



**NORTON SOUND SUBDISTRICT 1 (NOME) CHUM SALMON  
STOCK STATUS AND DEVELOPMENT OF  
MANAGEMENT/ACTION PLAN OPTIONS**

A Report to the Alaska Board of Fisheries

By:

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**SECTION I – STOCK STATUS  
TABLE OF CONTENTS**

LIST OF FIGURES.....ii

LIST OF TABLES.....iii

*SUBDISTRICT 1 (NOME) CHUM SALMON STOCK  
STATUS*.....1

*Synopsis*.....1

*Escapement*.....1

*Harvest*.....2

*Outlook*.....3

## LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1. Known chum salmon streams in Norton Sound. ....	4
2. Nome Subdistrict commercial and subsistence chum salmon harvest.....	5
3. Snake River tower cumulative escapement counts of chum salmon. ....	6
4. Eldorado River tower cumulative escapement counts of chum salmon. ....	7
5. Nome River weir cumulative escapement counts of chum salmon. ....	8

## LIST OF TABLES

<u>Table</u>	<u>Page</u>
1. Commercial and subsistence chum salmon harvests by districts, by year, Norton Sound District, 1961-2000.....	9
2. Assessment of Norton Sound chum salmon escapements, 1995-2000.....	10
3. 2000 Nome Area subsistence salmon management actions.....	11
4. Nome Subdistrict management actions.....	12
5. Norton Sound chum salmon conservation measures since 1993.....	14

## SECTION I

### *SUBDISTRICT 1 (NOME) CHUM SALMON STOCK STATUS*

#### *Synopsis*

In response to the guidelines established in the Sustainable Salmon Fisheries Policy, the Board of Fisheries has classified the Nome Subdistrict (Figure 1) chum salmon stock as a stock of concern. This classification is based on the definition of “management concern” found in the policy. The Nome Subdistrict chum salmon stock meets the definition of a management concern based on low escapement levels since 1998 and the anticipated low level in 2001. Spawning escapement assessments tend to vary each year depending on location, but in combination, Nome Subdistrict salmon escapement goals have generally not been achieved the past ten years despite the use of specific management measures.

#### *Escapement*

Aerial surveys, counting towers, and a weir project are all used to monitor chum salmon escapement to the Nome Subdistrict (Table 2 and Figures 3-5). Actual chum salmon escapement goals are established on the primary chum-producing streams. These goals are based on aerial surveys because it is the longest running database in the Nome area. However, the tower and weir assessment projects are becoming better management tools the longer they are operated. There are numerous occasions when desired peak aerial surveys are not completed and judged relative to a specified BEG. These new escapement projects will be used to better describe the escapement to a spawning area and to ultimately establish BEGs based on spawner-recruit models.

The Nome area streams have had a chronic problem with declining chum salmon production since the early 1980s. The 1992, 1993, and 1994 runs were very poor with the Nome and Eldorado Rivers chum salmon stocks identified as “management concerns” prior to adoption of the “Sustainable Fisheries Policy”. The next three years saw improved runs, but were again followed by near-record low runs in 1999 and 2000.

1995

- Chum salmon escapements generally achieved for most streams.

1996

- Streams to the east of Nome attained escapements while those to the west did not achieve escapement goals.

1997

- Chum salmon escapements generally good except for the Sinuk River, which was 17% below the goal.

1998

- Most streams did not attain desired escapement levels, except the Snake River. Escapement to the Snake River was twice the escapement goal.

1999

- Chum salmon escapements were low for all index streams.

2000

- Chum salmon escapements were attained for two of the six index streams.

### *Harvest*

Commercial and subsistence harvests (Table 1 and Figure 2) in the Nome Subdistricts have been a concern of fisheries managers since the late 1960s. The first subsistence salmon registration permits were issued in 1968 (Table 4). Fisheries management refocused attention from the nearly closed commercial fishery to subsistence users in 1984. Chum salmon became the primary stocks of concern with significant fishing season reductions beginning in 1990. In March 1999, the Board of Fisheries determined Nome area chum salmon stocks were not capable of providing adequate harvest levels for all subsistence fishers in the area (Table 5). The Board established a Tier II chum salmon fishery that allowed a limited number of participants based on past history and set season bag limits. Twenty Tier II permits were issued in 1999 and 10 permits in 2000 (Table 3).

1995

- Above-average subsistence chum salmon harvest; no directed commercial chum salmon fishery.
- Sport fishing closed by regulation for chum salmon.
- Subsistence fishing restricted by gear types to allow harvest of fish species other than chum salmon.

1996

- Above-average subsistence chum salmon harvest; no directed commercial chum salmon fishery.
- Management similar to 1995 except that beach seine gear used to target pink salmon for subsistence use while conserving chum salmon.

1997

- Above-average subsistence chum salmon harvest; no directed commercial chum salmon fishery.
- Management similar to 1995 except that no beach seine fishing was allowed.

1998

- Subsistence chum salmon harvest 65% below average; no commercial fishery allowed. Management began with a near total subsistence closure with incremental

relaxing of individual areas to subsistence fishing with gear restrictions to allow harvest of salmon species other than chum salmon.

1999

- BOF finds that the Nome chum salmon stock cannot fully support all subsistence users needs. BOF implements new Tier II subsistence chum fishing regulations which awards limited fishing opportunity to individuals with the longest history and greatest dependence on the Nome chum resource.
- Initially open Tier II only subsistence chum salmon fishing, issuing 20 permits and restricting effort to marine waters east of Cape Nome.
- Close all subsistence chum salmon fishing (including Tier II) due to very weak runs near mid-way point in run timing.

2000

- Open Tier II only subsistence chum fishing, issuing 10 permits and restricting effort to marine waters east of Cape Nome.
- Open Tier I beach seining for pink salmon; later in the season, small-mesh gillnets were allowed to harvest pink salmon from a strong pink salmon run while still protecting chum salmon.

### *Outlook*

Overall, the year 2001 Nome Subdistrict chum salmon run is anticipated to be weak, as it has been since the mid-1980s. The current management plan calls for continued Tier II subsistence fishing permits issued to 10 to 20 individuals at restricted fishing locations. Parent-year escapements for the 2001 run were generally attained, but the trend in productivity consistently falls below expectations. Therefore, a conservative management approach will be necessary.

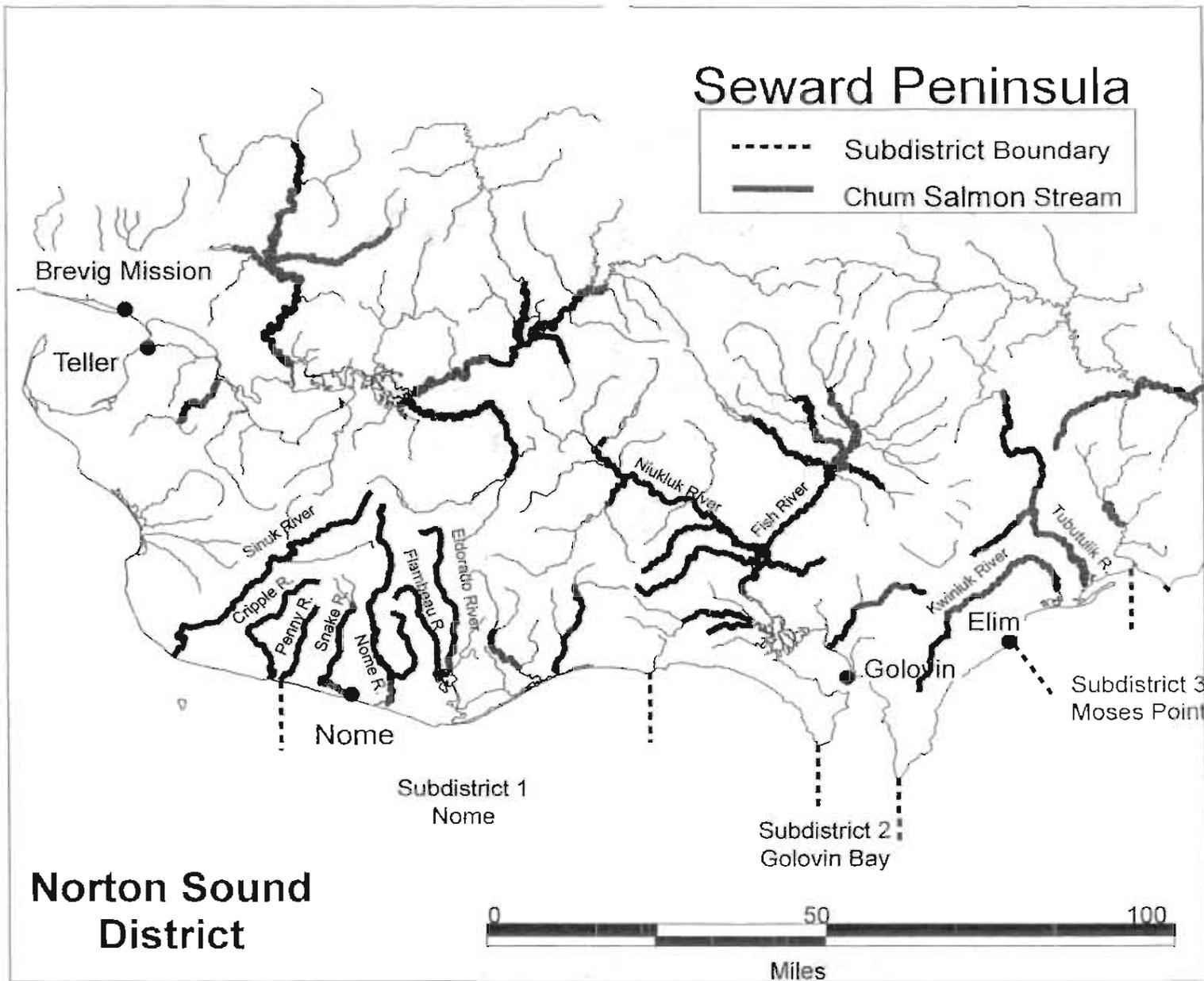
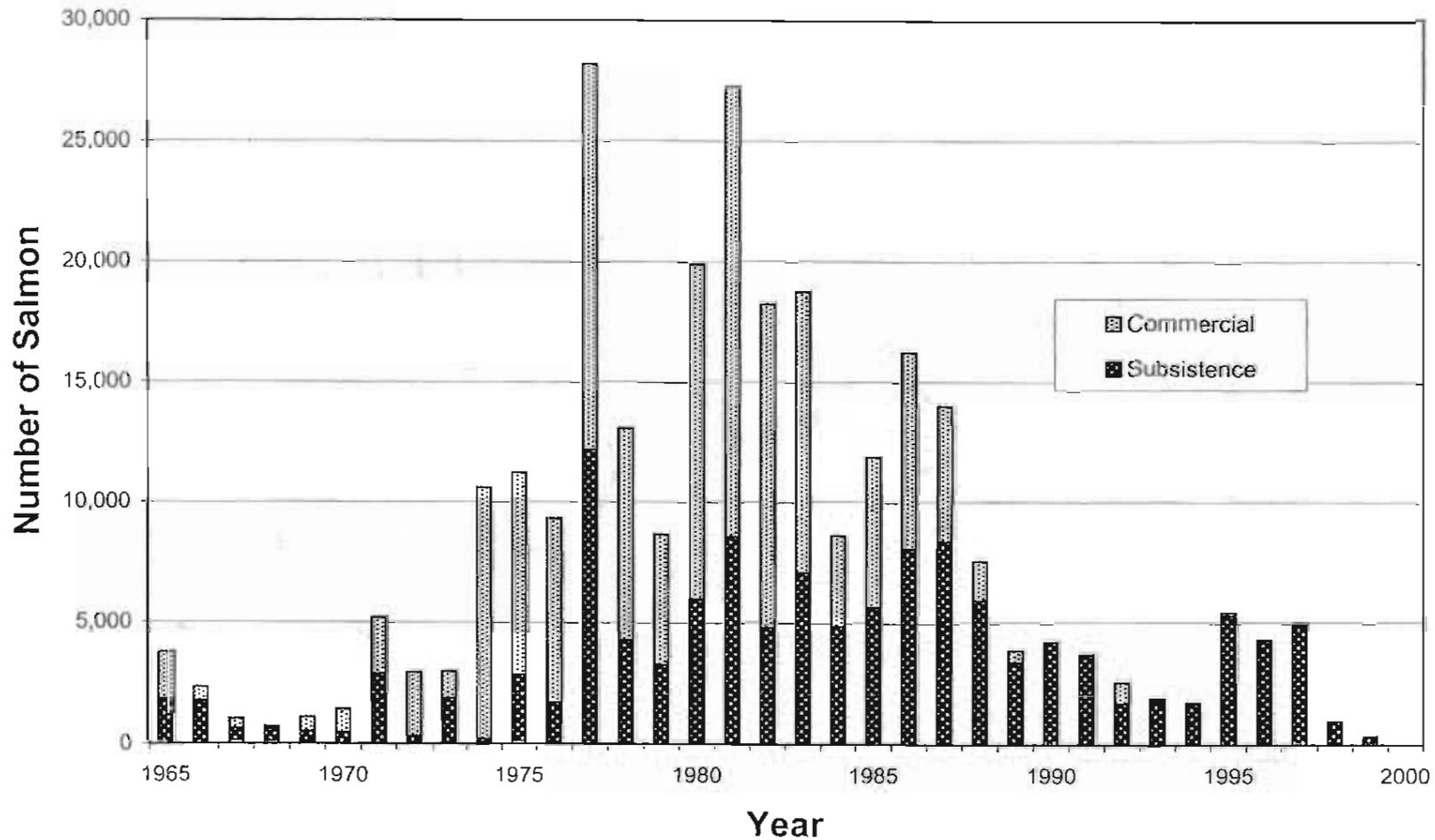


Figure 1. Known chum salmon streams in Norton Sound.

# Nome Subdistrict Chum Salmon



Note: 2000 subsistence harvest not available and incomplete prior to 1979.

Figure 2. Nome Subdistrict Commercial and Subsistence Chum Salmon harvest.

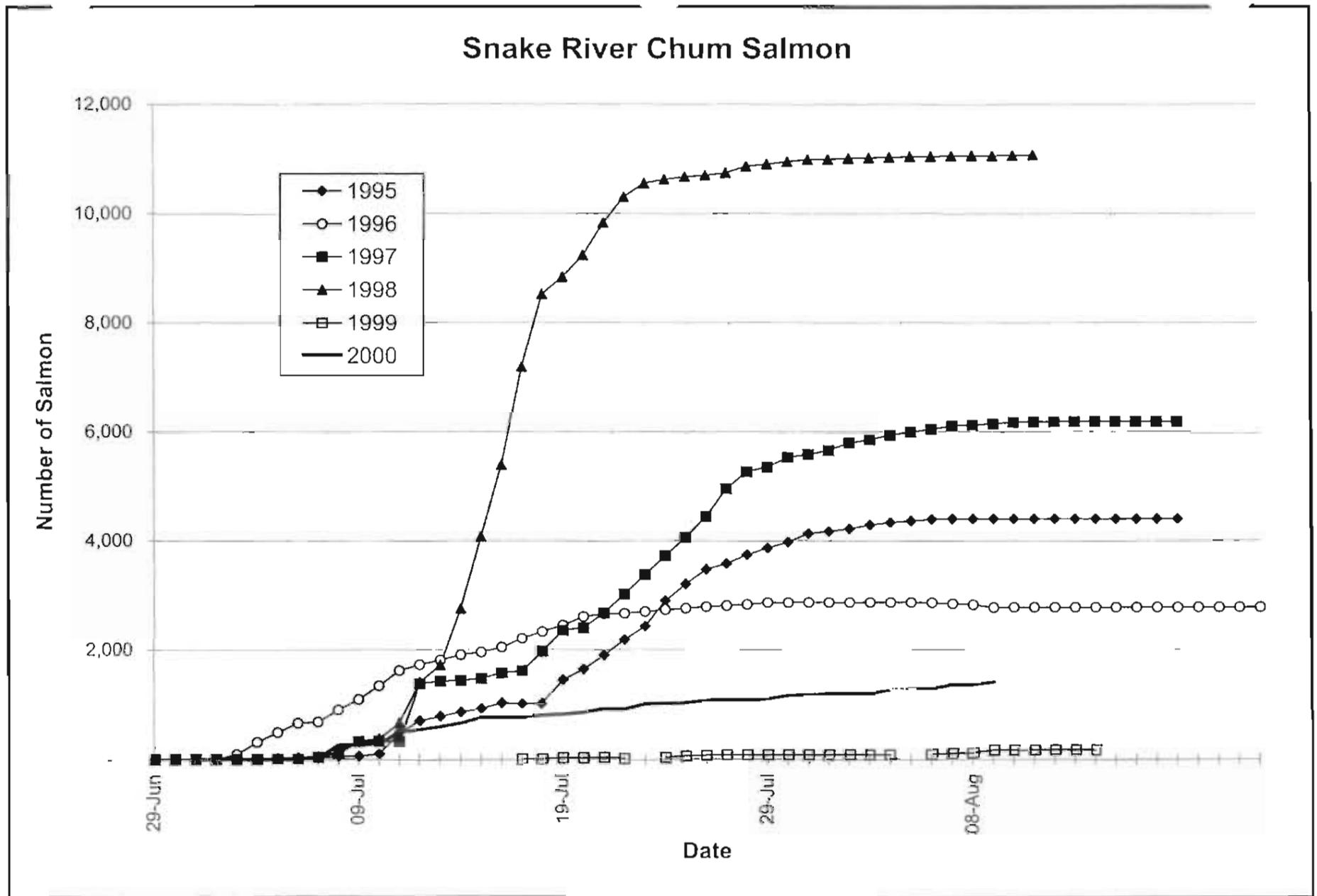


Figure 3. Snake River tower cumulative escapement counts of chum salmon.

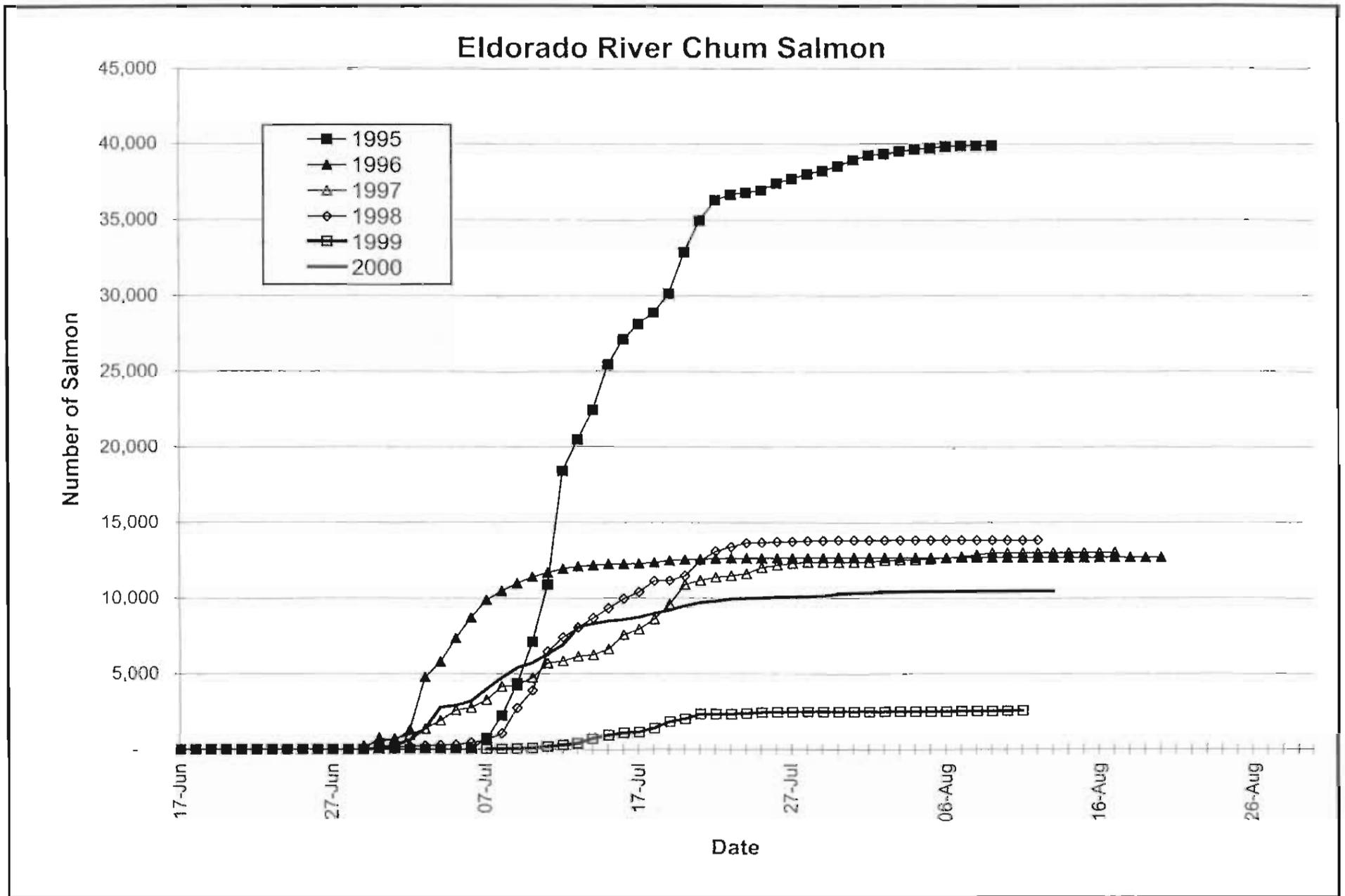


Figure 4. Eldorado River tower cumulative escapement counts of chum salmon.

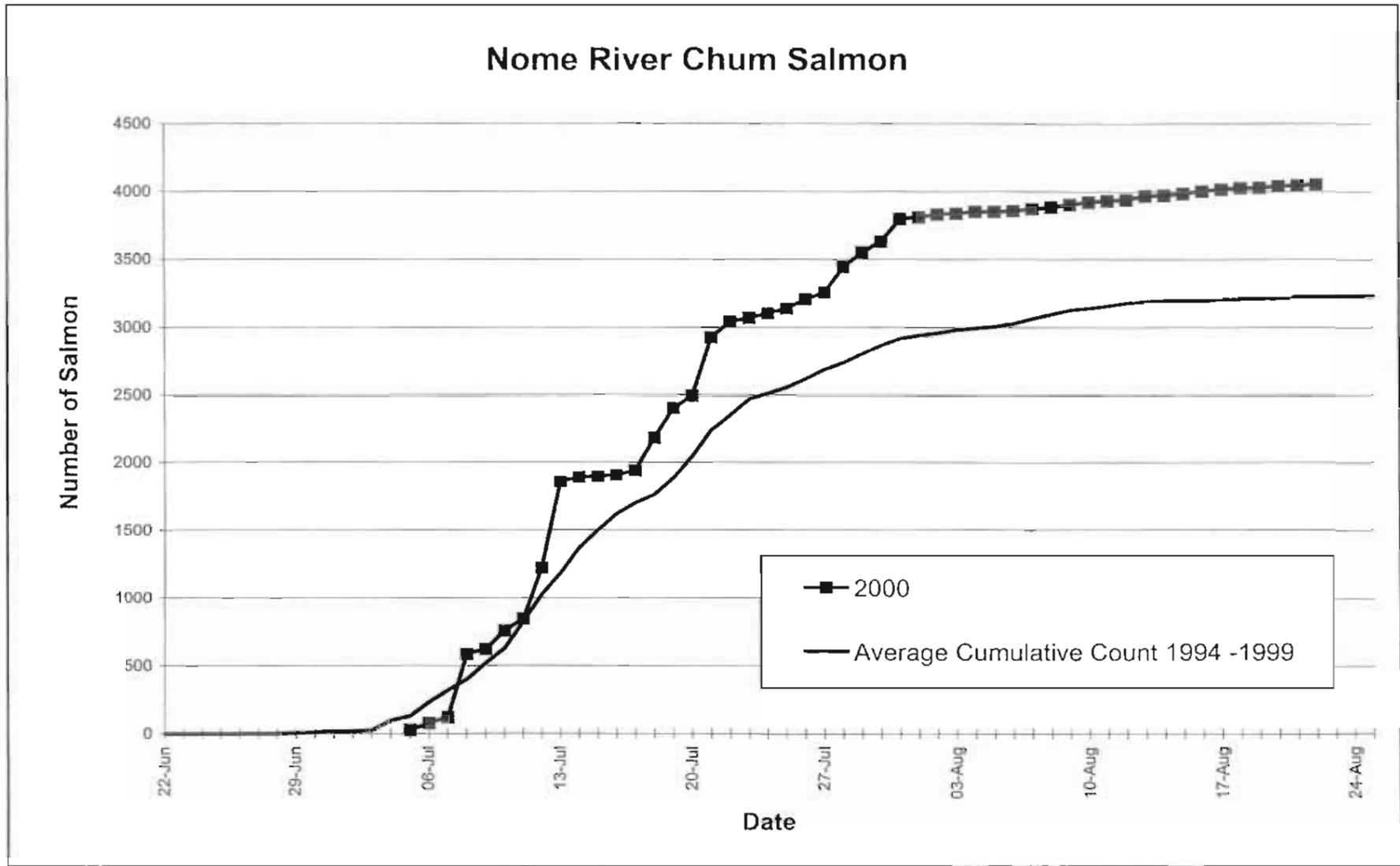


Figure 5. Nome River weir cumulative escapement counts of chum salmon.

Table 1. Commercial and subsistence chum salmon harvests by subdistrict, by year, Norton Sound District, 1961-2000.<sup>a</sup>

Year	Nome (1)		Golovin (2)		Moses Point (3)		Norton Bay (4)		Shaktolik (5)		Umiakleet (6)		Combined Totals	
	Commercial	Subsistence	Commercial	Subsistence	Commercial	Subsistence	Commercial	Subsistence	Commercial	Subsistence	Commercial	Subsistence	Commercial	Subsistence
1961	0	-	0	-	0	-	0	-	24,746	-	23,586	-	48,332	-
1962	0	-	68,720	-	50,883	-	24,380	-	8,718	-	30,283	-	182,784	-
1963	0	-	49,850	9,319	48,274	8,316	12,469	-	19,153	-	27,003	-	154,749	-
1964	1,194	-	58,301	-	28,588	348	5,916	-	35,272	5,412	19,611	6,726	148,982	-
1965	1,941	1,825	0	3,847	0	9,857	0	3,032	8,358	3,420	26,498	8,791	36,795	30,772
1966	581	1,782	29,791	3,520	24,741	5,409	0	3,612	8,292	4,183	16,840	3,387	80,245	21,873
1967	406	627	31,193	4,803	0	9,913	0	2,945	1,855	4,436	8,502	-	41,758	-
1968	102	821	10,011	1,744	17,908	2,527	0	1,872	2,504	1,915	14,865	2,982	45,300	11,661
1969	601	508	20,949	2,514	26,594	1,303	3,974	3,855	8,645	3,439	22,032	4,196	82,795	15,815
1970	960	458	20,966	2,614	29,726	6,960	0	3,500	15,753	2,016	40,929	7,214	107,034	22,752
1971	2,315	2,909	33,824	1,936	43,831	2,227	0	2,619	13,399	5,060	37,543	7,073	130,912	21,815
1972	2,643	215	27,097	2,028	30,919	2,070	7,799	2,022	12,022	3,389	20,440	4,132	100,920	13,966
1973	1,132	1,863	41,889	74	31,389	298	4,672	130	14,500	1,367	25,716	3,426	119,098	7,188
1974	10,431	183	30,173	205	59,276	1,723	3,828	900	26,391	358	36,170	588	162,267	3,957
1975	8,384	2,658	41,761	2,025	48,699	508	17,385	381	49,539	334	48,740	2,038	212,485	8,124
1976	7,620	1,705	30,219	1,128	10,890	1,548	7,161	236	15,798	289	24,268	2,832	95,956	7,718
1977	15,988	12,182	53,912	2,915	47,455	1,170	13,563	2,055	36,591	2,190	32,936	6,085	200,455	26,607
1978	6,782	4,296	41,462	1,061	44,595	1,229	21,973	1,060	35,388	1,170	37,079	3,442	189,279	12,257
1979	5,391	3,273	30,207	2,840	37,123	1,195	15,599	1,400	22,030	1,670	30,445	1,597	140,789	11,575
1980	13,922	5,985	52,609	4,057	14,755	1,393	7,855	1,132	27,453	1,927	64,198	5,230	190,732	19,622
1981	18,666	8,579	58,323	5,543	29,326	2,819	3,111	3,515	21,097	3,490	39,186	4,235	159,708	28,181
1982	13,447	4,831	51,970	1,868	40,030	3,537	7,128	2,485	26,240	1,165	44,520	4,694	183,335	18,580
1983	11,691	7,091	48,263	-	65,776	-	17,157	-	67,310	-	109,220	4,401	319,437	-
1984	3,744	4,883	54,153	-	6,477	-	3,442	-	32,309	-	43,317	3,348	146,442	-
1985	8,219	5,967	55,781	9,577	24,496	947	9,948	-	13,403	298	25,111	1,968	134,928	-
1986	6,160	8,085	89,725	-	20,698	-	1,094	-	16,126	-	30,239	-	146,912	-
1987	5,648	8,394	44,334	-	17,278	-	3,586	-	14,088	-	17,525	-	102,457	-
1988	1,628	5,952	33,348	-	18,585	-	7,521	-	21,521	-	25,363	-	107,966	-
1989	492	3,299	0	-	167	-	0	-	19,641	-	20,825	1,388	41,125	-
1990	0	4,246	18,993	-	3,723	-	0	-	21,748	-	23,659	-	65,123	-
1991	0	3,715	14,839	-	804	2,660	0	-	31,619	-	39,609	-	86,871	-
1992	881	1,684	1,002	-	8	1,280	1,767	-	27,867	-	52,547	-	84,090	-
1993	132	1,796	2,803	-	167	1,835	1,378	-	20,864	-	28,156	-	53,500	-
1994	66	1,673	111	1,337	414	3,476	0	4,581	5,411	1,221	12,288	12,732	18,290	25,020
1995	122	5,244	1,987	10,373	1,171	3,774	0	5,828	14,775	2,480	24,843	13,400	42,988	41,259
1996	3	4,333	0	2,867	0	2,319	0	4,181	3,237	4,425	7,369	16,481	10,609	34,586
1997	0	4,996	8,003	4,891	2,563	2,064	531	4,040	5,747	1,612	17,139	7,649	34,103	25,252
1998	0	964	723	1,693	2,311	1,376	0	6,192	7,080	1,034	6,210	2,651	16,324	14,010
1999	0	337	0	3,656	0	744	0	4,153	2,181	467	5,700	3,862	7,881	13,049
2000	0	-	194	-	535	-	0	-	2,751	-	2,700	-	6,150	-
5-year avg. <sup>b</sup>	25	3,195	2,143	4,736	1,233	2,065	108	4,875	6,604	2,004	12,262	8,767	22,383	25,631
10-year avg. <sup>b</sup>	120	2,906	4,546	-	1,128	-	370	-	14,053	-	21,752	-	41,969	-

<sup>a</sup> 1965-1999

<sup>b</sup> 1990-1999

<sup>c</sup> Subsistence harvest are incomplete prior to 1979.

<sup>d</sup> Data not yet available.

Table 2. Assessment of Norton Sound chum salmon escapements, 1995-2000.

Location	1995-1999 Average Estimate or Goal	1995		1996		1997		1998		1999		2000	
		Estimate	Assessment Made Goal or Average?	Estimate	Assessment Made Goal or Average?	Estimate	Assessment Made Goal or Average?	Estimate	Assessment Made Goal or Average?	Estimate	Assessment Made Goal or Average?	Estimate	Assessment Made Goal or Average?
Simuk River Aerial Survey	3,600-7,200 (Goal)	3,110	No	1,815 (early)	Unknown	2,975	No	630 (incomplete)	Unknown	no survey	Unknown	10 (incomplete)	Unknown
Snake River Tower	4,980 (Estimate)	4,393	Below avg.	2,772	Below avg.	6,184	Above avg.	11,067	Above avg.	454	Below avg.	1,400*	Below avg.
Aerial Survey	800-1,600 (Goal)	No Survey	Unknown	405	No	No Survey	Unknown	2,057	Yes	400 (incomplete)	Unknown	59 (incomplete)	Unknown
Nome River Tower/Welt	3,117 (Estimate)	5,092	Above avg.	3,339	Above avg.	5,131	Above avg.	976	Below avg.	1,048	Below avg.	4,051*	Above avg.
Aerial Survey	1,800-3,200 (Goal)	1,855	Yes	799 (incomplete)	Unknown	956 (incomplete)	Unknown	335 (incomplete)	Unknown	375 (incomplete)	Unknown	658 (incomplete)	Unknown
Eldorado/Flambeau Rivers Eldorado Tower	16,970 (Estimate)	39,867	Above avg.	12,655	Below avg.	14,302	Below avg.	13,808	Below avg.	4,218	Below avg.	10,604*	Below avg.
Eldorado, Flambeau Rivers Combined Aerial Survey	5,200-10,400 (Goal)	16,220	Yes	26,100 (incomplete)	Yes	4,340 (incomplete)	Unknown	no survey	Unknown	1,798 (incomplete)	Unknown	4,202 (incomplete)	Unknown
Bonanza River Aerial Survey	1,000-1,900 (Goal)	0 (incomplete)	Unknown	1,980 (incomplete)	Yes	881 (incomplete)	Unknown	no survey	Unknown	361 (incomplete)	Unknown	1,130 (incomplete)	Yes
Solomon River Aerial Survey	300-550 (Goal)	315	Yes	323	Yes	316 (incomplete)	Yes	90 (incomplete)	Unknown	51 (incomplete)	Unknown	150 (incomplete)	Unknown
Fish River Niukluk Tower	60,917	86,333	Above avg.	80,121	Above avg.	57,304	Below avg.	45,587	Below avg.	35,240	Below avg.	26,724*	Below avg.
Niukluk, Boston, Fish Rivers Combined Aerial Survey Index	23,200-46,400 (Goal)	43,012	Yes	19,077 (incomplete)	Unknown	40,500 (incomplete)	Yes	4,126 (incomplete)	Unknown	640 (incomplete)	Unknown	No Survey	Unknown
Kwiniuk River Kwiniuk Tower	15,600-31,200 (Goal)	42,703	Yes	28,403	Yes	20,118	Yes	24,248	Yes	8,763	No	12,251*	No
Tubutulik River Aerial Survey	13,600-27,200 (Goal)	16,516	Yes	10,790 (incomplete)	No	3,105	No	10,060	No	no survey	Unknown	No Survey	Unknown
Unalakleet River North Tower	5,543 (Estimate) <sup>2</sup>	no project	n/a	9,789 (incomplete)	Above avg.	6,904 (incomplete)	Above avg.	5,421 (incomplete)	Below avg.	5,600 (incomplete)	Above avg.	3,717*	Below avg.
Unalakleet Test Fish	943 (Index)	1,101	Above avg.	1,424	Above avg.	743	Below avg.	482	Below avg.	956	Above avg.	1,083	Above avg.
Unalakleet, Old Woman Rivers Combined Aerial Survey Index	2,400-4,800 (Goal)	6,089	Yes	296 (incomplete)	Unknown	4,840 (incomplete)	Yes	1,230 (incomplete)	Unknown	no survey	Unknown	no survey	Unknown

\* Preliminary estimate.

<sup>2</sup> Average estimate includes years 1995-1999.

Note: "incomplete" survey indicates a survey was flown, but not used in the "Goal" assessment due to timing or survey conditions.

Table 3. 2000 Nome Area subsistence salmon management actions.

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6/19/00	Closed all subsistence fishing in all Nome Subdistrict.
6/20/00	Tier II only fishing schedule 72 hrs/wk in marine waters East of Cape Nome. Only 10 permits awarded out of 31 applicants.
7/07/00	Tier I beach seining for pink salmon in fresh waters East of Cape Nome (Safety Sound, Flambeau, Eldorado, Bonanza, and Solomon Rivers) for 24 hours.
7/12/00	Tier I beach seining for pink salmon in fresh waters East of Cape Nome (Safety Sound, Flambeau, Eldorado, Bonanza, and Solomon Rivers) for 48 hours.
7/15/00	Tier I beach seining for pink salmon in fresh waters East of Cape Nome (Safety Sound, Flambeau, Eldorado, Bonanza, and Solomon Rivers) for 48 hours.
7/18/00	Tier II beach seining and gillnetting opened in marine waters East of Cape Nome and the fresh waters of Safety Sound, Flambeau, and Eldorado Rivers until bag limits reached.  Tier I beach seining opened for pink salmon in all fresh waters East of Cape Nome until 6 pm July 30.  Tier I gillnet fishing for pink salmon in marine waters East of Cape Nome until 6 pm July 30.
8/01/00	Fishing open to all subsistence users in all waters of the Nome Subdistrict below boundary markers in each stream to standard fishing schedule and bag limits.

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Table 4. Nome subdistrict management actions

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1962	Norton Sound District divided into subdistricts to focus management near terminal harvest areas.
1968	Subsistence registration permits required for fishing in the Sinuk, Snake, Nome and Solomon Rivers with bag limits and standard fishing times for entire sub-district.
Late 1970's	<ul style="list-style-type: none"> <li>- Board of Fish set commercial guideline harvest range between 5,000 and 15,000 chum salmon.</li> <li>- Commercial fishing period length reduced by half.</li> <li>- Subsistence permits required for all Nome area waters beginning in 1975.</li> </ul>
1984	<p>Salmon management shifted focus from commercial to subsistence.</p> <ul style="list-style-type: none"> <li>-Commercial harvest area reduced by half to protect subsistence harvest areas.</li> <li>-Commercial fishing time greatly reduced to allow for subsistence needs and adequate escapements.</li> <li>-Sport fish chum and coho bag limits reduced.</li> <li>-Subsistence season bag limits reduced to 20 chum and 20 coho.</li> </ul>
1987'	<ul style="list-style-type: none"> <li>-Commercial fishery nearly eliminated by current regulations and management due to low chum and pink stocks</li> <li>-Sport fish chum and coho bag limits further reduced.</li> <li>-Subsistence disallowed beach seines as a legal gear type in specific waters.</li> </ul>
1988	<ul style="list-style-type: none"> <li>-Sport fishing for chum closed in the Nome River.</li> <li>-Subsistence gillnets reduced to 50 feet maximum length in Nome River.</li> </ul>
1990	Subsistence fishing closure on Nome River to allow for chum escapement.
1991	Commercial, Sport, and Subsistence closures of nearly the entire subdistrict due to low chum and pink escapements. Restrictions were lifted once they became no longer effective and other species could be targeted.
1992	<p>Similar to 1991 except that subsistence restrictions were lifted incrementally as the abundant pinks returned while protecting the chum stocks. Beach seines were allowed as a legal gear type for pinks only.</p> <ul style="list-style-type: none"> <li>-Subsistence gillnet gear was restricted to 50 feet maximum length for all inland waters of the Nome area by regulation.</li> </ul>
1993	Same as 1991.

Table 4. (page 2 of 2)

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- 1994 Commercial fishing closed until August 1 when coho salmon could be targeted. Sport harvest of chum closed for entire season. Subsistence restrictions similar to 1992.
- 1995 Management similar to 1994 except: sport fishing for chum salmon became closed by regulation; beach seine gear was allowed in areas with adequate chum escapements; subsistence fishing time increased for marine waters to allow for more flexibility to deal with more harsh fishing conditions.
- 1996 Management similar to 1995 except that beach seine fishing targeted pink salmon and did not allow chum salmon to be retained.
- 1997 Management similar to 1995 except that no beach seine fishing was allowed.
- 1998 -Initial all salmon subsistence closure for all waters except marine west of Nome Jetty.  
-Incremental relaxing of individual areas to subsistence with gear restrictions to avoid chum salmon.  
-No commercial coho season.
- 1999 BOF implements Tier II subsistence chum fishing regulations which awards limited fishing opportunity to individuals with the longest history and greatest dependence on the Nome chum resource based on the inability of the Nome chum stock to fully support all subsistence user's needs.  
-Open Tier II only subsistence chum fishing, issuing 20 permits and restricting effort to marine waters east of Cape Nome.  
-Close all subsistence chum fishing due to very weak runs.  
-Close commercial, Sport and subsistence fishing for coho.
- 2000 -Open Tier II only subsistence chum fishing, issuing 10 permits and restricting effort to marine waters east of Cape Nome.  
-Open Tier I beach seining for pink salmon and later small mesh gillnets to take advantage of the strong pink run while protecting chum.  
-General subsistence fishing reopened to coho in all usual waters of the subdistrict.
-

**Table 5. Norton Sound chum salmon conservation measures since 1993.**

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As a result of the **December 1993 Board of Fisheries meeting** the following regulations took effect:

5 AAC 01.160. (b) (1) (A) and (B) This regulation allowed more subsistence fishing time in marine waters in the Nome Subdistrict and provided an alternative to the harvest of terminal stocks in the local rivers. *This may not be considered a conservation measure, just the opposite, although the BOF findings stated it was.*

5AAC 01.160. (b) (4) This regulation allowed emergency orders to require the release of chum salmon caught in beach seines in Subdistricts 2 and 3 of Norton Sound.

5 AAC 01.186 Customary and Traditional Use findings were made affecting the fisheries of Norton Sound and Kotzebue. These findings are fundamental to the management of subsistence, commercial and sport fisheries. The regulation was reconsidered in 1996, 1997, 1998 and finally amended in 1999. *This may not be considered a conservation measure.*

5 AAC 04. 331. Allows the manager of the Norton Sound commercial salmon fishery to direct fishing away from chum salmon to chinook salmon by emergency order adjusting commercial gillnet mesh size.

As a result of the **December 1997 Board of Fisheries meeting** the following regulations took effect:

5AAC 01.160. (a) Removed the weekly closed period at Port Clarence intended to conserve sockeye salmon, thereby allowing more opportunity for alternative harvests to chum salmon. *This may not be considered a chum salmon conservation measure.*

5AAC 70. 022. Clarified the sport fishery chum salmon restriction in the Northern Norton Sound Area. *This may not be considered a chum salmon conservation measure, it was a sockeye salmon conservation measure.*

As a result of the **March 1999 Board of Fisheries meeting** and the December 1997 and March 1998 meetings the following regulations took effect:

5AAC 01. 160. (b) (1) (B) Reduced subsistence fishing time in marine waters with the intent to reduce harvest from marine waters by half. *This regulation was primarily intended to reallocated salmon harvest to inriver fishing, but it was also intended to reduce intercept fishing and promote the targeting of terminal stocks.*

5AAC 01.175. (c) (4-9) Completed the closure of chum salmon spawning areas in all of the streams of the Nome Subdistrict.

**Table 5. (page 2 of 2).**

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5AAC 01. 180. (d) Placed a subsistence harvest permit limit for marine waters of the Nome Subdistrict. Previously there was no harvest limit in marine waters. *This regulation was primarily intended to reallocated salmon harvest to inriver fishing, but it was also intended to reduce intercept fishing and promote the targeting of terminal stocks.*

5AAC 01. 180 (e); 5AAC 01.182.; 5AAC 01. 184. Establish the regulations to manage a Tier II subsistence chum salmon fishery. *These regulations provide for the maximum opportunity while allowing for adequate escapement and may not be viewed as a conservation tool.*

5AAC 01.186 (a) (2 and 3), (b) (1 and 2) Updated the customary and traditional chum salmon subsistence needs in the Norton Sound and the Nome Subdistrict. In part, this enables Tier II management and determines when other uses of the resource are appropriate. *This may not be considered a conservation measure.*

5AAC 04. 200. (b) (1) Redraws the western boundary of the Nome Subdistrict to help provide appropriate chum salmon conservation to the Cripple and Sinuk Rivers.

## **SECTION II**

### **DEVELOPMENT OF MANAGEMENT/ACTION PLAN OPTIONS FOR THE NORTON SOUND SUBDISTRICT 1 (NOME) SALMON STOCK OF CONCERN AS OUTLINED IN THE SUSTAINABLE FISHERIES POLICY**

**SECTION II  
TABLE OF CONTENTS**

SUBDISTRICT 1 (NOME) CHUM SALMON MANAGEMENT PLAN REVIEW AND DEVELOPMENT.....1

    Current Stock Status.....1

    C&T Use Finding And The Amount Necessary For Subsistence.....1

    Habitat Factors Adversely Affecting the Stock.....1

    Do New Or Expanding Fisheries On This Stock Exist.....2

    Draft Management Plan.....3

    Escapement Goal Review.....4

*List of Current and Proposed BEGs or SEGs for Subdistrict 1*.....4

    Identify Research Needed On Stock.....4

***ACTION PLAN DEVELOPMENT***.....5

    Subdistrict 1 Chum Salmon Rebuilding Action Plan Goal .....5

    Action Plan Alternatives.....5

*Action #1*.....5

*Action #2*.....6

*Action #3*.....7

*Action #4*.....8

## SECTION II

### *NORTON SOUND SUBDISTRICT 1 (NOME) CHUM SALMON MANAGEMENT/ACTION PLAN REVIEW AND DEVELOPMENT*

#### **Current Stock Status**

In response to the guidelines established in the Sustainable Salmon Fisheries Policy, the Board of Fisheries during the September 28-29, 2000 work session classified the Nome Subdistrict chum salmon stock as a management concern. This classification was based on the inability, despite the use of specific management measures, to meet escapement goals since 1998 and the anticipated low level in 2001.

#### **C&T Use Finding And The Amount Necessary For Subsistence**

The Board of Fisheries has made a positive finding for Customary and Traditional Use for chum salmon in the Nome Subdistrict. Further, the Amount Necessary for Subsistence was determined in March 1999 to be 3,430 – 5,716 chum salmon.

#### **Habitat Factors Adversely Affecting The Nome Subdistrict Chum Salmon Stock**

Nome Subdistrict has been subjected to significant gold mining over a long time period. While historic mining did cause significant damage, most of the direct physical damage was to tributary streams and/or headwaters. For the most part, prime chum salmon spawning areas were not affected (except for the Nome and Solomon rivers). In addition there are other issues, such as road construction, which have contributed to loss of fish habitat (Mac McLean, personal communication). A discussion of habitat issues impacting Nome Subdistrict chum salmon production is contained in the Norton Sound/Bering Strait Regional Comprehensive Salmon Plan 1996 – 2010 (Norton Sound/Bering Strait Regional Regional Planning Team, 1996).

The following excerpts from the Comprehensive Plan describe some of the problems:

1. The Snake River “was heavily impacted by gold mining activities which played a significant role in damaging salmon spawning and rearing habitats as well as impacting the returns of the different species of salmon. The Snake River’s tributaries are still actively mined today.” (page 43)
2. “Prior mining activity on the Nome River and its tributaries as well as road construction has adversely impacted salmon populations over the years.” (page 44)
3. In the Solomon River “early mining activity was substantial; at least 13 dredges were operated on the Solomon River and its’ tributaries. Considerable damage was done to some sections of river as a result of these activities. Additionally road construction has resulted [in] redirection of portions of the river that may require stream channelization work for complete recovery.” (page 45)

In addition to existing mining activities, the possibility exists that new mining activity will occur in the future. One such possibility is a mine on Rock Creek (Swainbank et al, 1999), a tributary of the Snake River where there is an arsenopyrite deposit. The lower one-third of this deposit is reportedly acid producing. Information is not presently available on the buffering capacity of the remainder of the deposit. Electro-shocking and minnow trapping have not revealed the presence of any fish in Rock Creek, although it is similar in channel morphology to adjacent streams that do have juvenile Dolly Varden and coho. It is not clear at the present time what impact, if any, this mining activity may have on Snake River chum salmon.

### *Projects Needed*

1. Survey of the loss of chum salmon spawning and rearing habitat due to mining and instream gravel extraction (historic practice), especially in the Snake, Nome, and Solomon Rivers and an assessment of the feasibility and cost of restoration.
2. Rocky Mountain Creek Culvert Correction in the Nome River drainage would open up some additional chum salmon spawning habitat. Unlikely. Upstream of the highway provides rearing habitat for Dolly Varden and coho salmon. Also the culvert has already been replaced and the perched eliminated. Winter water flow in this portion of the Nome River is rather limited, although there are some spring seeps just upstream of Rocky Mountain Creek. One of them was tapped into with construction of the MP 22.4 Material Site/Fish Pond. This pond currently provides summer rearing and overwintering habitat. ADOT&PF are proposing to construct 2 to 3 additional ponds Between MP 24 and 27.
3. Solomon River restoration to correct loss of habitat due to historic dredging and material extraction (road construction).
4. Intensive monitoring of existing and future projects to determine whether or not chum salmon and their habitat is being impacted.

### *Literature Sources*

Norton Sound/Bering Strait Regional Planning Team. 1996. Norton Sound/Bering Strait Regional comprehensive salmon plan 1996-2010. Alaska Department of Fish and Game. 128 pp.

Swainbank, R.C., Szumigala, D.J., Henning M.W., and Pillifant, F.M. 1999. Alaska's Mineral Industry 1999. Special Report 54. Alaska Division of Geological and Geophysical Surveys, 794 University Avenue, Suite 200. Fairbanks Alaska 99709-3645.

### **Do New Or Expanding Fisheries On This Stock Exist?**

There are no new or expanding fisheries on this stock. There are three proposals (#'s 125, 128, and 129) which would allow the use of an additional subsistence fishing gear type or modify escapement goals and management.

## Draft Management Plan

Board reviews existing management plan for consistency with principles and criteria of Sustainable Salmon Fisheries Policy or adopts new management for the stock consistent with the principles and criteria of the Sustainable Salmon Fisheries Policy. A draft management plan has been laid out as requested in the November 2000 work session:

### 5 AAC 04.3XX. SUBDISTRICT 1 SALMON MANAGEMENT PLAN

The purpose of this management plan is to provide conservative management guidelines for the sustained yield management of the Subdistrict 1 salmon resources. The Department shall manage, to the extent practicable, the commercial, sport, subsistence, and personal use fisheries in Subdistrict 1 to achieve established escapement goal ranges, as follows:

- (1) The commercial salmon fishing season shall be opened by emergency order after July 1 and closes on August 31, unless closed earlier by emergency order
- (2) Commercial salmon fishing periods shall be opened and closed by emergency order with no more than two 24-hour fishing periods per week allowed.
- (3) Subsistence salmon fishing area and times shall be opened and closed by emergency order on a stream-by-stream basis when and where salmon stocks are judged adequate to provide for a harvestable surplus relative to established escapement goals.
- (4) A subsistence salmon fishing permit will be issued to each fishing household which identifies the body of water to be fished, the annual harvest limit of each salmon species, and specifies the allowable gear type.
- (5) Tier II subsistence chum salmon fishing permits will be issued when the harvestable surplus of chum salmon is expected to be insufficient to provide a reasonable opportunity for subsistence uses, the board has eliminated all nonsubsistence consumptive uses, and further restrictions are necessary to assure that the chum salmon stock is maintained and managed on a sustained yield basis, or to assure the continuation of subsistence uses as set forth in 5 AAC 01.182. and 5 AAC 01.184.
  - (a) Tier II subsistence chum salmon fishing permits will be issued based on run strength expectations. Initially, the top 10 scored applicants may be issued permits. If chum salmon returns allow, additional permits will be issued in increments of 10 up to a maximum of 30 Tier II permits. If chum salmon surpluses are in excess of these requirement, then subsistence chum fishing will open to Tier I subsistence users which include any state resident.
  - (b) Tier II subsistence fishing seasons, periods, methods, and locations will be opened and closed by emergency order.

- (6) subsistence Tier I fishing opportunities for other salmon species will be provided for each salmon species when and where they become available and in a manner to minimize potential negative impacts to the local chum salmon stocks through the use of time, area, and gear restrictions.

### Escapement Goal Review

The Department is undertaking a review of escapement goals for several AYK salmon stocks where adequate long term escapement, catch, and age composition data exist that enable the development of biological escapement goals based on analysis of production consistent with the Department's escapement goal policy. Stocks pertinent to this report include Norton Sound Subdistrict 1 chum salmon. The intent of the review is to recommend scientifically defensible biological escapement goals for these stocks. A detailed report will be published for each of these stocks, documenting the available data, methods for reconstruction of long-term age specific runs and recruits from parent escapement, analysis of the relationship between the parent spawning stock and recruits, or progeny, and recommended biological escapement goals. These reports will be prepared and, following an internal review and approval by the AYK Biological Escapement Goal review committee, will be provided for public review by December 20, 2000.

#### *List of current and proposed BEG, or SEG's for stock.*

Stream	Current Goal	Proposed Goal <sup>1</sup>
Sinuk River Aerial	3,600-7,200 BEG	4,000-6,200 BEG
Snake River Aerial	800-1,600 BEG	1,600-2,500 BEG
Nome River Aerial	1,600-3,200 BEG	2,900-4,300 BEG
Flambeau/Eldorado River Aerial	5,200-10,400 BEG	
Flambeau		4,100-6,300 BEG
Eldorado		6,000-9,200 BEG
Bonanza River Aerial	1,000-1,900 BEG	2,300-3,400 BEG
Solomon River Aerial	300-550 BEG	1,100-1,600 BEG
Penny River		400-600 BEG
Cripple River		600-900 BEG
Subdistrict Total Aerial	12,500-24,850 BEG	23,000-35,000 BEG

<sup>1</sup>Total spawners

### Identify Research Needed On Stock

A Norton Sound Research Initiative committee has been formed that is identifying and prioritizing research needs in response to the current low chum salmon stock status in much of Norton Sound. This initiative seeks to increase escapement monitoring, collect biological data, and advance understanding of the factors involved in salmon production studies of juvenile salmon and environmental conditions.

Current escapement monitoring projects:

- Nome River Wier, 1993-95(tower), 1996-2000
- Snake River Tower, 1995-2000
- Eldorado River Tower, 1996-2000
- Aerial and boat surveys

Past Research:

- Marine waters tagging, Norton Sound District, 1978 and 1979

## ***ACTION PLAN DEVELOPMENT***

### **Subdistrict 1 Chum Salmon Rebuilding Action Plan Goal**

Reduce fishing mortality in order to meet spawning escapement goals, to provide for subsistence levels within the ANS range, and to reestablish historic range of harvest levels by other users.

#### **Action Plan Alternatives**

##### ***ACTION #1.***

***5 AAC 04.360 Guideline Harvest Range for commercial fisheries.***

##### ***Objective***

The objective of this recommended action is of a housekeeping nature designed to correspond with current management practices. No commercial fishing for chum salmon has been allowed for 15 years and none is expected for the next several years. The regulation calls for a commercial harvest range of 5,000 to 15,000 chum salmon in the Nome Subdistrict. In the future, an escapement based management strategy will be utilized to manage any commercial fisheries.

##### ***Specific action recommended to implement the objective***

Repeal 5 AAC 04.360 Guideline Harvest Range for commercial fisheries.

##### ***Subsistence issues/considerations***

The recommended action is consistent with state subsistence law requirements.

##### ***Performance measures***

Projects are set in place to monitor commercial harvest and escapement in season and subsistence harvest by species and stream post season.

##### ***Research plan to address stock of concern***

A research plan is not applicable to this proposed action.

***ACTION #2.***

***Provide the Department authority to restrict subsistence harvest of salmon to gillnets of 4 1/2-inch mesh or smaller by emergency order when necessary to reduce harvest rates on chum salmon and provide opportunity to harvest pink salmon.***

***Objective***

To provide a management tool that could direct subsistence harvest on abundant pink salmon stocks while reducing the potential harvest of chum salmon stocks of concern. Subsistence fishermen would have a greater opportunity to harvest alternative salmon species rather than forego potential harvests in efforts to protect weak chum salmon stocks.

***Specific action recommended to implement the objective***

Adopt a regulation under 5 AAC 01.170 LAWFUL GEAR AND GEAR SPECIFICATIONS that allows the department to restrict gillnets to a 4 ½ inch maximum mesh size by emergency order. Pink salmon typically are abundant primarily during even year runs. Management of the subsistence fishery would use time and/or area and gear restrictions to provide for reasonable opportunity while allowing chum salmon to pass through lower river and marine areas. Management would open and close subsistence fishing seasons, establish subsistence fishing periods, and implement gear specifications by emergency order based upon inseason run assessment.

***Benefits***

Chum and pink salmon runs overlap in the subdistrict. Under current management authority, gillnet mesh size cannot be specified to target the harvest on pink salmon. However, the department can restrict gear type, which is often viewed as allocative between different types of fishing operations. This action would allow gillnet fishermen an opportunity to harvest pink salmon in the time and areas most commonly used historically by that gear type. Nome Subdistrict streams are managed based upon inseason assessments of the actual runs. When a very low chum salmon run is expected, mixed with a high pink salmon run, gillnet fishermen could fish earlier in the run when the weather is good rather than switching gear types, traveling further from camp, and/or fishing later in the season.

***Detriments***

Currently subsistence harvest levels cannot be determined inseason. Management of the subsistence fishery could be overly restrictive or too lenient prior to obtaining complete run abundance information. Low subsistence harvests of chum salmon incidental to a directed subsistence pink salmon fishery may be too excessive for the small stocks in some areas which are already in marginal health.

***Subsistence issues/considerations***

A Tier II subsistence chum salmon fishery was established in March 1999. This Action Alternative helps to provide subsistence fishers additional opportunity to harvest pink salmon when chum salmon stocks are at low levels in the mixed fishery.

### ***Performance measures***

The department encourages fishermen to keep track of their subsistence salmon harvest on required subsistence fishing permits which specify gear type and fishing location. Inseason salmon run assessment will be based on two counting towers, a wier, and aerial surveys. Harvest levels would be determined post season through subsistence surveys. Postseason analysis will apportion harvest information by species, effort, stream, and gear type.

### ***Research plan to address stock of concern***

(refer to Norton Sound Research Initiative Plan development)

### ***ACTION #3.***

***Close the Nome Subdistrict to directed subsistence chum salmon fishing to allow for rebuilding.***

***(common suggestion within Nome Tier II work group)***

### ***Objective***

To remove uncertainty in harvest of chum salmon in the Nome Subdistrict which occurs during limited subsistence fishing periods and assure the majority of returning fish go into escapement.

### ***Specific action recommended to implement the objective***

Close subsistence chum salmon fishing by regulation in the Nome Subdistrict with a sunset clause to revisit the issue after five years.

### ***Benefits***

When low chum salmon runs are projected and subsistence fishing is likely to be closed, or restricted, in order to meeting established escapement goals, there is the potential that even limited chum salmon subsistence harvests may prevent adequate spawning escapements. It is hoped that giving up expected small potential harvests now may result in a quicker recovery time for the chum salmon stocks, thus making Tier II allocations unnecessary in the future.

### ***Detriments***

This action assumes that depressed chum salmon stocks will rebuild more quickly if fish harvested for subsistence under the Tier II fishery are allowed to spawn. However, if escapements are within, or above, the department's established escapement goal ranges the primary effect will be to unnecessarily deprive subsistence users of an allowable harvest.

### ***Subsistence issues/considerations***

Amounts Necessary for Subsistence has been determined to be 3,430 – 5,716 chum salmon. A Tier II subsistence chum salmon fishery was established in March 1999. Under this action, when there is a harvestable surplus, no harvest would be allowed for anyone.

***Performance measures***

The department encourages fishermen to keep track of their subsistence salmon harvest on required subsistence fishing permits, which specify gear type and fishing location. Inseason salmon run assessment will be based on two counting towers, a wier, and aerial surveys. Postseason analysis will apportion harvest information by species, effort, stream, and gear type.

***Research plan to address stock of concern***

(refer to Norton Sound Research Initiative Plan development)

***ACTION #4.***

***Base chum salmon management on a subdistrict-wide escapement goal as well as escapement goals for individual streams to ensure adequate distribution of spawners. (related to Proposal #129)***

***Objective***

To establish an overall subdistrict escapement goal that will aid in managing individual streams for the purpose of ensuring adequate escapement within the subdistrict as a whole.

***Specific action recommended to implement the objective***

Manage fisheries in individual rivers for the upper end of the escapement goal range when escapements in other streams are below their escapement goal range.

***Benefits***

This action would provide greater overall escapement in the subdistrict in years when runs to some streams are weak.

***Detriments***

There may be large variations in stock size for different streams. The subdistrict could be judged to have achieved its overall goal even when a very low escapement occurs in an individual river.

***Subsistence issues/considerations***

This strategy would reduce subsistence fishing opportunity slightly on stronger runs in some years. Increasing the overall escapement in the subdistrict would improve runs in future years.

***Performance measures***

Inseason salmon run assessment will be based on two counting towers, a wier, and aerial surveys. Management actions will be assessed in terms of the individual stream BEG as well as the subdistrict wide BEG. Chronic inability of the management strategy to attain BEGs will result in alterations to management so that adequate escapements to all streams are ensured. The department encourages fishermen to keep track of their subsistence salmon harvest on required subsistence fishing permits, which specify gear

type and fishing location. Postseason analysis will apportion harvest information by species, effort, stream, and gear type.

*Research plan to address stock of concern*

(refer to Norton Sound Research Initiative Plan development)