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1994 HERRING FISHERY MANAGEMENT PLAN
NORTON SOUND DISTRICT

(Includes information regarding Port Clarence and
Kotzebue Herring Districts)

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Introduction

This management plan was developed to inform fishermen and processors of strategies that will be employed by the Department of Fish and Game to manage the Norton Sound herring fishery and to provide background regarding the Port Clarence and Kotzebue herring districts. Recent regulation changes are noted and briefly discussed. Also included in this management plan is a review of the status of the Norton Sound fishery and stocks, processor/buyer requirements, and a description of Department activities.

Unalakleet will be the base of operations for Department management, research, and enforcement activities within Norton Sound. A field camp will be established at Cape Denbigh. In recent years, a test fish crew has been moved to alternate locations depending on sea ice conditions and fishery information needs. Department activities will include aerial biomass assessment surveys, processor registration, catch monitoring, spawn deposition surveys, test fishing, and catch sampling of herring for age, sex, size and maturity information.

A daily fleet broadcast will be made at 11:00 a.m. and 6:15 p.m. on SSB 4125, VHF 7 and CB 7 to inform fishermen and processors of current fishery status. Announcements regarding fishery openings and closures will also be provided by phone to local villages and AM radio stations (KICY,850 and KNOM,780). The Unalakleet office will be open daily after May 16 from approximately 8:00 a.m. to 6:00 p.m. with a telephone recorded message providing fishery update information 24 hours per day.

Status of the Fishery

A large scale domestic herring fishery was not initiated in Norton Sound until 1979, although a smaller fishery had occurred sporadically within this area since the early 1900's. The historical catch information is presented in Table 1. During the recent years the majority of the harvest has occurred annually between Stuart Island and Cape Denbigh (Figure 1 and 2). The estimated biomass and harvest have remained relatively stable since 1981. Biomass estimates have ranged from 17,400 st to 57,974 st; harvests have ranged from 3,548 to 6,439 st, ignoring the fact no commercial fishery occurred during 1992 .

During recent years, the efficiency of the fishing fleet has increased dramatically. Openings have gradually shortened from 10 days during 1981 to less than 15 hours in 1991. This increase in efficiency is primarily due to advances in gear technology, i.e., mechanical aids, larger boats, and more efficient nets. Requirements limiting the rate of harvest and raising the quality standards in the 1993 fishery caused the gillnet harvest to be pulsed and net length to be limited. This new management strategy and the delay in the arrival of the younger age classes extended gill net fishing time in 1993 to 39.5 hours.

Port Clarence and Kotzebue District:

Until 1987 commercial herring catches from the Port Clarence and Kotzebue districts never totaled more than 10 st. During the 1987 season, 147 st of herring were delivered from the Port Clarence District roughly 2 weeks after the closure of the Norton Sound fishery. Roe condition indicated that the fishery could have occurred as much as 5 days later and yielded a higher value product.

During the 1988 season, a total of 80.0 st were harvested with an average roe percent of 8.2. The bulk of commercial fishery landings occurred on June 11. Gill net fishermen landed 23.6 st with an average roe recovery of 8.9%; purse seiners landed 56.4 st at 7.6% roe recovery. High catches of incidental species complicated fishing operations for both gear types. Incidental species captured included whitefish, starry flounder, tom cod, and char. No sac roe fishery occurred in Port Clarence since the 1988 season.

Biomass observations in Port Clarence are made difficult by the late breakup and heavy organic coloring of the water. Spotter pilots and fishermen experienced difficulty in distinguishing herring from saffron cod and other nonmarketable species.

The Kotzebue Sound herring stocks have never supported a commercial fishery. It is thought that a fishery would have a similar timing to the Port Clarence fishery and would probably occur in the vicinity of Deering.

Status of Stocks

The arrival of herring on the Norton Sound spawning grounds appears to be greatly influenced by climatological conditions, particularly the extent and distribution of the Bering Sea ice pack. Spawning herring generally appear near the coast soon after ice breakup, sometime in May or early June. The first commercial deliveries made in Norton Sound have ranged from May 18 to June 13, approximately 3 weeks after initiation of the Togiak herring fishery. The primary spawning areas have been from Stuart Island to Tolstoi Point. When sea ice has remained in this area into June, spawning has been more extensive along Cape Denbigh and several locations along the northern shore of Norton Sound between Bald Head and Topkok bluffs.

During 1993 the inseason biomass was estimated to be 46,549 st. By adjusting for growth and survival it is estimated that the 1994 biomass will be 39,103 st, which would yield a harvest of 7,821 at a 20% exploitation rate. This harvest estimate represents the pre-season projection which the beach seine quota will be based on. The beach seine harvest will not exceed 782 st. Since methods to reliably estimate recruitment have not been developed, returns of ages 3 through 5-year-old herring could increase the 1994 observed biomass over the projected biomass. The 1994 spawning biomass is expected to be dominated by age 6, 8, 11 and 12 year herring, these age classes are expected to compose 24%, 14%, 13% and 16% of the total biomass respectively with all other age classes composing less than 10%.

Management Strategies

The harvest in the Norton Sound District will follow the statewide management policy which sets the maximum exploitation rate at 20% of the estimated biomass of spawning herring. The upper end of the range will be applied to stocks in good condition (large volume, increasing abundance, good recruitment). Smaller stocks or stocks that are exhibiting a trend of decreasing abundance or poor recruitment will be exploited at lower than maximum rates.

The Norton Sound District herring biomass will be harvested near the 20% exploitation rate if inseason aerial biomass surveys and age class composition information indicate the return is as expected. Department personnel will be conducting aerial surveys and sampling age class compositions inseason to obtain current year biomass information. If the run does not develop as projected, the harvest exploitation rate could be reduced from the maximum level. Since methods to reliably forecast herring returns are still being developed, and estimates of recruitment are not available, harvest levels will be adjusted during the season according to observed biomass and age structure. The harvest should approach 7,821 st (7,039 st by gill nets, 782 st by beach seines). Once again the fishery managers will target the older age classes, which typically arrive earliest. Any late season openings will be announced to exclude areas where six year-old or younger herring might be concentrated in order to maximize roe recovery.

Herring abundance will be estimated primarily by aerial surveys. Surface area estimates will be made of each school and depending on water depth, a tonnage conversion factor will be assigned. Tonnage conversion factors are determined by capturing schools of herring with known surface areas and weighing the resulting catch. The tonnage conversion data base is updated from research conducted in the Togiak and Norton Sound Districts. There are problems inherent with aerial surveys, and some of these are inclement weather, variable densities and depths of schools, fish school species identification, and multiple school counting. The Department will monitor test fish catches in order to assess the incidence of other schooling fish in the district.

If inclement weather and water conditions prohibit satisfactory aerial surveys, then stock abundance and condition will be assessed by using a combination of data from test and commercial catches including catch rates, percentage roe recovery, ratios of pre-to post-spawners and relative age class composition. Additional information to assess stock abundance will include spawn deposition observations and projections from 1993 post-season escapement estimates.

Legal fishing gear within the Norton Sound District has been limited to gill nets and beach seines since 1980. Prior to the 1985 season the Alaska Board of Fisheries adopted regulations which: (1) limited beach seine harvest to not more than 10% of the pre-season projected harvest, and (2) closed the district to the commercial harvest of spawn on kelp.

Due to the nature of the herring gill net fishery, significant wastage can occur from unmarketable fish having poor roe recovery. Gill net fishermen can minimize wastage by staying with their nets and fishing only when the herring are carrying a marketable quality of roe. The volume of fish that are discarded (not sold or

utilized for subsistence) will be estimated and included in the total harvest. Because of the tendency of previous years' fisheries to have early fishing on unmarketable fish, the Department proposed a regulation that has been put into effect giving the staff authority to open the fishery by emergency order.

Gear Limits:

Two new regulations were established at the October 1991 Board of Fisheries meeting, they are:

1. At least one cork every ten fathoms must be marked with the permit holders CFEC number and vessel license number.
2. Effective January 1, 1994, gill nets will be limited to not more than 60 meshes in depth.

Fishing Season - Periods:

The commercial herring fishery will open by emergency order. This year roe quality will be monitored initially by ADF&G field crews at Cape Denbigh, Klikitarik, and Unalakleet. As the herring approach marketable ripeness, ADF&G will organize daily "beach parties". These "beach parties" are intended to provide a public forum where fishermen, buyers and biologists can evaluate the progress of herring maturity and reach a common decision on the marketability of the resource.

Ideally these "beach parties" will begin several days before the first opening at Unalakleet unless announced otherwise. In order to accurately evaluate the entire District's herring resource it may be necessary to find a central location to hold the "beach parties". Since herring usually ripen first in the southern subdistricts, St. Michael, Unalakleet, and Cape Denbigh will all be considered as possible sites. Final selection of the beach party site will depend on biomass observations and the number of potential participants.

The fishery will open once the herring are judged marketable or when significant spawn is observed. Fishing period length will depend on (1) processing capacity, (2) the backlog of harvested, but unprocessed fish, (3) biomass distribution, and (4) the timeliness of catch reporting. The fishery will close when 20% of the herring biomass is judged to have been harvested, when wastage is judged to be excessive, or when the buying capacity has been reached.

Several subdistricts will probably be opened simultaneously. However, subdistricts may be closed independently of each other to prevent over harvesting if herring biomass distribution and harvest rates make such action necessary. A difference in the timing of spawn could also cause the southern subdistricts to close before the northern subdistricts. Beach seine fishing periods may be reduced in length or established separately from gill net fishing periods to provide the Department the opportunity to closely monitor the harvest rate and gain accurate catch reports. With the emphasis on quality this year, the rate of harvest is likely to be reduced to minimize holding time in tenders. If a limited number of buyers are present, some fishermen may be without a market.

Relatively short periods will help to maintain top quality, while minimizing wastage.

Table 1. Commercial herring fishery summary information, Norton Sound District, 1979 – 1993.

| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 |
|-------------------|---------------|--------------|---------------|--------------|---------------|--------------|-------------|---------------|---------------|---------------|---------------|-------------------|---------------|
| Est. biomass (st) | 25100 | 17400 | 28100 | 23100 | 20000 | 28100 | 32370 | 33924 | 25981 | 39384 | 42854 | 57974 | 46549 |
| Catch (st) | | | | | | | | | | | | | |
| Gill net | 4371 | 3933 | 4541 | 3245 | 3379 | 4979 | 3759 | 4474 | 4351 | 6032 | 5150 | ^a | 4287 |
| Beach seine | 0 | 0 | 41 | 327 | 169 | 215 | 323 | 198 | 390 | 347 | 522 | ^a | 742 |
| No. of fishermen | 332 | 237 | 272 | 194 | 277 | 323 | 564 | 348 | 357 | 365 | 279 | ^a | 264 |
| No. of buyers | 13 | 7 | 9 | 8 | 11 | 10 | 11 | 11 | 9 | 8 | 8 | ^a | 5 |
| Average roe % | 8.8 | 8.8 | 8.6 | 10.3 | 9.9 | 9.6 | 8.6 | 9.0 | 9.2 | 8.8 | 9.3 | ^a | 9.9 |
| Peak catch day | 5/24 | 6/8 | 5/23 | 6/10 | 6/20 | 6/9 | 6/7 | 5/28 | 5/28 | 5/29 | 5/25 | 6/20 ^b | 5/25 |
| Fishery duration | 5/18 -5/28 | 6/3 -6/11 | 5/18 -5/28 | 6/6 -6/12 | 6/13 -6/21 | 6/3 -6/10 | 6/7 -6/8 | 5/27 -5/31 | 5/27 -5/30 | 5/28 -5/30 | 5/23 -5/25 | ^a | 5/24 -6/05 |

^a No fishery due to late sea ice breakup.

^b Date of peak aerial survey biomass estimate, typically one or two days prior to peak catch.

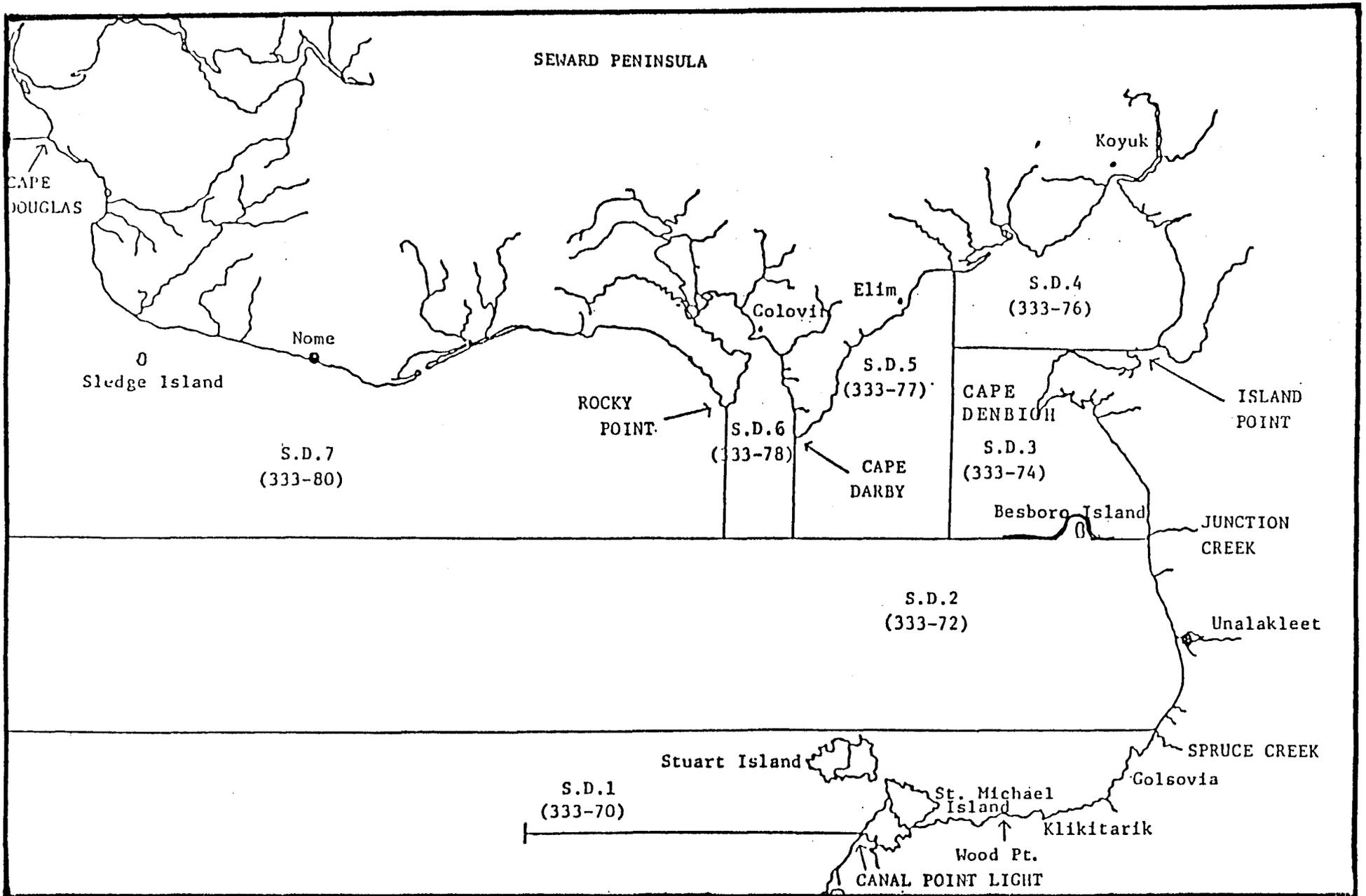


Figure 1. The Norton Sound District and Subdistricts.

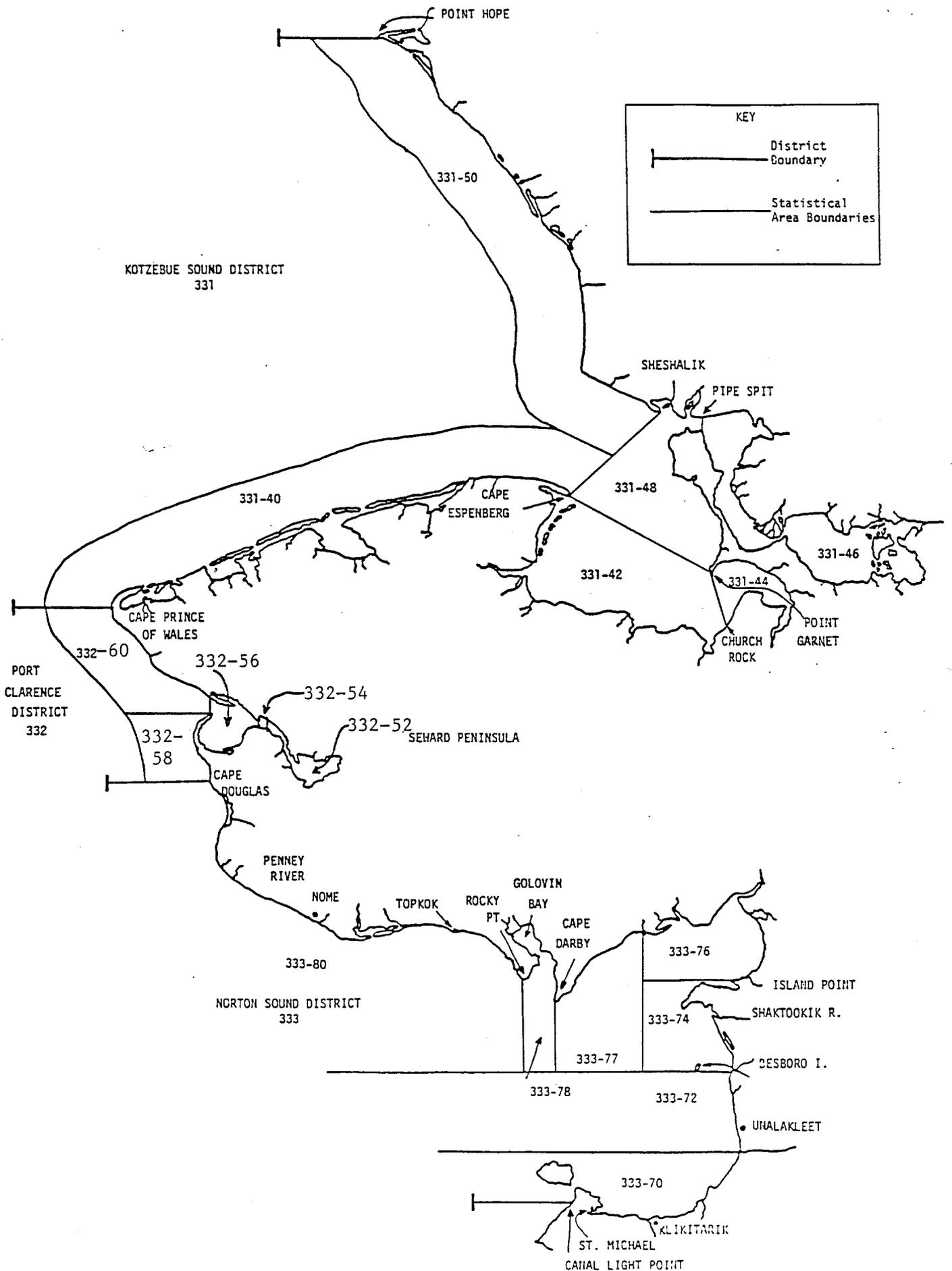


Figure 2. Statistical areas of the Norton Sound, Port Clarence, and Kotzebue commercial herring fishery districts