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NORTON SOUND DISTRICT  
SALMON REPORT  
to the  
Alaska Board of Fisheries

By  
Fred Bue  
and  
Charles Lean

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Alaska Department of Fish and Game  
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## 1993 NORTON SOUND SALMON FISHERY, A REPORT TO THE BOARD

### Commercial Fishery Overview

The Norton Sound commercial salmon fishing season typically begins on a date established by emergency order between June 8 and June 20 in Subdistricts 2, 3, 4, 5, and 6 and on July 1 in Subdistrict 1 as explained in regulation. Because of chum salmon conservation concerns the Nome(1) Subdistrict did not open until August 2, the Golovin(2) Subdistrict did not open until July 13, and the Moses Point(3) Subdistrict did not open until August 6. The Norton Bay(4) Subdistrict opened on June 17, while the Shaktoolik(5) and Unalakleet(6) Subdistricts opened on June 14. The season usually ends by regulation on August 31 in Subdistricts 1, 2, and 3, and September 7 in Subdistricts 4, 5, and 6. However, the 1993 fishing season was extended through September 8 in Subdistrict 5 and 6 (Figure 1).

The 1993 Norton Sound commercial salmon harvest totaled 263,670 fish, which was comprised of 8,972 chinook, 279 sockeye, 43,283 coho, 157,574 pink, and 53,562 chum salmon (Table 1). The chinook harvest was 53% above the previous 5-year average (1988-1992) and 11% above the previous 10-year average (1983-1992). The coho harvest was 43% below the previous 5-year average and 10% above the previous 10-year average. The pink salmon harvest which is seldom a directed fishery was 864% above the previous 5-year average and 385% above the previous 10-year average. The chum salmon harvest was 31% and 57% below the previous 5 and 10-year averages, respectively. Historical catch data for the Norton Sound District is presented in Table 1.

A total of 200 CFEC permits were renewed, of which 153 actually fished during the 1993 season (Table 2). The number of participating fishermen this season was slightly above the 10 year average of 142. Typically effort levels drop in light of poor chum salmon returns and low prices paid for the usual salmon species. The effort level was higher than in recent years possibly due to the increased market interest in Norton Sound pink salmon. The northern subdistricts had historically landed approximately 50% of the total commercial chum salmon harvest as compared to 2% this year with the southern subdistricts' portion also below their averages (Table 2).

Three domestic seafood buying companies purchased the majority of the commercially caught salmon in Norton Sound during 1993. One buyer operated out of Unalakleet, purchasing fish locally and also buying fish at Shaktoolik which were ferried to Unalakleet by small aircraft. The fish were iced in the round and shipped to Anchorage for processing via large cargo planes. The other major buyer had a processing vessel and two large tenders that purchased salmon catches throughout Norton Sound which were processed aboard ship. A third domestic buyer operated in the Moses Point Subdistrict for four periods during the coho salmon run. In addition, a few individual fishermen sold their catches of fresh salmon locally and to wholesale distributors, as permitted under the catcher-seller status.

Commercial fishermen received approximately \$322,117 for their catch in 1993. These earnings rank as the lowest value on record since 1976, and were 35% below

the previous 5 year average of \$492,425. This low fishery value is attributed to the low salmon returns, the lack of competitive markets, and low prices paid per pound for all salmon species. Prices paid to the fishermen averaged \$0.72 per pound for chinook, \$0.40 per pound for sockeye, \$0.22 per pound for coho, \$0.24 per pound for chum, \$0.15 per pound for pink, and \$1.76 per pound for coho salmon roe. These data are summarized in Table 3.

### **Subsistence Fishery Overview**

Household subsistence surveys were not conducted by the Commercial Fisheries Division during the 1993 season in Norton Sound villages due to budgetary restrictions. However, daily interviews of Unalakleet River and ocean subsistence fishermen were conducted at Unalakleet during the early portion of the fishing season in order to monitor the chinook salmon return. Total harvest by subsistence fishermen was not documented, however effort and catch information was used, in combination with the Department's test net in the lower Unalakleet River and commercial catch information, to judge the timing and magnitude of the chinook salmon return. This information was the basis for scheduling early commercial salmon fishing periods in the Unalakleet and Shaktoolik Subdistricts. Commercial fishing is typically only allowed after chinook salmon have been observed entering the Unalakleet River in building numbers for a weeks time to assure the harvest is directed on a healthy run and not on milling fish. There is a growing trend to move subsistence nets from the river mouth out to the ocean in order to avoid large debris loads from spring runoff. It is unclear what affects this change in fishing technique will have on chinook salmon escapement.

Subsistence fishing permits are required by regulation for each household that fishes in the Nome Subdistrict. These permits identify the body of water to be fished, the type of gear used, and the bag limit which is specific to that body of water. In addition there is a catch calendar where the permit holder records the catches in numbers of each species of fish for each day fished. If the subsistence fishers have filled their bag limits or would like to fish another location, they can be issued another permit generally for another area after the previous one has been returned. These permits are important to management because they identify users and bag limits, but the actual catch information can not be compiled until well after the season when the permits are returned to Fish and Game.

### **Season Summary by Subdistrict**

#### **Nome - Subdistrict 1**

The commercial salmon season was opened by Emergency Order(E.O.) on August 2. This management action was taken in order to avoid the harvest of chum salmon which were expected to return in low numbers to subdistrict. Similar action was taken to close subsistence and sport fishing in the area prior to the beginning of the chum salmon return. Subsistence fishing returned to its standard fishing schedule by E.O. on August 2 and beach seines were made a legal subsistence gear type with the condition that no chum salmon could be retained from the catch. Commercial and subsistence fishing was only allowed when there became little

chance for removing large portions of the chum return from each system and at the same time allowing the harvest of other species. The coho salmon return appeared to be average in the Nome Subdistrict which warranted the standard fishing schedule for the remainder of the season. The total commercial harvest for the Nome Subdistrict was 611 coho, and 132 chum salmon (Tables 2 and 5). One hundred forty-two subsistence permits were issued for the Nome area and harvest data will be presented in a later report following the return of the permits.

#### Golovin - Subdistrict 2

The 1993 Salmon Management Plan informed fishermen that the Golovin Subdistrict commercial harvest would be limited to 10,000 chum salmon in an attempt to protect the chum stock which has been experiencing decreasing returns over the past 5 years. This season the only buyer interested in operating in the subdistrict wanted a pink salmon directed fishery but was aware that once 10,000 chum salmon were harvested the fishery would be shut down. Therefore, the first commercial period was held off until July 1 when the fishery opened by E.O. for a 24 hour period in a restricted area with pink gear only. The intention was to not only limit the amount chum salmon harvested, but to also test the quantity and quality of the pink salmon and test the feasibility of tendering the fish across Norton Sound to the processor located near Shaktoolik. The buyer was somewhat satisfied with the results and the chum harvest was low, making up 25% of the total catch for that period.

Two additional periods were scheduled, one for 36 hours and the other for 24 hours. Both with the same gear and area restrictions. The last period was on July 22 after which the buyer's processing vessel departed Norton Sound. The total season harvest for the Golovin Subdistrict was 1 chinook, 4 sockeye, 2,803 chum, and 8,480 pink salmon (Tables 2 and 6). The season remained closed due to lack of market.

#### Moses Point - Subdistrict 3

The Moses Point Subdistrict has also experienced a decrease in size of the chum salmon return in recent years despite conservative management actions. Both a preseason fisherman's meeting and the 1993 Salmon Management Plan notified the public that a poor chum salmon return was expected. There was little hope for a chum directed fishery with the possibility of a subsistence closure during the run if the chum escapement levels appear certain to fall short of the Kwiniuk River counting tower goal. The chum salmon return was closely monitored throughout the run by both the counting tower and aerial surveys which indicated a poor chum salmon return.

On July 17 an E.O. was issued to restrict subsistence fishing in the Moses Point Subdistrict by not allowing fishing above the counting tower site on the Kwiniuk River and the entire Tubutulik River through July 31. This action was taken to protect those chum salmon that have already made their way to the spawning areas and at the same time allow for the harvest of pink and coho salmon that have slightly later migrational timings.

The coho salmon return was expected to be of at least average run strength and a buyer expressed interest in operating in the area during the coho season. On August 6 the subdistrict was opened by E.O. for a 24 hour period to test the run strength and the feasibility of shipping salmon from the remote location. Conditions appeared acceptable and 3 more periods were coordinated to accommodate the buyer's schedule with the last period ending on August 27. Thirteen fishermen harvested 4,065 coho and 167 chum salmon (Tables 2 and 7). The fish were gilled and gutted then sold to the buyer who accepted both the carcass and the roe. The fish were iced and flown to Fairbanks for further processing.

#### Norton Bay - Subdistrict 4

The Norton Bay Subdistrict has always had difficulty attracting a buyer due to its remoteness and its reputation for water-marked fish, however, this season a buyer was interested special periods. Since there were no biological indications why a limited harvest should not occur, an E.O. opened the subdistrict for a 24 hour period beginning on June 18 to test the run strength, feasibility of tendering the fish out of the area to a processing vessel, and the quality of the product. The runs appeared adequate to allow additional harvest, but the buyer was unhappy with the quality of the fish. The subdistrict did not open again until June 26 for 24 hours in order to check the quality again. The chum salmon were water-marked but the flesh was firm and the period was extended an additional 24 hours. Two additional periods were opened by E.O. because the king salmon run strength in eastern Norton Sound was shown to be above average, with good escapement levels. The last period ended on July 5 with a total season harvest for the subdistrict of 267 chinook, 290 pink, and 1,378 chum salmon (Tables 2 and 8).

#### Shaktoolik - Subdistrict 5

Both the Shaktoolik Subdistrict and the Unalakleet Subdistrict, located immediately to the south, consistently attract markets due to their larger volume of fish and better transportation services. Management actions often encompass both subdistricts because of their close proximity to one another and the fact that they have similar run timing abundance trends. However, there were several E.O.'s. issued this season that changed fishing times at the request of fish buyers who had to coordinate buying operations with tender vessels and cargo flights.

The first important E.O. opened commercial fishing in the Shaktoolik and Unalakleet Subdistricts for a 24 hour period on June 14 with unlimited mesh size. That opening was followed by a second 24 hour period on June 17 for the same areas and gear. Comparative catches from the first two periods indicated a good chinook salmon return, therefore both subdistricts were placed on a standard fishing schedule of two 24 hour periods per week beginning June 21 and continued with the open mesh size regulation. In addition, drift fishing was allowed which was intended to help fishermen from fowling their nets with the large amount of debris common during the spring season. Both subdistricts were placed on the standard two 48 fishing periods per week on June 25 which continued through the remainder of the season.

On July 11 both subdistricts opened for a 36 hour period with a gear restriction of 4 1/2 inch mesh or smaller and reduced harvest areas. The Shaktoolik Subdistrict was restricted to that section of coast between the mouth of the Shaktoolik River east to the Foothills. By that time early indications of the chum salmon run showed a weak return. Therefore on July 12 an E.O. continued those same parameters for the standard fishing schedule through July 31, after which gear restrictions would revert back to chum gear and harvest area would be extended out to the established subdistrict boundaries. There was one additional 24 hour pink salmon period added to the schedule which began on July 18.

The last two standard fishing periods in July were closed to help bolster chum salmon escapement and make up for the number of chum salmon that were caught as incidental species during the pink salmon directed fishing periods. Standard fishing periods and regulations were resumed through September, however the last remaining fish buyer ceased operations in the subdistrict on August 24.

Two fish buyers operated in the Shaktoolik Subdistrict during the season. One buyer operated from a processing vessel and was primarily interested in purchasing pink salmon which were filleted using pollack processing equipment. The other species were purchased by both buyers, iced in the round, transported to Unalakleet, and then shipped to Anchorage for further processing or for sale on the fresh market.

Thirty-seven fishermen harvested 2,757 chinook, 20 sockeye, 12,315 coho, 20,926 chum, and 106,743 pink salmon for a combined total harvest of 142,761 fish (Table 2 and 9). The chinook harvest was 98% above the previous 5 year average and 38% above the previous 10 year average catch. The coho salmon harvest was 36% and 46% above the previous 5 and 10 year average catches respectively. The chum salmon harvest was below both the previous 5 and 10 year averages at 15% and 21% respectively. A pink salmon harvest seldom occurs in the Shaktoolik Subdistrict with catches only reported three times in the previous 10 years. The 1993 pink harvest far exceeded all recorded seasons including the previous record catch in 1978 of 46,000 pinks .

#### Unalakleet - Subdistrict 6

The Unalakleet Subdistrict receives the most fishing effort in Norton Sound, and historically has not had problems obtaining buyers for all their salmon species with the exception of pink salmon. The commercial fishing management actions are typically the same as those for the Shaktoolik Subdistrict because of their close proximity (shared boundary) and the difficulty in obtaining timely escapement information. However fishing times varied throughout the season to accommodate buyers and fishermen. The Unalakleet subsistence fisherman interviews and the Fish and Game test net in the Unalakleet River were used as indicators of salmon abundance and escapement in both Subdistricts 5 and 6.

The first fishing period began on June 14. It was a 24 hour period with unlimited mesh restrictions and intended to test the run strength of the early portion of the chinook salmon return. Indications were good so a second 24 hour period was scheduled for June 17 and on June 21 the subdistrict was put on a standard schedule two 24 hour periods per week. Drift-fishing was allowed in an

attempt to avoid the large debris loads present in the water. Fishing time in the subdistrict increased on June 25 to two 48 hour periods per week and an E.O. was announced to restrict gear size to a six inch maximum mesh size on July 15 as required by regulation. The last two fishing periods of July were closed due to the low chum salmon escapement levels as indicated by the Department's aerial surveys and test net catches in the Unalakleet River. The subdistrict reopened on August 1 and the standard fishing schedule was shifted slightly to accommodate the only fish buyer operating in the area and the season ended on September 8.

There were two special pink salmon directed fishing periods scheduled during the regular season. These were at the request of a fish buyer who operated from a processing vessel which ran pink salmon through a pollack filet machine. The first period began on July 11 and lasted 36 hours and the second period began on July 18 and lasted 24 hours. The same buyer also processed pinks that were caught incidentally during the regularly scheduled chum salmon directed periods. The remainder of the subdistrict's harvest was iced in the round and flown to Anchorage markets. In addition, a few fishermen sold some of their catches to individuals and local businesses as permitted under the catcher-seller regulations.

A total of 66 fishermen harvested 5,944 chinook, 251 sockeye, 26,290 coho, 42,061 pink, and 28,156 chum salmon for a total combined harvest of 102,702 fish (Table 2 and 10). The chinook salmon harvest was 45% above the previous 5 year average and 9% above the previous 10 year average catch. The coho harvest was 47% and 32% below the previous 5 and 10 year average catches, respectively. The chum salmon harvest was also 13% and 27% below their respective previous 5 and 10 year average catches. As stated earlier, pink salmon fisheries only take place occasionally. The pink harvest this year was 77% and 78% above the previous 5 and 10 average catches respectively.

### Escapement

Table 4 lists aerial survey and tower escapement counts in the major index streams of Norton Sound. Survey conditions varied throughout the district and were only fair this season overall. Heavy rains occurred during the peak survey dates for both chum and coho salmon species. Some early and late surveys were obtained for chums, but have limited value when comparisons are made with previous seasons. The Nome Subdistrict streams received the most intensive survey efforts because salmon stocks local to the Nome area are limited, easily accessed by road system, and exposed to intensive subsistence and sport fishing pressure. For these reasons a new counting tower project was begun on the Nome River. The project got a late start for chum and pink salmon, but will provide good background information on coho run timing and abundance for the Nome River in the future. The counting tower on the Kwiniuk River in the Moses Point Subdistrict operated as usual and had good counting conditions with no breaks in the regular counting schedule. The Unalakleet Test Fish Project also operated as usual and is a very important management tool particularly during seasons with marginal surveying conditions.

Chinook

The Unalakleet and Shaktoolik Subdistricts are the primary chinook salmon producers in Norton Sound. Although on a smaller scale, the Norton Bay, Moses Point and Golovin Subdistricts have experienced gradually increasing chinook returns in recent years. Chinook salmon escapement surveys were well above average in the Unalakleet, Shaktoolik, and Moses Point Subdistricts. Daily subsistence fishermen interviews conducted at Unalakleet, the Department's test fish project in the Unalakleet River, comparative commercial catch data also agreed with the aerial survey results. However, chinook escapements were only average to slightly below average in the Golovin and Norton Bay Subdistricts.

#### Chum

Chum salmon escapements in the Nome Subdistrict were once again low at approximately 75% - 80% of the escapement goals. The Golovin Subdistrict is primarily a one river system with escapement goals set for individual tributaries. This season the chum salmon seemed to be redistributed with some tributaries well above goals and others well below, but as a combined system, escapement appeared adequate. The Moses Point Subdistrict was at about 80% of its goal while the one stream in the Norton Bay Subdistrict which was surveyed had three times the escapement goal for chum salmon.

Early surveys in both the Shaktoolik and Unalakleet Subdistricts and the Department's test net catch in the Unalakleet River indicated either low or late chum runs. No peak surveys were obtained for either subdistrict, but by the end of the season the test net catch was near the cumulative average. Therefore, it is assumed that the run was somewhat late and the chum salmon escapement was adequate in both systems.

#### Coho

Coho salmon are found in nearly all of the chum producing streams throughout Norton Sound with the major commercial producers being the Unalakleet and Shaktoolik Subdistricts. Because of the inclement weather normally experienced in this area during August and September, escapement data for all subdistricts is somewhat sketchy. Most streams in the northern subdistricts were flown under fair to good conditions while the rest of Norton Sound was flown under poor conditions or not attempted due to unacceptable conditions.

Overall, coho salmon escapements appeared to be average. The 1993 season was the first year coho salmon had been enumerated from a counting tower on the Nome River. The data shows a substantial population, but there is nothing to compare it with. Therefore, judging from the aerial surveys coho salmon escapements in the Nome Subdistrict were about average. The Golovin Subdistrict's index streams were mixed with one well above average and the other well below. Therefore, indications are of an average coho escapement in the subdistrict. The Moses Point Subdistrict aerial surveys showed good escapements which agreed with the strong commercial catches in that subdistrict.

No peak coho surveys were obtained for the Norton Bay, Shaktoolik, or Unalakleet Subdistricts in 1993 due to poor conditions which may also have been the cause

of the low commercial and test fishery catches. An early survey found good numbers of coho while catches had been low and therefore escapement was assumed to be adequate.

## Pink

Pink salmon returns to Norton Sound have recently followed an odd/even year cycle with the even years typically much larger than the odd years. This year the pink salmon escapement levels were believed to be one to two orders of magnitude below even year averages throughout the district. Pink salmon have a relatively short residence time in the rivers and are more easily washed out as a result of high water events similar to this year during the peak time period. Consequently, only adequate surveys were obtained for the Norton Bay and Shaktoolik Subdistricts, while the Kwiniuk River tower provided reliable pink salmon counts as usual.

## Management Concerns

Chum salmon stocks have declined throughout Norton Sound over the past six years with escapements in the northern subdistricts continuing to be a major concern. Chum salmon escapements consistently fall short of goals even when all forms of harvest have been drastically reduced. The Nome Subdistrict closed nearly the entire chum run to sport, commercial and subsistence fishing. The Golovin Subdistrict planned on closing commercial harvest once a 10,000 chum cap was reached to allow for escapement, but with a commercial harvest of only 2,800 the subdistrict barely made its goals. Even though the Moses Point Subdistrict was closed to commercial and sport fishing and, for the first time ever, subsistence fishing was restricted, the subdistrict still fell short of its goals. Both the Shaktoolik and Unalakleet Subdistricts required closed commercial periods to bolster chum escapements up to the goals for each of the river systems. Only the Norton Bay Subdistrict exceeded its escapement goals, which was not unexpected because of the low level of exploitation typical in the subdistrict.

The low chum salmon returns are no longer simply single age class failures in Norton Sound. Chum returns can be expected to be low for the next several years since the returns will be coming from low parent years. Even the exceptionally restrictive management actions taken in 1993 failed to achieve escapement goals in many of the district's river systems.

There has been a renewed interest in Norton Sound pink salmon this season where one fish buyer had adapted his pollack processing equipment to fillet pinks. Fishing schedules and gear conflicts must be worked out in season because the abundant pink and marginal chum runs overlap in time and area. Management will have to monitor more closely the pink stocks which in most areas have been considered in the past as an incidental species in the harvest with an insignificant level of impact.

The Unalakleet Subdistrict has experienced a black market fishery for king salmon over the past several years. In order to maintain escapement and provide subsistence opportunity, the legitimate commercial fishery has been cut back by

delaying the opening and keeping fishing periods to 24 hours in length. Subsistence fishing has been occasionally restricted during early summer to the lower section of the river in order to prevent the untraditional seining of pools where kings mill. More recently there have been complaints that coho salmon strips are now being illegally marketed outside of the local area. The illegal sale of salmon strips will continue to be a matter of concern in upcoming years.

### 1994 Outlook

Run forecasts and harvest projections for the 1994 commercial salmon season are based on qualitative assessments of brood year returns, subjective determinations of fresh water over-wintering survival and ocean survival, and projections of local market conditions. Salmon buyers are expected to operate in some of the subdistricts of Norton Sound during 1994. The chinook return is expected to be below average. Chinook commercial harvests are expected to range from 4,000 to 6,000. Pink salmon are expected to be strong, especially since it will be an even year cycle. In recent years, there has been little market for Norton Sound pink salmon, but a market for up to a million pink salmon is expected during 1994. Given this market and a typical even year return the pink salmon harvest could be significant. Chum and coho salmon escapements were not observed during the 1994 brood's parent year (1989 and 1990) due to high water and inclement weather conditions. A weak return of chum salmon is expected, but an average return of coho is expected. Harvests of chum are expected to range from 50,000 to 80,000. Commercial coho harvests are expected to range from 40,000 to 60,000.

Table 1. Commercial salmon catches by species, Norton Sound District, 1961 – 1993.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1961	5,300	35	13,807	34,327	48,332	101,801
1962	7,286	18	9,156	33,187	182,784	232,431
1963	6,613	71	16,765	55,625	154,789	233,863
1964	2,018	126	98	13,567	148,862	164,671
1965	1,449	30	2,030	220	36,795	40,524
1966	1,553	14	5,755	12,778	80,245	100,345
1967	1,804	—	2,379	28,879	41,756	74,818
1968	1,045	—	6,885	71,179	45,300	124,499
1969	2,392	—	6,836	86,949	82,795	178,972
1970	1,853	—	4,423	64,908	107,034	178,218
1971	2,593	—	3,127	4,895	131,362	141,977
1972	2,938	—	454	45,182	100,920	149,494
1973	1,918	—	9,282	46,499	119,098	176,797
1974	2,951	—	2,092	148,519	162,267	315,829
1975	2,393	2	4,593	32,388	212,485	251,861
1976	2,243	11	6,934	87,916	95,956	193,060
1977	4,500	5	3,690	48,675	200,455	257,325
1978	9,819	12	7,335	325,503	189,279	531,948
1979	10,706	57	31,438	167,411	140,789	350,344
1980	6,311	40	29,842	227,352	180,792	444,337
1981	7,929	56	31,562	232,479	169,708	441,734
1982	5,892	10	91,690	230,281	183,335	511,208
1983	10,308	27	49,735	76,913	319,437	456,420
1984	8,455	6	67,875	119,381	146,442	342,159
1985	19,491	166	21,968	3,647	134,928	180,200
1986	6,395	233	35,600	41,260	146,912	230,400
1987	7,080	207	24,279	2,260	102,457	136,283
1988	4,096	1,252	37,247	74,604	107,967	225,166
1989	5,707	265	44,091	123	42,625	92,811
1990	8,895	434	56,712	501	65,123	131,665
1991	6,068	203	63,647	221	86,871	157,010
1992	4,541	296	105,418	6,284	83,394	199,933
1993	8,972	279	43,283	157,574	53,562	263,670

5-Yr Avg<sup>a</sup>

5,861      490      61,423      16,347      77,196      161,317

10-Yr Avg<sup>b</sup>

8,104      309      50,657      32,519      123,616      215,205

<sup>a</sup> 1988–1992

<sup>b</sup> 1983–1992

Table 2. Norton Sound commercial salmon harvest summary by subdistrict, 1993.

		Subdistricts						Total
		1	2	3	4	5	6	Number
Number of Fishermen		1	8	26	15	37	66	153 <sup>a</sup>
Chinook	Number	0	1	3	267	2,757	5,944	8,972
	Weight(lbs.)		2	31	5,339	46,439	99,693	151,504
Sockeye	Number	0	4	4	0	20	251	279
	Weight(lbs.)		22	24	0	138	1,892	2,076
Coho	Number	611	2	4,065	0	12,315	26,290	43,283
	Weight(lbs.)	4,576	12	21,522	0	83,249	178,343	287,702
Coho Roe	Number	0	0	—	0	0	0	0
	Weight(lbs.)	0	0	2,608	0	0	0	2,608
Pink	Number	0	8,480	0	290	106,743	42,061	157,574
	Weight(lbs.)	0	21,780	0	1,125	277,532	106,383	406,820
Chum	Number	132	2,803	167	1,378	20,926	28,156	53,562
	Weight(lbs.)	879	13,439	845	10,219	133,946	187,744	347,072
Totals	Number	743	11,290	4,239	1,935	142,761	102,702	263,670
	Weight(lbs.)	5,455	35,255	25,030	16,683	541,304	574,055	1,197,782

<sup>a</sup> Some fishermen fished more than one subdistrict.

Table 3. Norton Sound salmon dollar value and average price paid to the fisherman, by species, 1993.

Species	Dollar value	Average price per lb.
Chinook	\$ 109,082.00	0.72
Sockeye	830.00	0.40
Coho	63,295.00	0.22
Roe	4,590.00	1.76
Pink	61,023.00	0.15
Chum	83,297.00	0.24
Total	\$ 322,117.00	

Table 4. Salmon survey counts of Norton Sound streams and associated chum salmon escapement goals, 1993.<sup>ab</sup>

Stream Name	Chinook	Coho	Sockeye	Pink	Chum	Chum Goal
Salmon L.			3,101			
Glacial L.			419			
Sinuk R.	7	104	30	5,120	1,570	4,500
Snake R.					317	1,000
Nome R.	56 <sup>c</sup>	3,061 <sup>c</sup>		9,212 <sup>c</sup>	1,520	2,000
Flambeau R.					1,590	3,250
Eldorado R.	38	110		120	2,885	5,250
Bonanza R.		510				1,500
Solomon R.		128		900	415	550
Fish R.	48			13,440	12,695	17,500
Boston Cr.	227			1,930	4,513	2,500
Niukluk R.	15	2,104		2,840	19,910	8,000
Ophir Cr.		14				
Kwiniuk R.	565 <sup>c</sup>	1,238		43,065 <sup>c</sup>	15,823 <sup>c</sup>	19,500 <sup>d</sup>
Tubutulik R.	1,061	1,395		18,650	8,740	12,000
Inglutalik R.						8,500
Ungalik R.	156			66,120	10,180	2,500
Shaktoolik R.	712			85,320	5,515	11,000
Unalakeet R.	253					
North R.	900	1,397		13,570	445	2,000
Old Woman R.	387					100
Kogok R.		115		70	70	
Pikmiktalik R.		525			150	

<sup>a</sup> Species identification difficult where large numbers of pinks salmon were observed.

<sup>b</sup> Counts should be considered minimums due to variable counting conditions.

<sup>c</sup> Preliminary expanded tower counts.

<sup>d</sup> Chum goal for tower count.

Table 5. Commercial salmon catches from Nome, Subdistrict 1, set gill nets, 1993.

Period Number	Period Dates	Hours Fished	No. of Fishermen	Period Catch and Catch Per Unit Effort											
				Chinook	Sockeye	Coho	CPUE	Chum	CPUE	Chinook	Sockeye	Coho	CPUE	Chum	CPUE
1	8/02-8/03	24	0	NO ONE FISHED -- TOO ROUGH											
2	8/05-8/06	24	0	NO ONE FISHED -- TOO ROUGH											
3	8/09-8/10	24	1	0	0	373	15.54	25	1.04	0	0	373	15.54	25	1.04
4	8/12-8/13	24	0	NO ONE FISHED -- TOO ROUGH											
5	8/16-8/17	24	1	0	0	38	1.58	34	1.42	0	0	411	8.56	59	1.23
6	8/19-8/20	24	0	NO ONE FISHED -- STORMY											
7	8/23-8/24	24	1	0	2	78	3.25	52	2.17	0	2	489	6.79	111	1.54
8	8/26-8/27	24	1	0	0	122	5.08	21	0.88	0	2	611	6.36	132	1.38
9	8/30-8/31	24	0	NO ONE FISHED -- TOO ROUGH											

All salmon sold as permitted under Catcher/Seller status.  
 No pink salmon were sold.  
 Total hours fished = 96  
 Total number of permits used = 1

Table 6. Commercial salmon catches from Golovin, subdistrict 2, Norton Sound, set gill nets, 1993.

Period Number	Period Dates	Hours Fished	No. of Fishermen	Period Catch and Catch Per Unit Effort							Cumulative Catch and Catch Per Unit Effort						
				Chinook	Sockeye	Coho	Chum	CPUE	Pink	CPUE	Chinook	Sockeye	Coho	Chum	CPUE	Pink	CPUE
1	7/13-7/14	24	4	0	1	0	290	3.02	885	9.22	0	1	0	290	3.02	885	9.22
2	7/16-7/17	36	8	0	3	0	1,357	4.71	3,559	12.36	0	4	0	1,647	4.29	4,444	11.57
3	7/22-7/23	24	7	1	0	2	1,156	6.88	4,036	24.02	1	4	2	2,803	5.08	8,480	15.36

Total hours actually fished = 84  
 Total number of permits used = 8

Table 7. Commercial salmon set gillnet catches from Moses Point, Subdistrict 3, Norton Sound, 1993.

Period Number	Period Dates	Hours Fished	No. of Fishermen	Period Catch and Catch Per Unit Effort						Cumulative Catch and Catch per Unit Effort				
				Chinook	CPUE	Coho	CPUE	Chum	CPUE	Chinook	Coho	CPUE	Chum	CPUE
1	8/06-8/07	24	16	1		537	1.4	41	0.11				41	0.03
2	8/10-8/12	48	21	2		1,921	1.91	77	0.08	3	2,458	1.77	118	0.08
3	8/17-8/18	24	18	0		879	2.03	35	0.08	3	3,337	1.83	153	0.08
4	8/26-8/27	24	13	0		709	1.60	14	0.04	3	4,065	1.86	167	0.08

Number of hours actually fished = 120

Number of permits used = 26

26 fishermen sold 2,608 pounds of roe which were recovered from same fish reported in catch.

Table 8. Commercial salmon set gillnet catches from Norton Bay, Subdistrict 4, Norton Sound, 1993.

Period Number	Period Dates	Hours Fished	No. of Fishermen	<u>Period Catch and Catch Per Unit Effort</u>						<u>Cumulative Catch and Catch Per Unit Effort</u>					
				Chinook	CPUE	Pink	CPUE	Chum	CPUE	Chinook	CPUE	Pink	CPUE	Chum	CPUE
1	6/17-6/18	24	6	31	0.22			1	0.01	31	0.22	0	0.00	1	0.01
2	6/26-6/28	48	13	178	0.29	9	0.01	391	0.63	209	0.27	9	0.01	392	0.51
3	6/30-7/01	24	13	36	0.12	84	0.27	455	1.46	245	0.23	93	0.09	847	0.78
4	7/03-7/05	48	9	22	0.05	197	0.46	531	1.23	267	0.18	290	0.19	1,378	0.91

Total number of hours fished = 144

Total number of permits fished = 15

Norton Bay subdistrict closed by Emergency Order on July 5 due to a lack of buyers in the area.

Table 9. Commercial salmon set gillnet catches from Shaktoolik, Subdistrict 5, Norton Sound, 1993.

Period Number	Period Dates	Hours Fished	No. of Fishermen	Period Catch and Catch Per Unit Effort								Cumulative Catch and Catch Per Unit Effort										
				Chinook	CPUE	Sockeye	Coho	CPUE	Chum	CPUE	Pink	CPUE	Chinook	CPUE	Sockeye	Coho	CPUE	Chum	CPUE	Pink	CPUE	
1	6/14-6/15	24	13	192	0.62					20	0.06			192	0.62				20	0.06	0	0.00
2	6/17-6/18	24	18	464	1.07					161	0.37			656	0.88				181	0.24	0	0.00
3	6/21-6/22	24	25	562	0.94					607	1.01	1	0.00	1,218	0.91	0			788	0.59	1	0.00
4	6/24-6/26	48	29	886	0.64	0	0	0.00		2,096	1.51	72	0.05	2,104	0.77	0			2,884	1.05	73	0.03
5	6/28-6/30	48	29	401	0.29	0	0	0.00		4,035	2.90	70	0.05	2,505	0.61	0			6,919	1.68	143	0.03
6	7/01-7/03	48	28	152	0.11	0	0	0.00		4,610	3.43	904	0.67	2,657	0.49	0			11,529	2.11	1,047	0.19
7	7/05-7/07	48	27	55	0.04	0	1	0.00		3,273	2.53	11,183	8.63	2,712	0.40	0	1		14,802	2.19	12,230	1.81
8	7/08-7/10	48	17	10	0.01	1	0	0.00		515	0.63	2,990	3.66	2,722	0.36	1	1		15,317	2.02	15,220	2.01
9	7/11-7/12	36	19	8	0.01	1	0	0.00		631	0.92	21,046	30.77	2,730	0.33	2	1		15,948	1.93	36,266	4.39
10	7/12-7/14	48	22	4	0.00	0	1	0.00		465	0.44	18,663	17.67	2,734	0.29	2	2		16,413	1.76	54,929	5.89
11	7/15-7/17	48	27	4	0.00	1	8	0.01		832	0.64	34,014	26.25	2,738	0.26	3	10		17,245	1.62	88,943	8.38
12	7/18-7/19	24	11	0	0.00	0	4	0.02		458	1.73	6,229	23.59	2,738	0.25	3	14		17,703	1.63	95,172	8.74
13	7/19-7/21	48	25	4	0.00	3	8	0.01		981	0.82	6,909	5.83	2,742	0.23	6	22		18,684	1.55	102,171	8.46
14	7/22-7/24	48	9	0	0.00	1	5	0.01		308	0.71	4,572	10.58	2,742	0.22	7	27		18,992	1.52	106,743	8.53
15	7/26-7/28	Period Closure																				
16	7/29-7/31	Period Closure																				
17	8/01-8/03	48	0	NO BUYER										2,742		7	27		18,992	1.52	106,743	
18	8/04-8/06	48	15	1	0.00	2	1,406	1.95		441	0.61			2,743		9	1,433	1.99	19,433	1.47	106,743	
19	8/08-8/10	48	16	7	0.01	4	2,446	3.18		711	0.93			2,750		13	3,879	2.61	20,144	1.44	106,743	
20	8/11-8/13	48	19	4	0.00	3	4,146	4.55		523	0.57			2,754		16	8,025	3.34	20,667	1.39	106,743	
21	8/15-8/17	48	14	0	0.00	0	494	0.74		81	0.12			2,754		16	8,519	2.77	20,748	1.33	106,743	
22	8/18-8/20	48	0	NO ONE FISHED - STORMY										2,754		16	8,519	2.77	20,748	1.33	106,743	
23	8/22-8/24	48	13	2	0.00	4	2,611	4.18		116	0.19			2,756		20	11,130	3.01	20,864	1.29	106,743	
24	8/25-8/27	48	0	NO BUYER										2,756		20	11,130		20,864		106,743	
25	8/29-8/31	48	0	NO BUYER										2,756		20	11,130		20,864		106,743	
26	9/01-9/03	48	0	NO BUYER										2,756		20	11,130		20,864		106,743	
27	9/06-9/08	48	0	NO BUYER										2,756		20	11,130		20,864		106,743	

Total hours actually fished = 852  
 Total number of permits used = 37  
 Cumulative coho boat hours began when 100 coho were caught.

Table 10. Commercial salmon set gillnet catches from Unalakleet, Subdistrict 6, Norton Sound, 1993.

Period Number	Period Dates	Hours Fished	No. of Fishermen	Period Catch and Catch Per Unit Effort								Cumulative Catch and Catch Per Unit Effort											
				Chinook	CPUE	Sockeye	Coho	CPUE	Chum	CPUE	Pink	CPUE	Chinook	CPUE	Sockeye	Coho	CPUE	Chum	CPUE	Pink	CPUE		
1	6/14-6/15	24	31	802	1.08	1				26	0.03			802	1.08	1	0			26	0.03		
2	6/17-6/18	24	41	543	0.55	0				40	0.04			1,345	0.78	1	0			66	0.04		
3	6/21-6/22	24	33	680	0.86	0				116	0.15			2,025	0.80	1	0			182	0.07		
4	6/24-6/26	48	47	1,682	0.75	1	1	0.00		498	0.22	1	0.00	3,707	0.78	2	1			680	0.14	1	0.00
5	6/28-6/30	48	48	1,076	0.47	11	0	0.00		3,602	1.56	9	0.00	4,783	0.68	13	1			4,282	0.60	10	0.00
6	7/01-7/03	48	49	592	0.25	6	2	0.00		4,337	1.84	139	0.06	5,375	0.57	19	3			8,619	0.91	149	0.02
7	7/05-7/07	48	43	269	0.13	24	0	0.00		3,634	1.76	1,535	0.74	5,644	0.49	43	3			12,253	1.07	1,684	0.15
8	7/08-7/10	48	34	99	0.06	8	2	0.00		2,196	1.35	1,246	0.76	5,743	0.44	51	5			14,449	1.10	2,930	0.22
9	7/11-7/12	24	18	8	0.02	7	1	0.00		620	1.44	11,703	27.09	5,751	0.42	58	6			15,069	1.11	14,633	1.08
10	7/12-7/14	48	28	43	0.03	19	8	0.01		1,393	1.04	7,684	5.72	5,794	0.39	77	14			16,462	1.10	22,317	1.50
11	7/15-7/17	48	29	44	0.03	57	30	0.02		3,212	2.31	9,029	6.49	5,838	0.36	134	44			19,674	1.21	31,346	1.92
12	7/18-7/19	24	8	4	0.02	7	24	0.13		554	2.89	6,417	33.42	5,842	0.35	141	68			20,228	1.23	37,763	2.29
13	7/19-7/21	48	33	22	0.01	18	74	0.05		2,252	1.42	2,516	1.59	5,864	0.32	159	142	0.01		22,480	1.24	40,279	2.23
14	7/22-7/24	48	26	21	0.02	13	156	0.13		2,309	1.85	1,782	1.43	5,885	0.30	172	298	0.02		24,789	1.28	42,061	2.18
15	7/26-7/28	Period Closure																					
16	7/29-7/31	Period Closure																					
17	8/01-8/03	48	6	3	0.01	4	92	0.32		140	0.49			5,888		176	390	0.03		24,929	1.27	42,061	
18	8/04-8/06	48	32	9	0.01	20	2,047	1.33		986	0.64			5,897		196	2,437	0.15		25,915	1.23	42,061	
19	8/08-8/10	48	38	9	0.00	21	4,790	2.63		636	0.35			5,906		217	7,227	0.40		26,551	1.16	42,061	
20	8/11-8/13	48	42	13	0.01	12	4,403	2.18		608	0.30			5,919		229	11,630	0.58		27,159	1.09	42,061	
21	8/15-8/17	48	30	7	0.00	5	3,401	2.36		372	0.26			5,926		234	15,031	0.69		27,531	1.04	42,061	
22	8/18-8/20	48	12	1	0.00	5	880	1.53		98	0.17			5,927		239	15,911	0.72		27,629	1.02	42,061	
23	8/22-8/24	48	21	5	0.00	4	2,141	2.12		202	0.20			5,932		243	18,052	0.78		27,831	0.99	42,061	
24	8/25-8/27	48	21	6	0.01	3	2,263	2.25		165	0.16			5,938		246	20,315	0.84		27,996	1.00	42,061	
25	8/29-8/31	48	20	4	0.00	3	3,359	3.50		73	0.08			5,942		249	23,674	0.94		28,069	0.97	42,061	
26	9/01-9/03	48	19	1	0.00	2	1,814	1.99		70	0.08			5,943		251	25,488	0.98		28,139	0.94	42,061	
27	9/06-9/08	48	15	1	0.00	0	802	1.11		17	0.02			5,944		251	26,290	0.98		28,156	0.92	42,061	

19

Total hours fished = 1080

Total number of permits used = 66

Cumulative coho boat hours began when 100 coho were caught.

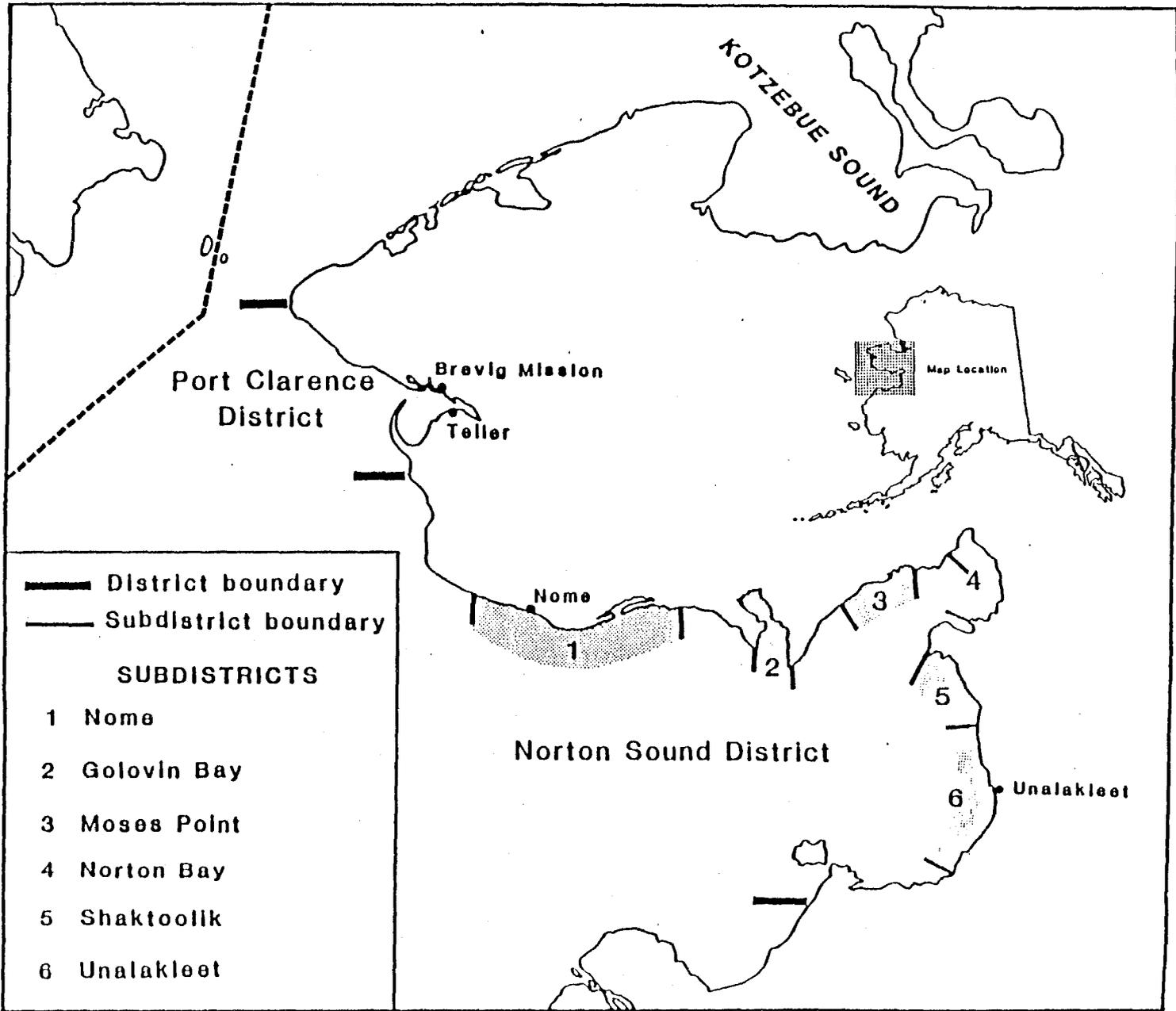


Figure 1. Norton Sound commercial salmon fishing subdistricts.

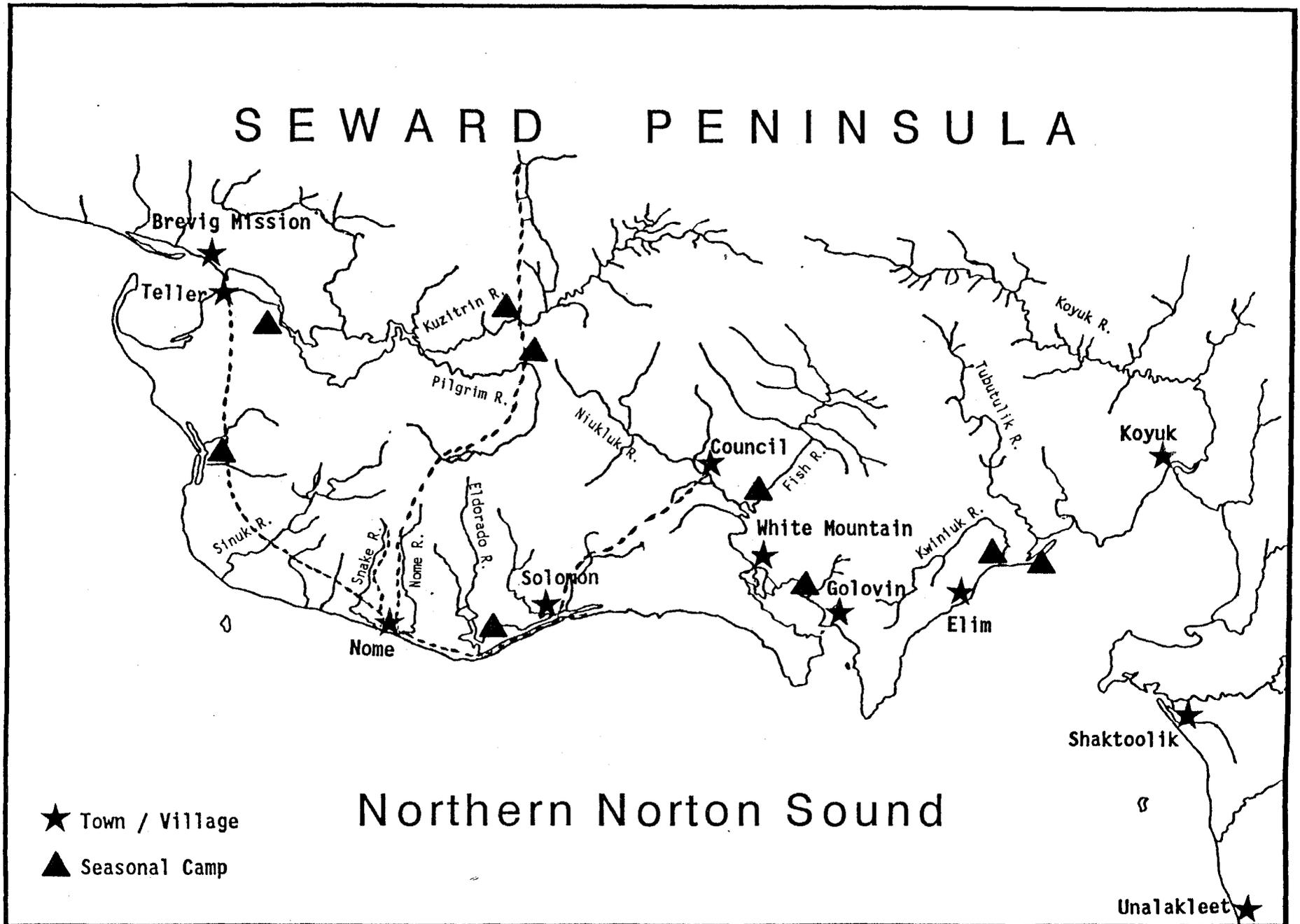


Figure 2. Northern Norton Sound subsistence fishing sites.