

AGENDA ITEM: D4

PRELIMINARY REPORT ON THE
1980 WESTERN ALASKA
HERRING FISHERY

Presented To:

The North Pacific Fishery Management Council

By

Alaska Department of Fish and Game

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SUMMARY

A total of 24,061 metric tons (mt) of herring were harvested commercially during the 1980 season in Togiak, Security Cove, Goodnews Bay, Cape Romanzof, and Norton Sound (Table 1, Figure 1). The 1979 harvest in these districts was 10,939 mt. The first commercial herring delivery was made from the Togiak fishery April 26. The fishery proceeded northward along the Bering Sea coast to Norton Sound. Herring fishing in all districts was closed by June 7. Aerial surveys were used in all districts to estimate the inshore biomass, except in Goodnews Bay and Cape Romanzof, where turbid waters prevailed in 1980. The fishery exploitation rates exceeded 20% (Table 2), in all districts where reliable biomass estimates were obtained. Wastage was a major problem encountered in the Togiak fishery. The Department recommends that no additional fishing be permitted on the Western Alaska herring stocks for the remainder of the 1980 season. A final report will be prepared in September.

TOGIAK

The 1980 Togiak herring fishing season opened by regulation on April 15, but the first commercial delivery was not made until April 26. The season closed May 10 resulting in a harvest of 17,774 mt. Eighty-five percent of the harvest was used for sac roe, and the remainder was processed for food or bait. Purse seines accounted for 84% of the catch with gill nets taking 16%. The 1979 harvest in the Togiak district was 10,115 mt.

Fishing effort levels were determined from an aerial survey on May 7. Observed were 140 purse seine and 363 gill net vessels as well as 102 tenders, trampers, and processing vessels. Twenty-seven companies purchased herring from the fishermen.

The average roe recovery ranged from 8 - 11%. The estimated season average was 9.2%. Price paid to fishermen was \$200 per ton for 10% roe and \pm \$20 for each percentage point above or below 10%. Food/bait herring sold for \$50 per ton. The estimated ex-vessel value of the Togiak fishery was \$3.2 million.

Wastage of herring was the most significant problem of the 1980 season. The Department estimates that at least 2,500 mt of herring were wasted. This estimate, made in season immediately prior to the closure of the fishery on May 10, is a minimum estimate and the final figure may be 2 - 3 times higher once the Department completes a survey of fishermen and processors. Results of this survey will be available in September. Some of the reasons for wastage include dumping due to low roe recovery, inability of fishermen to market their catch, and storms which made retrieving of fishing gear hazardous.

Five companies purchased 86 mt of spawn on kelp between May 2-13 (Table 3). Seventyeight fishermen participated and were paid 30 to 50 cents per pound harvested. Spawn density was rather poor. Three emergency orders which progressively closed portions of the fishery were used by the Department to distribute fishing effort throughout the area. The value of the spawn on kelp fishery to the fishermen was \$95,000.

Herring abundance - A final seasonal biomass estimate for the Togiak district will not be available until September when school abundance, distribution, entry pattern, incidental species abundance and new area-density conversion figures have been analyzed. In-season observations were adequate to manage the inshore roe fishery and combined with subsequent analysis allow general conclusions as to the status of the resource and measures needed to further regulate harvest in 1980-81.

A total of 23 aerial surveys were flown in the Togiak district from April 15 through June 7. Herring were first observed on April 28. Aerial estimates progressively increased until a peak estimate of 50,800 - 108,200 mt occurred May 6, (based on post season analysis). During the season 58 spawnings totaling 34 km were sighted. With the exception of a few of these, all spawnings were very light. The 1979 biomass estimate for the same area was 216,800 568,500 mt.

In season, an estimate of 100,000 tons was used for the peak biomass as the basis for management decisions. Application of a 20% exploitation rate to this biomass coupled with a drastic decline in observed biomass on May 8 and a general reduction from past years in spawning density throughout the district necessitated a total closure of the Togiak district fishery on May 10. Department managers who evaluated the fishery judged the low end of the range of estimates to be unrealistic because as the fishery peaked there were no discernible effects of the fishery removal of 20,000 mt (17,774 mt harvest plus 2,500 mt wastage).

After the fishery, two additions to the biomass reduction estimate have been considered. Herring spawned during two distinct periods: the older (6, 7, and 8 year olds) prior to May 13 and younger (3 and 4 year olds) on between May 19 and June 7. It may be appropriate to add the separate estimates to give a better estimate of the total run. This procedure yields a 1980 biomass range (estimate) of 69,300 to 146,000 mt if the same density conversion is used to convert school surface area to biomass as in 1979.

Data collected after the fishery may result in a further modification of the biomass estimate. In 1978, two aerial estimates of purse seine sets yielded 6.7 and 11.0 mt of herring per 50 square meters of surface area. In 1979, a single aerial estimate produced 2.4 mt per 50 sq. m. Seven new estimates taken after the 1980 season showed 1.0 to 3.0 mt per 50 sq. m. Simply averaging the 10 estimates and applying this value to the observed school counts results in a biomass estimate closer to the lower end of the range.

The final evaluation of the fishery is not yet complete as there are data that have not been fully evaluated. However, the significant fact remains that there has been a drastic decrease in the spawning biomass from 1979 to 1980. Using similar techniques, the low end of the biomass estimates (which is the technique set forth in the Herring FMP) has decreased 68% from 216,000 mt in 1979 to 69,300 mt in 1980, in the Togiak district.

Age composition - Commercial catch samples were taken during the fishery. Variable mesh gill nets were fished from late April to early June. During the closed fishery, additional samples were obtained from purse seine test sets made in conjunction with aerial biomass point estimates.

Preliminary scale analysis indicate that the majority of the harvest was 6, 7, and 8 year old fish with approximately 47%-6's, 40%-7 's, and 11%-8's. Very few 5 year olds were observed, as was expected due to the poor show of 4's in 1979. Late in the run 3 and 4 year old fish appeared but in significantly reduced numbers, compared to the older age classes.

SECURITY COVE

A total of 611 mt (90% sac roe, 10% bait) was landed by 178 fishermen in Security Cove. Roe recovery for the season average 8.2%. Although the season opened on May 1, the first deliveries were not made until May 14 when the first buyer arrived. Department studies indicated that herring had been present in the district since May 2 and also some spawning had occurred prior to fishing.

Due to a decrease in herring abundance and an increase in fishing effort compared to last year, periodic season closures were required to maintain the harvest within acceptable biological limits. A substantial decline in herring abundance was observed on May 16 and the season was closed from 6:00 P.M. May 17 until 12 noon May 19. Another closure occurred during May 24-27. A final 24 hour fishing period was permitted during May 27-28 but by this time only limited processing and fishing effort was available.

It is estimated that 110-120 boats were present and most of these had previously participated in the Togiak fishery. This estimate includes about 20-30 "local" boats, most of which were from the Bethel area.

Eight companies were present in Security Cove to purchase herring. Processing varied from freezing or brining in the round to stripping sac roe on the fishing grounds and freezing or brining the carcasses. Several processors offloaded frozen herring directly onto a Japanese tramper on the fishing grounds.

Prices ranged from \$200-\$400 a short ton for 10% roe recovery with \pm \$20 for each point above or below 10%. Later in the season several buyers in the Security Cove and Goodnews Bay districts raised prices to \$400 a ton for 10% roe and \pm \$40 a point. The price for bait herring was generally \$50 a short ton.

A few fishermen were known to dump herring due to poor roe recovery and there also was an unknown quantity of "drop-outs" from gill nets. Generally, wastage was regarded as minimal compared to the Togiak fishery due to the slower pace of the fishery and the presence of one or more buyers in each district that would purchase the lower quality herring for bait.

Herring abundance - A total of 14 aerial surveys were flown in the Security Cove district from May 2 - June 7. The majority of the surveys were flown under fair to excellent survey conditions. Although herring were present throughout the entire survey period, peak abundance for the Security Cove index area was estimated on May 22 when 2,726 to 4,477 mt

of fish were observed. These estimates show a substantial decline from peak abundance in 1979 which was estimated at 19,510 to 32,032 mt on May 14. The 1980 estimates were similar to those made on May 30, 1978, 1,648 to 2,706 mt. Only one light patch of milt was observed in Security Cove on May 13. However, 5.8 km of milt was recorded about 4 to 5 km west of Security Cove on June 7.

GOODNEWS BAY

In Goodnews Bay, a total of 407 mt (93% sac roe 7% bait) was landed by 165 fishermen. Roe recovery for the season averaged 9.5%. The season was opened by emergency order on May 15 and continuous fishing occurred from May 18 through May 24 when the season was closed.

A number of the larger gill net boats fished this district during the May 18-19 closure of the Security Cove district but for the remainder of the season the effort was by local boats. A total of 44 boats were observed fishing during a May 22 aerial survey. The greatest percentage of the catch was taken by local fishermen.

Four companies purchased herring from fishermen in Goodnews Bay. Processing of herring as well as value to the fishermen was similar to the Security Cove fishery.

Herring abundance - A reliable estimate of biomass in Goodnews Bay was not possible. Nine attempts were made to survey from May 5 through May 24. With the exception of two surveys, one on May 8 and the other on May 16, survey conditions were unacceptable due to turbid water and inclement weather. The highest estimate of fish abundance was on May 8 when 576 to 720 mt were observed. These early estimates are markedly lower than those observed on May 17, 1979, which ranged from 3,729 to 8,949 mt. No milt was observed in either year.

CAPE ROMANZOF

A total of 554 mt (98% sac roe 2% bait) was landed which marked the first time Cape Romanzof has been fished commercially. Processing and

tender vessels of two buyers were anchored just inside Kokechik Bay near Aniktun Island. Average roe recovery for the season was 9.8%.

A total of 69 fishermen made at least one delivery during the season and operated out of 54 boats. Seventy and 78% of the fishermen and boats, respectively were from the local area. Approximately 40% of the harvest was taken by local fishermen.

The commercial fishing season officially opened April 15 but fishing did not begin until May 21 when the first processor arrived. By May 26 a cumulative catch of 393 mt had been taken and a temporary season closure was made from May 26-30 to allow further evaluation of stock condition and abundance. Additional spawning and good test fishing catches of maturing herring were documented during the closure and the season was reopened at noon May 30. Fishing effort during the "second season" was hampered by severe storms that lasted for several days. Only one buyer and local fishermen were present during the second season when 16 mt were taken.

Herring abundance - Aerial stock assessment surveys were not possible in the Cape Romanzof district during the 1980 season due to turbid water conditions. However, based on Department test fish results which have run continuously since 1978, the catches during the 1980 season were the greatest of the past three seasons.

Other studies - The Department sampled both the Cape Romanzof and Security Cove areas with variable mesh gill nets to examine age, weight, length, and maturity relationships of herring runs. They also documented the occurrence and distribution of non-herring fish. In addition, these crews assisted in obtaining commercial catch samples from the various fisheries.

The preliminary analysis of commercial catch samples showed the commercial harvest in Security Cove and Goodnews Bay to have primarily 6, 7, and 8 year old herring and to a lesser extent age 4 herring. Preliminary test fishing results from Security Cove indicated that the

younger age classes (3 and 4) began to appear in the area after about midMay, somewhat later than the older fish. A similar finding was suggested from preliminary analysis of Cape Romanzof data with the exception that 6 and 8 year old herring predominated the older age groups. Age 4 herring were frequently encountered in test nets but did not show as strong in the commercial catch as at Security Cove and Goodnews Bay. The relative strength of each age group will not be available until the analysis can be completed.

A preliminary evaluation of data indicates spawn deposition at Cape Romanzof was similar in both 1980 and 1979, while findings at Security Cove showed little intertidal egg deposition in 1980. Results suggested shallow subtidal spawning to predominate in the Security Cove area.

NORTON SOUND

The Norton Sound 1980 herring season opened by regulation on April 15, but the first commercial delivery was not made until May 21. The season was closed on June 6 and resulted in a harvest of 2,215 mt. Ninety-nine percent of the herring was used for sac roe, with the remainder being processed for bait. Gill nets accounted for 98.5% of the harvest, with beach seines taking the remainder. Last year's harvest totaled 1,172 mt.

There were approximately 289 fishermen who made at least one delivery in Norton Sound. Of these, 70% were residents of the Norton Sound area. The remaining 30% were gill net fishermen who accompanied processors or tenders who came into Norton Sound from herring fisheries located in the south. Local fishermen landed approximately 50% of the total harvest.

There were eight companies present to buy herring from the fishermen. There were seven processing vessels, six tenders, and one land based buying operation.

The average percentage of roe recovery for sac roe herring was 8.1%. Prices ranged from \$56 per ton to \$340 per ton; however, the average

price paid to the fishermen for a ton of 8.1% fish was \$205. The value of the total herring harvest to the fishermen was approximately \$500,000.

Wastage of herring did occur in Norton Sound, but was judged to not be a major problem. There was a major storm that lasted two days, May 31 through June 1. Some nets were lost or were washed up on the beach and herring in these nets were generally not salvageable.

There was one company which bought spawn on kelp. Between June 9 and 12, 22 mt of spawn on kelp was harvested by twenty fishermen. This fishery terminated when the company voluntarily quit buying on June 12. The price paid was between \$1.50 and \$1.30 per pound. Total value of the spawn on kelp harvest to the fishermen was approximately \$73,000. In 1979, 19 fishermen harvested 12 mt of spawn on kelp worth approximately \$15,600 to the fishermen.

Herring abundance - A total of nine aerial surveys along coastal sections from Cape Denbigh to Stuart Island was flown during the period May 8 through June 7. Survey effort was severely hampered by inclement weather and turbid sea conditions, particularly in the area from Unalakleet to Cape Denbigh. Consequently, 1980 estimates for that area can be considered conservative.

Peak abundance in southern Norton Sound from Stuart Island to Unalakleet was observed on May 29 (5,165 to 11,363 mt) and likewise at Cape Denbigh (2,535 to 5,577 mt). Herring were also present in the area between Unalakleet and Cape Denbigh on May 29, but turbid water conditions prevented any estimate from being made. Consequently, the highest abundance observed in this latter area was on May 19 (1,529 to 3,344 mt). Although no milt was observed on these surveys, aerial spotters and commercial fishermen reported nearly 3 km of heavy spawn May 30 in southern Norton Sound.

Peak estimates in 1980 from these three index areas (9,220 to 20,284 mt) showed an increase from the 1979 estimates (7,580 to 16,676 mt). It was from these three areas that more than 98% of the commercial harvest was taken in both 1979 and 1980.

Age composition - The Department sampled the Cape Denbigh area from May 21 through June 11 with variable mesh gill nets to examine herring age, length, and relative maturity composition. In addition, non-herring species composition was documented as well as the occurrence and density of herring spawn deposition. The Cape Denbigh crew also collected commercial catch samples from the herring fishery in their area while other personnel sampled catches from other geographic locations in Norton Sound.

A comparison of preliminary age structures between test netted herring and those taken commercially in the Cape Denbigh area reveal that the commercial catch was composed primarily of age 6 followed by age 4 herring. Test gill netting showed a very high proportion of age 3 herring to be present in addition to ages 4 and 6. Likewise, commercial samples collected elsewhere in Norton Sound were also dominated by age 6 and 4yearold fish.

CONCLUSIONS

The Western Alaska sac roe herring fishery, virtually nonexistent 4 years ago, was fully exploited during the brief 1980 season. This marks the first time that herring in every fishing district from Togiak north to Norton Sound were commercially harvested.

Problems were encountered during the course of the fishery which will have to be addressed through the regulatory process. Wastage was a significant problem in the Togiak fishery as was the allocation between gear types. A revised management plan with supportive regulations to address these problems will be a major topic of discussion at the December Board of Fisheries meeting.

The Alaska Board of Fisheries has encouraged the development of the Bering Sea herring fishery while giving priority use to subsistence needs. The Board recognized that the current scientific data base is weak and the aerial stock assessment technique unproven. The Board directed the Department to conservatively manage herring while building an adequate data base upon which future management measures will be based.

The spawning biomass, particularly in the Togiak district, was dramatically less than last year's estimate. The bulk of the observed biomass was composed of older, mature fish. There was almost a complete absence of some age classes and an extremely poor showing of newly recruited fish. Although fisheries managers do not at this time forecast future abundance, the prospect for next year's fishery may be poor. The major component of the 1981 season may be 7 and 8 year old fish.

During the course of the 1980 season Department managers following the Boards guidelines, consequently closed all the districts as the desired harvest levels were achieved. In all fishing districts which produced reliable aerial biomass estimates, the exploitation rates exceeded 20%. For the Togiak fishery, the exploitation rate exceeded 29% of the low range of the biomass estimate. After completion of the Department survey of herring wastage, the exploitation rate may go higher.

RECOMMENDATIONS

The Department recommends that no additional fishing during the 1980 season be permitted on the Western Alaska herring stocks. Under State regulations no domestic offshore fishery for food or bait herring is permitted north of 56° north latitude in the Bering Sea. The Department strongly recommends that the foreign and joint venture fishery for herring not be permitted for the remainder of the 1980 fishing season. We would further recommend Federal sanctions which would strongly discourage covert targeting on herring. This could be accomplished by instituting a herring savings area or to continue the classification of herring as a prohibited species, coupled with increased enforcement.

Table 1. Preliminary results of the 1980 Western Alaska Herring Fishery. This table will be revised September 1980.

Fishing District	Fishing Dates	1980 Harvest (mt)	Harvest by Gear			Harvest Use		Number Fishermen	Number of Vessels		Number Processors
			Purse Seine (mt)	Gill Net (mt)	Beach Seine (mt)	Sac roe (mt)	Bait Food (mt)		Purse Seine	Gill Net	
Togiak	Apr 26-May 15	20,274 ^{1/}	14,967 (84%)	2,807 (16%)	-	15,059	2,715	N.A.	140	363	27
Security Cove	May 14-May 28	611	-	611 (100%)	-	537	74	178	-	110-112	8
Goodnews Bay	May 18-May 24	407	-	407 (100%)	-	378	29	165	-	44	4
Cape Romanzof	May 21-June 7	554	-	554 (100%)	-	543	11	69	-	54	2
Norton Sound	May 21-June 6	2,215	-	2,181 (98.5%)	34 (1.5%)	2,214	1	289	-	N.A.	8

^{1/} Includes a minimum estimates of 2,500 mt of herring wastage.

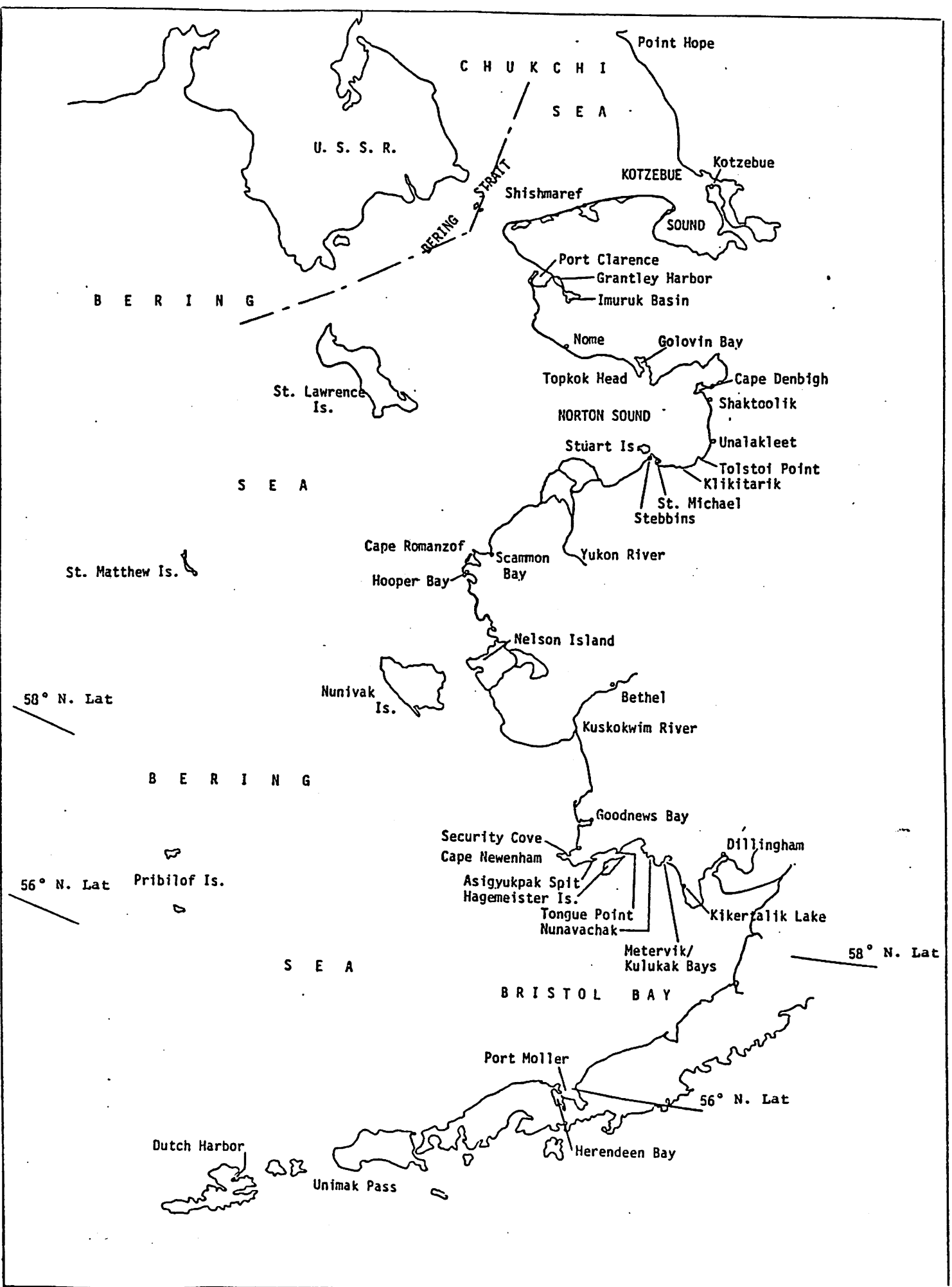


Figure 1. Bering Sea Area

Table 2. Preliminary results of aerial surveys flown during the 1980 Western Alaska Herring Fishery. This table will be revised September 1980.

Fishing District	Number of Surveys	Dates of Surveys	Survey Conditions	Population Estimate ^{1/} (mt)	1980 Harvest (mt)	Exploitation Rate	Available Offshore Harvest ^{3/}	1979 Population Estimate (mt)
Togiak	23	April 15-June 7	Acceptable	69,300-146,000	20,274 ^{2/}	29%	0	196,600-450,900
Security Cove	14	May 2-June 7	Acceptable	2,700-4,500	611	23%	0	10,900-21,900
Goodnews Bay	9	May 5-May 24	Unacceptable	N.A.	407	N.A.	N.A.	5,600-8,400
Cape Romanzof	N.A.	N.A.	Unacceptable	N.A.	554	N.A.	N.A.	1,600-3,200
Norton Sound	9	May 8-June 7	Acceptable	10,800-23,800	2,215	21%	0	7,000-14,000

1/ Refer to text for explanation of biomass estimates.

2/ Includes preliminary estimate of 2,500 mt of wastage.

3/ Includes domestic offshore, Joint Venture, and TALFF.

Table 3. Preliminary results of the 1980 Western Alaska roe on kelp fishery.
This table will be revised September 1980.

Fishing District	Fishing Dates	1980 Harvest (mt)	Number of Fishermen	Number of Processors
Togiak	May 5-May 13	86	78	5
Security Cove	N.A.	0		
Goodnews Bay	N.A.	0		
Cape Romanzof	N.A.	0		
Norton Sound	June 9-June 12	22	20	1