

# NORTHWEST & ALASKA FISHERIES CENTER PROCESSED REPORT

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## EXPLOITATION, DISTRIBUTION AND LIFE HISTORY FEATURES OF PACIFIC HERRING IN THE BERING SEA

by  
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## FOREWORD

This report has been prepared in response to a growing demand for information pertaining to herring resources in the Bering Sea. Much of the demand has been from the U.S. fishing industry which is primarily interested in herring distribution and the feasibility of establishing fisheries. To fulfill these and other more general requests, the available relevant information relative to exploitation and distribution have been included in this report. Also included in entirety are the reported herring catches of the Japanese Bering Sea fisheries. These are reported monthly by  $1^{\circ}$  longitude and  $1/2^{\circ}$  latitude and are probably the best indicators of the feasibility of commercial exploitation by the U.S. fishing industry.

## Introduction

In recent years, a combination of declining stocks in traditional fisheries and harvest reductions in the new 200-mile fishery zones of several nations has led to a shortage of herring supplies in world markets. This shortage has spurred interest in the development of herring fisheries by the U.S. fishing industry.

The eastern Bering Sea is presently the area of greatest increase in domestic exploitation. Until 1977, herring production in the eastern Bering Sea was primarily a foreign activity with very little domestic production. In 1977, domestic production increased to over 2,500 mt from less than 100 mt in 1976, and in 1978 increased to around 7,000 mt. Harvests are expected to further increase in the coming years.

To assist a U.S. fishing industry in the development of an eastern Bering Sea herring fishery, the information available through the National Marine Fisheries Service (NMFS) and the Alaska Department of Fish and Game (ADF&G) pertaining to herring life history, distribution, and past exploitation has been compiled in this report. Most of the available information comes from NMFS and ADF&G Outer Continental Shelf Environmental Assessment Program surveys, Japanese fisheries data, and Soviet exploratory fishing efforts in the early 1960's. Many gaps exist in the data base and inferences must be made from investigations in other areas, primarily southeastern Alaska and British Columbia.

### History of exploitation

Domestic herring fisheries developed in Norton Sound in 1909 and in 1928 at Dutch Harbor, Unalaska Island (Rounsefell 1930). The Unalaska fishery continued until 1945, but the Norton Sound fishery ended some years earlier. These fisheries ended due to a decline in demand and price for salted and cured herring, the principal products of these fisheries.

In 1961, foreign fishing of eastern Bering Sea stocks began when Soviet exploratory trawlers located the herring winter grounds northwest of the Pribilof Islands (Figure 1). Herring were abundant on the winter grounds, and the Soviet fleet increased annually until 1964-65 when 100-150 vessels fished for herring. In the 1965-66 season, only 15 trawlers were engaged in the fishery because commercial concentrations of herring could not be located. After the 1965-66 decline, Soviet effort continued to increase into the early 1970's and then declined as herring abundance decreased to where, by 1975-76, most of the effort was directed to pollock and very little to herring.

The Japanese joined the Soviets in trawling for herring in the eastern Bering Sea in 1964 and began a gillnet fishery east of 175°W in 1968 (Low 1976). The Japanese trawl fishery operates mainly inside the 200-meter contour between the Pribilof Islands and St. Matthew Island from November to April. The Japanese gillnet fishery operated from April to June from Bristol Bay to Norton Sound until 1977 when coastal waters east of 168°W and north of 58°N were closed to protect native subsistence fisheries. In 1977, a limited amount of gillnetting occurred outside the closed area, but none in 1978 as the closure line was extended from 58°N to the Alaska Peninsula.



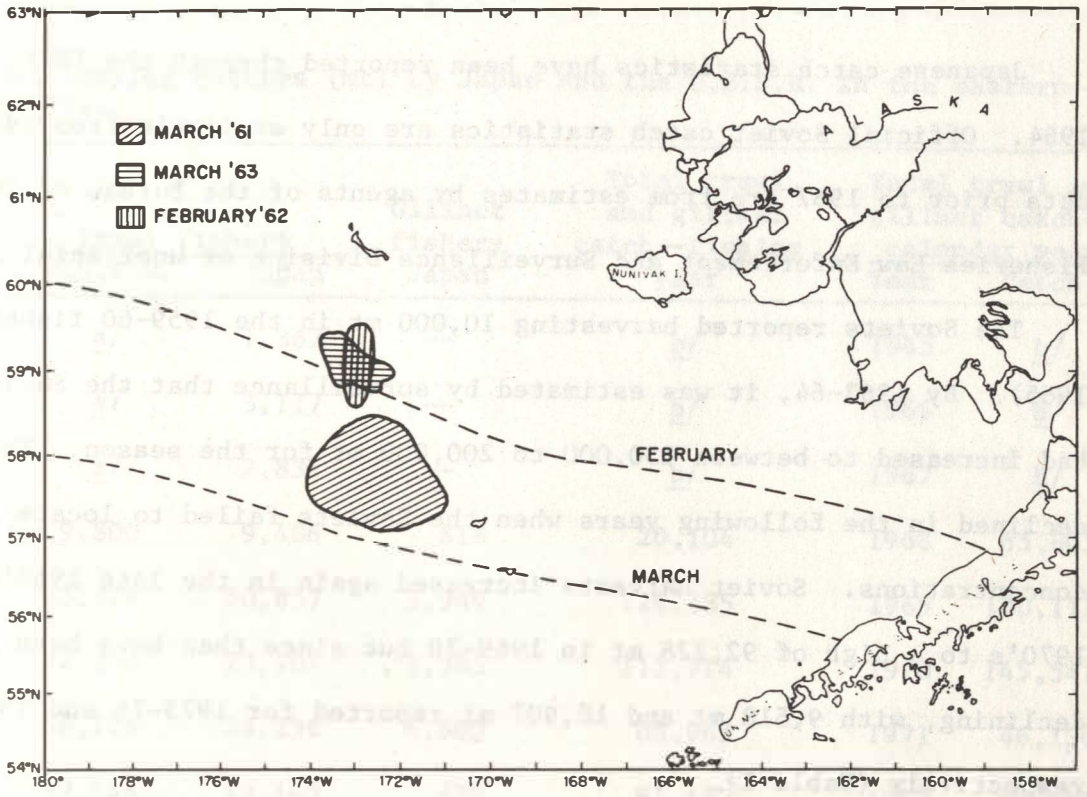


Figure 1.--Location of herring winter grounds in 1961-1963 and the approximate terminus of the ice in February and March.

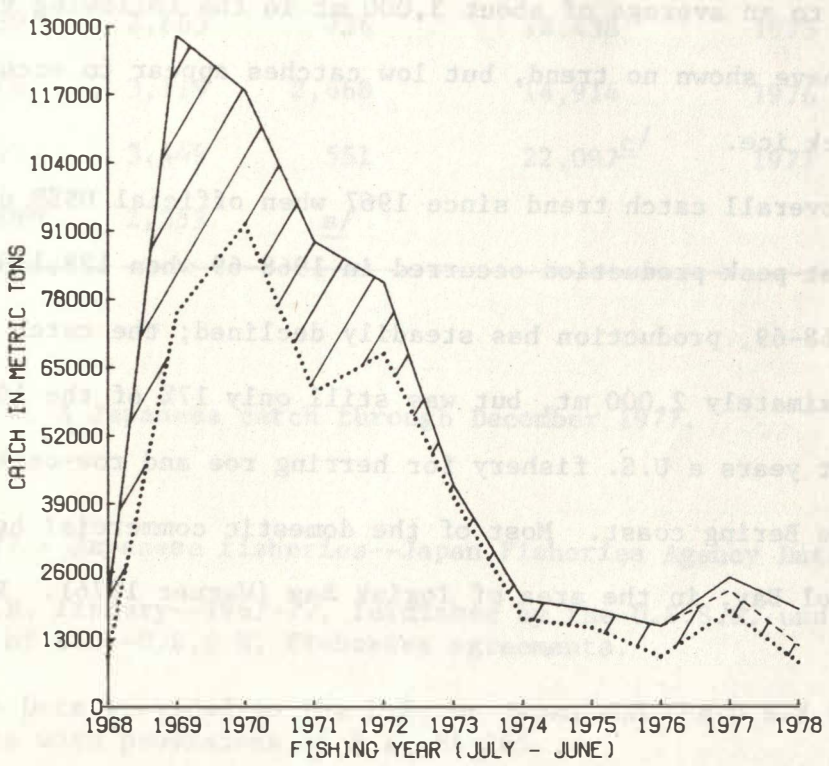


Figure 2.--Catch of herring in the eastern Bering Sea by all nations, 1967-1978. USSR catch under dotted line, Japan catch shaded, U.S. catch above dashed line.

Japanese catch statistics have been reported through the INPFC since 1964. Official Soviet catch statistics are only available from 1967. Catch data prior to 1967 are from estimates by agents of the Bureau of Commercial Fisheries Law Enforcement and Surveillance Division or unofficial Soviet reports.

The Soviets reported harvesting 10,000 mt in the 1959-60 fishery (Shaboneev 1965). By 1963-64, it was estimated by surveillance that the Soviet catch had increased to between 150,000 to 200,000 mt for the season. The catch declined in the following years when the Soviets failed to locate herring concentrations. Soviet harvests increased again in the late 1960's-early 1970's to a high of 92,228 mt in 1969-70 but since then have been generally declining, with 9,518 mt and 18,907 mt reported for 1975-76 and 1976-77, respectively (Table 1).

Japanese trawl catches have generally paralleled Soviet catch trends (Table 1). Japanese trawl catches were extremely low in 1972-73 and 1973-74, but rose to an average of about 3,000 mt in the following years. The gillnet catches have shown no trend, but low catches appear to occur in years of heavy pack ice.

The overall catch trend since 1967 when official USSR data became available shows that peak production occurred in 1968-69 when 128,175 mt were harvested. Since 1968-69, production has steadily declined; the catch increased in 1976-77 to approximately 2,000 mt, but was still only 17% of the 1968-69 peak (Figure 2). In recent years a U.S. fishery for herring roe and roe-on-kelp has developed along the Bering coast. Most of the domestic commercial herring fishing occurs in Bristol Bay, in the area of Togiak Bay (Warner 1976). Roe-on-kelp has been

Table 1.--Annual herring catches (mt) by Japan and the U.S.S.R. in the eastern Bering Sea.

Fishing year (July-June)	Trawl fishery		Gillnet fishery Japan	Total trawl and gillnet catch--fishing year	Total trawl and gillnet catch-- calendar year	
	U.S.S.R.	Japan			Year	Catch
1964-65	a/	1,362	--	b/	1965	b/
1965-66	a/	3,117	--	b/	1966	b/
1966-67	a/	2,831	--	b/	1967	b/
1967-68	9,800	9,486	818	20,104	1968	65,805
1968-69	75,379	50,857	1,949	128,185	1969	130,117
1969-70	92,228	23,901	1,585	117,714	1970	145,547
1970-71	60,126	24,236	4,603	88,965	1971	46,130
1971-72	67,546	13,143	472	81,162	1972	60,458
1972-73	39,999	346	1,878	42,223	1973	36,274
1973-74	16,810	219	3,337	20,366	1974	25,435
1974-75	15,039	2,663	736	18,438	1975	16,015
1975-76	9,518	3,119	2,668	14,914	1976	23,330
1976-77	18,097	3,449	551	22,097 <sup>c/</sup>	1977	18,737
1977-78	4,888 <sup>d/</sup>	2,353	a/			

a/ Not available.

b/ Incomplete.

c/ Preliminary.

d/ Preliminary U.S.S.R. & Japanese catch through December 1977.

Data Sources: To 1977 - Japanese fisheries--Japan Fisheries Agency Data.

U.S.S.R. fishery--1967-77, furnished by the U.S.S.R. under provisions of U.S.-U.S.S.R. fisheries agreements.

1977 - Data provided to the U.S. by Japan and the U.S.S.R. in compliance with provisions of P.L. 94-265.

harvested since 1968 with a record harvest of 134 mt reported for 1976 (Table 2). U.S. commercial fishing for whole herring has occurred annually since 1967, with the exception of 1971 and 1976 when low prices curtailed operations. Prior to 1977, the larger catches were taken in 1967 (122 mt) and 1974 (114 mt). In 1976 commercial fishing took place at St. Michaels and Golovin Bay in Norton Sound with a catch of 7.73 mt reported for St. Michaels (Barton 1976).

In 1978, catches by U.S. fishermen rose to approximately 7,025 mt, with the majority of this harvest coming from the Bristol Bay area.<sup>1/</sup> Most of the Bristol Bay catch came from the Nunavarchak section, but catches were made in all sections from Hagemeister to Nushagak Peninsula (Figure 3).<sup>2/</sup> Additional catches were taken in the Goodnews Bay, Security Cove, and Norton Sound districts.

### Distribution

Within the Bering Sea, herring are found in both the eastern and western portions. In the western Bering Sea, herring occur all along the Kamchatka Peninsula, in the Olytorskyy Gulf and north into the Gulf of Anadyr (Andriyashev 1954). In the eastern Bering Sea, herring occur from Unalaska Island to Port Clarence on the Seward Peninsula. Herring distribution is continuous into the Chukchi Sea and Arctic Ocean from the eastern Bering Sea. Herring distribution may also be continuous through the Aleutian Island chain as spawning herring have been observed at Adak Island, and Japanese catch records report catches from the western Aleutians. In the winter, herring concentrate on the

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<sup>1/</sup> Ron Regnart, AYK regional supervisor, Alaska Dept. Fish & Game—Personal Communication.

<sup>2/</sup> Skrade, J., 1978. Preliminary herring summary, Togiak, 1978. Alaska Dept. Fish & Game. Unpublished report, 3 p.

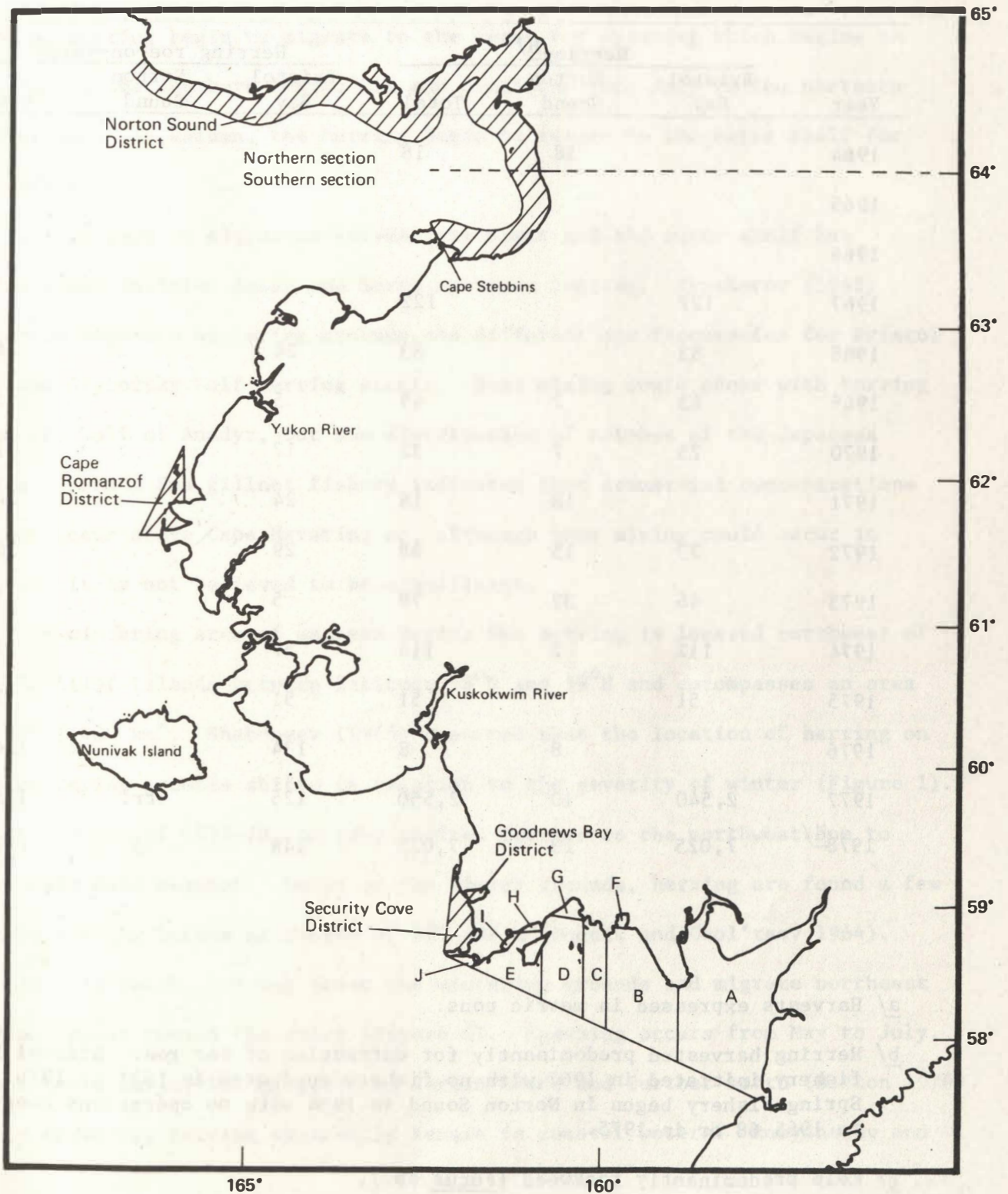


Figure 3.--Location of Alaska Dept. Fish & Game fishing districts. Bristol Bay District: A-General District; B-Nushagak Section; C-Nunavarchak Section; D-Walrus Island Section; E-Hagemeister Section; F-Kulukak Section; G-Togiak Section; H-Matogak Section; I-Osviak Section; J-Cape Pierce Section.

Table 2.--Commercial herring and herring roe-on-kelp harvests by inshore American fisheries in the Bering Sea, 1964-77.<sup>a/</sup>

Year	Herring <sup>b/</sup>			Herring roe-on-kelp <sup>c/</sup>		
	Bristol Bay	Norton Sound	Total	Bristol Bay	Norton Sound	Total
1964		18	18			
1965						
1966						
1967	122		122			
1968	83		83	24		24
1969	43	2	45	5		5
1970	25	7	32	17		17
1971		18	18	24		24
1972	73	15	88	29		29
1973	46	32	78	5		5
1974	112	2	114	57		57
1975	51		51	51		51
1976		8	8	134		134
1977	2,540	10	2,550	125	tr.	125
1978 <sup>d/</sup>	7,025	13	7,025	148	3	151

a/ Harvests expressed in metric tons.

b/ Herring harvested predominantly for extraction of sac roe. Bristol Bay fishery initiated in 1967 with no fishery conducted in 1971 or 1976. Spring fishery begun in Norton Sound in 1964 with no operations conducted in 1965-68 or in 1975.

c/ Kelp predominantly rockweed (Fucus sp.).

d/ Preliminary

Source: Alaska Dept. Fish & Game (1977) and Skrade (1978).

continental slope to avoid the sub-zero C<sup>0</sup> waters of the shelf. In early spring, herring begin to migrate to the coast for spawning which begins in mid-May in the southern Bering Sea and continues into July in the northern Bering Sea. In autumn, the herring begin to return to the outer shelf for the winter.

The pattern of migration between the coast and the outer shelf has effectively isolated Asian and North American herring. Prokhorov (1968) reported separate wintering grounds and different age frequencies for Bristol Bay and Olytorsky Gulf herring stocks. Some mixing could occur with herring from the Gulf of Anadyr, but the distribution of catches of the Japanese western Bering Sea gillnet fishery indicates that commercial concentrations do not occur above Cape Navarin; so, although some mixing could occur in winter, it is not believed to be significant.

The wintering area of eastern Bering Sea herring is located northwest of the Pribilof Islands between latitude 58<sup>0</sup>N and 59<sup>0</sup>N and encompasses an area of 800-1,400 km<sup>2</sup>. Shaboneev (1965) reported that the location of herring on the wintering grounds shifts in relation to the severity of winter (Figure 1). In the winter of 1977-78, herring shifted farther to the northwest due to extremely mild weather. While on the winter grounds, herring are found a few meters off the bottom at depths of 105-137 m (Dudnik and Usol'tsev 1964).

In late March, herring leave the wintering grounds and migrate northeast and southeast toward the coast (Figure 4). Spawning occurs from May to July, the later spawning taking place in Norton Sound and further north (Barton 1976). After spawning, herring apparently remain in coastal waters. Rumyantsev and

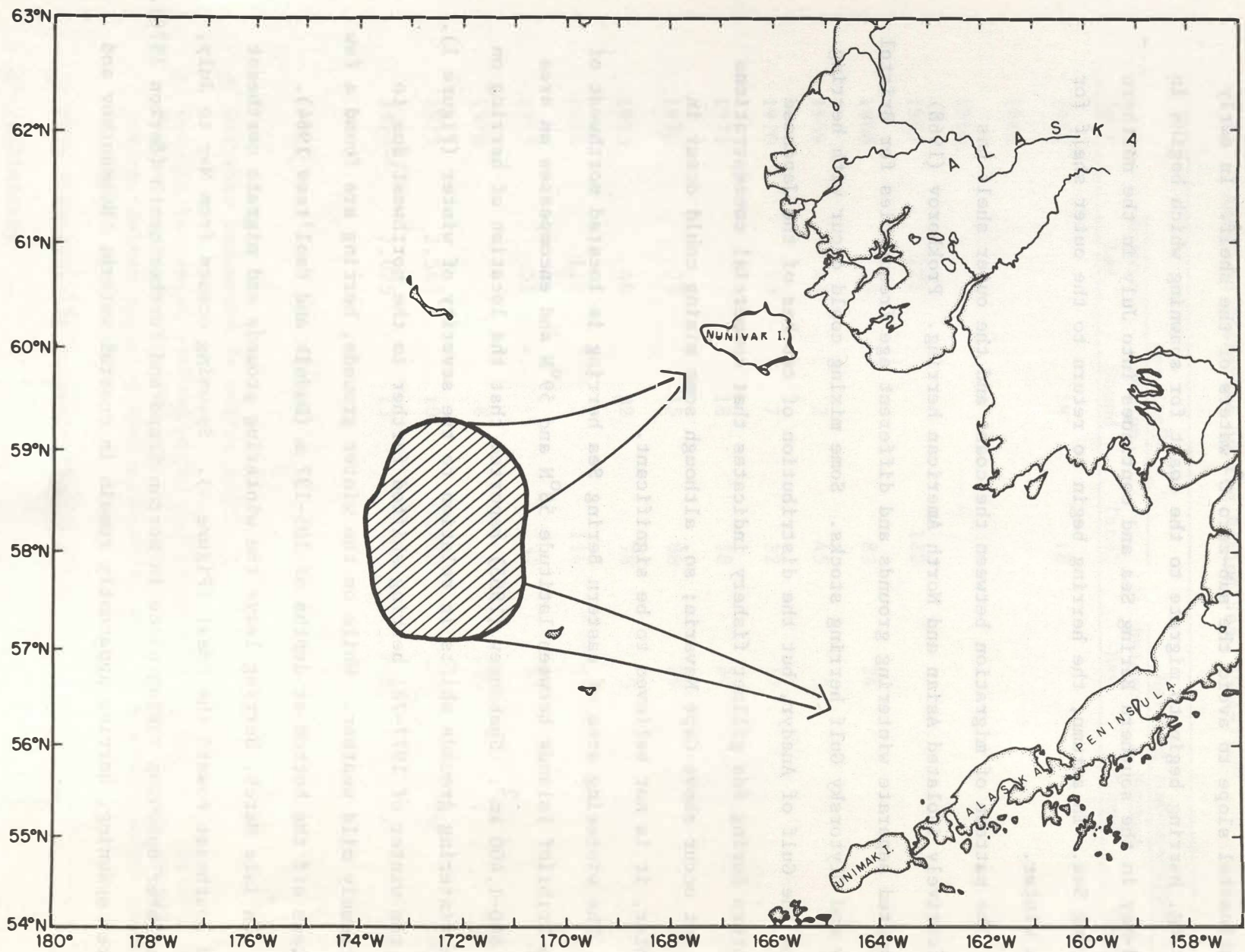


Figure 4.--General location of eastern Bering Sea herring winter grounds and spring migration routes to the spawning grounds. (Modified from Dudnik and Usol'tsev, 1964.)



Darda (1970) found few herring beyond the 200 km coastal zone during summer. Trawl surveys covering much of the continental shelf of the eastern Bering Sea in August-October 1975 (Pereyra, Reeves, and Bakkala 1976) support this observation as very few herring were taken in the survey. Since some herring were taken in offshore water, it is possible that herring are offshore in summer but unavailable to trawls because they are widely scattered or highly mobile.

In August, herring begin to migrate back toward the winter grounds, coming first from the Nunivak and Unimak Island areas. Of interest is the age difference in herring noted by Romyantsev and Darda (1970) in migrations from Nunivak and Unimak areas, which may be an indication of stock differences (Figure 5). The migration continues through September, and by October herring begin to concentrate on their winter grounds. Mature herring were found to reach the wintering grounds prior to the arrival of immature fish (Romyantsev and Darda 1970). The differential in arrival at the wintering grounds may be a function of differences in homing ability, swimming ability or temperature sensitivity.

Temperature seems to be the major factor influencing the seasonal distribution of herring in the Bering Sea. Herring move to the shallow, warmer coastal waters in spring for spawning and feeding and return to deeper waters in autumn as surface waters cool (Figure 6). Salinity may also influence herring distribution. A conclusive relationship has not been established, although there appears to be an age-salinity relationship (Taylor 1964). Figure 5 shows that there is a tendency for immature herring to occupy lower salinity water than adults.

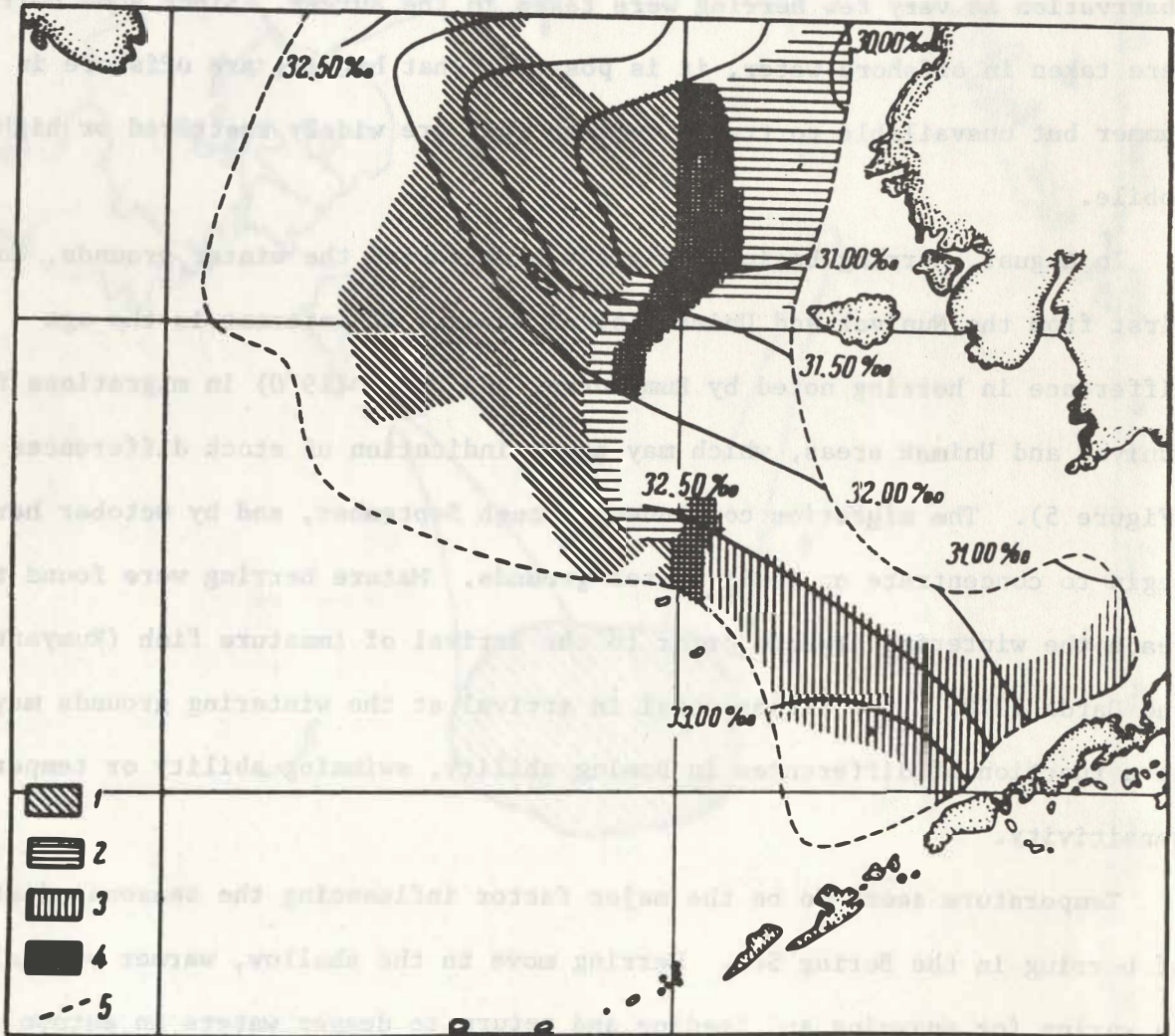


Figure 5.--Distribution of herring in September, during migration to winter grounds. 1 - herrings older than 5 years (100%); 2 - herrings aged 2+ (70-100%); 3 - herrings aged 3+ (30-90%); 4 - mixed herrings; 5 - investigated region. Numbers and contours are recorded salinities. (from Rumyantsev and Darda, 1970).

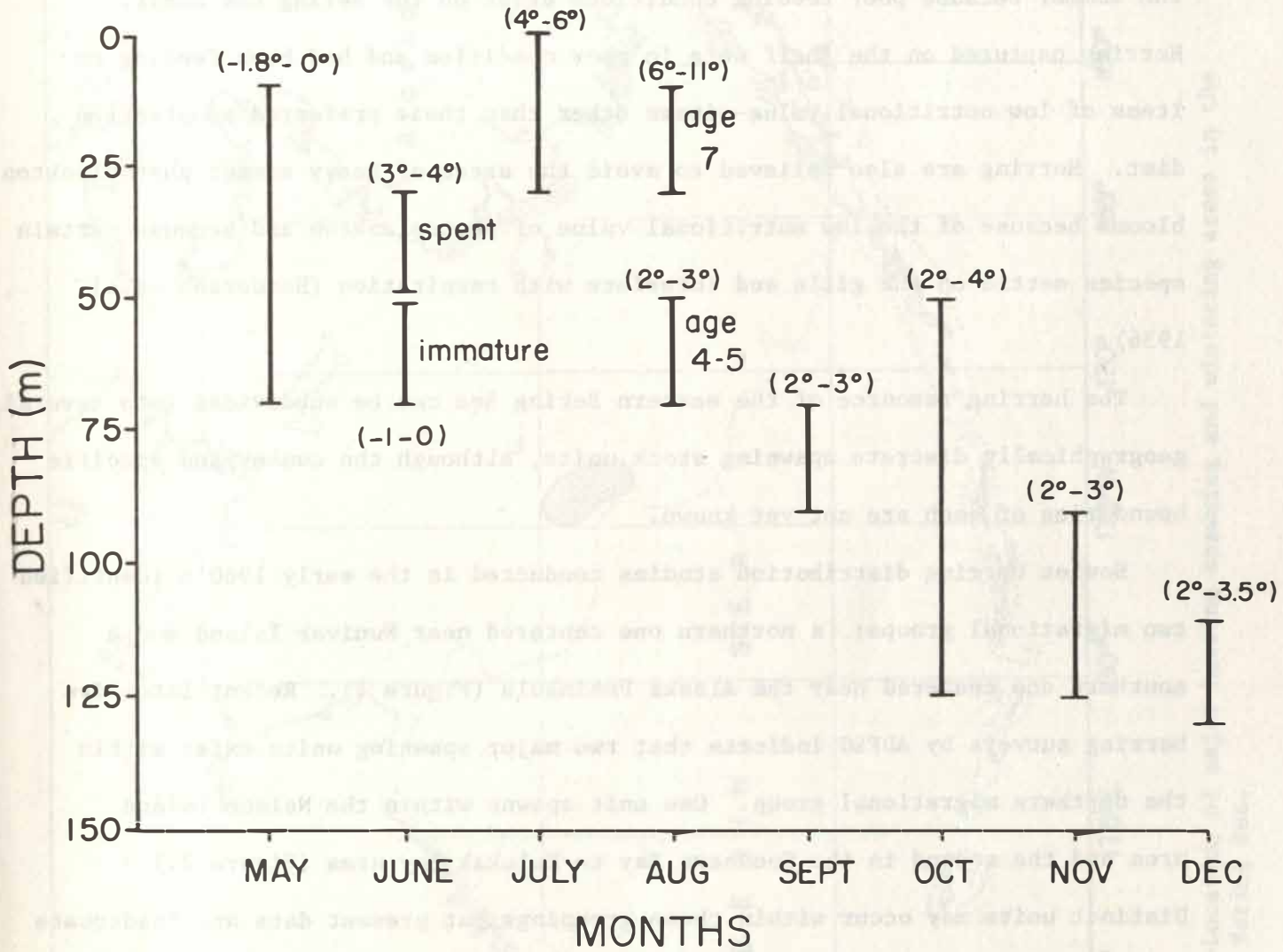


Figure 6.--Monthly distribution of herring by depth (in meters) and temperature (°C) in the eastern Bering Sea. May-November data from Rummyantsev and Darda (1970), December data from Shaboneev (1965).

Summer distribution in the Bering Sea may be influenced by the availability of food and heavy phytoplankton blooms (1-3 g/m<sup>3</sup>) (Rumyantsev and Darda 1970). Rumyantsev and Darda concluded that herring remained in coastal waters during the summer because poor feeding conditions exist on the Bering Sea shelf. Herring captured on the shelf were in poor condition and had been feeding on items of low nutritional value--items other than their preferred zooplankton diet. Herring are also believed to avoid the areas of heavy summer phytoplankton blooms because of the low nutritional value of phytoplankton and because certain species settle on the gills and interfere with respiration (Henderson et al. 1936).

The herring resource of the eastern Bering Sea can be subdivided into several geographically discrete spawning stock units, although the number and specific boundaries of each are not yet known.

Soviet herring distribution studies conducted in the early 1960's identified two migrational groups: a northern one centered near Nunivak Island and a southern one centered near the Alaska Peninsula (Figure 4). Recent intensive herring surveys by ADF&G indicate that two major spawning units exist within the northern migrational group. One unit spawns within the Nelson Island area and the second in the Goodnews Bay to Kulukak Bay area (Figure 7.) Distinct units may occur within these groupings but present data are inadequate to identify them.

In the southern migrational group, the number and location of stocks is unclear. Spawning concentrations have been found in Herendeen-Port Moller Bays, Port Heiden, and the north coast of Unimak Island. The estimated abundance

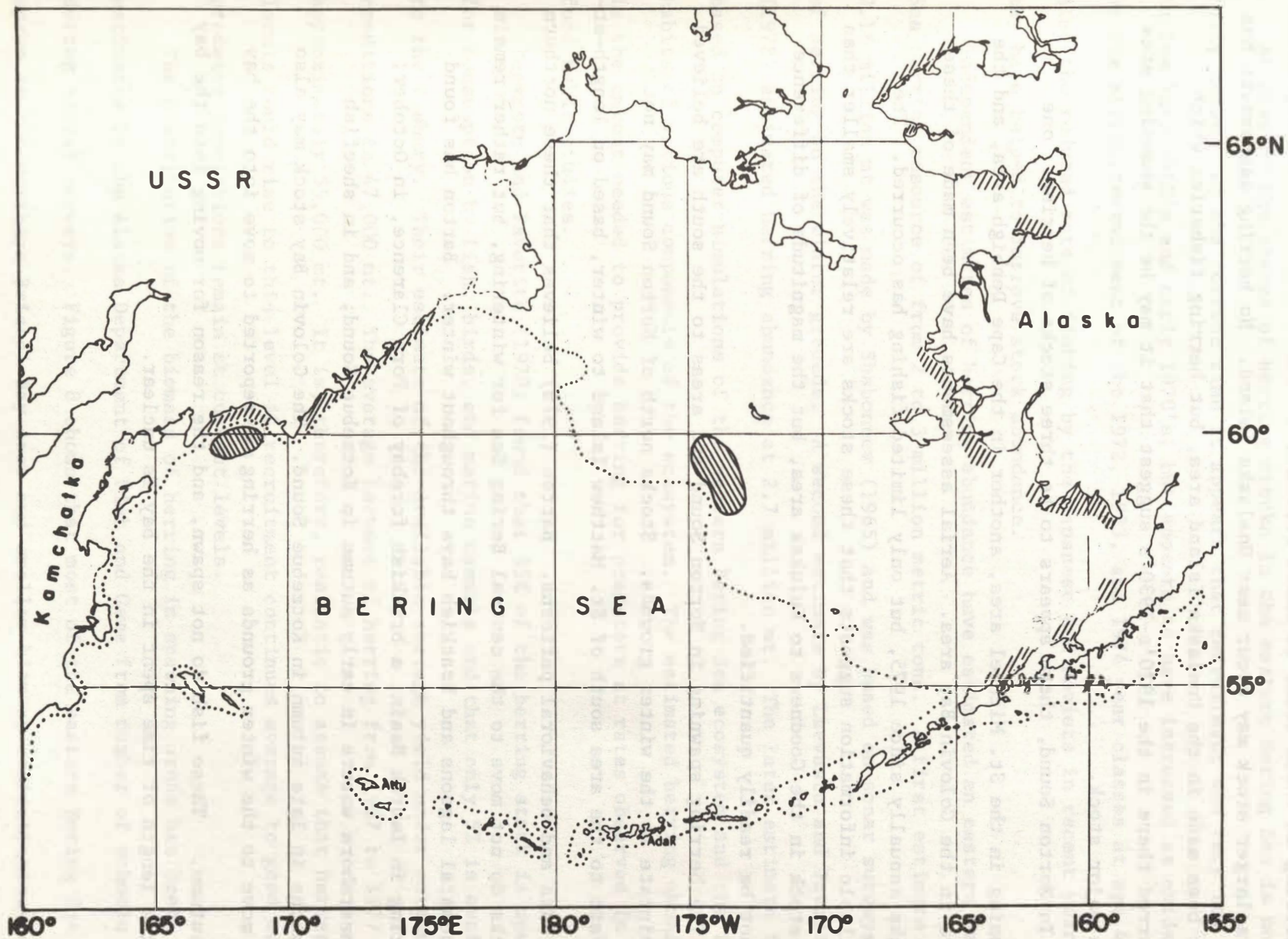


Figure 7.--Location of major herring spawning and wintering areas in the Bering Sea.

of herring in these areas is small relative to the northern Bristol Bay stocks, but a larger stock may occur near Unalaska Island. No herring assessment has ever been made in the Unalaska Island area, but herring fisheries which occurred there in the 1920's-1930's suggest that it may be the spawning area of a major stock.

In Norton Sound, there appears to be three stocks of herring: one spawning in the St. Michael area, another in the Cape Denbigh area, and the third in the Golovin Bay area. Aerial assessments have been made of these stocks annually since 1975, but only limited fishing has occurred. The available information suggests that these stocks are relatively smaller than the stock in the Goodnews to Kulukak area, but the magnitude of difference cannot be readily quantified.

The herring spawning in Norton Sound and areas to the south are believed to migrate to the winter grounds. Stocks north of Norton Sound may not migrate to the area south of St. Matthew Island to winter, based on length-at-age data and behavioral patterns. Barton (1978) believes that these northern stocks do not move to the central Bering Sea for wintering, but rather remain in coastal lagoons and brackish bays throughout winter. Barton has found herring in Imuruk Basin, a brackish forebay of Port Clarence, in October; in nearshore waters in early autumn in Kotzebue Sound; and in sheefish stomachs in late autumn in Kotzebue Sound. The Golovin Bay stock may also not move to the winter grounds as herring are reported to move into the bay in autumn. These fish do not spawn, and the reason for moving into the bay or the length of time spent in the bay is unclear.

### Herring abundance in the eastern Bering Sea

At present the status of herring stocks in the eastern Bering Sea is not fully known. At the current time it appears that recruitment was very low in the late 1960's and early 1970's, but appears to have increased as evident by the strong recruitment of the 1972, 1973, and 1974 year classes at age 4. Also the reduced rate of fishing by the Japanese and Soviets in recent years may have helped to improve stock abundance.

Independent estimates of herring abundance have estimated an eastern Bering Sea herring resource of from 2 to 3 million metric tons. A first estimate of 2.16 million mt was made by Shaboneev (1965) and was based on sonar surveys of herring on the winter grounds. A second estimate by Laevastu and Favorite (1978) estimated herring abundance at 2.7 million mt. The later estimate is based on computer simulations of the eastern Bering Sea ecosystem and the food habits of various components of the ecosystem. The estimated herring abundance is the amount needed to provide herring for predators at rates observed in food habit studies.

Laevastu and Favorite (1978) found that 95% of the herring stock is needed for consumption by fish, birds, and marine mammals and that only 5% is available to the fishery. Their estimate of the available average yield under current conditions is 47,000 mt. The average harvest of herring from 1967 to 1977 was approximately 55,000 mt. It is, therefore, realistic to assume that harvest levels could rise to this level if recruitment continues average to good and predator populations remain at current levels.

The distribution of the biomass of herring in spawning areas has been estimated by the Alaska Department of Fish and Game from number of schools seen during aerial surveys. Figure 8 shows that most of the eastern Bering Sea herring spawn in the northern Bristol Bay area and smaller biomass concentrations occur in other areas.

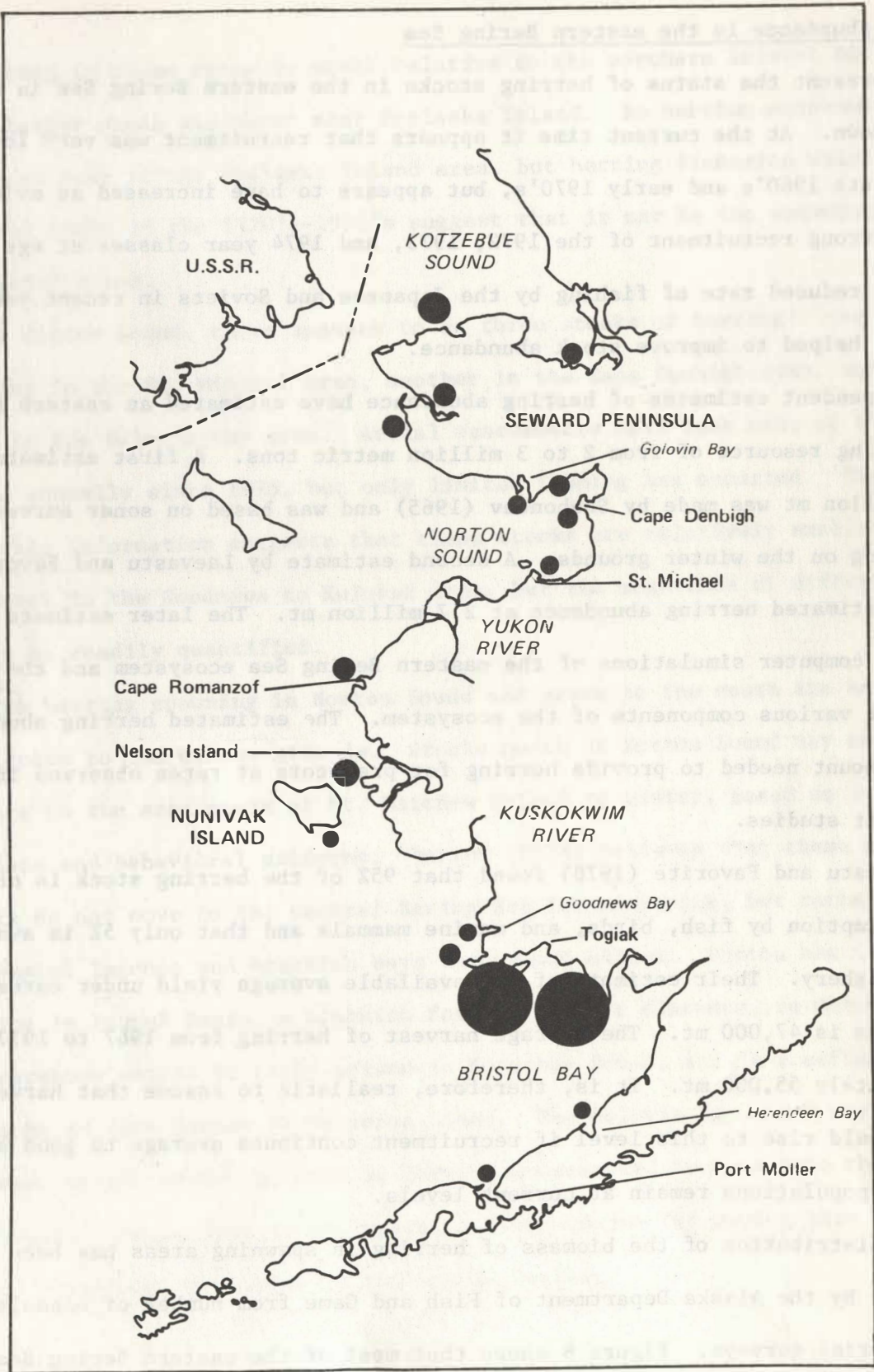


Figure 8.--Distribution of herring biomass in coastal spawning areas (from Barton, 1978).



Distribution of herring based on Japanese harvests

The Japanese have reported catches by  $1^{\circ}$  longitude and  $1/2^{\circ}$  latitude areas since 1964. These data were averaged by month over the nine-year period in which active herring fishing occurred. The following tables of average monthly herring catches cover the area of  $179^{\circ}\text{W} - 159^{\circ}\text{W}$  longitude in  $1^{\circ}$  intervals and from  $65^{\circ}30'\text{N} - 52^{\circ}00'\text{N}$  latitude in  $1/2^{\circ}$  intervals for trawl catches and from  $172^{\circ}\text{W} - 159^{\circ}\text{W}$  longitude in  $1^{\circ}$  intervals for gillnet catches. Figure 9 contains a graphic representation of the  $1/2 \times 1^{\circ}$  statistical blocks and geographic features.

The individual monthly catches for the years 1964-1976 from which the average catch data were derived are contained in the appendix. The tables are arranged in chronological order beginning with September 1964, when the first reported catches occurred. Months in which no catches occurred were omitted to reduce the volume of the tables.

The Japanese catch data shows the concentration of herring northwest of the Pribilof Islands during the winter months and the spring migration to the Alaska coast for spawning. The data also indicates a smaller concentration north of Unimak Pass. It is not clear that this is a wintering concentration since herring have not been caught here regularly during the winter months. The area north of Unimak Pass does appear to have a major herring concentration during late summer and fall and may be large enough to support a food herring fishery.



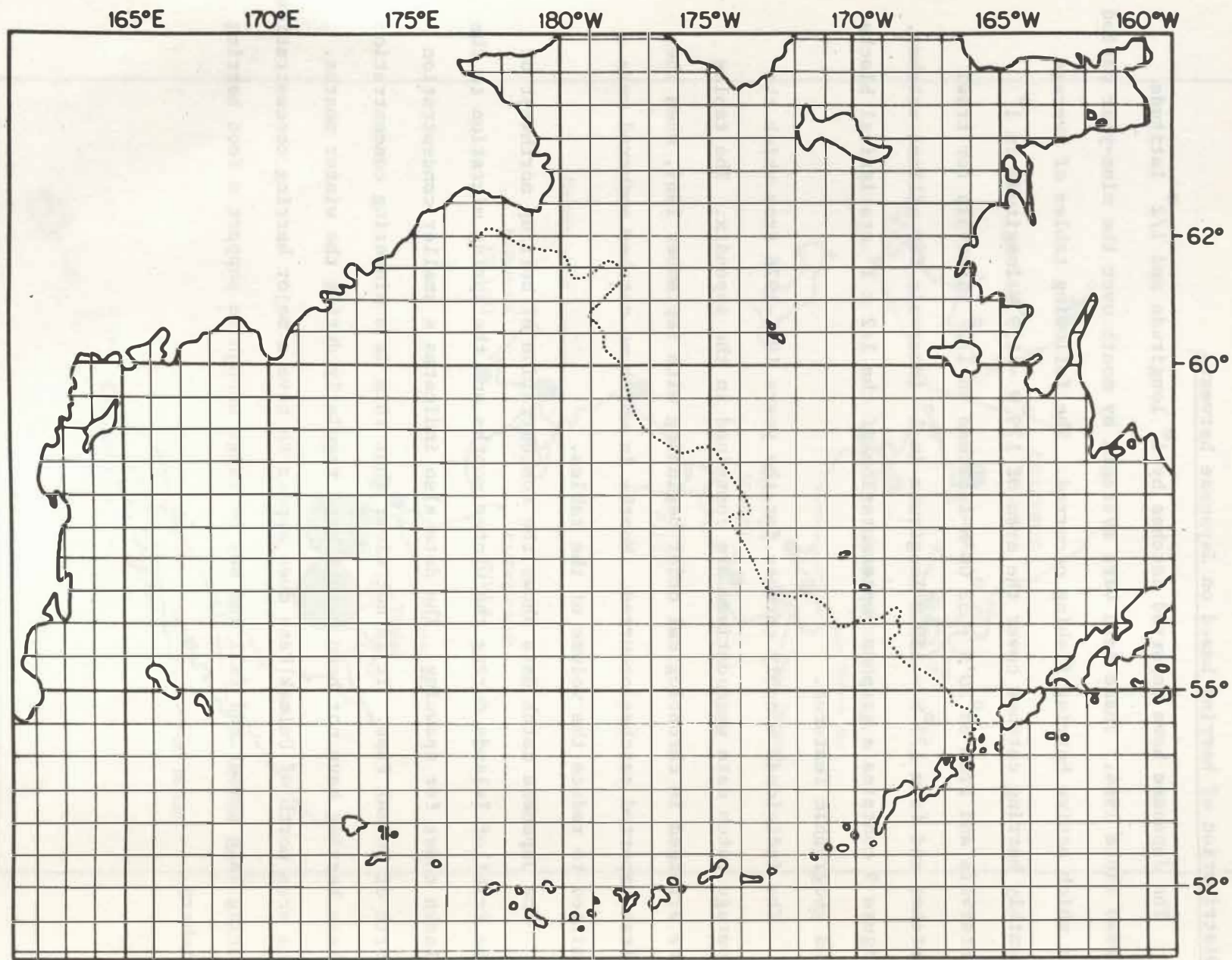


Figure 9.--Bering Sea 1° longitude x ½° latitude groundfish statistical blocks.  
Dotted line shows 100m isobath.

## Summary

Eastern Bering Sea herring have been extensively exploited by Japanese and Soviet fisheries and only lightly by American fisheries. The establishment of the 200-mile fisheries management zone has curtailed the Japanese gillnet fishery and reduced the Soviet and Japanese trawl fisheries. The American herring fisheries have expanded with harvests tripling from 1977 to 1978 and further increases are expected in the future.

Herring in the eastern Bering Sea winter on the continental slope northwest of the Pribilof Islands and migrate to the Alaska coast in spring. During the summer herring either remain inshore or are widely scattered in small schools. In the autumn, larger schools form and move to the continental slope. The herring appear to be divided into four major spawning groups: Norton Sound, Nelson Island, Togiak, and Alaska Peninsula. Within these groups there may be one to several spawning stocks. The Togiak group appears to be the largest of the four groups in terms of biomass.

Japanese catch data are available since 1964 by month and  $1^{\circ}$  longitude and  $1/2^{\circ}$  latitude for the major gear types. This data shows the major fishing areas utilized by the Japanese and illustrates the areas and time periods for establishment of U.S. herring fisheries.

The outlook for herring fisheries in the next several years is favorable. Foreign catches have been reduced and recruitment appears to have improved in recent years. Increases are evident in some indices of abundance and if good recruitment continues stocks should increase to former levels of abundance in the next few years.

Literature Cited

Andriyashev, A. P.

1954. Fish of northern Soviet Seas. Izdatel'stvo Ak. Nauk., SSSR, Moscow, 619 p. (In Russian. Transl. 1964 Israel Program Sci. Transl., avail. U.S. Dept. Commer., Natl. Tech. Inf. Serv., Springfield, Va.).

Barton, L. H.

1976. Spawning herring surveys in the Bering Sea and finfish resource surveys in Norton Sound and Kotzebue Sound. Outer Continental Shelf Energy Assessment Program, Quart. Rept. (July-Sept.):41-62.

1978. Spawning herring surveys in the Bering Sea and finfish resource surveys in Norton Sound and Kotzebue Sound. Outer Continental Shelf Energy Assessment Program, Project Rept. In Press.

Henderson, G. T. D., C. E. Lucas and J. H. Fraser.

1936. Ecological relations between the herring and the plankton investigated with the plankton indicator. J. Mar. Biol. Assoc. U.K. 21(1).

Dudnik, Y. I. and E. A. Usol'tsev.

1964. The herring of the eastern part of the Bering Sea. In P. A. Moiseev (ed.). Soviet fisheries investigations in the northeast Pacific. Part II:225-229. (In Russian. Transl. 1968. Israel Program Sci. Transl., avail. U.S. Dept. Commer., Natl. Tech. Inf. Serv., Springfield, Va.).

Laevastu, T. and F. Favorite.

1978. Fluctuations in Pacific herring stock in the eastern Bering Sea as revealed by ecosystem model (DYNUMES III). I.C.E.S. symposium on Biological Basis of Pelagic Fish Stock Management. No. 31. 26 p.

Low, L. L.

1976. Status of major demersal fishery resources of the Northeastern Pacific, Bering Sea, and Aleutian Islands. U.S. Dept. Commerce, Natl. Mar. Fish. Serv., Northwest & Alaska Fisheries Center, Seattle, Unpubl.

Pereyra, W., J. Reeves and R. Bakkala.

1976. Demersal fish and shellfish resources of the eastern Bering Sea in the baseline year 1975. Data appendices. U.S. Dept. Commerce, Natl. Mar. Fish. Serv., Northwest & Alaska Fisheries Center, Seattle, Unpubl.

Prokhorov, V. G.

1968. Winter period of life of herring in the Bering Sea. Proceedings of the Pacific Scientific Research Institute of Fisheries and Oceanography 64:329-338. (In Russian. Transl. 1970, Fish. Res. Bd. Can., Transl. Ser. 1433).

Rounsefell, G. A.

1930. Contribution to the biology of the Pacific herring, Clupea pallasii, and the condition of the fishery in Alaska. Bull. U.S. Bur. Fish. 45:227-320.

Rumyantsev, A. I. and M. A. Darda.

1970. Summer herring in the eastern Bering Sea. In P. A. Moiseev (ed.), Soviet fisheries investigations in the northeastern Pacific, Part V:409-441. (In Russian. Transl. 1972, Israel Program Sci. Transl., avail. U.S. Dept. Commer., Natl. Tech. Inf. Serv., Springfield, Va.)

Shaboneev, I. E.

1965. Biology and fishing of herring in the eastern part of the Bering Sea. In P. A. Moiseev (ed.), Soviet fisheries investigations in the northeastern Pacific, Part IV:130-154. (In Russian. Transl. 1968. Israel Program Sci. Transl., avail. U.S. Dept. Commer. Natl. Tech. Inf. Serv., Springfield, Va.).

Taylor, F. H. C.

1964. Life history and present status of British Columbia herring stocks. Fish. Res. Bd. Can., Bull. 143. 81 p.

Warner, I. M.

1976. Forage fish spawning surveys, Unimak Pass to Ugashik River. Outer Continental Shelf Energy Assessment Program, Quarterly Report (July-Sept.):61-96.

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Appendix A

Average catch by month of the  
Japanese herring fishery



AVERAGE JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN JAN 1954-76

LAT	LONGITUDE																							
	179*					175*					170*					155*					160*			
65.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
64.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
63.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
62.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
61.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
61.0	.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
60.5	.8	0.0	0.0	0.0	0.0	0.0	.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
60.0	.1	2.6	0.0	0.0	0.0	0.0	6.1	10.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
59.5	0.0	.7	0.0	0.0	0.0	28.3	14.0	5.5	9.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
59.0	0.0	.1	0.0	0.0	16.1	239.7	120.9	13.2	23.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
58.5	0.0	0.0	57.0	44.2	93.0	281.1	2061.2	222.6	13.1	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
58.0	0.0	0.0	4.6	0.0	1.8	9.8	142.7	168.7	78.4	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
57.5	0.0	0.0	0.0	0.0	0.0	6.9	27.9	4.3	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
57.0	0.0	0.0	0.0	0.0	0.0	0.0	19.8	0.0	.2	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
56.5	0.0	0.0	0.0	0.0	0.0	0.0	5.8	3.0	.3	3.3	5.7	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.2	0.0	.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
55.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
54.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
54.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
53.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
53.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
52.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
52.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT

AVERAGE JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN FEB 1964-76

LONGITUDE

LAT	179				175				170				165				160			
	*				*				*				*				*			
65.5	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00
64.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.0	0.0	0.00	0.0	0.00	0.00	0.00	0.00
64.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
63.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00
63.0	0.0	0.00	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00
62.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.0	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
62.0	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00
61.5	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00
61.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
60.5	.1	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00
60.0	0.00	.3	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.00
59.5	0.00	.2	1.1	0.0	0.00	3.3	0.0	0.0	0.00	0.0	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
59.0	0.00	.7	.1	.1	0.00	20.9	11.8	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
58.5	0.00	0.00	0.00	2.6	11.8	94.0	656.6	29.3	2.6	0.0	0.00	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00
58.0	0.00	0.00	0.00	0.0	.1	.8	209.1	87.9	7.0	0.0	0.00	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00
57.5	0.00	0.00	0.00	0.00	0.00	2.7	21.3	17.2	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00
57.0	0.0	0.00	0.0	0.0	0.0	0.0	38.6	53.9	0.0	0.0	0.00	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00
56.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00
56.0	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55.5	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00
55.0	0.0	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	2.7	0.00	0.00	0.00	0.00	0.00	0.00
54.5	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	1.3	.3	0.00	0.00	0.00	0.00	0.00
54.0	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.0	0.0	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00
53.5	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
53.0	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00
52.5	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00
52.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.0	0.00	0.00	0.0	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT

AVERAGE JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN MAR 1964-76

LONGITUDE

LAT	179*				175*				170*				165*				160*				
65.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.5	0.0	4.0	1.2	0.0	.1	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.0	0.0	.3	3.1	.2	3.7	12.8	6.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.5	0.0	0.0	0.0	.2	2.2	68.7	97.0	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.0	0.0	0.0	0.0	0.0	0.0	0.0	9.9	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57.5	0.0	0.0	0.0	0.0	0.0	0.0	7.4	10.0	14.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57.0	0.0	0.0	0.0	0.0	0.0	0.0	13.2	22.6	29.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.5	0.0	0.0	0.0	0.0	0.0	0.0	.2	.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT



AVERAGE JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN MAY 1964-76

LONGITUDE

LAT	179				175				170				165				160			
	*				*				*				*				*			
65.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
64.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
63.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
62.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
61.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
60.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
59.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
58.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
57.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
57.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
56.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
55.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
54.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
54.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
53.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
53.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
52.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
52.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT

AVERAGE JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN JUNE 1964-76

LONGITUDE

LAT	179*				175*					170*					165*					160*		
65.5	0.0	0.0.	0.0.	0.0.	0.0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0.	0.0.	0.0	0.0.	0.0	0.0
65.0	0.0.	0.0.	0.0.	0.0	0.0.	0.0.	0.0.	0.0.	0.0	0.0	0.0.	0.0.	0.0	0.0	0.0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.5	3.2	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	.3	0.0	0.0	0.0.	0.0	0.0	0.0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	1.4	0.0	0.0.	0.0.	0.0.	0.0	0.0	0.0	0.0	0.0	0.0.	0.0.	0.0	0.0.	0.0	17.9	5.3	9.9	1.0	0.0	0.0	0.0
63.5	0.0.	0.0.	0.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0	0.0	0.0.	0.0.	0.0	0.0.	0.0	3.7	50.9	86.6	55.7	0.0.	0.0.	0.0.
63.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	.3	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.
62.5	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	2.8	.6	0.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.
62.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0	0.0	0.0.	0.0.	0.0	0.0.	24.3	0.0.	0.0	0.0.	0.0.	0.0.	0.0.	0.0.
61.5	0.0.	0.0.	0.0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0.	0.0.	0.0	6.9	22.3	0.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.
61.0	0.0.	0.0.	0.0.	0.0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0.	0.0.	0.0	13.0	10.6	0.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.
60.5	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	.3	1.0	7.2	.8	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.
60.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0	0.0	0.0	0.0.	0.0	0.0.	1.2	0.0.	0.0	0.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.
59.5	0.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0	0.0.	0.0	0.0.	0.0.	0.0.	5.2	7.4	16.2	8.7	0.0.	0.0.	0.0.	0.0.	0.0.
59.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0	6.1	12.6	59.8	.8.	0.0	0.0	0.0.	0.0.	0.0.
58.5	0.0.	0.0	0.0.	.5	.7	1.4	0.0.	.1	0.0.	1.7	1.1	0.0.	0.0.	4.8.	.8	5.1	1.4	0.0	0.0.	0.0.	0.0.	0.0.
58.0	0.0	0.0.	0.0.	0.0.	0.0.	0.0.	1.2	0.0.	1.2	9.7	1.7	0.0.	0.0.	0.0.	0.0.	.4	1.2	0.0.	0.0.	.8	1.8	1.8
57.5	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	.2	0.0.	0.0.	0.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	1.7	1.1	0.0.	0.0.
57.0	0.0.	0.0	0.0.	0.0.	0.0	0.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.
56.5	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.
56.0	0.0.	0.0.	0.0	0.0.	0.0.	0.0.	0.0.	0.0	0.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.
55.5	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.
55.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.
54.5	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.
54.0	0.0.	0.0.	0.0.	0.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	.1	0.0.	0.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.
53.5	0.0.	0.0.	0.0.	0.0	0.0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.
53.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0	0.0	0.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.
52.5	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0	0.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.
52.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT



AVERAGE JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN AUG 1964-76

LONGITUDE

LAT	179*				175*				170*				165*				160*				
65.5	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.0	0.00	0.0	0.00	0.0	0.0	0.00	0.00	0.0	0.0	0.00	0.00	0.00
65.0	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.0	0.00	0.00	0.00
64.5	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.0	0.00	0.00	0.00
64.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00
63.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00
63.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00
62.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.0
62.0	0.00	0.00	0.0	0.00	0.0	0.0	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00
61.5	0.00	0.00	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
61.0	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60.5	0.00	0.00	0.00	0.0	0.0	0.00	0.0	0.00	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0	0.00	0.00	0.00	0.00
60.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.0	0.00	0.00	0.00	0.00
59.5	0.00	0.00	0.00	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0
59.00	0.00	0.00	0.00	0.00	.3	0.0	0.00	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
58.5	0.00	0.00	.1	0.00	.1	0.00	.1	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.0
58.0	0.00	0.00	0.00	0.00	0.00	.1	0.0	1.3	2.2	25.1	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
57.5	0.00	0.00	0.00	0.0	0.00	0.00	.4	0.00	12.0	8.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
57.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.2	0.0	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
56.5	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.0
56.0	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	.4	3.1	7.2	0.0	0.00	2.4	0.00	0.00	0.00	0.00	0.00	0.00
55.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.0	0.00	2.4	1.6	0.0	0.00	0.00	0.00	0.00	0.0
55.0	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.0	2.0	6.3	1.8	0.00	0.00	0.0	0.00	0.00	0.00	0.00
54.5	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.0	.2	3.1	7.2	0.0	0.0	0.00	0.0	0.00	0.00
54.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
53.5	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00
53.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
52.5	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52.0	0.00	0.0	0.00	0.0	0.00	0.0	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.0	0.0	0.0	0.0

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT



AVERAGE JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN SEPT 1964-76

LAT	LONGITUDE																				
	179	179	179	179	175	175	175	175	175	170	170	170	170	170	165	165	165	165	165	160	
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
65.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.5	2.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.0	0.0	0.0	.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.5	0.0	.7	6.4	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.0	0.0	0.0	.3	.1	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.5	0.0	0.0	.3	0.0	3.0	2.4	.8	2.1	9.4	2.2	.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.6	4.4	5.1	14.2	.1	0.0	.4	0.0	0.0	0.0	0.0	0.0	0.0
57.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.9	8.7	.8	0.0	0.0	.1	0.0	.1	0.0	0.0	0.0	0.0	0.0	0.0
57.0	0.0	0.0	0.0	0.0	0.0	0.0	.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.1	0.00	0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.0
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.1	.2	0.0	21.1	0.0	.2	0.0	0.0	0.0	0.0
55.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	.8	11.8	31.2	0.0	0.0	0.0	0.0	0.0	0.0
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.6	19.9	8.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	12.1	5.2	0.0	0.0	0.0	0.0	0.0	0.0
54.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT.

AVERAGE JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN OCT 1964-76

LAT	LONGITUDE																			
	179*				175*				170*				165*				160*			
65.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.5	2.6	16.0	.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.0	0.0	9.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.5	0.0	13.1	.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.0	0.0	0.0	0.0	0.0	0.0	5.9	8.2	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.5	0.0	0.0	.3	.1	6.4	2.7	159.6	9.4	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.0	0.0	0.0	0.0	0.0	1.9	0.0	75.1	.4	14.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57.0	0.0	0.0	0.0	0.0	0.0	0.0	.8	0.0	77.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	.6	3.7	1.9	0.0	0.0	0.0	0.0
55.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	24.2	27.1	3.9	0.0	0.0	0.0	0.0
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.8	2.1	0.0	0.0	0.0	0.0	0.0
54.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT

AVERAGE JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN NOV 1964-76

LONGITUDE

LAT	179*				175*				170*				165*				160*				
65.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.5	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.0	.1	12.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.0	0.0	.2	0.0	0.0	0.0	0.0	6.6	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.5	0.0	0.0	0.0	0.0	0.0	0.0	20.4	12.7	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.0	0.0	0.0	0.0	3.7	18.7	101.6	34.6	.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.5	0.0	0.0	0.0	0.0	24.0	302.3	535.9	27.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.0	0.0	0.0	0.0	0.0	0.0	17.2	71.8	11.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57.5	0.0	0.0	0.0	0.0	0.0	0.0	9.6	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.9	1.9	1.2	1.3	.3	0.0	0.0	0.0
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.4	.7	.3	0.0	0.0	0.0	0.0	0.0
54.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.4	0.0	.3	0.0	0.0	0.0	0.0	0.0
53.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT

AVERAGE JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN DEC 1964-76

LONGITUDE

LAT	179*					175*					170*					165*					160*	
65.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.0
65.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
64.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
64.00	0.0	0.00	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.0
63.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.0
63.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.0
62.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.0
62.0	0.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.0	0.00	0.00	0.00	0.00
61.5	0.0	7.7	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.0	0.00	0.00	0.0	0.00	0.00	0.00	0.00
61.00	5.20	10.80	3.10	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60.50	0.00	0.00	0.00	0.00	0.00	0.00	1.4	15.7	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
60.0	0.00	9.0	0.00	0.00	0.0	0.0	9.2	5.3	0.00	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
59.5	0.00	2.9	0.00	6.70	0.00	8.30	22.1	8.8	1.7	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00
59.0	0.00	0.0	.4	0.0	4.7	171.1	197.1	30.1	7.3	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
58.50	0.00	6.80	60.0	134.2	10.6	687.23	211.7	118.6	2.20	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
58.00	0.00	0.00	26.2	7.2	7.0	17.3	94.7	90.2	16.2	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
57.50	0.00	0.00	0.00	0.00	0.0	8.0	12.0	23.8	.4	0.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
57.0	0.00	0.00	0.0	0.00	0.0	0.0	37.4	13.7	0.00	16.9	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
56.50	0.00	0.00	0.00	0.00	0.0	0.0	11.4	12.7	5.8	0.0	5.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.0
56.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.4	4.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0
55.50	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.0	1.0	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00
54.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
54.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.0
53.5	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
53.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
52.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
52.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	.9	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT

Appendix B

Average catch of herring by month of the  
Japanese gillnet fishery

AVERAGE JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN JAN 1964-76  
CATCHES MADE BY GILL NET

LONGITUDE

LAT	170						165						160		
	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
65.5	0.0.	0.0	0.0	0.0.	0.0.	0.0	0.0.	0.0	0.0.	0.0	0.0.	0.0.	0.0.	0.0	0.0
65.0	0.0.	0.0	0.0.	0.0.	0.0.	0.0.	0.0	0.0	0.0	0.0.	0.0.	0.0.	0.0	0.0	0.0
64.5	0.0.	0.0	0.0.	0.0.	0.0.	0.0.	0.0	0.0	0.0	0.0.	0.0.	0.0.	0.0	0.0	0.0
64.0	0.0	0.0.	0.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0	0.0.	0.0.	0.0.	0.0
63.5	0.0.	0.0	0.0.	0.0.	0.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0	0.0.	0.0.	0.0.	0.0.
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0.	0.0.	0.0	0.0	0.0.	0.0.	0.0.	0.0.	0.0.
62.5	0.0	0.0	0.0.	0.0.	0.0	0.0	0.0.	0.0.	0.0.	0.0	0.0.	0.0.	0.0.	0.0	0.0
62.0	0.0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0.	0.0.	0.0.	0.0.	0.0.
61.5	0.0	0.0	0.0	0.0	0.0	0.0.	0.0	0.0.	0.0	0.0.	0.0.	0.0.	0.0	0.0.	0.0
61.0	0.0	0.0	0.0	0.0	0.0.	0.0	0.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.
60.5	0.0	0.0	0.0	0.0.	0.0.	0.0	0.0.	0.0.	0.0.	0.0	0.0.	0.0.	0.0.	0.0.	0.0.
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0.	0.0.	0.0.	0.0.	0.0	0.0.
59.5	0.0	0.0	0.0	0.0	0.0.	0.0	0.0	0.0	0.0	0.0.	0.0.	0.0.	0.0.	0.0	0.0.
59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0	0.0.
58.5	0.0	0.0	0.0	0.0	0.0	0.0.	0.0.	0.0.	0.0.	0.0	0.0	0.0.	0.0.	0.0.	0.0.
58.0	0.0	0.0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0.	0.0.	0.0	0.0	0.0	0.0.	0.0
57.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0.	0.0.	0.0	0.0.	0.0.	0.0.	0.0	0.0
57.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0.	0.0.	0.0	0.0	0.0.	0.0.	0.0.	0.0.	0.0.
56.5	0.0.	0.0	0.0	0.0.	0.0.	0.0	0.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.
56.0	0.0.	0.0	0.0	0.0	0.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.
55.5	0.0	0.0	0.0.	0.0	0.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0
55.0	0.0	0.0	0.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0	0.0.	0.0.	0.0.	0.0.	0.0.
54.5	0.0.	0.0	0.0	0.0	0.0.	0.0.	0.0.	1.3	0.0	0.0.	0.0	0.0.	0.0	0.0.	0.0.
54.0	0.0.	0.0	0.0.	0.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0	0.0.	0.0.	0.0.	0.0.	0.0.
53.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0	0.0.
53.0	0.0	0.0	0.0	0.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.
52.5	0.0	0.0	0.0	0.0	0.0	0.0.	0.0.	0.0.	0.0.	0.0	0.0.	0.0	0.0.	0.0.	0.0.
52.0	0.0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0.	0.0.	0.0	0.0.	0.0	0.0.	0.0.	0.0

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT

AVERAGE JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN FEB 1964-76  
 CATCHES MADE BY GILL NET

LONGITUDE

LAT	170							165							160									
	*							*								*								
65.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT

AVERAGE JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN MAR 1964-76  
 CATCHES MADE BY GILL NET

LONGITUDE

LAT	170							165					160		
	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
65.5	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	
65.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	
64.5	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	
64.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	
63.5	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	
63.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	
62.5	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	
62.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	
61.5	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	
61.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	
60.5	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	
60.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	
59.5	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	
59.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	
58.5	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	
58.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	
57.5	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	
57.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	
56.5	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	
56.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	
55.5	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	
55.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	1.7	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	
54.5	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	1.4	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	
54.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	
53.5	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	
53.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	
52.5	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	
52.0	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	0.0.	

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT



AVERAGE JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN APRIL 1964-76  
CATCHES MADE BY GILL NET

LONGITUDE

LAT	170							165							160								
	*							*								*							
65.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.5	.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.0	12.2	0.0	.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57.5	0.0	0.0	1.4	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57.0	.3	3.1	0.0	1.7	0.0	3.1	.3	2.4	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT

AVERAGE JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN MAY 1964-76  
CATCHES MADE BY GILL NET

LONGITUDE

LAT	170						165						160	
	*						*							
65.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.1	.7	2.9	.7	.4	0.0	0.0
63.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.1	23.1	22.4	19.2	3.1	0.0	0.0
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.3	0.0	0.0	0.0	0.0	0.0	0.0
62.5	0.0	0.0	0.0	0.0	0.0	.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.0	0.0	0.0	0.0	0.0	0.0	.1	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0
61.5	0.0	0.0	0.0	0.0	0.0	17.8	14.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.0	0.0	0.0	0.0	0.0	0.0	20.6	77.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.5	0.0	0.0	0.0	0.0	0.0	0.0	2.0	7.9	0.0	0.0	0.0	0.0	0.0	0.0
60.0	1.0	0.0	0.0	0.0	0.0	.7	0.0	8.6	0.0	0.0	0.0	0.0	0.0	0.0
59.5	0.0	0.0	0.0	0.0	0.0	9.6	34.0	22.0	15.6	0.0	2.0	0.0	0.0	0.0
59.0	0.0	0.0	0.0	0.0	0.0	3.1	54.8	28.4	49.8	119.8	.8	0.0	0.0	0.0
58.5	0.0	0.0	0.0	.1	2.2	0.0	9.1	3.0	25.1	52.0	2.6	0.0	.4	4.4
58.0	1.6	0.0	.9	0.0	14.2	.1	4.9	1.0	8.4	40.0	74.6	6.6	56.0	335.4
57.5	0.0	.2	0.0	9.4	.3	.7	9.6	1.1	.7	7.4	65.4	18.7	0.0	19.6
57.0	0.0	0.0	0.0	0.0	2.0	1.1	4.1	5.6	0.0	.7	23.4	0.0	0.0	0.0
56.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.5	0.0	0.0	0.0	0.0	0.0	.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT

AVERAGE JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN JUNE 1964-76  
CATCHES MADE BY GILL NET

LONGITUDE

LAT	170							165							160	
	*							*								
65.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
64.5	0.0	.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.4	0.0	0.0	0.0	
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.9	5.3	9.9	1.0	0.0	0.0	0.0	
63.5	0.0	0.0	0.0	0.0	0.0	0.0	.7	.9	0.0	3.7	50.9	86.6	55.7	0.0	0.0	
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.3	0.0	0.0	0.0	0.0	0.0	
62.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	.6	0.0	0.0	0.0	0.0	0.0	0.0	
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
61.5	0.0	0.0	0.0	0.0	0.0	0.0	6.9	22.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
61.0	0.0	0.0	0.0	0.0	0.0	0.0	13.0	100.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
60.5	0.0	0.0	0.0	0.0	0.0	.3	1.0	7.2	.0	0.0	0.0	0.0	0.0	0.0	0.0	
60.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
59.5	0.0	0.0	0.0	0.0	0.0	5.2	7.4	16.2	8.7	0.0	0.0	0.0	0.0	0.0	0.0	
59.0	0.0	0.0	.2	.1	0.0	0.0	6.1	12.6	59.9	.8	0.0	0.0	0.0	0.0	0.0	
58.5	0.0	0.0	1.3	1.1	0.0	0.0	4.8	.8	5.1	1.4	0.0	0.0	0.0	0.0	0.0	
58.0	0.0	0.0	1.7	1.7	0.0	0.0	0.0	0.0	.4	1.2	0.0	0.0	.8	1.8	0.0	
57.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
57.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
56.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
55.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
54.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
54.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
53.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
53.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
52.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
52.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT

AVERAGE JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN JULY 1964-76  
CATCHES MADE BY GILL NET

LONGITUDE

LAT	170						165						160	
	*	*	*	*	*	*	*	*	*	*	*	*	*	
65.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.1	.1	0.0
57.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0
57.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.1	0.0	0.0	0.0	0.0
56.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT



No gillnet catches of herring in September.



No gillnet catches of herring in November.



No gillnet catches of herring in December.

Appendix C

Average catch of herring by month of the  
Japanese trawl fishery

AVERAGE JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN JAN 1964-76  
CATCHES MADE BY TRAWL

LONGITUDE

LAT	179*				175*					170*					165*						160*
65.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.0	.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.5	.8	0.0	0.0	0.0	0.0	0.0	.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.0	.1	2.6	0.0	0.0	0.0	0.0	6.1	10.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.5	0.0	.7	0.0	0.0	0.0	28.3	14.0	5.6	9.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.0	0.0	.1	0.0	0.0	18.1	239.7	120.9	13.2	23.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.5	0.0	0.0	57.0	44.2	93.0	281.1	206.1	222.6	13.1	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.0	0.0	0.0	4.6	0.0	1.8	9.8	142.7	168.7	78.4	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57.5	0.0	0.0	0.0	0.0	0.0	6.9	27.9	4.3	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57.0	0.0	0.0	0.0	0.0	0.0	0.0	19.8	0.0	.2	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.5	0.0	0.0	0.0	0.0	0.0	0.0	5.8	3.0	.3	3.3	5.7	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.2	0.0	.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT

AVERAGE JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN FEB 1964-76  
CATCHES MADE BY TRAWL

LAT	LONGITUDE																				
	179*	178	177	176	175*	174	173	172	171	170*	169	168	167	166	165*	164	163	162	161	160*	
65.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.5	.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.0	0.0	.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.5	0.0	.2	1.1	0.0	0.0	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.0	0.0	.7	.1	.1	0.0	20.9	11.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.5	0.0	0.0	0.0	2.6	11.8	94.0	656.6	29.3	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.0	0.0	0.0	0.0	0.0	.1	.8	209.1	87.9	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57.5	0.0	0.0	0.0	0.0	0.0	2.7	21.3	17.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57.0	0.0	0.0	0.0	0.0	0.0	0.0	38.6	33.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT

AVERAGE JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN MAR 1964-76  
CATCHES MADE BY TRAWL

LONGITUDE

LAT	179 *				175 *					170 *					155 *						160 *
65.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.5	0.0	4.0	1.2	0.0	.1	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.0	0.0	.3	3.1	.2	3.7	12.8	6.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.5	0.0	0.0	0.0	.2	2.2	68.7	97.0	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.0	0.0	0.0	0.0	0.0	0.0	0.0	9.9	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57.5	0.0	0.0	0.0	0.0	0.0	0.0	7.4	10.0	14.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57.0	0.0	0.0	0.0	0.0	0.0	0.0	13.2	22.6	29.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.5	0.0	0.0	0.0	0.0	0.0	0.0	.2	.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT

AVERAGE JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN APRIL 1964-76  
CATCHES MADE BY TRAWL

LAT	LONGITUDE																			
	179				175				170				165				160			
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
65.5	0.0	0.0	0.00	0.00	0.0	0.00	0.0	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.0	0.0	0.0	0.0
65.0	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.0	0.0	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.0	0.0	0.0
64.5	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.0	0.00
64.0	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.0	0.00
63.5	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.0	0.00
63.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00
62.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0	0.00	0.00	0.00
62.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00
61.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.00	0.00	0.00	0.00
61.0	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.0	0.00	0.00	0.00
60.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0	0.00	0.00	0.00
60.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.0	0.0	0.0
59.5	0.00	0.00	0.00	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.00	0.0	4.7	0.00	0.00	0.0	0.00	0.00	0.00	0.00
59.0	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.0	0.00	0.00	0.0	0.00
58.5	0.00	0.00	0.0	0.0	0.00	0.00	1.6	18.3	6.2	4.4	0.0	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00
58.0	0.00	0.00	0.00	0.00	.7	16.0	9.6	309.1	117.9	255.3	14.6	30.6	10.2	0.00	9.0	1.3	0.00	0.0	0.0	0.0
57.5	0.00	0.00	0.00	0.00	0.0	4.6	3.9	33.0	52.6	.1	.4	23.4	135.4	19.6	11.7	1.7	1.7	1.1	0.00	0.0
57.0	0.00	0.00	0.00	0.00	0.00	0.00	6.6	1.1	.7	0.0	1.1	2.0	16.9	3.6	2.2	0.00	1.4	0.00	0.00	0.00
56.5	0.00	0.00	0.00	0.00	0.00	0.00	.1	1.4	0.0	0.0	0.00	0.00	0.00	0.00	0.00	.4	0.00	0.00	0.00	0.00
56.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.5	0.00	0.0	1.3	.6	1.4	0.00	0.0	0.00	0.00	0.00	0.0	0.00
55.5	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.0	0.00	0.0	0.00	0.00	0.00	0.00	.4	0.00	0.00	0.00	0.00	0.00
55.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.0	2.2	0.00	0.0	0.0	0.0	0.00	0.00	0.00
54.5	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.0	0.0	1.0	0.0	0.00	0.00	0.00	0.00
54.0	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00
53.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
53.0	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00
52.5	0.0 0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.0	0.0	0.00	0.00	0.00	0.00
52.0	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT

AVERAGE JAPANESE HERPING CATCH (MT) IN THE EASTERN BERING SEA IN MAY 1964-76  
CATCHES MADE BY TRAWL

LAT	LONGITUDE																					
	179*	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	179	160*	
65.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.5	0.0	0.0	0.0	0.0	9.3	.8	.3	17.6	36.0	1.6	0.0	0.0	0.0	0.0	0.0	.4	0.0	0.0	0.0	0.0	0.0	.4
58.0	0.0	0.0	0.0	0.0	0.0	14.1	13.9	178.1	200.9	57.2	89.0	5.8	2.7	3.2	.1	3.0	1.3	.7	10.6	5.8	.2	.2
57.5	0.0	0.0	0.0	0.0	0.0	.6	2.7	81.0	193.2	51.6	36.1	20.9	21.7	6.8	2.9	1.9	2.3	5.7	5.8	.2	.3	
57.0	0.0	0.0	0.0	0.0	0.0	.6	16.7	17.8	.7	.3	14.9	4.1	14.1	5.1	4.8	6.6	0.0	0.0	0.0	0.0	0.0	0.0
56.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	2.2	0.0	0.0	0.0	1.0	3.3	2.2	.4	.3	0.0	0.0	0.0	0.0	0.0
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.6	.2	3.0	.6	.9	5.1	8.2	0.0	.7	0.0	0.0	0.0	0.0	0.0	0.0
55.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT

AVERAGE JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN JUNE 1964-76  
CATCHES MADE BY TRAWL

LONGITUDE

LAT	179*				175*				170*				165*				160*					
65.5	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	
65.0	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.5	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0
63.5	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
63.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0
62.5	0.0	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.0	0.00	0.0	0.0	0.0
62.0	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.0	0.00	0.0	0.0	0.0
61.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.0	0.0
61.0	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.0	0.00	0.00	0.00	0.0
60.5	0.0	0.00	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.0
60.0	0.00	0.0	0.0	0.00	0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.0	0.0
59.5	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
59.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
58.5	0.00	0.00	0.0	.6	.7	1.4	0.0	.1	0.00	.3	0.0	0.0	0.00	0.0	0.0	0.00	0.00	0.00	0.0	0.0	0.0	0.0
58.0	0.0	0.00	0.00	0.00	0.00	0.00	1.2	0.00	1.2	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
57.5	0.00	0.00	0.00	0.00	0.0	0.0	.2	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	1.7	1.1	0.0	0.0	
57.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.0
56.5	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.0
56.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.0
55.5	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
55.0	0.00	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0
54.5	0.0	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
54.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	.1	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
53.5	0.00	0.00	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0
53.0	0.0	0.00	0.0	0.00	0.0	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.0	0.0	0.0
52.5	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.0
52.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.0	0.00	0.00	0.00	0.0

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT



AVERAGE JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN JULY 1964-76  
CATCHES MADE BY TRAWL

LONGITUDE

LAT	179*				175*				170*				165*				160*			
65.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT



AVERAGE JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN SEPT 1964-76  
CATCHES MADE BY TRAWL

LONGITUDE

LAT	179*				175*				170*				165*				160*			
65.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.5	2.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.0	0.0	0.0	.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.5	0.0	.7	6.4	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.0	0.0	0.0	.3	.1	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.5	0.0	0.0	.3	0.0	3.0	2.4	.8	2.1	9.4	2.2	.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.9	8.0	4.4	5.1	14.2	.1	0.0	.4	0.0	0.0	0.0	0.0	0.0
57.0	0.0	0.0	0.0	0.0	0.0	0.0	.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.1	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.1	.2	0.0	21.1	0.0	.2	0.0	0.0	0.0
55.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	.8	11.8	31.2	0.0	0.0	0.0	0.0	0.0
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.6	19.9	8.9	0.0	0.0	0.0	0.0	0.0	0.0
54.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	12.1	5.2	0.0	0.0	0.0	0.0	0.0
54.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT

AVERAGE JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN OCT 1964-76  
CATCHES MADE BY TRAWL

LONGITUDE

LAT	179					175					170					165					160				
	*				*					*					*					*					
55.5	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.0	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00	0.0	0.0	
65.0	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	
64.5	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	
64.0	0.00	0.00	0.0	0.00	0.0	0.00	0.00	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	
63.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	
63.0	0.00	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	
62.5	0.0	0.00	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
62.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
61.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
61.0	0.00	1.8	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	
60.5	2.6	16.0	.1	0.0	0.0	0.00	0.0	0.00	0.0	0.0	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	
60.0	0.00	9.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	
59.5	0.00	13.1	.4	0.00	0.0	0.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	
59.0	0.00	0.0	0.00	0.0	0.00	5.9	2.2	0.00	2.4	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	
58.5	0.0	0.00	.3	.1	6.4	2.7	159.6	9.4	2.0	0.0	0.0	0.0	0.00	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
58.0	0.00	0.00	0.00	0.0	1.9	0.0	75.1	.4	14.1	0.0	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
57.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
57.0	0.00	0.00	0.00	0.00	0.00	0.0	.5	0.00	77.8	0.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
56.5	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	0.00	.8	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
56.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.00	1.3	.6	3.7	1.0	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.00	
55.5	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.00	1.1	24.2	27.1	3.7	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
53.0	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	.9	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	
54.5	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	.8	2.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	
54.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
53.5	0.00	0.0	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	
53.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	
52.5	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	
52.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT

AVERAGE JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN NOV 1964-76  
CATCHES MADE BY TRAWL

LONGITUDE

LAT	179				175				170				165				160			
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
65.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.5	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.0	.1	12.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.0	0.0	.2	0.0	0.0	0.0	0.0	6.6	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.5	0.0	0.0	0.0	0.0	0.0	0.0	20.4	12.7	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.0	0.0	0.0	0.0	3.7	18.7	101.6	54.6	.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.5	0.0	0.0	0.0	0.0	24.0	302.3	535.9	27.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.0	0.0	0.0	0.0	0.0	0.0	17.2	71.8	11.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57.5	0.0	0.0	0.0	0.0	0.0	0.0	9.6	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	.9	1.9	1.2	1.3	.3	0.0	0.0	0.0
55.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.4	.7	.3	0.0	0.0	0.0	0.0	0.0
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	.0	.0	0.0	0.0	0.0	0.0	0.0
54.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.4	.0	.8	0.0	0.0	0.0	0.0	0.0
54.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT

AVERAGE JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN DEC 1964-76  
CATCHES MADE BY TRAWL

LONGITUDE

LAT	179*				175*				170*				165*				160*			
65.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.5	0.0	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.0	5.2	10.8	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.5	0.0	0.0	0.0	0.0	0.0	0.0	1.4	15.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.0	0.0	9.0	0.0	0.0	0.0	0.0	9.2	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.5	0.0	2.9	0.0	6.7	0.0	8.3	22.1	8.8	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.0	0.0	0.0	.4	0.0	4.7	171.1	197.1	30.1	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.5	0.0	6.8	60.0	134.2	10.6	687.2	23211.7	118.6	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58.0	0.0	0.0	26.2	7.2	7.0	17.3	84.7	90.2	16.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57.5	0.0	0.0	0.0	0.0	0.0	8.0	12.0	23.8	.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57.0	0.0	0.0	0.0	0.0	0.0	0.0	37.4	13.7	0.0	16.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.5	0.0	0.0	0.0	0.0	0.0	0.0	11.4	12.7	6.8	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

\*AVERAGE BASED ON NINE YEARS OF DIRECTED EFFORT

Appendix D

Catch of herring by month of the  
Japanese herring fishery from September 1964-December 1976

































JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN APRIL 1968

LONGITUDE

LAT	179				175				170				165				160			
	*				*				*				*				*			
65.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN APRIL 1968

LONGITUDE

LAT	179				175				170				165				160			
	*				*				*				*				*			
55.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

P5

02013 651

272 141

3 28













JAPANESE HERRING CATCH (MT) IN THE EASTERN BERING SEA IN DEC 1968

LONGITUDE

LAT	179				175				170				165				160			
	*				*				*				*				*			
65.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62.5	0	0	0	0	0	0	0	32	0	0	0	0	0	0	0	0	0	0	0	0
62.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60.5	0	0	0	0	0	0	0	61	0	0	0	0	0	0	0	0	0	0	0	0
60.0	0	0	0	0	0	0	39	40	0	0	0	0	0	0	0	0	0	0	0	0
59.5	0	0	0	0	0	34	199	20	0	0	0	0	0	0	0	0	0	0	0	0
59.0	0	0	0	0	0	180	194	29	0	0	0	0	0	0	0	0	0	0	0	0
58.5	0	0	0	0	93	920	****	611	0	0	0	0	0	0	0	0	0	0	0	0
58.0	0	0	0	0	0	30	0	177	0	0	0	0	0	0	0	0	0	0	0	0
57.5	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0
57.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

\*\*\* 14939 m.t.











































































































































































