

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES

1986
NORTON SOUND DISTRICT
SALMON REPORT
to the
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BACKGROUND

District/Subdistrict Boundaries and Legal Gear

The Norton Sound District includes all waters from Canal Point Light north to Cape Douglas. The district is comprised of six subdistricts: Nome (subdistrict 1), from Penny River to Topkok Head; Golovin Bay (subdistrict 2), from Rocky Point to Cape Darby; Moses Point (subdistrict 3), from Elim Point to Kwik River; Norton Bay (subdistrict 4), from Kuiuktulik River to Island Point; Shaktoolik (subdistrict 5), from Cape Denbigh to Junction Creek; and Unalakleet (subdistrict 6), from Junction Creek to Black Point (Figure 1). Gill nets are the only legal commercial fishing gear.

The Port Clarence District includes all waters from Cape Douglas north to Cape Prince of Wales (Figure 1).

Management Objectives and Strategies

Commercial salmon fishing in the Port Clarence District has been prohibited since 1967. In 1966 a total of 1,216 salmon consisting of 93 sockeye, 131 pink, and 992 chum salmon was taken commercially in the Grantley Harbor/Tuksuk Channel area. This was the only bona fide commercial fishery, but a few salmon are sold or bartered each year in Teller and Nome. Due to the relatively small runs in this area and the existence of an important subsistence fishery, commercial salmon fishing has not been reopened.

The Division of Commercial Fisheries of the Alaska Department of Fish and Game manages commercial and subsistence fisheries in Norton Sound. The main objective of the Department's program is to manage the fishery resource on a sustained yield basis in accordance with policies set forth by the Alaska Board of Fisheries, with subsistence fishing the highest priority among beneficial uses of the resource. Spawning escapements in major rivers are monitored through aerial surveys, counting towers, and a test fishing project. Escapement goals or levels have been set for most index streams to assure a sustained yield based on historic escapement and returns. In most cases escapement goals can be achieved through scheduled weekly closures of the commercial fishery.

Subsistence fishing is allowed seven days a week in both marine and river waters with no catch limits, except in the Nome subdistrict where subsistence as well as commercial fishermen must be limited by periodic closures and catch limits so that escapement goals may be reached. Due to increased access, effort, and lim-

ited chum and coho salmon stocks in local streams, subsistence fishing has been conducted in the Nome subdistrict on a permit system since 1974. Subsistence fishermen are required to record the number of fish taken by permit and return it at the end of the season thereby documenting the harvest. The permit system also distributes fishing effort by limiting the number of fish each family can harvest from each river. Nome subdistrict streams have permit catch limitations ranging from 100 to 250 salmon, depending on stock strengths and historical effort, with further limits of no more than 20 chum and 20 coho from the Nome and Snake Rivers. There is no catch limit in marine waters. Fishing is restricted by regulation to 4 days per week from June 15 through August 31.

In the past, further restrictions have been necessary in the Nome subdistrict to achieve chum salmon escapement goals. During the 1985 season, portions of the Nome River were closed to salmon sport fishermen and subsistence (net) fishermen alike, to enhance chum salmon escapement. During 1986, subsistence salmon fishing was allowed 4 days per week in the Nome subdistrict; subsistence surveys were not conducted in subdistricts 2-6 due to budgetary restrictions.

All five species of Pacific salmon occur in Norton Sound. Generally, pink salmon are the most abundant followed by chum, coho, and chinook salmon. Sockeye salmon occur only rarely. Chum salmon are generally the most economically important species followed by chinook, coho, pink and sockeye salmon, respectively.

Each subdistrict contains at least one major salmon spawning stream. Commercial fishing effort occurs in marine waters, usually near stream mouths. Subdistrict boundaries were established around the most productive salmon streams to minimize interception of stocks bound for other areas. Subdistricts are managed independently based on the status of local stocks and fisheries.

Regulations provide for the commercial fishing season to be opened by emergency order between June 8 and June 20. The arrival of salmon in Norton Sound is greatly influenced by breakup, and the season is not opened until salmon have started their upstream migration as documented by reports of increasing subsistence catches, and river test fishing indices. The timing and abundance of the chinook salmon run is monitored in Unalakleet by a fisheries biologist and a test fishing crew operating in the Unalakleet River. Subsistence effort and chinook salmon catches are monitored daily to assure that subsistence needs are being met before the commercial fishery is opened.

During normal breakup conditions, the commercial season is opened on June 15, the midpoint of the opening date range, on a subdistrict by subdistrict basis if increasing subsistence catches are made over a 7-day period. If the season is opened early, initial fishing periods may be only 24 hours in duration until additional run strength information is obtained. If an early or late breakup occurs, the season will be opened before or after June 15, the exact date based on run timing and abundance. The published fishing schedule is four days a week, 6:00 pm Monday to 6:00 pm Wednesday and from 6:00 pm Thursday to 6:00 pm Saturday. The exception to this schedule is in the Nome subdistrict where in recent years intense fishing pressure, small local stocks, or expected poor returns have resulted in decreased fishing time. Commercial fishing in the Nome subdistrict has been closed when the regulatory 5-15,000 chum harvest guideline for this subdistrict has been reached.

Adjustments in fishing time for other subdistricts may be required for conservation purposes if returns are below average and fishing effort remains high. Effort, catch and escapement data are compared with previous seasons to judge relative run magnitudes of the current season.

The pink salmon return usually begins in early to mid-July, shortly after the chinook and chum returns have started to peak. When exceptionally large pink salmon runs occur, additional fishing periods are provided when only gill nets with a maximum of 4 1/2" mesh may be used. These additional fishing periods, coupled with mesh restrictions, are an attempt to allow for the harvest of surplus pinks without overharvesting chum stocks. A regulation adopted in 1981 provided fishermen with the option of setting or drifting their 4 1/2" mesh gill nets during these special periods. Pink salmon gear takes fewer chum salmon, but takes a larger percentage of female chums. In subdistricts where low chum salmon escapements are occurring, additional pink gear periods are delayed until most chum salmon have entered spawning streams. These additional openings with small mesh gill nets are usually terminated about August 1 when the pink return has greatly diminished.

Coho salmon return during August. All subdistricts, except the Nome subdistrict, are scheduled by regulation to two 48-hour fishing periods per week. The Nome subdistrict commercial fishery is scheduled for two 24-hour periods per week due to intense subsistence and sport fishing pressure on local stocks which are not abundant.

STATUS OF FISHERY AND STOCKS

Chinook Salmon

There is a directed chinook salmon fishery in the Shaktoolik and Unalakleet subdistricts where fishermen target on this species with the use of large mesh (6 7/8" - 8 1/2") gear. Historically, commercial quantities of chinook salmon have not occurred north of the Shaktoolik subdistrict; however, increasing annual harvests of chinook salmon in the Moses Point subdistrict indicate a trend of range expansion for this species. The bulk of the commercial chinook salmon harvest normally occurs from approximately June 15-July 5.

During the first three years of the fisheries, (1961-1963), annual catches averaged about 6,000 chinook. The following 14 years (1964-1977) the commercial catch averaged about 2,000 chinook. Since 1978, the average annual chinook salmon catches have increased to about 9,800 fish, however the 1986 catch of 6,395 was 35% below the previous eight year average. Subsistence catches have also increased, and have averaged 1,300 chinook for the most recent 6 years that subsistence salmon harvests were documented (1979-1982, 1985). Escapement data for chinook salmon are limited to a few escapement projects and aerial surveys on select systems. Data collected at the Kwiniuk and North River counting towers indicate increasing chinook salmon abundance and range distribution.

Chum Salmon

Chum salmon is the primary commercial species throughout Norton Sound. Most of the chum salmon commercial harvest occurs from approximately June 25 - July 20. Catches were large during the first four years of the fishery (1961-1964) averaging about 134,000 fish annually. Annual catches dropped to an average of 66,000 fish during 1965-1970. Since 1970 chum catches have stabilized somewhat, averaging about 162,000 fish per year. Documented subsistence catches have ranged from 4,000 to 33,000 chum salmon. Subsistence catch estimates are not as accurate as commercial catch figures due to the methods by which they are collected. During years when funding has been available (1963-1982), subsistence salmon catches were documented by door-to-door, personal interviews of fishermen. During these surveys, not all fishermen are contacted nor do all subsistence fishermen "count" their harvests; some estimates are based on the number of "bundles" or "strings" of fish. In addition some specie misidentification exists. Therefore, documented subsistence harvests are minimum estimates.

In 1986, chum salmon escapement surveys were hindered by stormy weather conditions prevalent throughout Norton Sound during most of July. As a result, very few peak survey counts were obtained. A further complication in attaining peak chum salmon survey counts was the return of pink salmon. Because of the overlap in the return of these two species, it was difficult to differentiate chum salmon from pink salmon in some streams. Early surveys (before run peak) flown in the Nome and Golovin subdistricts indicated fairly strong escapements at that time of year, but poor weather prevented reassessment during run peaks. Mid-July Kwiniuk River tower counts and Tubutulik River survey counts in the Moses Point subdistrict indicated below average escapements. Because of low chum salmon escapements, the Moses Point subdistrict was closed from July 14 - July 27 in an attempt to bolster escapements in the Kwiniuk and Tubutulik Rivers. Although near average escapement occurred in the Kwiniuk River, no further aerial surveys of the Tubutulik River were obtained to reassess chum salmon escapement.

The chum salmon escapements in the Norton Bay and Shaktoolik subdistricts were not possible due to inclement weather conditions. Chum salmon escapements in the Unalakleet subdistrict appeared to be average to above average as documented by the North River tower counts (a Unalakleet River tributary) and a late July survey of the upper Unalakleet River system.

Pink Salmon

A trend of elevated even year returns has become evident since 1978, with odd year returns having experienced severe winter conditions in 1981 and 1983. The result has been the development of an odd/even year cycle of weak odd year returns of pink salmon in Norton Sound. During strong, even year returns, the bulk of the commercial fishing has occurred from July 1-July 10.

Because of near record parent year escapements throughout Norton Sound in 1984, and expected good egg survival the following winter, the 1986 pink salmon return was expected to be very strong. However, the return in 1986 was generally just average when compared to the last 5 years and below average when compared to the even year returns since 1980. Commercial pink salmon harvests in the Golovin and Moses Point subdistricts, where a market was present, were also below average. Special small mesh openings were allowed in these subdistricts from July 2 through July 9; pink salmon harvests were much less than expected and the high incidental harvest of chum salmon in the Moses Point subdistrict caused an early closure of these openings. The Kwiniuk River

tower in the Moses Point subdistrict documented a pink salmon escapement that was 44% below the recent 5 year average escapement to this river.

Another unexpected feature of the 1986 pink salmon return was the run timing. The pink salmon return has normally had a single, large peak in early to mid-July. This year, numerous small peaks occurred in different areas of Norton Sound, with some river systems experiencing a second or third "peak" in August. The "extended" return of pink salmon resulted in smaller than normal harvests of pink salmon per fishing day.

Coho Salmon

The commercial salmon fishery targets on coho during August and September; normally, most of the commercial coho harvest occurs between August 7 and August 31. Commercial coho salmon catches averaged about 6,000 fish from 1961-1978. Returns increased greatly during the next six years when the average annual catch for the 1979-1985 period was 46,000 fish. With the largest return ever documented in Norton Sound comprising this season's parent year (1982), an above average return was expected in 1986. As with the pink salmon, the return was much lower than anticipated as indicated by below average commercial harvests and limited field observations. The 1986 commercial coho salmon harvest of 35,600 was 32% below the recent five year average. In addition to apparent below average coho salmon abundance, stormy weather conditions prevalent throughout August and September hindered commercial fishing efforts. Aerial survey escapement estimates were also precluded by poor weather conditions.

SEASON SUMMARY

Harvest, Effort, and Economic Value

For the third consecutive year, due to the late timing of the salmon runs, the season opening was delayed in subdistricts 2, 3, 4, 5, and 6. The Golovin, Moses Point, Norton Bay, Shaktoolik, and Unalakleet subdistricts opened June 23 for a 24 hour test opening; the Nome subdistrict opened July 1 for 24 hours. The season closed by regulation on August 31 in subdistricts 1, 2, and 3, and on September 7 in subdistricts 4, 5, and 6 (Figure 1).

The 1986 Norton Sound commercial salmon harvest totaled 230,400 fish, which was comprised of 6,395 chinook, 233 sockeye, 35,600 coho, 41,260 pink, and 146,912 chum salmon (Tables 1 and 2).

The chinook harvest was 39% and 25% below the recent 5 and 10

year averages, respectively. The chum harvest was 23% and 17% below the recent 5 and 10 year averages, respectively. The pink salmon harvest was 61% and 73% below the recent 5 and 10 year averages, respectively. This low pink salmon harvest was due to a much weaker return than expected and the lack of a market in the Nome, Shaktoolik, and Unalakleet subdistricts. The coho harvest was 32% below but 4% above the recent 5 and 10 year averages, respectively. Historical catch data for the Norton Sound district is presented in Table 1.

A total of 199 CFEC permits were renewed, with 163 actually fished during the 1986 season (Table 2). This is 8 more than the 155 permits fished in 1985. Looking at the Norton Sound district as a whole, fishing effort has been fairly stable, averaging about 163 fishermen since 1977.

Two domestic processors operated in Norton Sound during 1986. In addition, a joint venture between KEG (Koyuk-Elim-Golovin) and NPL Alaska, Inc., operated during the 1986 season. Two fishermen also sold fresh chinook salmon, as catcher/sellers, to restaurants in Nome and Fairbanks.

Commercial fishermen received approximately \$539,576.00 for their catch. This is the lowest dollar value on record since 1977 and was 38% below the recent 5 year average of \$865,800.00. This may be attributed to low prices for chinook and chum salmon in Norton Sound, and below average catches of all salmon species. Prices paid to the fishermen averaged \$0.88 per pound for chinook, \$0.27 per pound for chum, \$0.15 per pound for pink, \$0.69 per pound for sockeye, and \$0.52 per pound for coho salmon. These data are summarized in Table 3.

During 1986, no funds were made available for subsistence surveys in the Norton Sound district. Subsistence salmon permits are required in the Nome subdistrict. In 1986, 265 permits were issued; preliminary harvest totals from 209 permits returned to date are 146 chinook, 101 sockeye, 7,645 chum, 8,360 pink, and 575 coho salmon.

SPECIAL MANAGEMENT ACTIONS

Nome Subdistrict

Chum salmon escapement in the Nome subdistrict was again a major management concern.

The Alaska Board of Fisheries was advised of the management concerns in the Nome subdistrict during the November 1984 meet-

ing. Three commercial fisheries regulations were amended which reduced fishing time to two 24 hour periods per week; established an opening date of July 1st; and restricted commercial fishing to the portion of the subdistrict east of Cape Nome. The Department was also directed to allow a harvest at the lower end of the guideline harvest range of 5,000 to 15,000 chum (5AAC 04.360) in the Nome commercial fishery which averaged a catch of 12,000 chum salmon over the 5 year period, 1979-1983. Following a series of public meetings with the Northern Norton Sound Advisory Committee, these regulations became formalized management strategies used by the Department of Fish and Game. During the 1986 season no further restrictions were placed on the Nome subdistrict commercial fishery.

In addition to the commercial fishery restrictions, a proposal to restrict the sport fishery in the Nome and Snake Rivers was adopted in 1984:

- 1) With a bag and possession limit of 15 salmon, other than king salmon, only 5 could be chum and coho, in combination.

With input from the public and the Northern Norton Sound Advisory Committee, subsistence permits in the Nome and Snake Rivers were restricted to 20 chum and 20 coho salmon, with the remainder of the permit limit being filled with salmon other than chum or coho. No further restrictions were placed on the Nome subdistrict subsistence or sport fisheries during 1986.

Moses Point Subdistrict

In the Moses Point subdistrict (Figure 2) the season opening was delayed until June 23 because of the late ice breakup; initial tower counts and commercial catches indicated that an average chum salmon return was underway. By July 9, it became increasingly apparent that the chum salmon return was diminishing rapidly; the commercial catches peaked on July 1 and the Kwiniuk tower escapement counts peaked July 3, with an overall run peak 5 days earlier than normal. Thus, it was apparent that average chum escapement would not be reached unless the commercial fishery was restricted. This resulted in two management actions: 1) closure of the special "pink gear" periods on July 9 due to high incidental catches of chum salmon, and 2) subsequent closure of the entire subdistrict on July 14 when Kwiniuk tower counts indicated continuing declines in chum escapements. An aerial survey of the Tubutulik River on July 14 also documented below average chum salmon escapement. Average chum salmon escapement was eventually reached in the Kwiniuk River. Further documentation of Tubutulik River chum salmon escapement was not possible due to poor weather conditions.

Unalakleet Subdistrict

During the chinook salmon return in late June, increased subsistence fishing effort has been observed in the lower Unalakleet River for the last 4 years. As many as 30 nets have been observed in the first mile of the river. There is concern that this large effort may reduce escapement to such a degree that the reproductive potential of the stock may be damaged.

Household subsistence surveys conducted in Unalakleet in 1983, 1984, and 1985 documented a reported chinook salmon harvest of 1,868, 1,650, and 1,397, respectively. No subsistence surveys were conducted post season in 1986 as a result of lack of funding and personnel.

The 1983-85 catches are the largest on record, and more than double the previous 5 year average catch (1978-1982). Approximately 80% of the harvest was taken from the Unalakleet River with the average fisherman reporting a harvest of about 25 chinook salmon. The lack of accurate and complete historical chinook salmon escapement data for the Unalakleet drainage makes it difficult to judge what the effect of an increased catch will have on the reproductive potential of the stock. With a first subsistence chinook salmon catch reported around June 16, and a trend of steadily increasing chinook catches in the river, the first commercial fishing period was opened June 23 for 24 hours. Subsistence effort began to decrease by June 25 as evidenced by a reduction of nets in the lower river (from 21 nets to 15 nets); The commercial fishery was then placed on the normal schedule of two 48 hour periods per week beginning June 26. The chinook salmon return appeared to be fairly compressed since about 50% of the Unalakleet commercial harvest occurred during the first two periods. This management strategy worked fairly well as subsistence fishermen were again given priority use of the resource, and chinook salmon escapement appeared to be good based on aerial surveys, tower counts, and test net catches. Although interviews with river subsistence fishermen were conducted inseason and used as chinook run timing and strength indices, total chinook catches were not attained.

Norton Sound District

The 1986 commercial salmon season was notable for its very poor weather. In the past, missed fishing time was compensated for by allowing one-half the missed time at some later date. The compensation was only made if escapement appeared adequate. Only subdistrict 1 was compensated using the historical method during

1986 because more than a month of fishing time had been missed, and escapement levels appeared adequate. Beginning on August 23, and through the season closure, subdistricts 2-6 were allowed an additional 24 hours of fishing time per week. Although it was impossible to evaluate exactly how much fishing time had been missed, this was an attempt to compensate for some of the lost fishing time. Inclement weather conditions which hindered commercial fishing activities also precluded aerial surveys, however, test fish and river subsistence catches indicated adequate escapements. This management action was justified on the basis of adequate escapement rather than compensation of lost fishing time.

OUTLOOK FOR 1987

Insufficient data are available to enable reliable forecasting methods to be employed in Norton Sound. The 1987 "outlook" is based upon analysis of comparative escapement and commercial catch information, age data, and "subjective determinations". This outlook is presented only as an indicator of possible 1987 return strength.

The chinook salmon return will be determined mostly by the 1981 brood year with some contribution from the 1982 brood year. The 1981 chinook return was average, however the 1982 return was below average. An "average to below average" return is most probable.

The 1987 pink salmon return will be the progeny of the 1985 brood year which was far below the recent 5 and 10 year averages. Although frost levels in 1985 were normal, because the parent run was so poor, a "below average" return of pink salmon is anticipated.

The chum salmon return will be primarily produced by the 1983 brood year which yielded the largest commercial harvest on record for this district. Escapements for the parent year were average throughout Norton Sound in 1983, however, frost levels in the winter which followed were very deep due to lack of snowfall and extreme cold temperatures. Although it is difficult to estimate the potential return of chum salmon in 1987, it will most likely be "below average".

The 1987 coho salmon outlook is also difficult to estimate. With an average return during the 1983 parent year, and deep frost levels during the following winter, the 1987 coho return may be below average when compared to the last 5 years.

POTENTIAL MANAGEMENT PROBLEMS

Nome Subdistrict

The cumulative fishing pressure of commercial, subsistence, and sport fishing on local stocks, which are less abundant than in other portions of Norton Sound, requires special management strategies. Unlike other subdistricts, nearly all the spawning streams are accessible by road to subsistence and sport fishermen. During the last five years, an average of 219 permits have been issued yearly for subsistence fishing in the Nome subdistrict. Reported subsistence harvests have averaged 18,400 salmon during the past 5 years. The commercial fishery, which targets on chum salmon during most years, must be managed very conservatively due to the importance of subsistence fishing, the limited abundance of local chum salmon stocks and the interception of other stocks bound for Kotzebue Sound, Port Clarence and eastern Norton Sound fisheries.

The 1987 pink salmon return is expected to be very poor because of a weak parent year return in 1985. There is concern that this may cause an overexploitation of chum salmon stocks in the Nome area streams by sport and subsistence fishermen alike, and cause the management staff to restrict fishing in some streams.

Unalakleet Subdistrict

As discussed in the Special Management Actions section, increased subsistence effort has been observed in the lower Unalakleet River for the last 4 years during the chinook salmon return. As many as 30 nets have been observed in the first mile of the river. There is concern that this large effort may reduce escapement to such a degree that the reproductive potential of the stock may be damaged. If escapement levels appear low and a high number of subsistence nets are observed in the lower Unalakleet River, restrictions in commercial fishing time may be necessary.

Joint Venture Operations

During the 1984, 1985, and 1986 seasons, under a permit issued by the Governor, two Japanese freezer ships were allowed to buy Norton Sound salmon directly from domestic fishermen. Their operations were limited to internal waters, which the federal government defined as Norton and Golovin Bays (subdistricts 2, 3, and 4).

Although the outlook for the 1987 season indicates a poor return of pink salmon, there is a possibility of the presence of a market for this species next season. Re-definition of Internal Waters by the Federal Government will now allow a domestic/foreign processing joint venture to operate in subdistricts 2, 3, 4, 5, and 6. Thus, the joint venture may operate in the Shaktoolik and Unalakleet subdistricts, as well as in the Golovin, Moses Point, and Norton Bay subdistricts. While pink salmon have historically been underutilized commercially, there is concern that targeting on this species may result in an incidental catch of chum salmon, which is presently being fully utilized by the existing fishery.

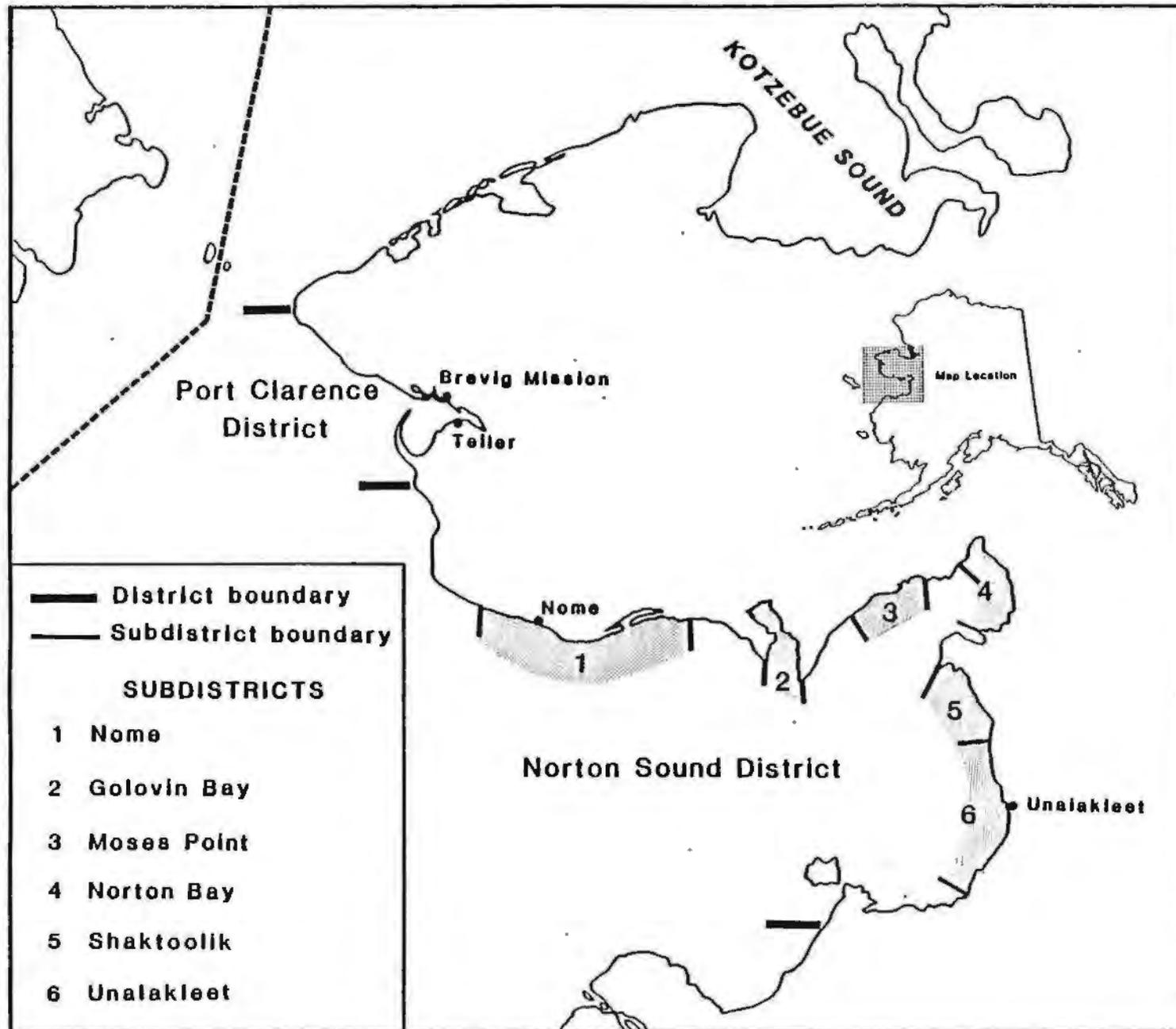


Figure 1. Norton Sound commercial salmon fishing subdistricts.

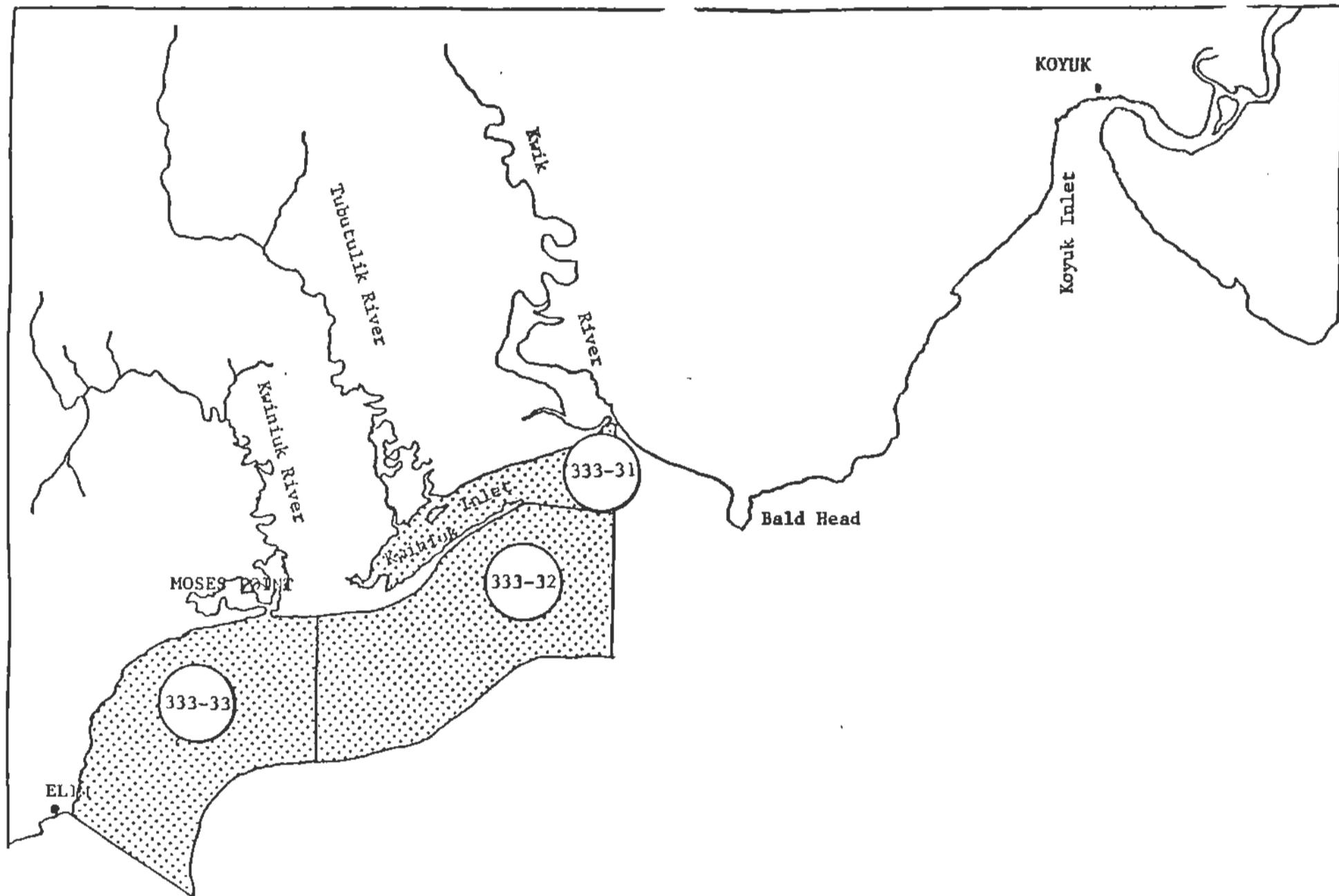


Figure 2. Statistical areas of the Moses Point commercial salmon fishing subdistrict, Norton Sound.

Table 1. Commercial salmon catches by species, Norton Sound District, 1961-1986.

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	--	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
5-Yr Avg. 1/ 10,415	53	52,566	132,540	190,770	386,344	
10-Yr Avg. 2/ 8,565	33	34,207	151,956	176,112	370,874	
1/ 1981-1985						
2/ 1976-1985						

Table 2. Norton Sound commercial salmon harvest and effort by subdistrict, 1986.

Subdistrict	Fisher men	Chinook	Sockeye	Coho	Pink	Chum	Total
Nome	13	6	-	50	2/	8160	8216
Golovin	24	81	8	958	25425	69725	96197
Moses Point	34	600	41	5874	15795	20668	42978
Norton Bay	9	139	2	1512	40	1994	3687
Shaktoolik	30	1075	29	6626	2/	16126	23856
Unalakleet	73	4494	153	20580	2/	30239	55466
District Totals	163 1/	6395	233	35600	41260	146912	230400

1/ Several fishermen fished more than one subdistrict.

2/ No market for pink salmon in these subdistricts.

Table 3. Norton Sound salmon value and average price paid to the fishermen, by species, 1986.

Species	Dollar value	Average price paid
Chinook	\$ 117,054.00	\$ 0.88
Sockeye	1,210.00	0.69
Coho	126,912.00	0.52
Pink	19,980.00	0.15
Chum	274,420.00	0.27
Total	\$ 539,576.00	

Table 4. Aerial survey counts of Norton Sound streams, 1986. 1/

Subdistrict	Stream	Chum Goal	Observed			
			Chum	Pink	Chi-nook	Coho 5/
Nome (1)	Sinuk 2/	3,500	1,960	28,690 6/	4	-
	Snake	-	415	1,690	0	-
	Nome	2,000	1,150	13,580	2	-
	Flambeau 2/	4,500	3,075	300	2	-
	Eldorado	6,000	3,490	18,200	9	-
	Bonanza	-	-	18,480 6/	-	-
	Solomon 2/	-	165	3,440	-	-
Golovin (2)	Fish	16,000	25,190	140	200	-
	Niukluk	12,500	2,442	0	2	-
	Boston	2,500	220	0	2	-
Moses Pt. (3)	Kwiniuk 3/	25,000	23,901	228,113	588	421 4/
	Tubutulik 2/	14,000	5,975	35,680	453	-
Norton Bay (4)	Inglutalik 7/	-	-	-	-	-
	Ungalik	-	0	0	0	-
Shaktoolik (5)	Shaktoolik	11,000	20	0	10	-
Unalakleet (6)	Unalakleet System 8/	-	1,296	15	382	-
	North River 3/	2,500	3,482	234,816	1,212	-

1/ Due to stormy weather conditions prevalent in July, August, and September, most surveys were flown prior to or after run peaks.

2/ Peak chum salmon survey count.

3/ Tower counts are preliminary expanded totals.

4/ Early coho tower counts prior to July 27.

5/ No surveys flown due to stormy conditions.

6/ Species identification problem; may include some chums.

7/ Not surveyed.

8/ Partial survey, includes counts from Chirosky to Old Woman.

Table 5. Kwiniuk Tower expanded chum and pink salmon escapements, 1965-1986. 1/

Year	Chum	Pink
1965	32,861	8,668
1966	32,182	10,864
1967	26,661	3,587
1968	18,976	129,052
1969	19,749	57,497
1970	68,004	235,131
1971	38,679	16,634
1972	30,686	62,461
1973	28,617	38,426
1974	35,899	40,816
1975	14,344	57,317
1976	6,466	28,087
1977	22,289	44,602
1978	11,049	70,148
1979	12,355	167,492
1980	19,374	319,363
1981	34,561	566,417
1982	44,099	469,674
1983	56,907	251,965
1984	54,043	736,544
1985	9,912	22,548
1986 2/	23,901	228,113

1/ Chum salmon escapement goal for Kwiniuk River is 25,000 fish.

2/ Tower counts from 1986 are preliminary expanded totals.

September 24, 1986

PRELIMINARY NORTON SOUND COMMERCIAL SALMON
FISHERIES REPORT

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1986 NORTON SOUND SALMON SEASON SUMMARY

Introduction

The commercial salmon fishing regulations state that the Norton Sound season opens 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. For the third consecutive year, due to the late timing of the salmon runs, the season opening was delayed in subdistricts 2, 3, 4, 5, and 6. The Golovin, Moses Point, Norton Bay, Shaktoolik, and Unalakleet subdistricts opened June 23 for a 24 hour test opening; the Nome subdistrict opened July 1 for 24 hours. The season closed by regulation on August 31 in subdistricts 1, 2, and 3, and on September 7 in subdistricts 4, 5, and 6 (Figure 1).

The 1986 Norton Sound commercial salmon harvest totaled 230,308 fish, which was comprised of 6,303 chinook, 41,260 pink, 146,912 chum, 35,600 coho and 233 sockeye salmon (Table 1).

The chinook harvest was 40% and 26% below the recent 5 and 10 year averages, respectively. The chum harvest was 23% and 17% below the recent 5 and 10 year averages, respectively. The pink salmon harvest was 61% and 73% below the recent 5 and 10 year averages, respectively. This low pink salmon harvest was due to a much weaker return than expected rather than the lack of a market. The coho harvest was 32% below but 4% above the recent 5 and 10 year averages, respectively. Historical catch data for the Norton Sound district is presented in Table 1.

A total of 199 CFEC permits were renewed, with 163 actually fished during the 1986 season. This is 8 more than the 155 permits fished in 1985. Looking at the Norton Sound district as a whole, fishing effort has been fairly stable, averaging about 164 fishermen.

Two domestic processors operated in Norton Sound during 1986. In addition, a joint venture between KEG (Koyuk-Elim-Golovin) and NPL Alaska, Inc., operated during the 1986 season. Under a permit issued by the Governor, two Japanese freezer ships were allowed to buy Norton Sound salmon directly from domestic fishermen. Their operations were limited to internal waters, which the federal government defines as Norton and Golovin Bays.

Commercial fishermen received approximately \$537,500.00 for their catch. This is the lowest dollar value on record since 1977 and was 38% below the recent 5 year average of \$865,800.00. This may

be attributed to low prices for chinook and chum salmon in Norton Sound, and below average catches of all salmon species. Prices paid to the fishermen averaged \$0.88 per pound for chinook, \$0.27 per pound for chum, \$0.15 per pound for pink, \$0.69 per pound for sockeye, and \$0.52 per pound for coho salmon. These data are summarized in Table 2.

Season Summary

Nome-subdistrict 1

Due to poor chum salmon escapement during the 1982 and 1983 seasons, the Board of Fisheries, in response to an advisory committee petition, directed the Department to manage the commercial fishery so that chum salmon escapement could be optimized. During the 1984 fall Board of Fishery meetings, these directives became regulation. In response to public and advisory board proposals, the following commercial fishery restrictions were adopted as regulations:

- 1) Salmon may be taken commercially only from July 1 through August 31.
- 2) Fishing periods were restricted to two 24 hour periods per week.
- 3) Waters west of Cape Nome were closed to commercial salmon fishing.

The Department was also directed to allow a harvest at the lower end of the guideline harvest range of 5,000 to 15,000 chum salmon, as stipulated in 5AAC 04.360.

In addition to these commercial fishing restrictions, a proposal to restrict the sport fishery in the Nome and Snake Rivers was adopted:

- 1) With a bag and possession limit of 15 salmon, other than king salmon, only 5 could be chum and coho, in combination.

Subsistence permit limits in the Nome and Snake Rivers were restricted to 20 chum and 20 coho salmon. The remainder of the permit limit could be filled with salmon other than chum or coho.

The commercial salmon season opened July 1 by emergency order. Thirteen fishermen harvested 6 chinook, 8,160 chum, and 50 coho salmon for a combined total of 8,216 fish (Table 3). The chum harvest was 24% below the recent 5 year average. Fishing effort was average when compared to the last 5 years. One buyer operated in this subdistrict, but ceased operations on August 20. Stormy weather throughout July and August hindered fishing efforts, especially during the coho salmon run. The season

closed by regulation on August 31.

Golovin-subdistrict 2

Commercial landings began on June 23. A total of 24 fishermen harvested 81 chinook, 69,725 chum, 25,425 pink, 8 sockeye, and 958 coho salmon (Table 3). The chum salmon harvest was the highest on record for this subdistrict, and comprised nearly 50% of the entire Norton Sound district chum harvest in 1986.

The Golovin Co-op freezer plant did not operate in 1986. On June 23, a Japanese freezer ship affiliated with the joint venture began buying operations in Golovin Bay. Two additional "pink gear" periods were allowed between July 2 and July 7, but were removed due to a weaker than expected pink salmon return. On July 12, fishing time was increased to seven days per week because early surveys indicated a very strong chum salmon return, with above average escapement likely to be achieved.

The Japanese freezer ship ceased operations on July 23; joint venture representatives met with ADF&G personnel in Nome on July 24 and departed the district on the same day.

On July 31, the normal 4 day per week fishing schedule resumed for the coho season, however an emergency order issued on August 21 increased fishing time to 5 days per week until the season closure. One domestic buyer operated during 4 periods between August 11 and 24, flying the fish out in the round to Anchorage via Unalakleet. All buying operations ceased by August 24, and the season closed by regulation August 31.

Moses Point-subdistrict 3

The Elim Fishermen's Co-op plant at Moses Point did not operate during the 1986 season. A Japanese freezer ship affiliated with the joint venture began operations on June 23. The vessel was located just inside of the line which designates the internal waters of Norton Bay, as defined by the federal government.

As in the Golovin subdistrict, special "pink gear" periods were opened by emergency order on July 2; however, these special periods were closed in this subdistrict on July 7 due to a weaker pink salmon return than expected and high incidental catches of chum salmon.

On July 14, an emergency order was issued which closed the entire subdistrict to commercial salmon fishing. This action was precipitated by below average tower counts to date of chum salmon

in the Kwiniuk River, below average escapements in the Tubutulik River, and diminishing commercial catch rates.

On July 28, the Moses Point subdistrict was re-opened for the coho season; on August 21, fishing time was increased to five days per week. One domestic buyer operated in this subdistrict from August 7 through August 31. The season closed August 31 by regulation.

Thirty-four commercial fishermen harvested 600 chinook, 20,668 chum, 15,795 pink, 41 sockeye, and 5,874 coho salmon for a combined total of 42,978 fish (Table 3). Fishing effort was slightly higher than the recent 5 year average of 32 fishermen. The chinook harvest was twice the recent five year average; the chum harvest was 40% below the recent five year average; the pink harvest was similar to the recent five year average; the coho harvest was well above the recent five year average for this subdistrict, which historically has not fished throughout August. Preliminary expanded count totals on the Kwiniuk River indicated an escapement of 23,901 chum salmon (Table 4).

Norton Bay-subdistrict 4

The Norton Bay fishermen made a few deliveries to a Japanese freezer ship, anchored near Moses Point, during late June and early July. Rough seas prevented further deliveries to the freezer ship. A domestic buyer operated there during one period in mid-July, and from August 4 through August 31. Thus, no buying operations were available during 9 of 22 periods open to commercial salmon fishing in 1986. Following the initial 24 hour test opening, subdistrict 4 remained on a fishing schedule of two 48 hour periods a week until August 21, when fishing time was increased to 5 days per week. The season ended by regulation on September 7.

Nine fishermen caught 139 chinook, 1,994 chum, 40 pink, 2 sockeye, and 1,512 coho salmon (Table 3). The chinook harvest was below the recent 5 year average; the chum and pink harvests were far below the recent 5 year averages; the coho harvest was 2.5 times greater than the recent 5 year average. It is uncertain whether the combined low harvests of chinook, chum, and pink salmon are due to poor returns or sporadic/poor marketing conditions (or both); stormy weather precluded flying of peak surveys in this subdistrict (Table 4).

Shaktoolik-subdistrict 5

Due to the late timing of the chinook salmon run, the Shaktoolik

and Unalakleet subdistricts did not open to commercial fishing until June 23. The season closed by regulation on September 7.

Two domestic buyers operated in Shaktoolik during 1986 with at least one buyer present during 17 of 22 periods open to commercial fishing. All fish were iced and flown out, in the round, to Anchorage or tendered by boat to Unalakleet, and flown out to Anchorage. In addition, one fisherman sold some of his chinook salmon catch directly to a Fairbanks restaurant.

Thirty fishermen harvested 1,075 chinook, 16,126 chum, 29 sockeye, and 6,626 coho salmon for a combined total of 23,856 fish (Table 3). There was no market for pink salmon. The chinook, chum, and coho harvests were 58%, 50%, and 33% below the recent five year averages for these species, respectively. Following the initial 24 hour test opening on June 23, subdistrict 5 remained on the four days per week fishing schedule until August 21 when fishing time was increased to 5 days per week until the season closure.

Unalakleet-subdistrict 6

The Unalakleet subdistrict receives the most fishing effort in Norton Sound, and has not had problems obtaining buyers for their fish, with the exception of pink salmon. A total of 73 fishermen caught 4,402 chinook, 30,239 chum, 153 sockeye, and 20,580 coho salmon, for a combined total of 55,374 fish (Table 3). The chinook, chum, and coho salmon harvests were 40%, 42%, and 46% below the recent 5 year averages for these species, respectively. The Unalakleet fishermen were on the same fishing schedule as the Shaktoolik fishermen throughout the 1986 season.

Two processors bought fish in the Unalakleet subdistrict. All salmon were flown out iced, in the round, to fresh markets and canneries. The Norton Sound Fisherman's Co-op plant did not operate in 1986; however, the plant facility was leased by one buyer to receive and ice the fresh salmon delivered to their dock.

Escapement

Table 4 lists aerial survey and tower escapement counts in the major index streams of Norton Sound. Due to stormy weather conditions prevalent during most of July, August, and September, very few peak survey counts were obtained.

Chum salmon escapements in the Nome subdistrict streams appeared to be average to slightly below average. Early July surveys on

the Nome and Eldorado Rivers indicated fairly strong escapements for this time of year, however poor weather prevented peak survey counts from being obtained. Surveys flown late in July on the Flambeau, Bonanza, Sinuk, Snake, and Solomon documented average to slightly below average escapements. Peak pink salmon counts in the Bonanza and Sinuk Rivers may have contributed to low chum counts because of species identification problems.

Chum salmon counts in the Golovin subdistrict indicated that average to above average escapements may have been reached. Again, aerial surveys flown on July 3 indicated strong chum returns to the Fish River system, however, stormy conditions hindered further attempts to document these returns. A record commercial harvest by Golovin fishermen indicates above average escapement may have been attained.

Chum salmon escapements in the Moses Point subdistrict were average to below average. The mid-July survey of the Tubutulik River as well as mid-July cumulative chum counts on the Kwiniuk River indicated below average escapements of chum salmon. As a result of a management action which closed commercial fishing in this subdistrict, average escapement occurred in the Kwiniuk River; however, no further aerial surveys of the Tubutulik were obtained to document escapement.

Chum salmon escapements in the Norton Bay subdistrict are virtually undocumented for 1986. An early survey flown on the Ungalik River spotted no salmon. Inclement weather prevented further attempts to survey the Inglutalik River or to re-survey Ungalik River. Since fishing effort was low due to difficulties in tendering fish to a processor, average escapements were probably attained.

Chum salmon escapement in the Shaktoolik was not documented in 1986. An aerial survey flown, prior to the commercial season opening, on the Shaktoolik River spotted few salmon. Although the commercial chum harvest was below normal, average escapements may have occurred since fishermen used predominantly large mesh gear (8 1/4" stretched measure) during the chinook return which overlapped with the chum return. Stormy weather which prevented aerial surveys may have helped to bolster escapement levels in July and August.

Chum salmon escapement in the Unalakleet subdistrict appeared to be average to above average. A late July survey documented fair chum escapement in the upper Unalakleet River system; the lower Unalakleet River was characteristically unsurveyable due to turbid water conditions. Chum salmon counts obtained on the

North River from a counting tower indicated an above average escapement to this tributary of the Unalakleet River.

The Unalakleet and Shaktoolik subdistricts contain the major chinook salmon runs. A successful chinook survey was not flown on the Shaktoolik River, however, chinook escapements appeared to be only slightly below average on the Unalakleet River system. Chinook salmon escapement counts were negligible or missing in the Nome, Golovin, and Norton Bay subdistricts. The counting tower on the Kwiniuk River and a mid-July survey of the Tubutulik River indicated above average escapements of chinook salmon in the Moses Point subdistrict.

The major coho salmon runs also occur within the Shaktoolik and Unalakleet subdistricts. Aerial survey efforts were precluded by poor weather conditions in August and September. Commercial catch statistics indicated an average to below average coho run overall when compared to the last five years.

Management concerns

Chum salmon escapement in the Nome subdistrict was again a major concern, as was chum salmon escapement in the Moses Point subdistrict.

In the Nome subdistrict, regulations were in effect which severely restricted the Nome commercial fishermen and, to a lesser degree, the sport fishermen. In addition, subsistence fishermen were restricted in the Nome and Snake Rivers by lowered chum and coho quotas, and a closure of the first 200 yards upstream from the Nome River mouth for salmon fishing.

In the Moses Point subdistrict, it became apparent inseason that average chum escapement would not be reached unless the commercial fishery was restricted. The entire subdistrict was closed by emergency order from July 14 through July 28 to bolster below average escapements in the Kwiniuk and Tubutulik Rivers. Average escapement was achieved in the Kwiniuk River; subsequent documentation of Tubutulik River was not possible due to stormy weather conditions.

The 1986 commercial salmon season was notable for its very poor weather. In the past, missed fishing time was compensated for by allowing one-half the missed time at some later date. The compensation was only made if escapement appeared adequate. Only subdistrict 1 was compensated using the historical method during 1986 because more than a month of fishing time had been missed, and escapement levels appeared adequate. Subdistricts 2-6 were

given an additional 24 hours per week beginning August 23 until the season closure. Escapements in these subdistricts appeared adequate but it was impossible to evaluate exactly how much fishing time had been missed; this management action was justified on the basis of adequate escapement rather than compensation of lost fishing time.

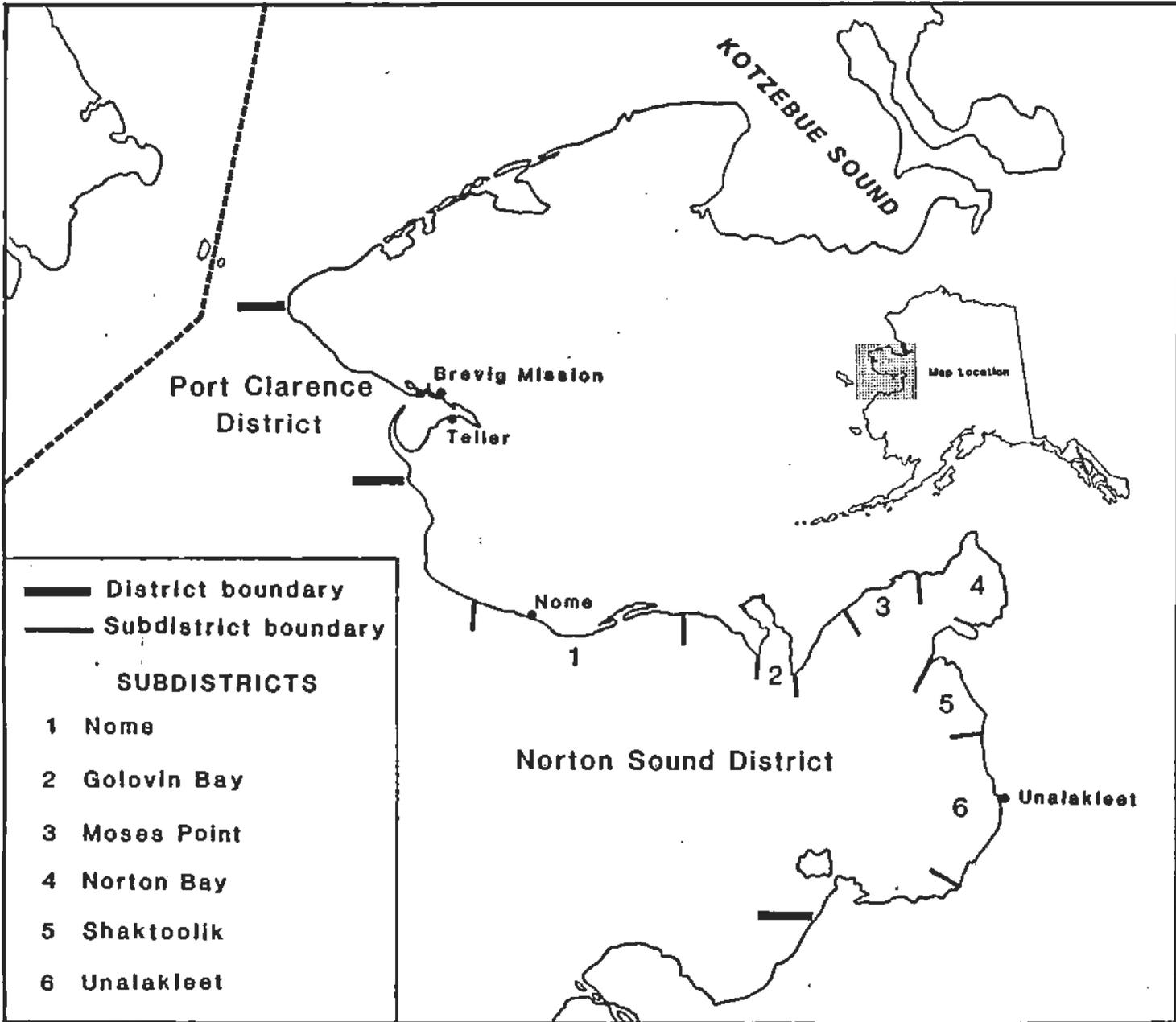


Figure 1. Norton Sound commercial salmon fishing subdistricts.

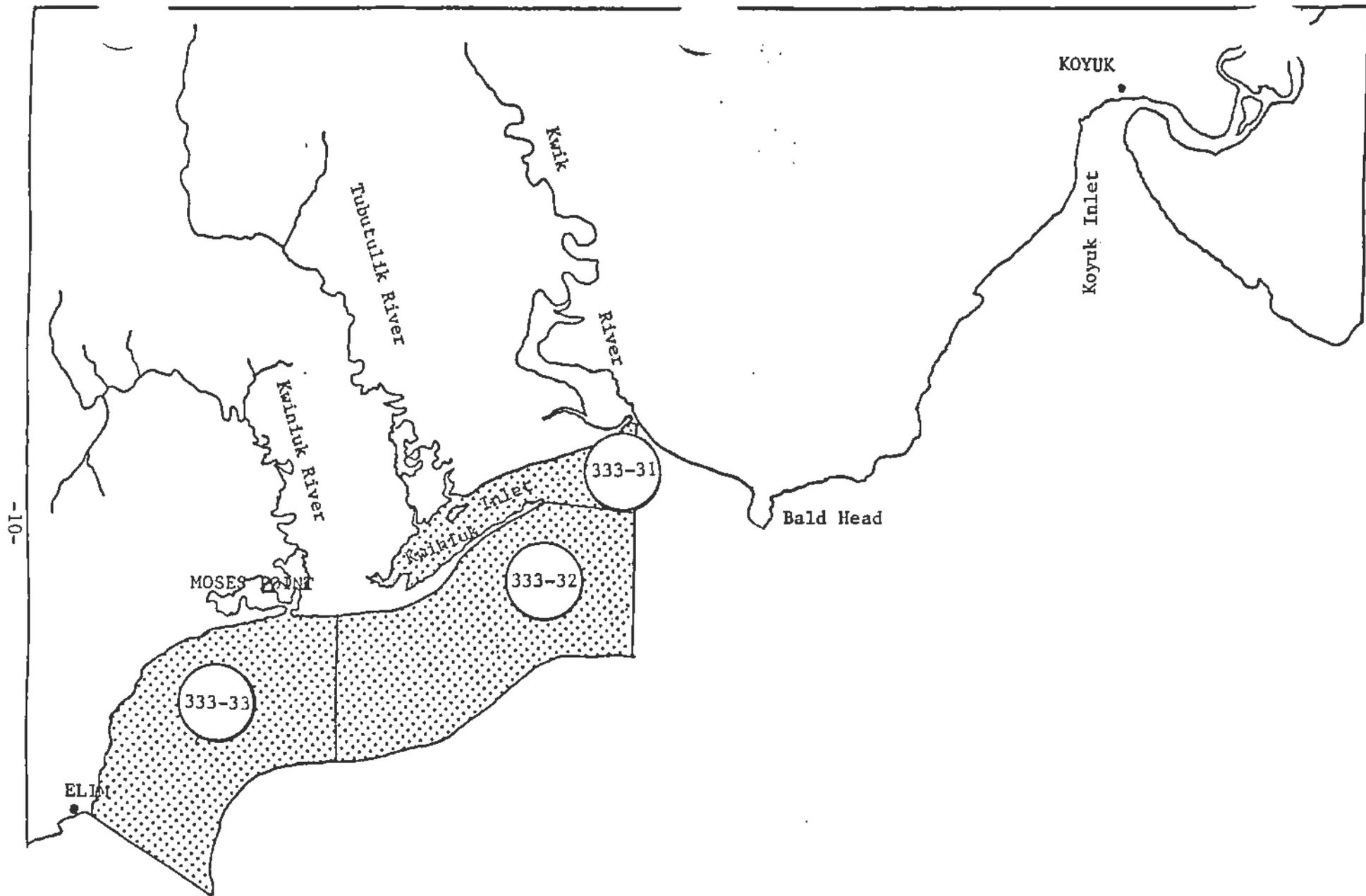


Figure 2. Statistical areas of the Moses Point commercial salmon fishing subdistrict, Norton Sound.

Table 1. Commercial salmon catches by species, Norton Sound District, 1961-1986.

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	--	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	6,303	233	35,600	41,260	146,912	230,308
5-Yr Avg. 1/	10,415	53	52,566	132,540	190,770	386,344
10-Yr Avg. 2/	8,565	33	34,207	151,956	176,112	370,874
1/ 1981-1985						
2/ 1976-1985						

Table 2. Norton Sound salmon dollar value and average price paid to the fishermen, by species, 1986.

Species	Dollar value	Average price paid
Chinook	\$ 114,980.00	\$ 0.88
Chum	274,420.00	0.27
Pink	19,980.00	0.15
Sockeye	1,210.00	0.69
Coho	126,912.00	0.52

Total	\$ 537,500.00	

Table 3. Norton Sound salmon season summary by subdistrict, 1986.

Sub-district	fm	Chinook/lbs	Chum/lbs	Pink/lbs	Sockeye/lbs	Coho/lbs	Total/Total lbs
1	13	6/ 90	8160/ 54758	0/ 0	0/ 0	50/ 343	8216/ 55191
2	24	81/ 1508	69725/ 477038	25425/ 80966	8/ 61	958/ 6333	96197/ 565906
3	34	600/ 10396	20668/ 136260	15795/ 52226	41/ 306	5874/ 44259	42978/ 243447
4	9	139/ 2807	1994/ 13660	40/ 127	2/ 16	1512/ 10343	3687/ 26953
5	30	1075/ 22553	16126/ 114448	0/ 0	29/ 246	6626/ 45940	23856/ 183187
6	73	4402/ 93824	30239/ 215660	0/ 0	153/ 1136	20580/ 138350	55374/ 448970
Total	163 1/	6303/ 131178	146912/ 1011824	41260/ 133319	233/ 1765	35600/ 245568	230308/ 1523654
Avg. wt.		20.8	6.9	3.2	7.6	6.9	

1/ Several fishermen fished more than one subdistrict.

Table 4. Aerial survey counts of Norton Sound streams, 1986. 1/

Stream name	Chum	Pink	Chinook	Coho 5/
Nome River	1,150	13,580	2	-
Flambeau 2/	3,075	300	2	-
Eldorado	3,490	18,200	9	-
Bonanza	-	18,480 6/	-	-
Snake	415	1,690	0	-
Sinuk 2/	1,960	28,690 6/	4	-
Solomon 2/	165	3,440	-	-
Fish	25,190	140	200	-
Niukluk	2,442	0	2	-
Boston	220	0	2	-
Tubutulik 2/	5,975	35,680	453	-
Kwiniuk 3/ (Tower count)	23,901	228,113	588	421 4/
Ungalik	0	0	0	-
Inglutalik 7/	-	-	-	-
Shaktoolik	20	0	10	-
North River 3/ (Tower count)	3,482	234,816	1,212	-
Unalakleet System 8/	1,296	15	382	-

1/ Due to stormy weather conditions prevalent in July, August, and September, most surveys were flown prior to or after run peaks.

2/ Peak chum salmon survey count.

3/ Tower counts are preliminary expanded totals.

4/ Early coho tower counts prior to July 27.

5/ No surveys flown due to stormy conditions.

6/ Species identification problem; may include some chums.

7/ Not surveyed.

8/ Partial survey, includes counts from Chirosky to Old Woman.