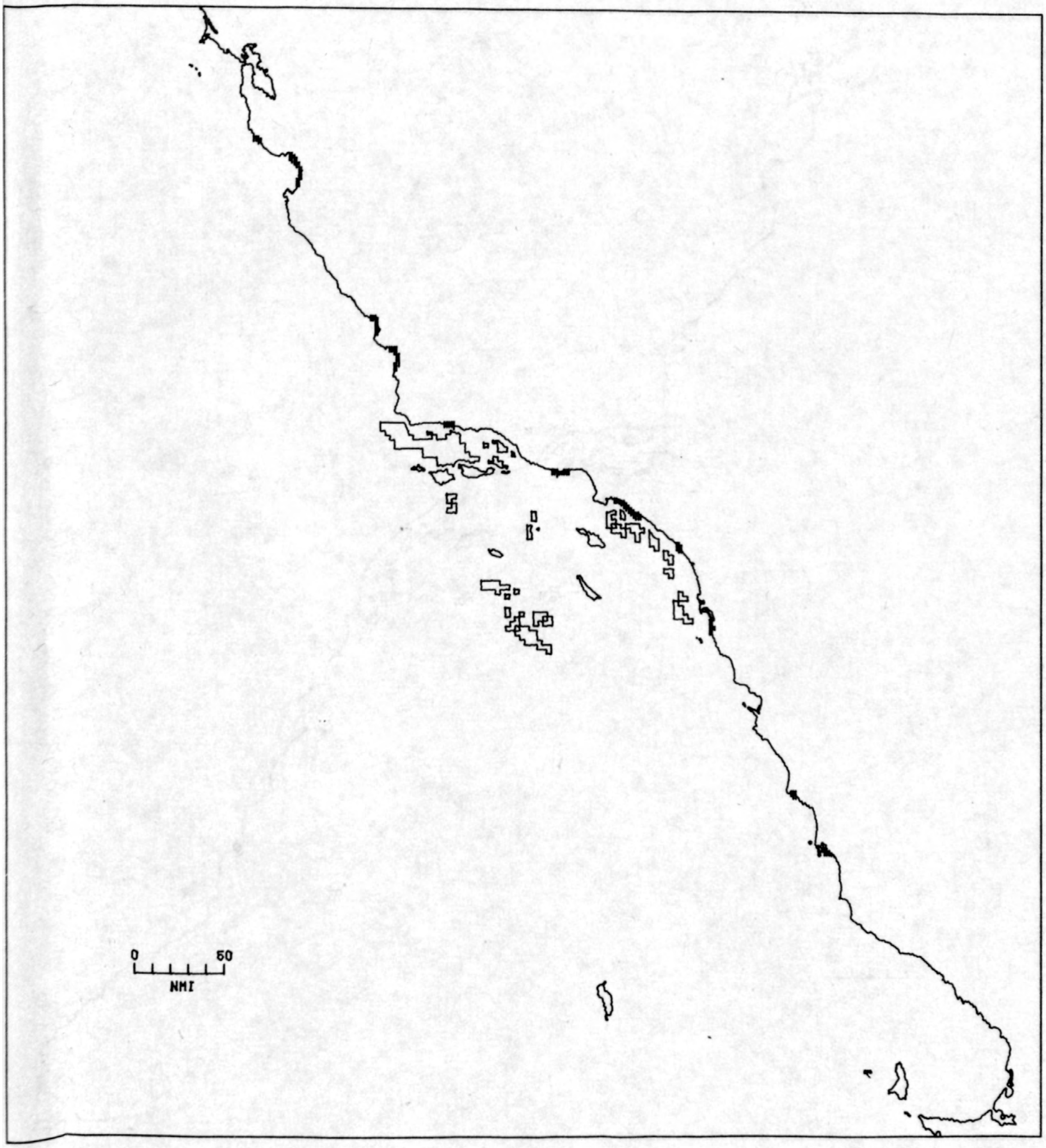

Figure A-30.--Hatched area indicates areal extent of clam beaches.

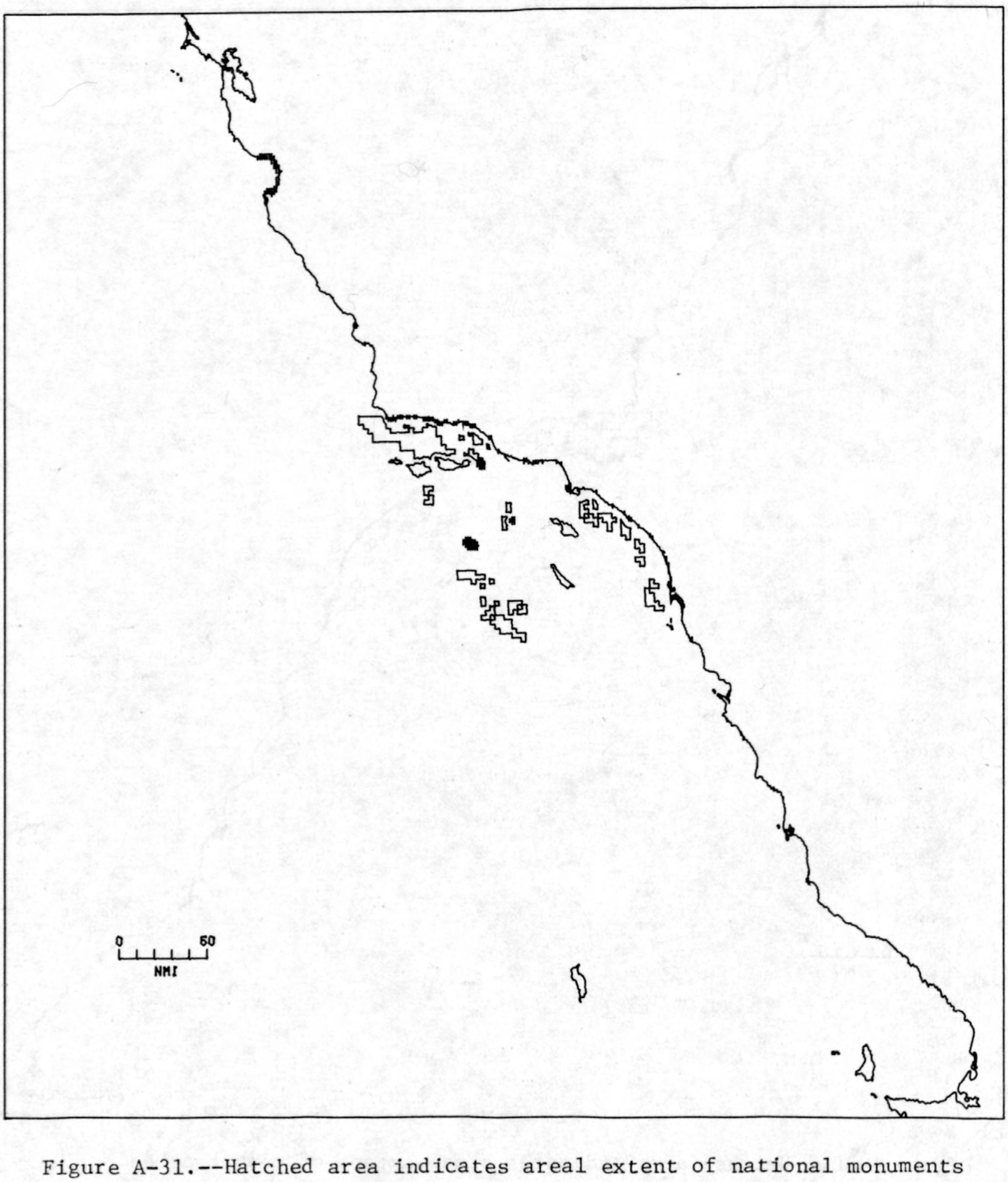

Figure A-31.--Hatched area indicates areal extent of national monuments and cultural resource sites.

APPENDIX B

Description of Transportation Scenarios

100% Tankering

a. Santa Barbara Channel Area (Subareas P1-P9, E1-E6). 70% tankered to Long Beach and 30% tankered to San Francisco.

b. Santa Rosa Island Area (Subareas P10, E7, E8). 70% tankered to Long Beach and 30% tankered to San Francisco.

c. Tanner-Cortez Banks Area (Subareas P13-P16, E10, E11). 70% tankered to Long Beach and 30% tankered to San Francisco.

d. Santa Barbara Island Area (Subareas P11, P12, E9). Tankered to Long Beach.

e. San Pedro Area (Subareas P17, P18, E12, E13). Tankered to Long Beach.

f. Dana Point Area (Subareas P19-P21). Tankered to Long Beach.

g. San Diego Area (Subareas P22, P23). Tankered to Long Beach.

Mixed A

a. Santa Barbara Channel Area. 50% pipelined to Ventura, from whence 35% will be tankered to Long Beach and 15% tankered to San Francisco. 35% will be tankered directly to Long Beach and 15% tankered directly to San Francisco.

b. Santa Rosa Island Area. Pipeline north of Santa Cruz Island to Ventura, from whence 70% will be tankered to Long Beach and 30% tankered to San Francisco.

c. Tanner-Cortez Banks Area. Same as 2b.

d. Santa Barbara Island Area. Same as 1d.

e. San Pedro Area. Pipeline to Long Beach.

f. Dana Point Area. Same as 1f.

g. <u>San Diego Area</u>. Same as 1g.

3. <u>Mixed B</u>

Mixed B is the same as Mixed A except:

d. <u>Santa Rosa Island Area</u>. Pipeline south of Santa Cruz Island to Ventura, from whence 70% will be tankered to Long Beach and 30% tankered to San Francisco.

e. <u>Tanner-Cortez Banks Area</u>. Same as 3d.

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