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Escapements of Chinook Salmon in Southeast Alaska and Transboundary Rivers in 1992

by

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ABSTRACT

The estimated total escapement of chinook salmon *Oncorhynchus tshawytscha* for all Southeast Alaska and transboundary rivers increased from 58,100 fish in 1991 to 68,950 fish in 1992, the first increase since 1988. The total escapement of chinook salmon in 1992 was 19% or 10,900 fish more than in 1991 and 84% of the escapement goal of 82,140 chinook salmon. The 1992 escapement represented an increase of approximately 116% or 37,100 chinook salmon over the 1975-1980 average of 31,850 chinook salmon and an increase of 46% or 21,800 chinook salmon over the 1981-1985 average of 47,100.

Escapements exceeded goals in the Stikine (up 47% from 1991) and Situk Rivers (up 60%) and in Andrew Creek (up 95%), and were good although below goal in the Taku River (up 10%). The Alsek River, however, declined dramatically, from 3,165 to 1,636 fish in 1992 (-38%), the lowest escapement since a weir was installed in 1976.

Escapements to the Behm Canal systems—the Unuk (+14%), Chickamin (-29%), Blossom (-37%) and Keta Rivers (-20%)—were all poor again. The King Salmon River escapement of 117 fish (-13%) was the lowest in the ten years the weir has operated.

KEY WORDS: Chinook, *Oncorhynchus tshawytscha*, escapement, Taku River, Stikine River, Alsek River, Chilkat River, Unuk River, Chickamin River, Blossom River, Keta River, Marten River, Wilson River, Chilkat River, King Salmon River, Situk River, Andrew Creek, Behm Canal, Southeast Alaska, U.S./Canada Treaty, Transboundary Rivers.

INTRODUCTION

Populations of chinook salmon *Oncorhynchus tshawytscha* are known to occur in some 34 river systems throughout Southeast Alaska, northwestern British Columbia, and the Yukon Territory, Canada. In the mid-1970's it became apparent that the majority of chinook salmon stocks in the Southeast Alaska region were depressed relative to historical levels of production (Kissner 1974). As a result, a fisheries management program was implemented to rebuild depressed stocks of chinook salmon in Southeast Alaska and transboundary rivers (rivers that originate in Canada and flow into Southeast Alaska coastal waters)(ADF&G 1981). Initially, this management program included regulatory closures of commercial and recreational fisheries in terminal and near-terminal areas. This program was formalized and expanded in 1981 to a 15-year (roughly 3 life-cycles) rebuilding program for the transboundary Taku, Stikine, Alsek, Unuk, Chickamin, and Chilkat rivers and the non-transboundary Blossom, Keta, Situk, and King Salmon rivers (ADF&G 1981). The program used regionwide, all-gear catch ceilings for chinook salmon to enable spawning escapements to rebuild by 1995 (ADF&G 1981). Then, in 1985, the Southeast Alaska rebuilding program was incorporated into a broader, coastwide, rebuilding program for natural stocks of chinook salmon under the auspices of the U.S./Canada Pacific Salmon Treaty (PST).

The indices of escapements of the major, medium, and minor stocks are expanded to total estimates of escapements for each system and for all Southeast Alaska, according to set formulas (Mecum 1990)(Appendix A1). These estimates are provided to the Joint Chinook Technical Committee of the Pacific Salmon Commission. In accordance with the PST, escapement indices are used to judge progress towards meeting escapement goals for the chinook salmon stocks of Southeast Alaska and transboundary rivers (Mecum 1990). These expansions are compared with similarly constructed historical estimates of escapement and appropriate fishery regulations are promulgated.

The overall goal of the Chinook Salmon Escapement Project is to collect information for management of commercial and recreational fisheries to ensure maximum sustained yield of Southeast Alaska and transboundary river chinook salmon stocks. Estimates of escapements by brood year will be used to investigate the relationship between spawners and subsequent recruitment. In 1991, the objective of this project was to estimate peak escapement of large (age 1.3, 1.4 and 1.5) chinook salmon to tributaries and mainstem areas of the Taku, Stikine, Alsek, Situk, Unuk, Chickamin, Chilkat, Blossom, Keta, Marten, King Salmon rivers and Andrew Creek.

METHODS

Of the 34 river systems with documented spawning populations of wild chinook salmon, three—the transboundary Taku, Stikine, and Alsek—are classified as major producers of chinook salmon, with total production in each river potentially exceeding 10,000 fish. Nine systems are considered medium producers, with production between 1,500 and 10,000 fish. The remaining 22 rivers are minor producers, with run sizes of fewer than 1,500 chinook salmon. Although chinook salmon have been observed in small numbers in other Southeast Alaska streams, successful spawning has not been documented.

Many chinook salmon spawning streams are surveyed annually to document escapements and to expand the database for Southeast Alaska (Appendix A4).

Counts from three major, seven medium, and one minor producing system are used to calculate an index of abundance for all Southeast Alaska/transboundary river chinook salmon stocks. Index areas were selected on the basis of their historical importance in local fisheries, size of stocks, geographic distribution, historical and ongoing database, and ease of collecting escapement data. Descriptions of the index areas and expansion methods are summarized in the following text and in Appendices A2 and A3. A detailed description of survey areas and spawning distribution in index tributaries can also be found in Mecum and Kissner (1989).

The status of index stock escapement is reviewed annually by the Pacific Salmon Commission (PSC) as one measure of rebuilding progress since implementation of conservation actions (PSC 1991a). Evaluation of the rebuilding program is focused on changes in average escapements since the base period years; comparison of current escapement with a linear trend from the escapement base period to the goal at the rebuilding target date; and trends in escapements since PST implementation.

Description of Study Areas

The Taku River originates in northern British Columbia and flows into the ocean 48 km east of Juneau, Alaska (Figure 1). The Taku River drainage covers over 16,000 km^2 and maximum flows range from 787 to 2,489 m^3/sec. Principal tributaries include the Sloko, Nakina, Sheslay, Inklin, and Nahlin rivers. The clearwater Nakina and Nahlin rivers contribute less than 25% of the total drainage discharge, most of the discharge is from glacier-fed streams on the eastern slope of the Coast Range of British Columbia. The drainage upstream of the abandoned mining community of Tulsequah, British Columbia remains in pristine condition with very little mining, logging, or other development activities. The upper Taku River area is extremely remote with no road access and few year-round residents. All of the important chinook salmon spawning areas in the Taku River are found in tributaries in the upper drainage in British Columbia. These include the Nakina, Nahlin, Dudidontu, Tatsamenie, Hackett, and Kowatua rivers and Tseta Creek.

The Stikine River originates in British Columbia and flows to the sea approximately 32 km south of Petersburg, Alaska (Figure 2). The drainage covers about 52,000 km^2 of which about 90% is inaccessible to anadromous fish due to natural barriers and velocity blocks. The Stikine River's principal tributaries include the Tahltan, Chutine, Scud, Iskut, and Tuya rivers. The lower river and most tributaries are glacially occluded (e.g., Chutine, Scud, and Iskut rivers). Only 2% of the Stikine River drainage is in Alaska (Beak Consultants Limited 1981), and the majority of the chinook salmon spawning areas in the Stikine River are located in British Columbia, Canada in the mainstem Tahltan and Little Tahltan rivers (including Beatty Creek). However, Andrew Creek, in the lower Stikine River, supports a significant run of chinook salmon (Figure 3). The upper drainage of the Stikine is accessible via the Telegraph Creek Road. Development includes several active mines in the Canadian portion of the Stikine drainage and proposals for major hydroelectric projects.

The Alsek River originates in the Yukon Territory, Canada and flows in a southerly direction into the Gulf of Alaska approximately 75 km Southeast of Yakutat, Alaska (Figure 4). The Dezadeash and Tatshenshini rivers are the largest tributaries of the Alsek River. Velocity barriers and blockages prohibit migration of anadromous salmonids to most of the Alsek River drainage. Most of

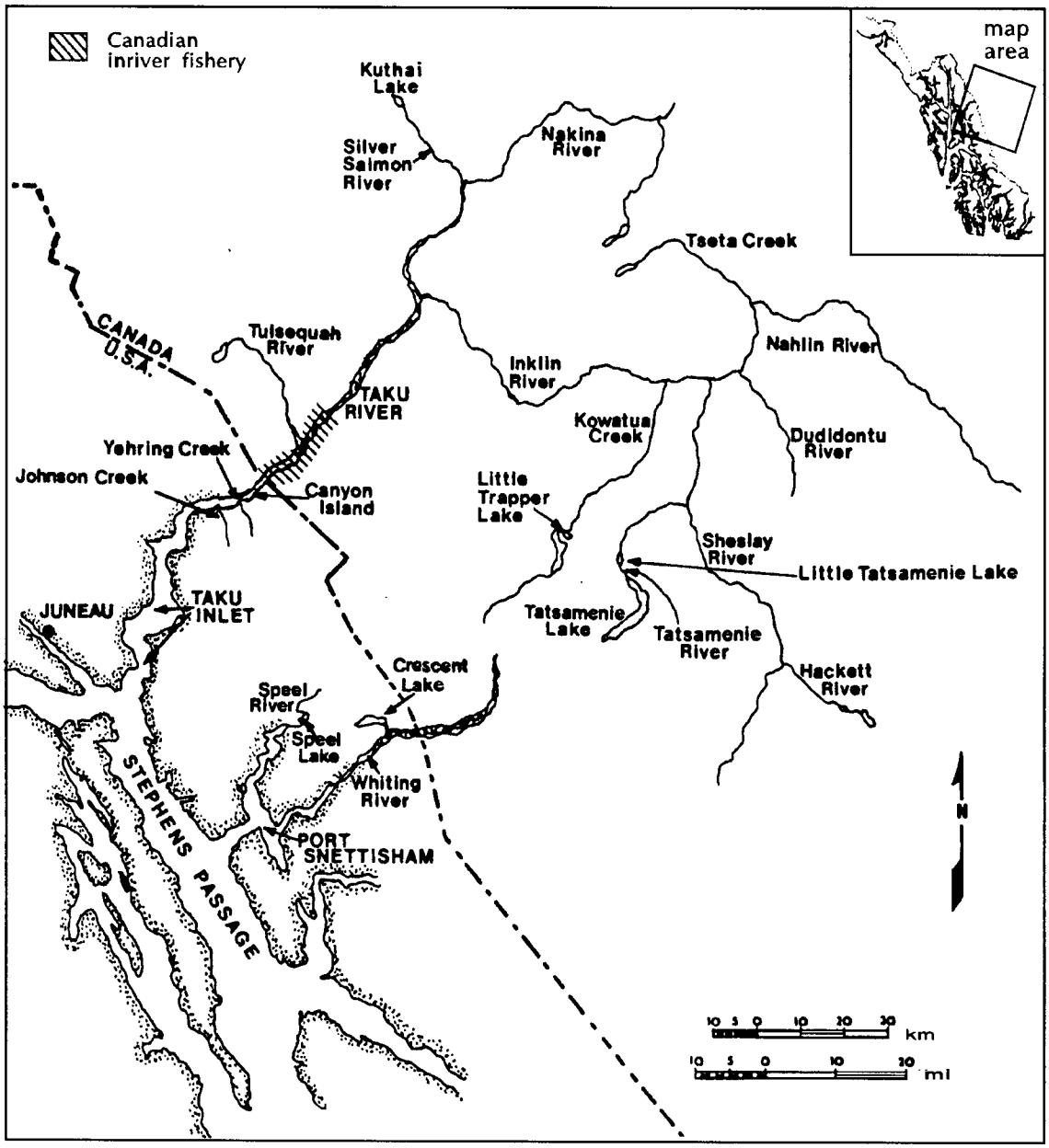

Figure 1. Taku River drainage, northwestern British Columbia and Southeast Alaska.

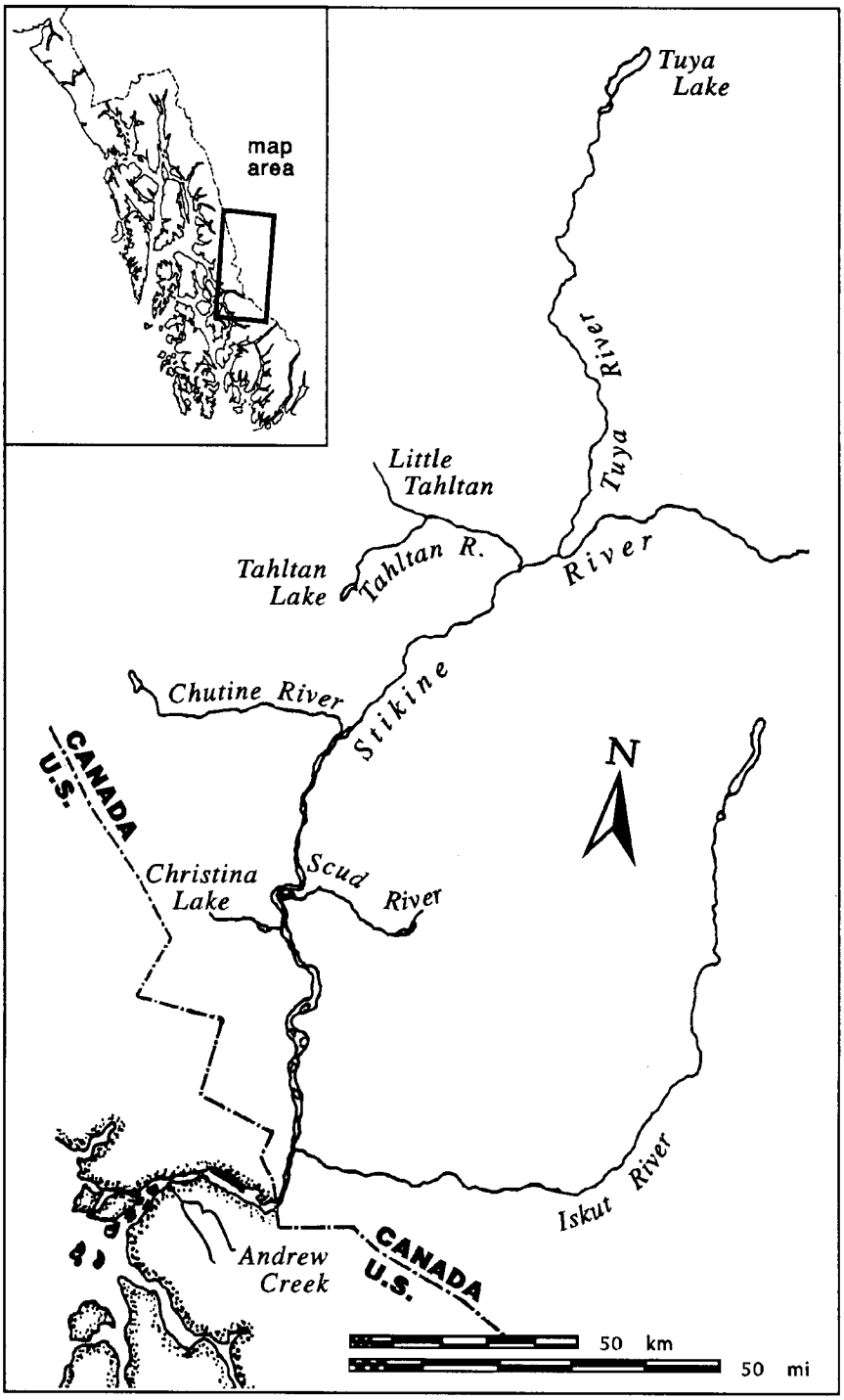

Figure 2. Stikine River drainage, northwestern British Columbia and Southeast Alaska.

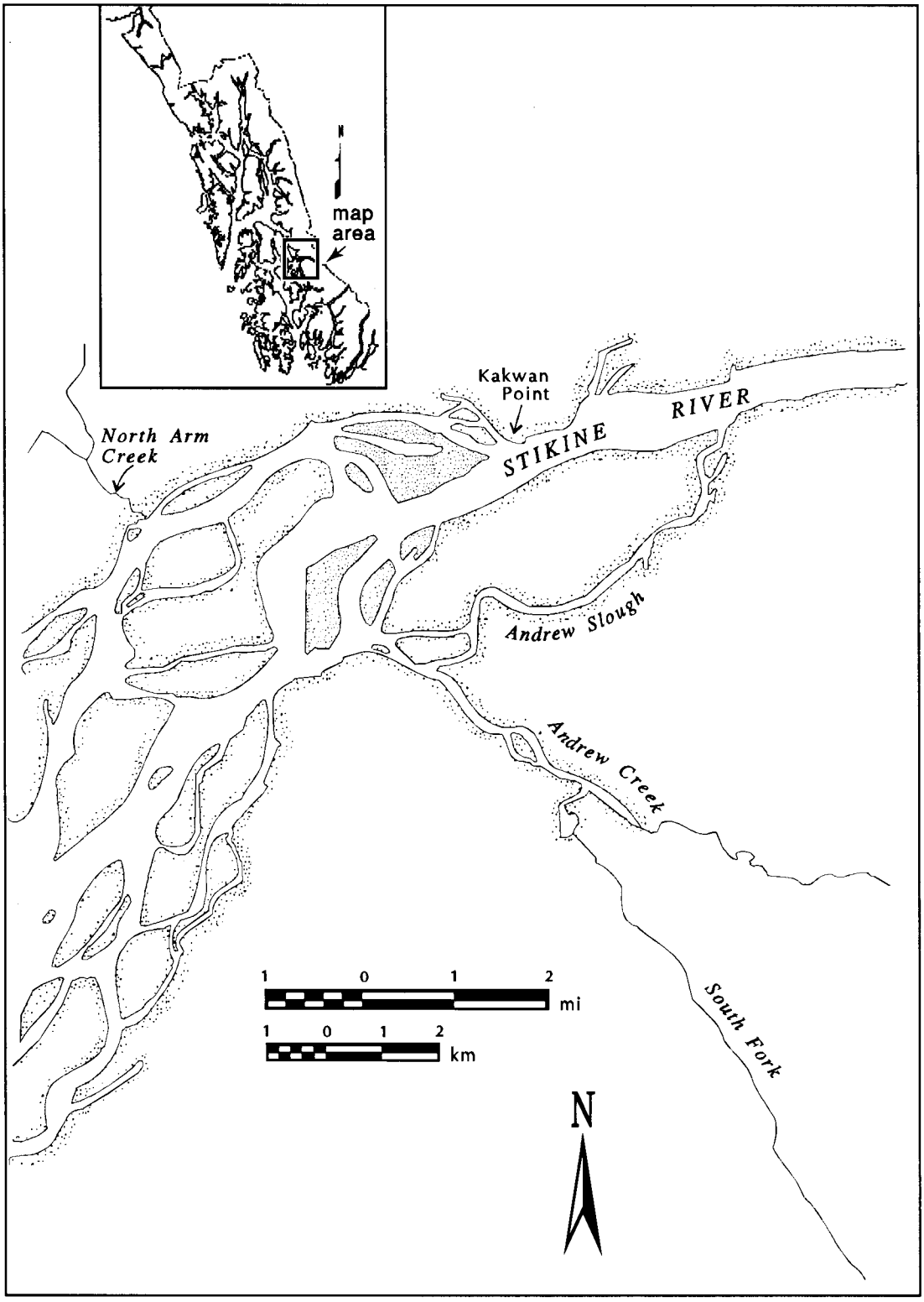

Figure 3. Andrew Creek, Southeast Alaska.

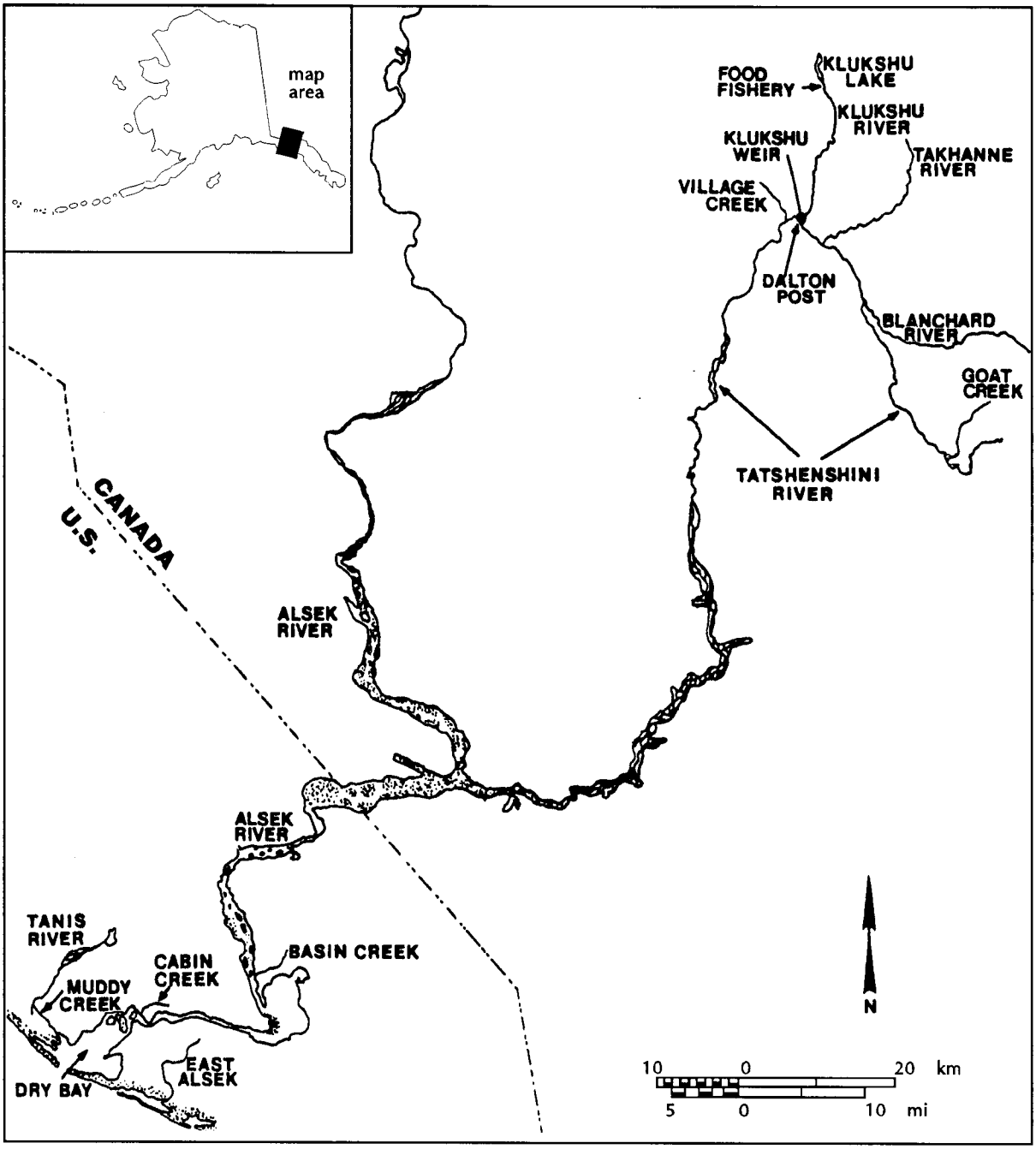

Figure 4. Alsek River drainage, northwestern British Columbia and northern Southeast Alaska.

the significant chinook salmon spawning areas are found in tributaries of the Tatshenshini River, including the Klukshu, Blanchard, and Takhanne rivers and Village and Goat creeks. The Klukshu and upper Tatshenshini rivers are accessible by road near Dalton Post, Yukon Territory.

Behm Canal is a narrow passage of water encircling Revillagigedo Island in southern Southeast Alaska. The Misty Fjords National Monument/Wilderness Area surrounds the eastern or "back" Behm Canal and includes the Boca de Quadra fjords. Many of the mainland rivers in the area support populations of wild chinook salmon and the Unuk, Chickamin, Blossom and Keta rivers are designated chinook salmon escapement index systems.

The Unuk River originates in a glaciated area of British Columbia and flows for 129 km to Burroughs Bay 85 km northeast of Ketchikan, Alaska; only the lower 39 km of the river are in Alaska (Figure 5). The Unuk is a large braided, glacially occluded river with a drainage of approximately 3,885 km^2. Most of the known chinook salmon spawning areas are in tributaries in the U.S. portion of the river. The survey index areas are all small clearwater tributaries, including the Eulachon River and Cripple, Genes Lake, Clear, Lake, and Kerr creeks. Cripple Creek and Genes Lake Creek cannot be surveyed from the air because of heavy vegetation, and the escapements are counted by foot surveys.

The Chickamin River is a large, glacial river that originates in British Columbia, and flows into Behm Canal approximately 32 km southeast of Burroughs Bay and 65 km northeast of Ketchikan (Figure 6). Although technically a transboundary river, there are no known chinook spawning areas on the Chickamin River upstream from the Canadian border. Important spawning tributaries are the South Fork of the Chickamin and Barrier, Butler, Indian, Leduc, Humpy, King, and Clear Falls creeks.

The Chilkat River is a large glacial river which originates in the Yukon Territory and flows into Chilkat Inlet at the head of northern Lynn Canal near Haines, Alaska (Figure 7). Lynn Canal is bounded by the U.S.-Canada border to the north and west and by the Takhinsha Mountains and the ice fields of Glacier Bay National Park to the south. Important tributaries for spawning chinook salmon include Stonehouse, Nataga and Big Boulder creeks and Tahini and Kelsall rivers.

The Blossom, Keta, Wilson, and Marten rivers are non-transboundary rivers that flow into Behm Canal approximately 45 km east of Ketchikan (Figure 8). These rivers lie in an area within the boundaries of the Misty Fjords National Monument in southern Behm Canal that has been specifically excluded from Wilderness designation due to potential development of a large-scale molybdenum mine (Quartz Hill) near the divide of the Blossom and Keta rivers. The mine is inactive at this time; however, the access road is complete and terminates at salt water near the mouth of the Blossom River. Chinook salmon escapements to the Wilson and Marten rivers have been monitored on an intermittent basis in recent years. The Marten River, the most southern of the four rivers, flows into Marten Arm near Boca de Quadra.

The King Salmon River drains an area of approximately 100 km^2 on Admiralty Island, flowing into King Salmon Bay in the eastern portion of Stephens Passage about 48 km south of Juneau (Figure 9). The King Salmon River is the only Southeast Alaska river system located on an island that supports a significant population of spawning chinook salmon. The only other island system with a documented run of chinook salmon is Wheeler Creek, also on Admiralty Island. An

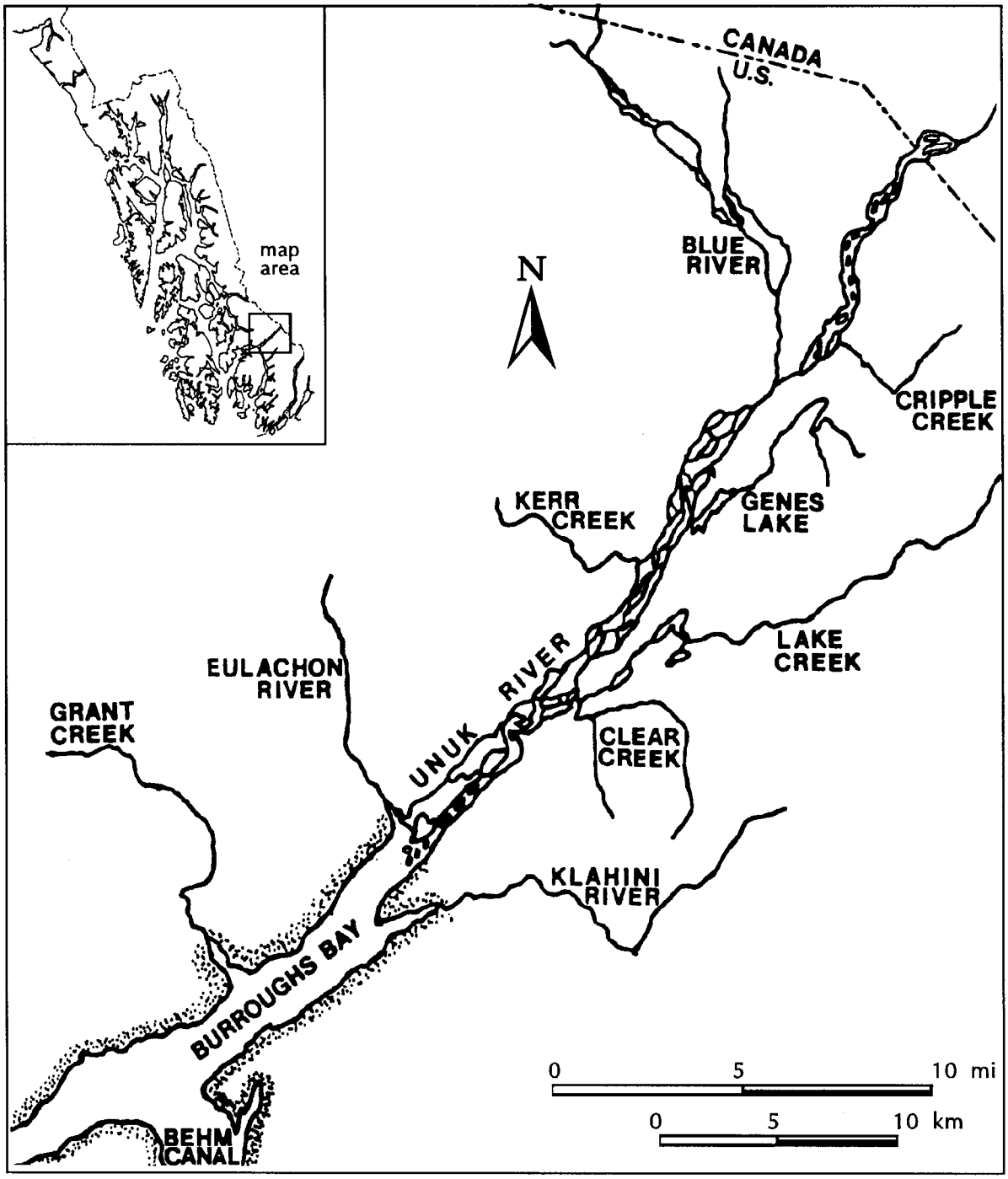

Figure 5. Unuk River drainage, northwestern British Columbia and southern Southeast Alaska.

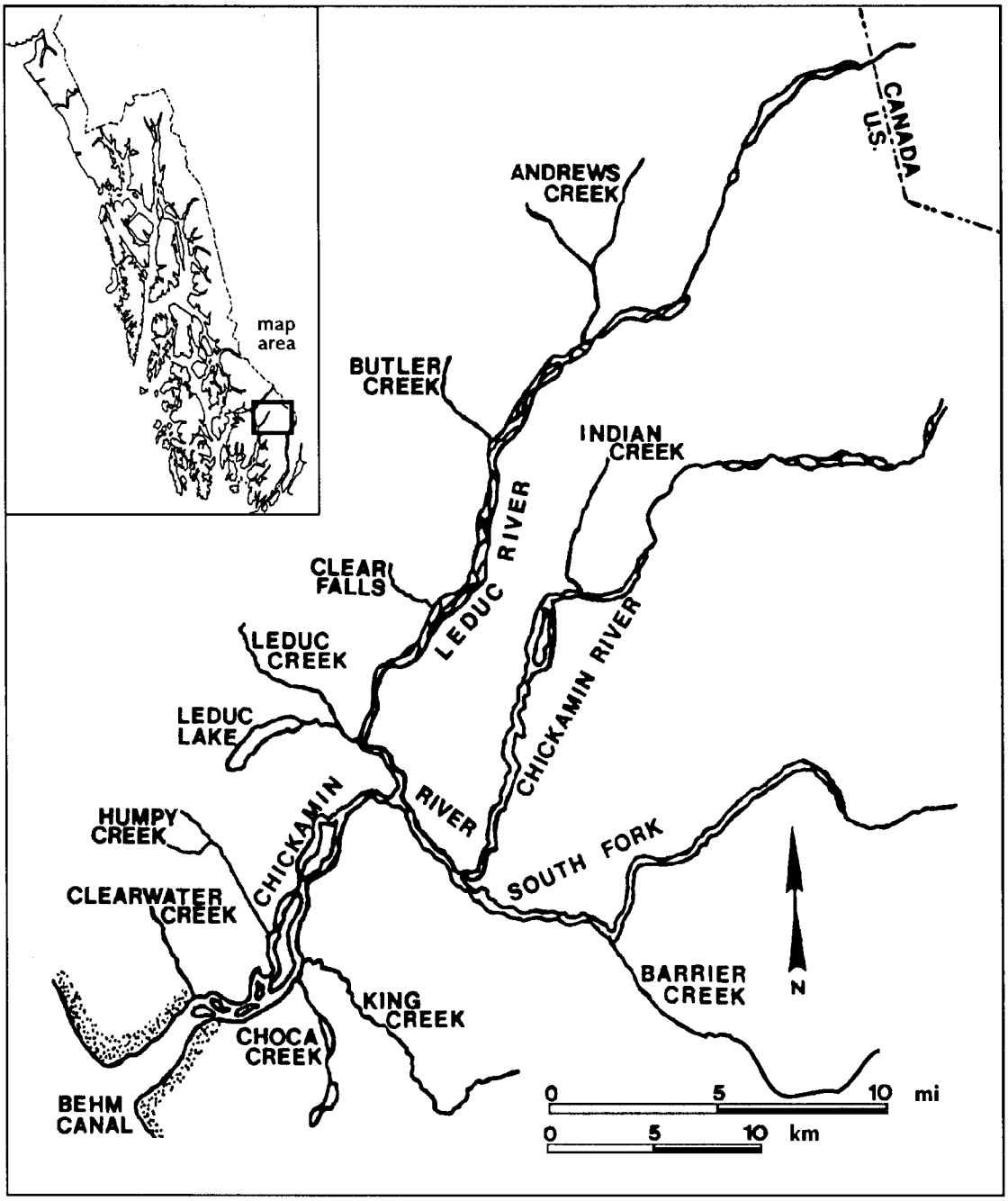

Figure 6. Chickamin River drainage, southern Southeast Alaska.

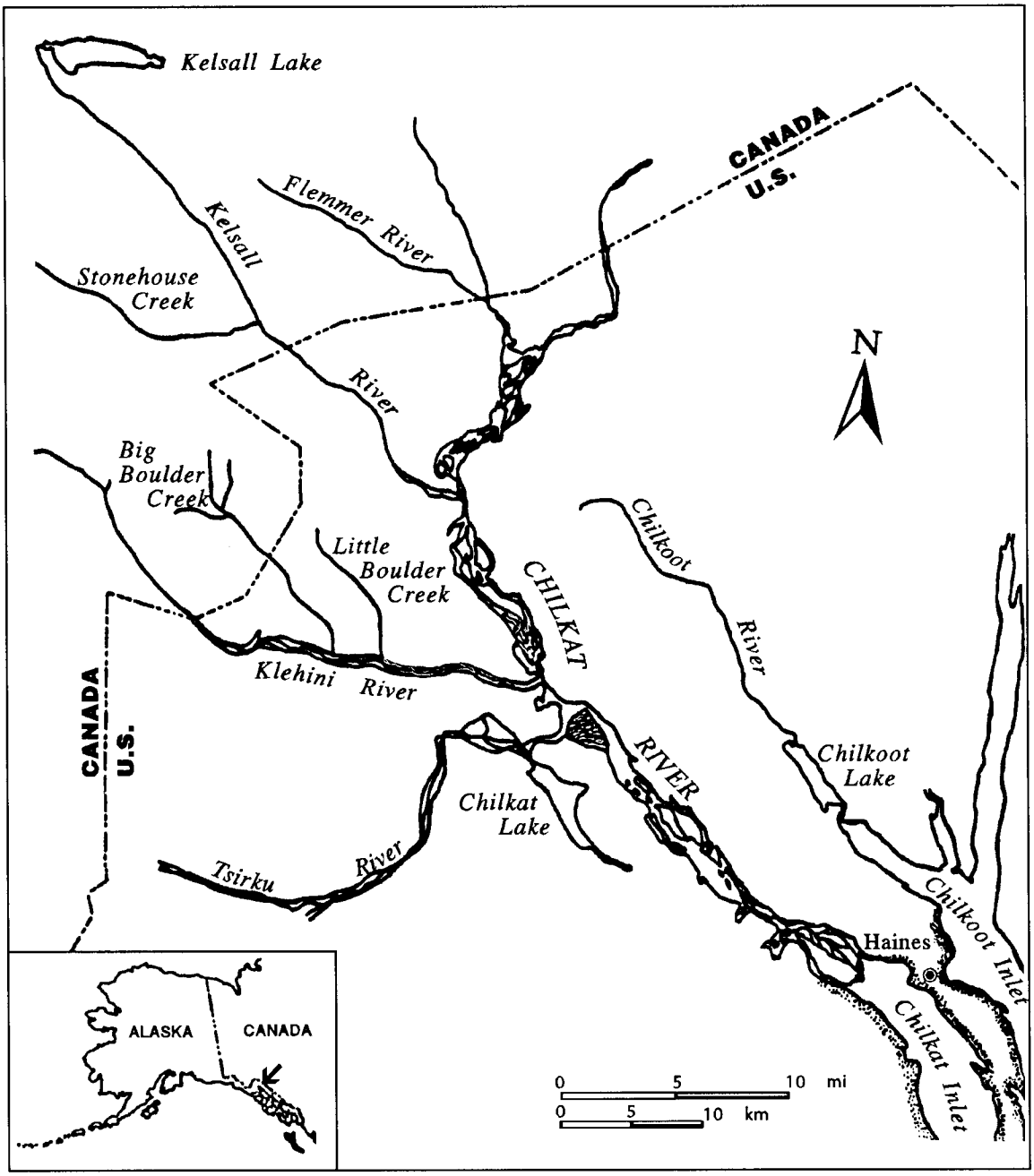

Figure 7. Chilkat River drainage, northwestern British Columbia and northern Southeast Alaska.

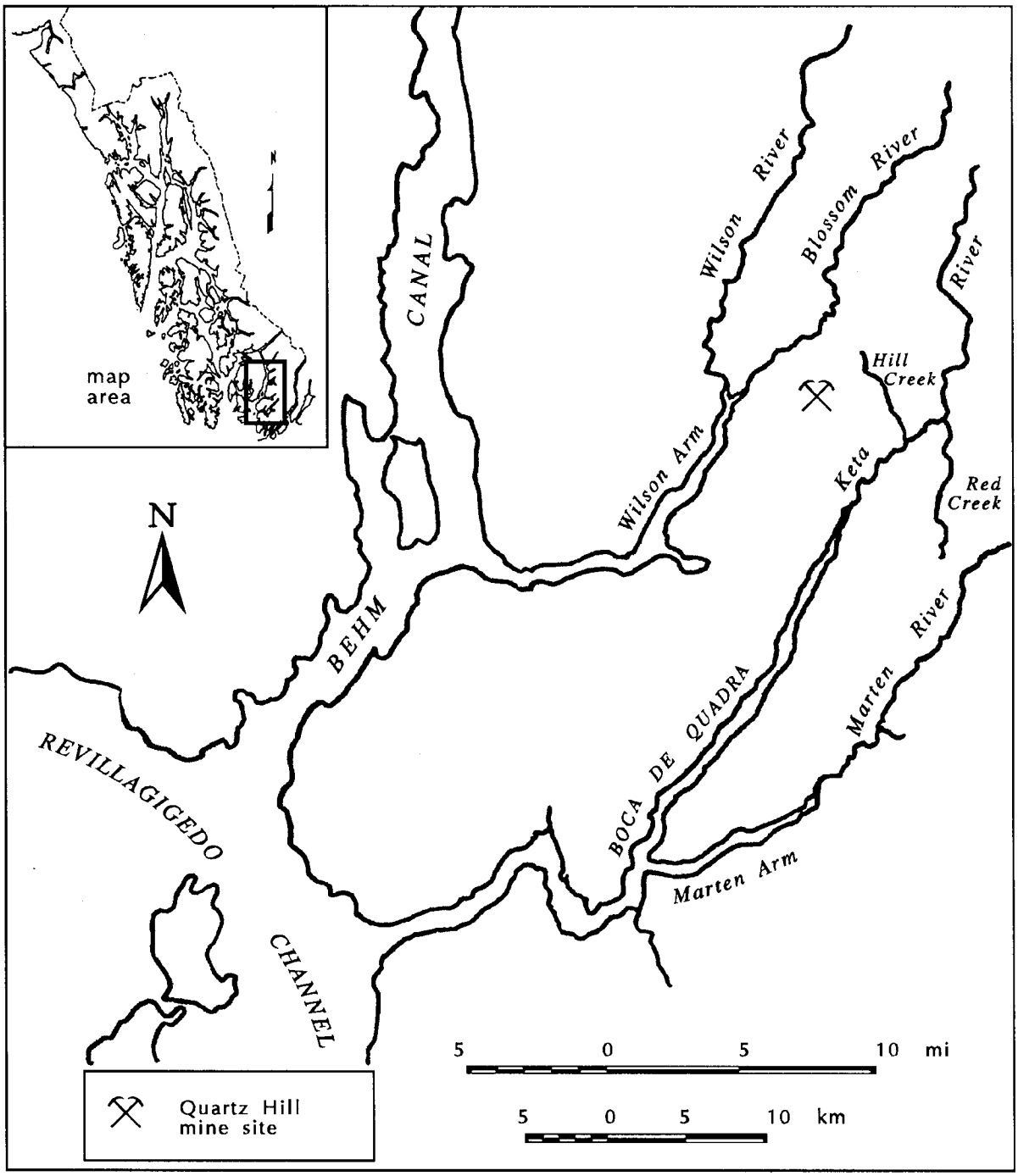

Figure 8. Blossom, Keta, Wilson, and Marten river drainages, southern Southeast Alaska.

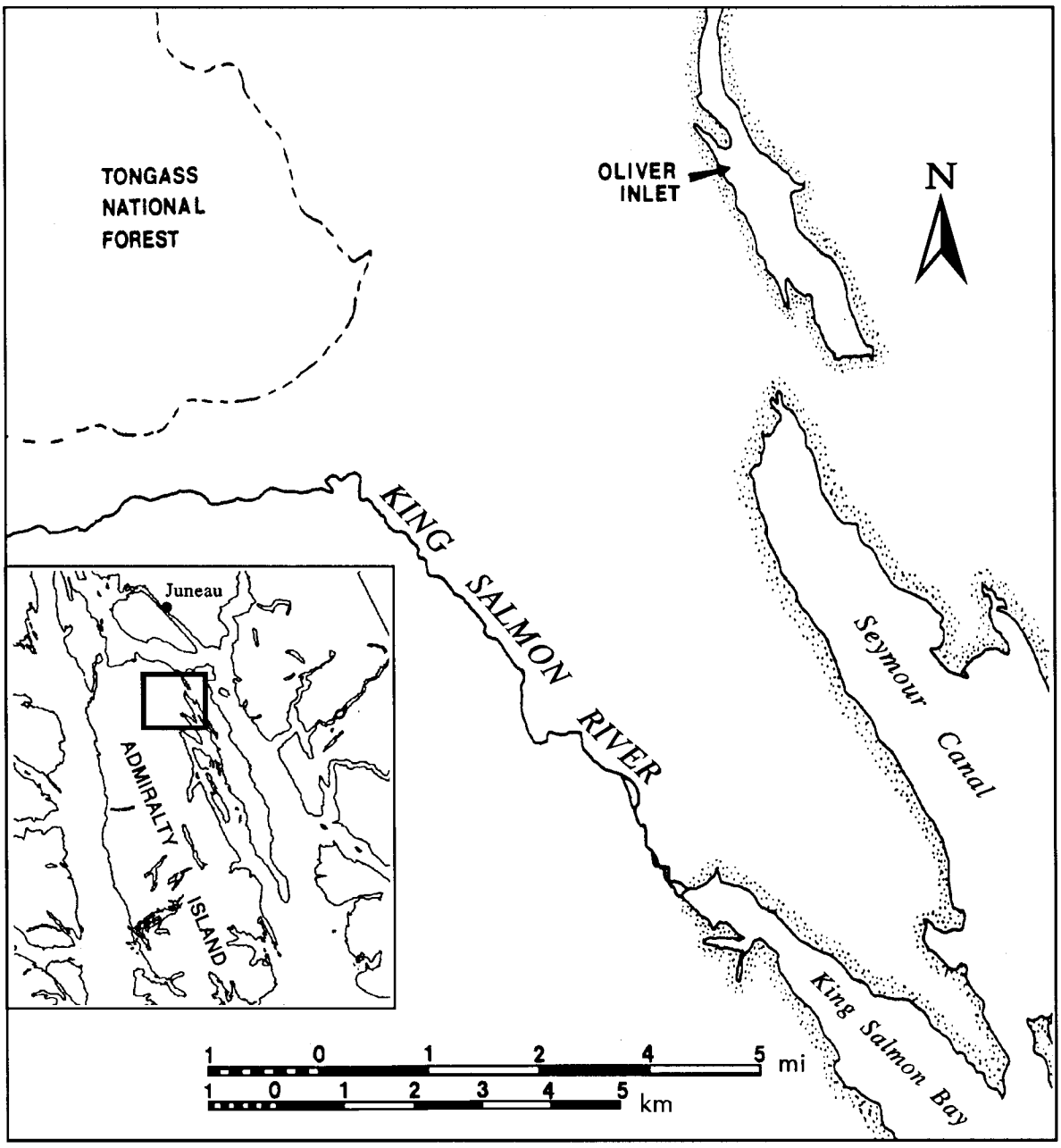

Figure 9. King Salmon River drainage, Admiralty Island, Southeast Alaska.

upstream weir has been operated by the Alaska Department of Fish and Game (ADF&G), on the King Salmon River since 1983 to collect chinook salmon eggs for developing broodstock for the Snettisham Hatchery.

The Situk River is located about 16 km east of Yakutat, Alaska (Figure 10). The Situk River supports a large run of sockeye salmon *O. nerka* which are harvested in commercial and subsistence set gill net fisheries concentrated at the mouth of the Situk River. Situk River chinook salmon have been harvested incidentally in the set gill net fishery and a recreational fishery in the lower river. A weir was operated on the Situk River at the upper limit of the intertidal area from 1928 to 1955 to count all five species of Pacific salmon spawning in the river. From 1976 to 1988, a weir was operated further upstream near the 9-mile road bridge, primarily to count chinook and sockeye salmon. This weir was moved downstream closer to the old weir location in 1988 and operated there from 1988 through 1992.

Enumeration of Adult Chinook Salmon

Indices of chinook salmon escapement in selected areas of nine river systems in Southeast Alaska, northwest British Columbia, and the Yukon Territory, Canada are obtained annually. Surveys are conducted on foot or from a Bell 206 or Hughes 500D helicopter during periods of peak spawning. Peak spawning times, defined as the period when the largest number of adult chinook salmon actively spawn in a particular stream or river, are well documented from previous surveys of the same index areas conducted over the past 15 years (Kissner 1982). These escapement counts have been collected since 1975 and a subset of these data (Appendix A1) is used to form an index of abundance for all Southeast Alaska. In accordance with the U.S./Canada Pacific Salmon Treaty, this abundance index was used to determine the progress of rebuilding for the chinook salmon stocks of Southeast Alaska and transboundary rivers.

Index areas were surveyed at least twice unless turbid water or unsafe flying conditions precluded the second survey. Pilots were directed to fly the helicopter from 6 to 15 meters above the river bed at a speed of 6-16 km/h. The helicopter door on the side of the observer was removed, and the helicopter was flown sideways while observations of spawning chinook salmon were made from the open space. Only large (age-.3, -.4 and -.5) chinook salmon >660 mm mideye-to-fork length (MEF) were counted during aerial or foot surveys. No attempt was made to accurately count small (age-.1 and -.2) chinook salmon that are typically <660 mm MEF (Mecum 1990). These small chinook salmon, also called jacks, are early maturing, precocious males that are considered to be surplus to spawning escapement needs. These small chinook salmon are easy to visually separate from their older age counterparts under most conditions, due to their short, compact body configuration and lighter coloration. They are however, difficult to distinguish from other smaller species such as pink *O. gorbuscha* and sockeye salmon.

Detailed escapement survey counts are entered into the ADF&G Integrated Fisheries Database (IFDB) where they are accessible to any interested party (Appendix A4).

Escapement counts in index areas are expanded by a "survey expansion factor" (SEF) which is an estimate of the proportion of the total season escapement observed during the peak spawning period. These expansion factors vary according to the difficulties encountered in observing spawning chinook salmon due to overhanging vegetation, turbid water conditions, presence of other salmon species

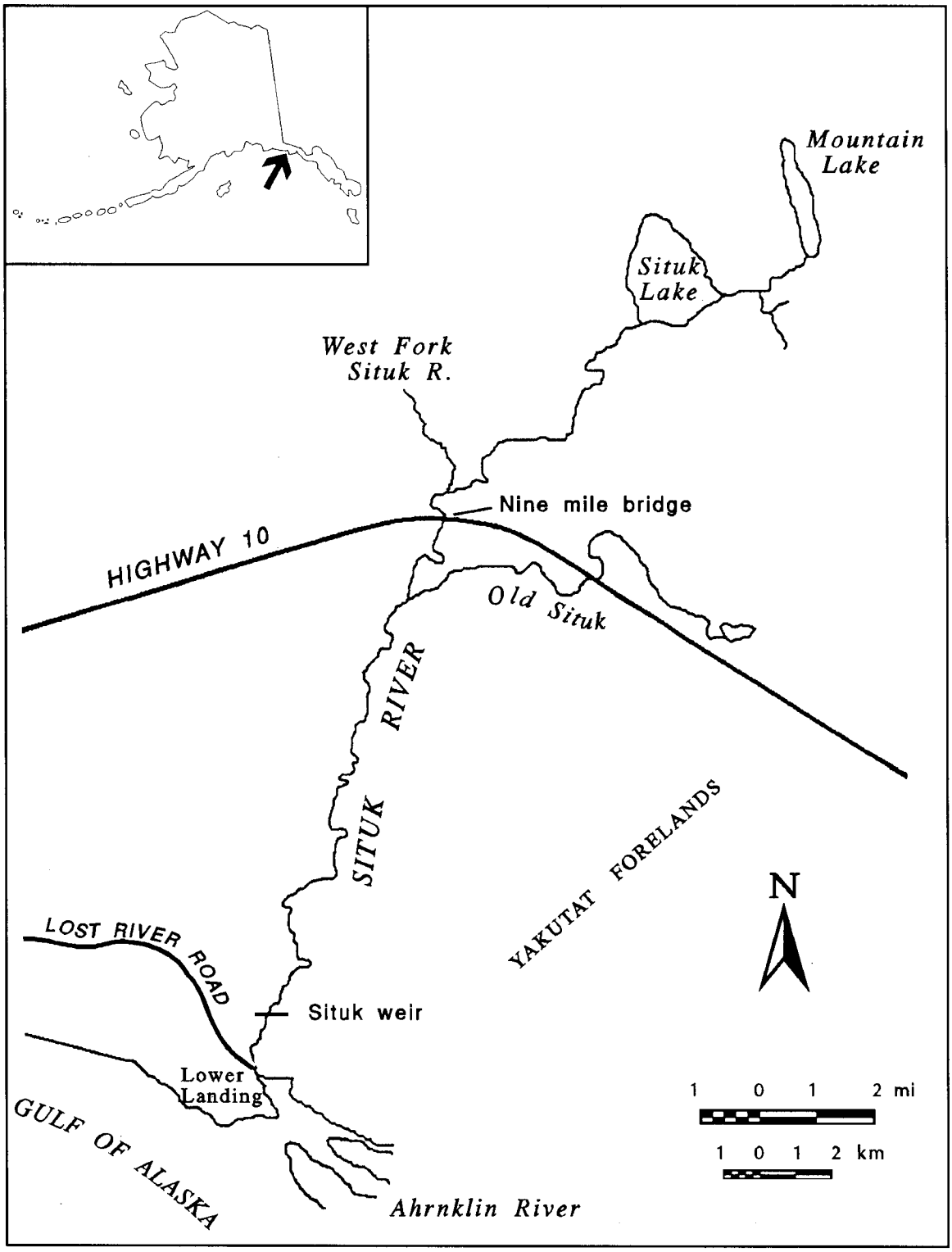

Figure 10. Situk River drainage, northern Southeast Alaska.

(i.e., pink and chum *O. keta* salmon), or protraction of run timing. Survey expansion factors range from 1/0.75 for the Nakina and Nahlin Rivers to 1/0.625 for most other systems (Appendix A1). Survey expansions are not necessary for those streams where weirs are used to count migrating chinook salmon. Peak aerial, foot, or weir counts are also expanded by a tributary expansion factor (TEF) which is an estimate of the proportion of spawners observed in index tributaries in relation to the escapement to the entire drainage (i.e., not all tributaries or spawning areas were surveyed). Tributary expansion factors range from 1/0.25 for the Stikine River to 1/0.64 for the Klukshu River (Appendix A1).

The expansion factors represent estimates whose validity is unknown for the majority of the index systems. In fact, comparison of aerial surveys with weir counts on some systems indicates the survey expansion factors for the larger systems may be too low. However, these expansion factors have been used since 1981 and have been adopted by the Joint Chinook Salmon Technical Committee (CTC) of the Pacific Salmon Commission (PSC). Changing the expansion factors would require a formal review of these index expansion methods by ADF&G, the Canadian Department of Fisheries and Oceans (DFO) and the CTC. In 1991, the Transboundary Technical Committee (TBTC) of the PSC reviewed the escapement goals for the Taku, Stikine and Alsek Rivers and developed jointly accepted goals which are different from the goals discussed in the 1991 escapement report (Pacific Salmon Commission 1991b). In the process of revising escapement goals the aerial survey index method was modified for the Taku River to include 6 index areas rather than the two areas used since 1981. This change was based on new spawner distribution data collected in 1989 and 1990 (Eiler et al. *In press*).

A radio-tagging study conducted on the Chilkat River in 1991 and 1992 found that the majority of the population did not spawn in the index areas and the index expansions grossly underestimated the total escapement to the drainage (Johnson et al. 1992).

Chinook escapement counts are also obtained from fish-counting weirs operated by the DFO on the Little Tahltan (Stikine), Tatsamenie (Taku), and Klukshu (Alsek) rivers, and by ADF&G on the King Salmon River (Admiralty Island) and Situk River. Except for the Situk River, where aerial surveys were not practical because of overhanging vegetation, weir counts were compared with aerial or foot surveys to determine the relative accuracy of surveys of peak escapement in predicting total escapements. ADF&G is reviewing all available material on escapement counts and the relationships between the various methods and a summary of the findings is in preparation.

RESULTS

Thirty-eight locations were surveyed in 1992 (Appendix A3). Surveys generally progressed as planned, but poor weather and water conditions prevented an aerial survey of the Klukshu River. However, total counts to that system are obtained at a weir and the surveys are primarily for calibration of survey technique. Surveys of the Behm Canal systems (Unuk, Chickamin, Blossom, Keta, and Marten rivers) were expanded to insure that at least two good surveys were completed for each index system. The Wilson, Grant, and Klehini rivers were surveyed for the first time in several years.

Taku River

The observed peak escapement of 11,058 large chinook salmon into the six major spawning tributaries of the Taku River was the second largest escapement observed since surveys began in 1951 (Table 1). Escapements were above recent year averages in all index tributaries (Table 2). Expanding the index escapement counts by the revised survey expansion factors (1/0.75) for Nakina/Nahlin and (1/.625) for the other 4 tributaries and expanding those numbers by the revised tributary expansion factor (1/0.52) resulted in a total escapement estimate for the Taku River of 30,142 large chinook salmon (Appendix A1). The Taku River chinook salmon escapement has increased steadily since 1983. Despite this increasing trend the estimated total escapement for 1992 is 18% below the revised escapement goal of 36,500 large chinook salmon (Figure 11). The six tributary total count of 11,058 is also below the escapement goal, as revised in 1991 for those six systems, of 13,200 fish (PSC 1991b).

Stikine River

Helicopter surveys of the Little Tahltan River index area have been conducted annually since 1975 and the DFO has operated a fish counting weir at the mouth of the Little Tahltan River since 1985. From 1985 to 1992, the percentage of the total escapement of chinook salmon observed during peak aerial surveys has ranged from 39.2% in 1991 to 56.6% in 1987 and averaged 48.2% (Table 3). The low percentage of total escapement observed in 1986 resulted from poor survey conditions, caused by a mudslide that occurred approximately 1.5 km above the weir site. The low counts in 1990 and 1991 resulted in part from the formation of a new river channel through a heavily wooded area which was difficult to survey. The proportion of the total escapement observed in a single survey often declined after the peak of spawning as fish died or were removed by predators (Table 3).

The peak aerial count in the Little Tahltan River of 3,607 large chinook salmon was the second highest on record (Table 4). A total of 6,627 chinook salmon was counted through the Little Tahltan weir in 1992, 46% higher than the weir count of 4,506 large chinook salmon observed in 1991. The observed escapement on the glacially turbid mainstem Tahltan River in 1992 was 1,891. The peak escapement count of 362 large chinook salmon in Beatty Creek was 87% higher than the count of 193 chinook salmon seen in 1991.

Expansion of the 1992 Little Tahltan weir count of 6,627 large chinook salmon by the tributary expansion factor (1/0.25) resulted in a total Stikine River escapement estimate of 26,508 large chinook salmon. The revised escapement goal agreed to in 1991 is 5,300 fish through the Little Tahltan River weir. The 1992 escapement was above the revised goal and above the linear rebuilding schedule required to achieve the escapement goal by 1995 (Figure 12).

Andrew Creek

The observed escapement of chinook salmon to Andrew Creek increased from 400 in 1991 to 778 in 1992 (Table 4). A foot survey counted 673, a fixed wing aerial survey counted 750, and a helicopter survey counted 778. This was the sixth year since 1985 that the Andrew Creek escapement exceeded the goal of 470 fish (Figure 13). The stream channel changed significantly in 1987 and counts before that were revised in 1991 to be consistent with the present survey. Changes were small, <40 fish except in 1987 when 137 fish were added to the count.

Table 1. Peak escapement counts of chinook salmon for tributaries of the Taku River, 1951-1992.

Year[a]	Nakina River	Kowatua River	Tatsamenie River	Dudidontu River	Tseta Creek	Nahlin River	Total
1951	5,000 (F)[b]	-	-	400 (F)	100 (F)	1,000 (F)	6,500
1952	9,000 (F)	-	-	-	-	-	9,000
1953	7,500 (F)	-	-	-	-	-	7,500
1954	6,000 (F)	-	-	-	-	-	6,000
1955	3,000 (F)	-	-	-	-	-	3,000
1956	1,380 (F)	-	-	-	-	-	1,380
1957	1,500 (F,W)	-	-	-	-	-	1,500[c]
1958	2,500 (F,W)	-	-	4,500 (A)	-	2,500 (A)	9,500[c]
1959	4,000 (F,W)	-	-	-	-	-	4,000[c]
1962	-	-	-	25 (A)	81 (A)	216 (A)	322
1965	3,050 (H)	200 P(A)	50 P(A)	110 (A)	18 (A)	35 (A)	3,463
1966	3,700 P(A)	14 P(A)	100 P(A)	252 (A)	150 (A)	300 (A)	4,516
1967	700 (A)	250 P(A)	-	600 (A)	350 (A)	300 P(A)	2,200
1968	300 P(A)	1,100 (A)	800 E(A)	590 (A)	230 (A)	450 (A)	3,470
1969	3,500 (A)	3,300 (A)	800 E(A)	-	-	-	7,600
1970	-	1200 P(A)	530 E(A)	10 (A)	25 (A)	26 (A)	1,791
1971	500 (A)	1,400 E(A)	360 E(A)	165 (A)	- (A)	473 (A)	2,898
1972	1,000 (F)	170 (A)	132 (A)	102 (A)	80 P(A)	280 (A)	1,764
1973	2,000 N(H)	100 N(H)	200 E(H)	200 E(H)	4 (A)	300 E(H)	2,804
1974	1,800 E(H)	235 (A)	120 (A)	24 (A)	4 (A)	900 E(H)	3,083
1975	1,800 E(H)	-	-	15 N(H)	-	274 E(H)	2,089
1976	3,000 E(H)	341 P(A)	620 E(H)	40 (H)	-	725 E(H)	4,726
1977	3,850 E(H)	580 E(H)	573 E(H)	18 (H)	-	650 E(H)	5,671
1978	1,620 E(H)	490 N(H)	550 E(H)	-	21 E(H)	624 E(H)	3,305
1979	2,110 E(A)	430 N(H)	750 E(H)	9 E(H)	-	857 E(H)	4,156
1980	4,500 E(H)	450 N(H)	905 E(H)	158 E(H)	-	1,531 E(H)	7,544
1981	5,110 E(H)	560 N(H)	839 E(H)	74 N(H)	258 N(H)	2,945 E(H)	9,786
1982	2,533 E(H)	289 N(H)	387 N(H)	130 N(H)	228 N(H)	1,246 E(H)	4,813
1983	968 E(H)	171 E(H)	236 E(H)	117 E(H)	179 N(H)	391 N(H)	2,062
1984	1,887 (H)	279 E(H)	616 E(H)	-	176 (H)	951 (H)	3,909[d]
1985	2,647 N(H)	699 E(H)	848 E(H)	475 (H)	303 E(H)	2,236 E(H)	7,208
1986	3,868 (H)	548 E(H)	886 E(H)	413 E(H)	193 E(H)	1,612 E(H)	7,520
1987	2,906 E(H)	570 E(H)	678 E(H)	287 E(H)	180 E(H)	1,122 E(H)	5,743
1988	4,500 E(H)	1,010 E(H)	1,272 E(H)	243 E(H)	66 E(H)	1,535 E(H)	8,626
1989	5,141 E(H)	601 (W)	1,228 E(H)	204 E(H)	494 E(H)	1,812 E(H)	9,480[e]
1990	7,917 E(H)	614 (W)	1,068 N(H)	820 E(H)	172 N(H)	1,658 E(H)	12,249[e]
1991	5,610 E(H)	570 N(H)	1,164 E(H)	804 E(H)	224 N(H)	1,781 E(H)	10,153
1992	5,750 E(H)	782 E(H)	1,624 N(H)	768 N(H)	313 N(H)	1,821 E(H)	11,058

[a] Escapement counts before 1975 may not be comparable due to changes in survey dates and methods. Early foot surveys may have included jacks.

[b] - = No survey conducted.
(F) = Foot survey; (A) = Fixed-wing aircraft; (H) = Helicopter.
P = Survey conditions hampered by glacial or turbid waters.
N = Normal water flows and turbidities; average survey conditions.
E = Survey conditions excellent.

[c] Partial survey of Nakina River in 1957-59; comparisons made from carcass weir counts.

[d] Surveys in 1984 conducted by DFO; partial survey of Tseta Creek and Nahlin.

[e] Carcass weir at Kowatua River used to partially enumerate escapement due to unfavorable water conditions.

Table 2. Percentages of escapement observed in tributaries of the Taku River during years when all index tributaries were surveyed.

Year	Nakina River	%	Kowatua River	%	Tatsamenie River	%	Dudidontu River	%	Tseta Creek	%	Nahlin River	%	Total
1981	5,110	52	560	6	839	9	74	1	258	3	2,945	30	9,786
1982	2,533	53	289	6	387	8	130	3	228	5	1,246	26	4,813
1983	968	47	171	8	236	11	117	6	179	9	391	19	2,062
1985	2,647	37	699	10	848	12	475	7	303	4	2,239	31	7,211
1986	3,868	51	548	7	886	12	413	5	193	3	1,612	21	7,520
1987	2,906	51	570	10	678	12	287	5	180	3	1,122	20	5,743
1988	4,500	52	1,010	12	1,272	15	243	3	66	1	1,535	18	8,626
1989	5,141	54	601	6	1,228	13	204	2	494	5	1,812	19	9,480
1990	7,917	65	614	5	1,068	9	820	7	172	1	1,658	14	12,249
1991	5,610	55	570	6	1,164	11	804	8	224	2	1,781	18	10,153
Average	4,120	52	563	8	861	11	357	5	230	4	1,634	21	7,764
1992	5,750	52	782	7	1,624	15	768	7	313	3	1,821	16	11,058

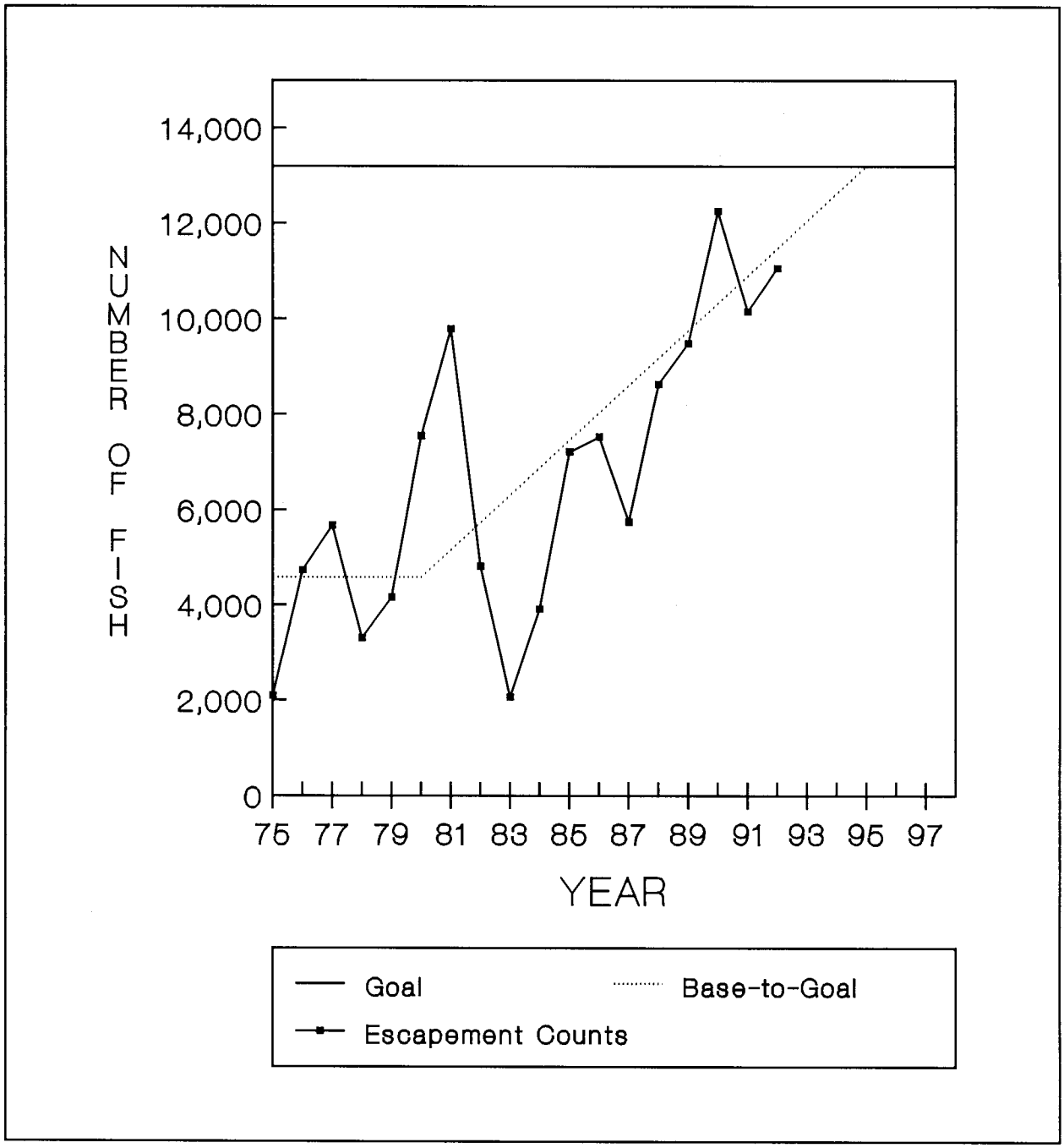

Figure 11. Observed escapements of chinook salmon to index areas of the Taku River, 1975-1992. Base-to-goal line indicates linear rebuilding schedule, starting in 1981 at average escapement level during the base period (1975-1980) and ending at revised escapement goal of 13,200 large chinook salmon in 1995 (final year of the three-cycle rebuilding program).

Table 3. Comparison of weir counts and aerial survey estimates of chinook salmon escapements to the Little Tahltan River, 1985-1992.

Date	Weir count	Low level helicopter count	Percent escapement observed from helicopter
8/02/85	2,379	1,262	53.1
8/06/85	2,864	1,598	55.8
Final	3,146	1,598	50.8
8/01/86	2,323	1,101	47.4
8/05/86	2,646	1,143	43.2
Final	2,893	1,201	41.5
7/31/87	3,903	2,446	62.7
8/03/87	4,456	2,706	60.7
Final	4,781	2,706	56.6
7/30/88	5,573	3,484	62.5
8/05/88	6,822	3,796	55.6
Final	7,292	3,796	52.1
7/29/89	3,772	2,515	66.7
8/04/89	4,394	2,527	57.5
Final	4,715	2,527	53.6
7/31/90	3,780	1,658	43.8
8/07/90	4,232	1,678	39.7
Final	4,354	1,755	40.3
7/31/91	3,649	1,768	48.5
8/07/91	4,141	1,678	32.0
Final	4,506	1,768	39.2
7/30/92	6,070	3,419	56.3
8/06/92	6,587	2,702	41.2
Final	6,627	3,419	51.6

Table 4. Peak escapement counts for Stikine River tributaries, including Andrew Creek, 1956-1992.

Year[a]	Little Tahltan River		Mainstem Tahltan River	Beatty Creek	Andrew Creek	Total
	Peak count	Weir count				
1956	493 (F)[b]	-	-	-	4,500 (A)	4,993
1957	199 (F)	-	-	-	3,000 (F/A)	3,199
1958	790 (F)	-	-	-	2,500 (F/A)	3,290
1959	198 (F)	-	-	-	150 (F/A)	348
1960	346 (F)	-	-	-	287 N(F)	633
1961	-	-	-	-	103 (F)	103
1962	-	-	-	-	300 (A)	300
1963	-	-	-	-	500 (A/H)	500
1964	-	-	-	-	400 (H)	400
1965	-	-	85	-	100 (A)	185 [c]
1966	-	-	318	-	75 (A)	393 [c]
1967	800 N(H)	-	-	-	30 (A)	830
1968	-	-	-	-	15	15
1969	-	-	-	-	12 (A)	12
1970	-	-	-	-	-	-
1971	-	-	-	-	305 (A)	305
1972	-	-	-	-	-	-
1973	-	-	-	-	40 (A)	40
1974	-	-	-	-	129 (A)	129
1975	700 E(H)	-	2,908 E(H)	-	260 (F)	3,868
1976	400 N(H)	-	120 (H)	-	468 (W)	988 [d]
1977	800 P(H)	-	25 (A)	-	534 (W)	1,359
1978	632 E(H)	-	756 P(H)	-	400 (W)	1,788
1979	1,166 E(H)	-	2,118 N(H)	-	382 (W)	3,666
1980	2,137 N(H)	-	960 P(H)	122 E(H)	363 (W)	3,582
1981	3,334 E(H)	-	1,852 P(H)	558 E(H)	644 (W)	6,388
1982	2,830 N(H)	-	1,690 N(F)	567 E(H)	947 (W)	6,034
1983	594 E(H)	-	453 N(H)	83 E(H)	444 (W)	1,574
1984	1,294 (H)	-	-	126 (H)	389 (W)	1,809 [e]
1985	1,598 E(H)	3,114	1,490 N(H)	147 N(H)	319 E(F)	5,070 [f]
1986	1,201 E(H)	2,891	1,400 P(H)	183 N(H)	707 N(F)	5,181
1987	2,706 E(H)	4,783	1,390 P(H)	312 E(H)	788 E(H)	7,273
1988	3,796 E(H)	7,292	4,384 N(H)	593 E(H)	470 E(F)	12,744
1989	2,527 E(H)	4,715	-	362 E(H)	530 E(F)	5,607
1990	1,755 E(H)	4,392	2,134 N(H)	271 E(H)	664 E(F)	7,461
1991	1,768 E(H)	4,506	2,445 N(H)	193 N(H)	400 N(A)	7,544[g]
1992	3,607 E(H)	6,627	1,891 N(H)	362 N(H)	778 E(H)	9,658

[a] Escapement counts prior to 1975 may not be comparable because of differences in survey dates and counting methods.

[b] (F) = survey conducted by walking; (A) = survey conducted by fixed-wing aircraft; (H) = survey conducted by helicopter; (W) = weir count; (F/A) = combined foot and aerial count; N = normal survey conditions; P = survey conditions hampered by glacial or turbid waters; E = excellent survey conditions; - = no survey conducted or data not comparable.

[c] Chinook lifted over barrier on mainstem Tahltan.

[d] Late count on mainstem Tahltan, minimal estimate.

[e] Surveys by DFO in 1984.

[f] Total = Little Tahltan weir count plus aerial or weir counts on other systems.

[g] Andrew Creek counts revised to include North Fork. Some fish removed for broodstock 1976-1984, see Mecum and Kissner 1989.

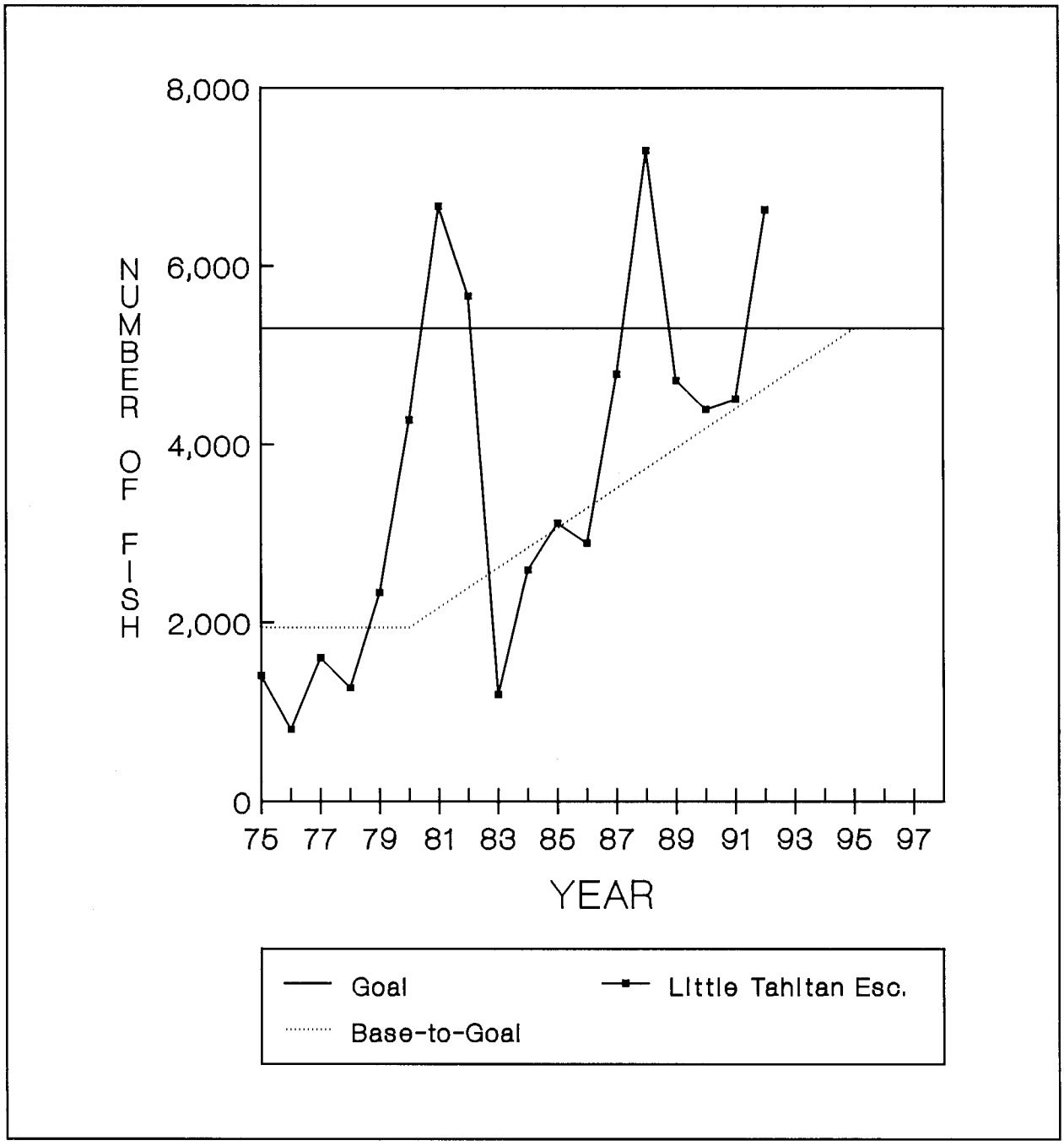

Figure 12. Observed escapements of chinook salmon to the Little Tahltan River, tributary of the Stikine River, 1975-1992. Base-to-goal line shows linear rebuilding schedule, starting in 1981 at average escapement level during base period (1975-1980) and ending at escapement goal of 5,300 large chinook salmon in 1995 (final year of the three-cycle rebuilding program).

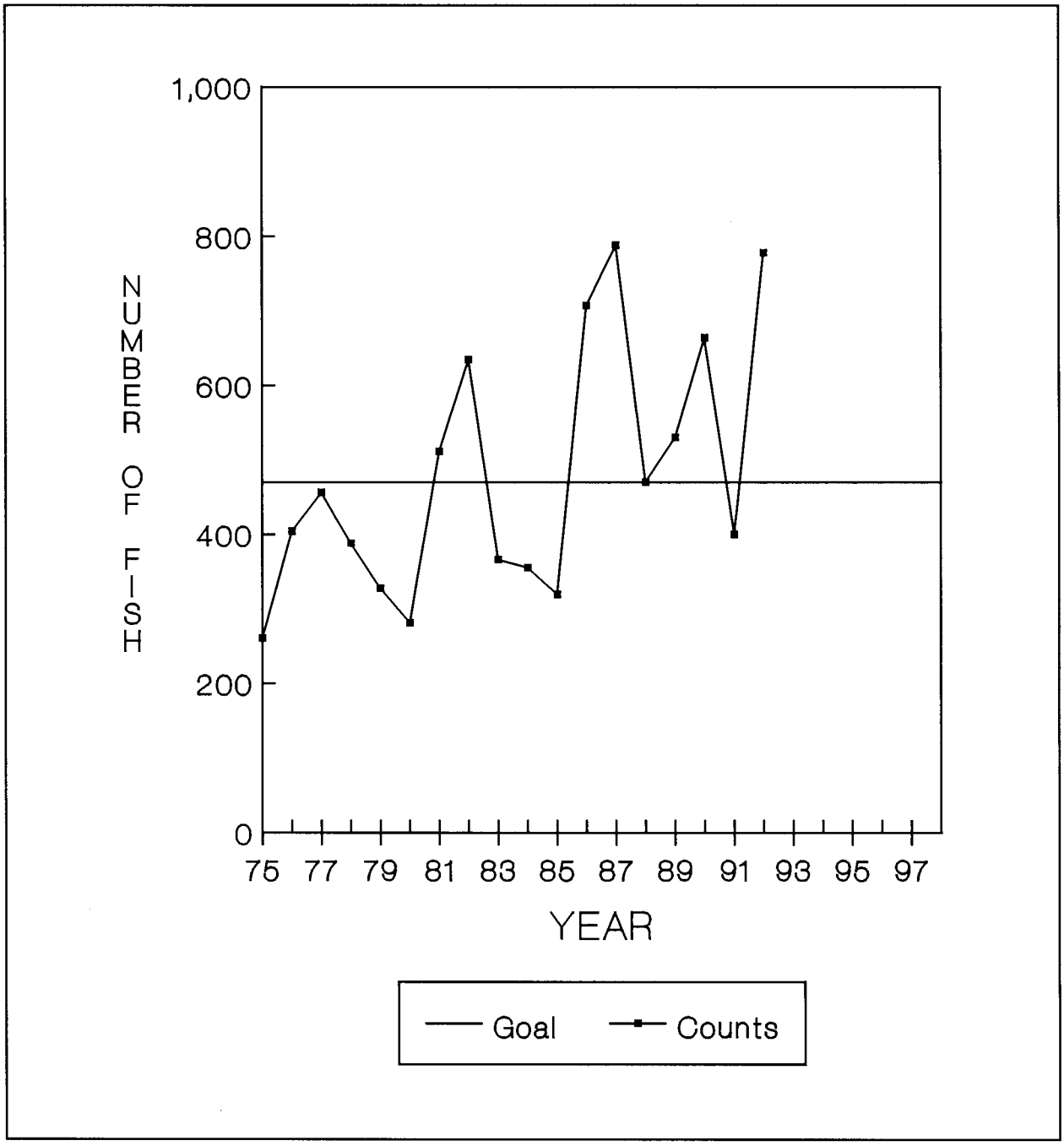

Figure 13. Observed escapements of chinook salmon to Andrew Creek, 1975-1992.

Alsek River

Escapement data on Alsek River chinook salmon has been collected since 1962. Since 1976, the DFO has operated a counting weir at the confluence of the Klukshu and Tatshenshini rivers to count chinook, sockeye, and coho *O. kisutch* salmon into the Klukshu River drainage. Helicopter surveys of chinook salmon escapements to index tributaries of the Alsek River have been conducted by ADF&G since 1981. Before 1976, chinook salmon escapement surveys were usually conducted from fixed-wing aircraft. Poor flying conditions during the peak spawning period resulted in a poor aerial survey of the Klukshu River in 1992.

The count of 1,367 large chinook salmon through the Klukshu River weir in 1992 was the lowest since the weir was installed in 1976 (Table 5). The escapement to the Klukshu, estimated by subtracting the subsistence harvest from the weir count was 1,283, a decrease of 870 fish from 1991. The 1992 peak aerial count of 77 large chinook salmon in the Takhanne River was similar to the 1991 count of 86 fish. The aerial count of large chinook salmon escapement to Goat Creek in 1992 was 16 fish, only one quarter the 1991 count of 63 fish. The total escapement for the Alsek River drainage, estimated by expanding the weir escapement count for the Klukshu River by 1/0.64 (tributary expansion factor) and subtracting sport (102) and subsistence (84) harvest, was 1,950 large chinook salmon. This was 48% below 1991 and 61% less than the pre-1991 escapement goal of 5,000 large chinook salmon. Escapements of chinook salmon to the Alsek River have exceeded the escapement goal only in 1979, and average escapements during the first cycle of the rebuilding program (1981-1985) have actually declined relative to the 1975-1980 base period (Figure 14). In 1991, the TBTC revised the Alsek River chinook escapement goal to 4,700 large fish through the Klukshu River weir. New expansion factors were not agreed upon therefore the total escapement was estimated using the above factors.

Unuk River

Escapements of chinook salmon to the Unuk River have historically been the largest of any river system in Behm Canal. In 1992, 875 large chinook salmon were observed in index areas of the Unuk River (Table 6) and escapements were below average in 3 out of 6 index tributaries (Table 7). This was 51% below the survey escapement goal of 1,800 fish.

In 1991 and 1992, a weir was operated on Cripple Creek, a major spawning tributary of the Unuk River. The index count for Cripple Creek was estimated to be 327 fish. A total of 336 large chinook were counted through the weir and 100 below the weir in 1992. The weir count was reduced by a factor of 0.625 to be comparable with foot surveys previously done (Sands et al. *In prep.*), and the 117 fish observed below the weir and upstream prior to installation were added to that, resulting in the index count 327 fish. In 1992, Boundary Creek was included with the tributaries surveyed, but not in the index expansion. A recent change in the river has revealed more spawning area in that tributary than previously observed.

Expansion of 1992 peak aerial survey counts by a survey expansion factor of 1/0.625 resulted in a total escapement estimate of 1,400 large chinook salmon. The 1992 estimated total escapement was 14% above the 1991 escapement of 1,221 chinook salmon and only 49% of the management escapement goal of 2,880 large chinook salmon. The 1992 estimated escapement of chinook salmon to the Unuk River was 30% below the average escapements observed during the first rebuilding

Table 5. Peak escapement and weir counts of chinook salmon for tributaries of the Alsek River, 1962-1992.

Year[a]	Klukshu aerial	Klukshu weir	Canadian inriver harvest IFF	Canadian inriver harvest Sport	Klukshu escapement[b]	Blanchard River	Takhanne River	Goat Creek	Total[c]
1962	86				86	-[d]	-	-	86
1963	-				-	-	-	-	-
1964	20				20	-	-	-	20
1965	100				100	100	250	-	450
1966	1,000				1,000	100	200	-	1,300
1967	1,500				1,500	200	275	-	1,975
1968	1,700				1,700	425	225	-	2,350
1969	700				700	250	250	-	1,200
1970	500				500	100	100	-	700
1971	300				300	-	-	-	300
1972	1,100				1,100	12 (A)	250	-	1,362
1973	-				-	-	49 (A)	-	49
1974	62				62	52 (A)	132	-	246
1975	58				58	81 (A)	177 (A)	-	316
1976	-	1,278	125	200	1,153	-	-	-	1,153
1977	-	3,144	250	300	2,894	-	-	-	2,894
1978	-	2,976	300	300	2,676	-	-	-	2,676
1979	-	4,404	130	650	4,274	-	-	-	4,274
1980	-	2,637	150	200	2,487	-	-	-	2,487
1981	-	2,113	150	315	1,963	35 (H)	11 (H)	-	2,009
1982	633	2,369	400	224	1,969	59 (H)	241 (H)	13 (H)	2,282
1983	917	2,537	300	312	2,237	108 (H)	185 (H)	-	2,530
1984	-	1,672	100	475	1,572	304 (H)	158 (H)	28 (H)	2,062
1985	-	1,458	175	250	1,283	232 (H)	184 (H)	-	1,699
1986	738	2,709	102	165	2,607	556 (H)	358 (H)	142 (H)	3,663
1987	933	2,616	125	367	2,491	624 (H)	395 (H)	85 (H)	3,595
1988	-	2,037	43	249	1,994	437 E(H)	169 E(H)	54 E(H)	2,654
1989	893	2,456	167	272	2,289	-	158 E(H)	34 E(H)	2,481
1990	1,381	1,915	173	555	1,742	-	325 E(H)	32 E(H)	2,099
1991	-	2,489	336	388	2,153	121 N(H)	86 E(H)	63 E(H)	2,423
1992	261	1,367	84	102	1,283	86 P(H)	77 N(H)	16 N(H)	1,462

[a] Escapement counts prior to 1975 may not be comparable due to differences in survey dates and counting methods.

[b] Klukshu River escapement = weir count minus Indian Food Fishery (IFF).

[c] Total escapement = Klukshu escapement plus aerial counts of other systems.

[d] (A) = Aerial survey from fixed wing aircraft; (H) = helicopter survey; (E) = excellent survey conditions; (N) = normal conditions; (P) = poor conditions; (-) = no survey.

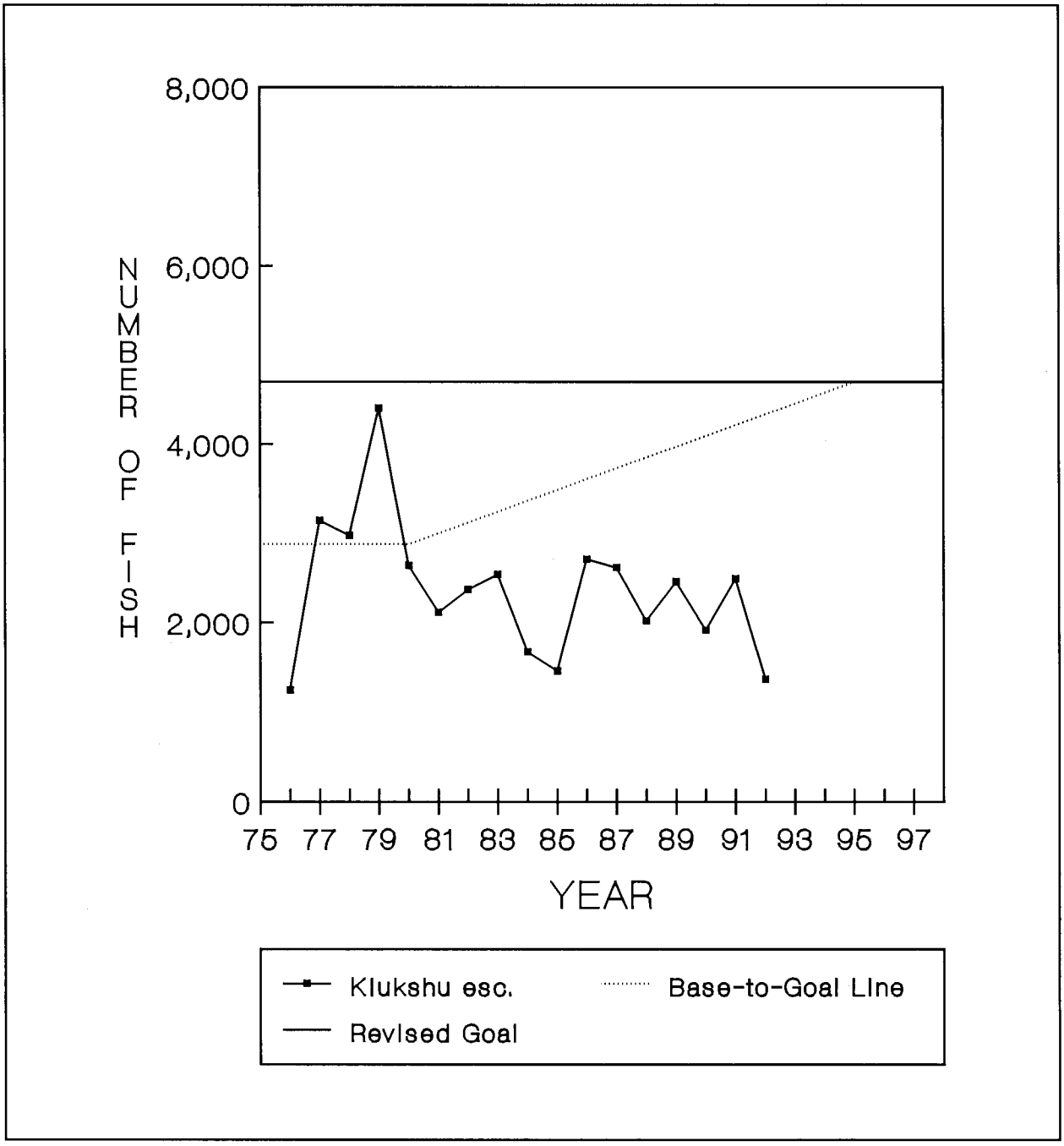

Figure 14. Observed escapements of chinook salmon to the Klukshu River tributary of the Alsek River, 1975-1992. Base-to-goal line indicates linear rebuilding trend, starting in 1981 at average escapement level during base period (1975-1980) and ending at the escapement goal of 4,700 large chinook salmon in 1995 (final year of three-cycle rebuilding program).

Table 6. Peak escapement counts of chinook salmon to index tributaries of the Unuk River, 1960-1992.

Year[a]	Cripple Creek	Genes Lake Creek	Eulachon Creek	Clear Creek	Lake Creek	Kerr Creek	Total
1960	-[b]	-	250 (A)	-	-	-	250
1961	3 (F)	200 (F)	270 (F)	65 (F)	-	53 (F)	591
1962	-	150 (A)	145 (A)	100 (A)	30 (A)	-	425
1963	100 (A)	750 (A)	150 (A)	25 (A)	-	-	1,025
1964	-	-	25 (A)	-	-	-	25
1965	-	-	-	-	-	-	-
1966	-	-	-	-	-	-	-
1967	-	-	60 (H)	-	-	-	60
1968	-	-	75 (H)	-	-	-	75
1969	-	-	150 (H)	-	-	-	150
1970	-	-	-	-	-	-	-
1971	-	-	30 (A)	-	-	-	30
1972	95 (A)	35 (A)	450 (A)	90 (A)	55 (A)	-	725
1973	-	-	64 (H)	-	-	-	64
1974	-	-	68 (H)	-	-	-	68
1975	-	-	17 (H)	-	-	-	17
1976	-	-	3 (A)	-	-	-	3
1977	529 (F)	339 (F)	57 (H)	34 (H)	-	15 (H)	974
1978	394 (F)	374 (F)	218 (H)	85 (H)	20 (H)	15 (H)	1,106
1979	363 (F)	101 (F)	48 (H)	14 (H)	30 (H)	20 (H)	576
1980	748 (F)	122 (F)	95 (H)	28 (H)	5 (H)	18 (H)	1,016
1981	324 (F)	112 (F)	196 (H)	54 (H)	20 (H)	25 (H)	731
1982	538 (F)	329 (F)	384 (H)	24 (H)	48 (H)	28 (H)	1,351
1983	459 (F)	338 (F)	288 (H)	24 (H)	12 (H)	4 (H)	1,125
1984	644 (F)	647 (F)	350 (H)	113 (H)	32 (H)	51 (H)	1,837
1985	284 (F)	553 (F)	275 (H)	37 (H)	22 (H)	13 (H)	1,184
1986	532 (F)	838 (F)	486 (H)	183 (F)	25 (H)	62 (H)	2,126
1987	860 (F)	398 (F)	520 (H)	107 (H)	37 (H)	51 (H)	1,973
1988	1,068 (F)	154 (F)	146 (F)	292 (H)	60 (H)	26 (H)	1,746
1989	351 (F)	302 (F)	298 (H)	128 (H)	27 (F)	43 (H)	1,149
1990	86 (F)	284 (F)	81 (H)	103 (F)	26 (F)	11 (H)	591
1991	358(W/F)	123 (F)	43 (H)	96 (F)	23 (F)	12 (H)	655[c]
1992	327(W/F)	360 (F)	57 (F)	69 (F)	31 (H)	31 (H)	874[d]

[a] Escapement counts prior to 1975 may not be comparable due to differences in survey dates and counting methods.

[b] (F) = escapement survey conducted by walking river.
(A) = escapement Survey conducted from fixed-wing aircraft.
(H) = escapement survey conducted from helicopter.
- = no survey conducted or data not comparable.

[c] Total does not include 108 from Boundary Creek, Cripple Creek weir count reduced by /0.625 to be comparable with foot surveys.

[d] Total does not include 123 from Boundary Creek, Cripple Creek weir count reduced by /0.625 to be comparable with foot surveys.

Table 7. Percentages of total escapements of chinook salmon to index tributaries of the Unuk River for years when all index tributaries were surveyed.

Year	Cripple Creek	%	Genes Lake Creek	%	Eulachon Creek	%	Clear Creek	%	Lake Creek	%	Kerr Creek	%	Total
1978	394	36	374	34	218	20	85	8	20	2	15	1	1,106
1979	363	63	101	18	48	8	14	2	30	5	20	4	576
1980	748	74	122	12	95	9	28	3	5	1	18	2	1,016
1981	324	44	112	15	196	27	54	7	20	3	25	3	731
1982	538	39	329	24	384	28	24	2	48	4	28	2	1,351
1983	459	40	338	30	288	26	24	2	12	1	4	0	1,125
1984	644	35	647	35	350	19	113	6	32	2	51	3	1,837
1985	284	24	553	47	275	23	37	3	22	2	13	1	1,184
1986	532	25	838	39	486	23	183	9	25	1	62	3	2,126
1987	860	44	398	20	520	26	107	5	37	2	51	3	1,973
1988	1,068	61	154	9	146	8	292	17	60	3	26	2	1,746
1989	351	31	302	26	298	26	128	11	27	2	43	4	1,149
1990	86	15	284	48	81	14	103	17	26	4	11	2	591
1991	358	27	123	10	43	3	96	7	23	2	12	1	655
Average	501	42	334	26	245	19	92	7	28	2	27	2	1,226
1992	336	57	360	29	57	5	69	6	31	3	30	2	883

cycle (1981-1985) and 5% below the 1975-1980 average of 1,469 chinook salmon. Escapements of chinook salmon to the Unuk River have been below the linear rebuilding schedule since 1989 (Figure 15).

Chickamin River

Chinook salmon have been counted by foot or helicopter surveys in index tributaries of the Chickamin River each year since 1977. The 1992 observed escapement to the eight index tributaries of the Chickamin River was 346 large chinook salmon, compared to 487 in 1991 (Table 8). Escapements in 1992 were below average in all Chickamin River tributaries (Table 9). The survey expansion goal is 900 fish observed and the expanded goal for the system is 1,440.

Expansion of the total observed peak escapement by the survey expansion factor of 1/0.625 gave an estimated total escapement to the Chickamin River drainage of 554 chinook salmon, only 38% of the management escapement goal of 1,440 large chinook salmon. The 1992 total escapement was 29% lower than in 1991 and 47% lower than 1981-1985 average escapement of 1,169; however, it was 64% higher than the 1975-1980 average of 338 fish. The 1992 escapement of chinook salmon to the Chickamin River falls below both the management escapement goal and the rebuilding schedule. Prior to 1990, total escapements had been above the linear rebuilding schedule since 1980, and close to or above the management escapement goal since 1984 (Figure 16).

Chilkat River

In 1992, 75 large chinook salmon were observed during the peak aerial and foot surveys of the Big Boulder and Stonehouse creek index streams (Table 10). Ongoing research on the Chilkat River has indicated that the aerial survey expansion method does not accurately reflect the actual chinook salmon escapement (Figure 17). The surveys will be discontinued and researchers are looking for an alternative method of annually indexing escapement. Until one is developed, the Chilkat River has been removed from the Southeast Alaska chinook index program.

Other Rivers

The observed peak escapement of 150 large chinook salmon to the Blossom River in 1992 was a 48% decrease from the 1991 escapement of 239 (Table 11). The expanded escapement estimate for the Blossom River of 240 fish was approximately 19% of the escapement goal of 1,280 fish. This escapement goal was exceeded in both 1986 and 1987. Since 1988, escapements of chinook salmon to the Blossom River have fallen below the linear rebuilding schedule (Figure 18).

Escapement to the Keta River in 1992 decreased to 217 fish from 272 in 1991 (Table 11). Expanding the peak aerial count by the survey expansion factor of 1/0.625 resulted in an estimate of 347 large chinook salmon, again below the escapement goal of 800 fish. Prior to 1990, chinook salmon escapements to the Keta River had increased steadily since implementation of the rebuilding program in 1980, and had exceeded the escapement goal every year since 1983 (Figure 19).

The Marten River is not used as a chinook salmon index stream and no escapement goals have been established. The escapements to this system have, however, been regularly monitored since 1982. The 1992 peak escapement count for the Marten River of 76 large chinook salmon was the lowest count in five years. One hundred

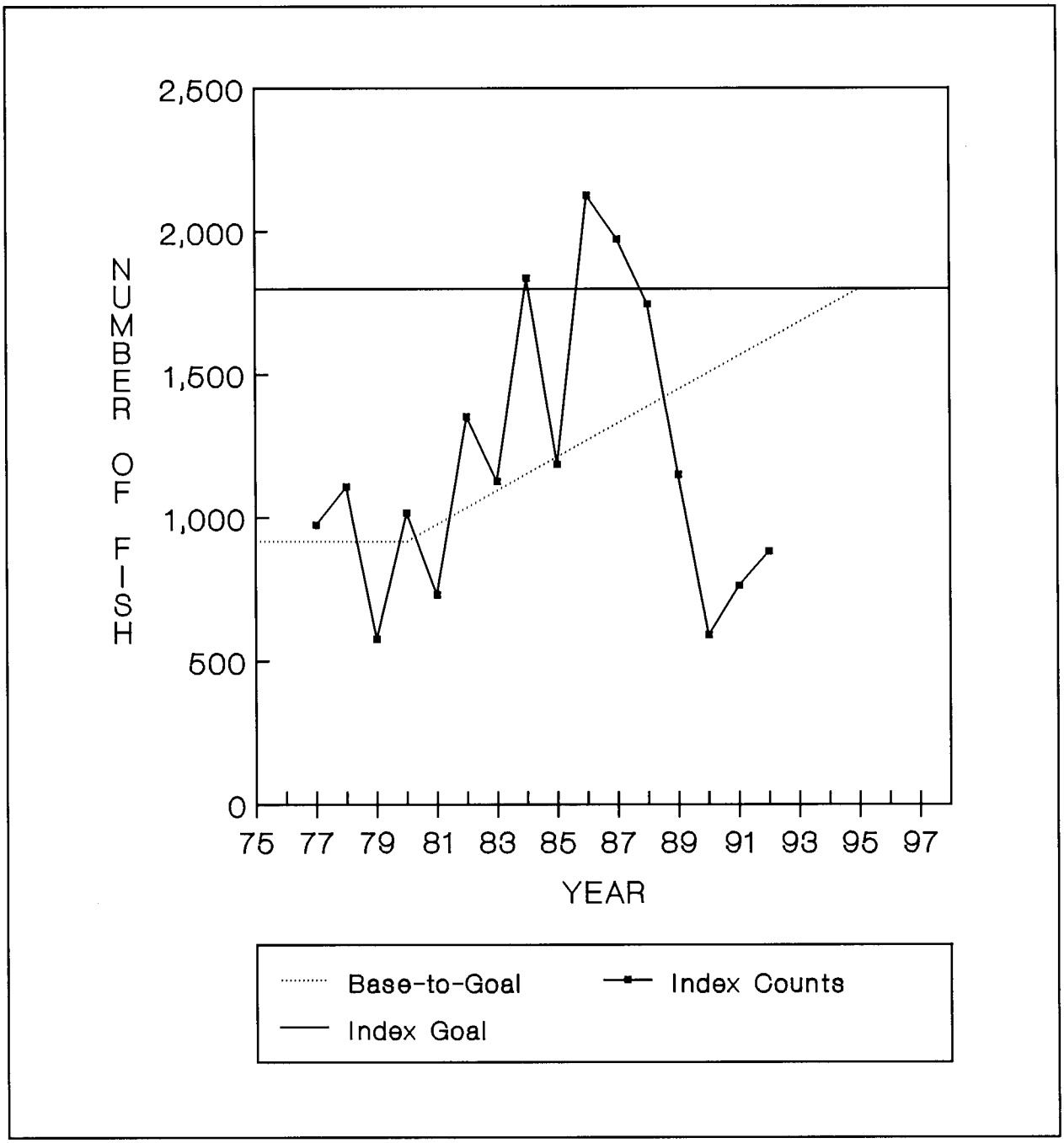

Figure 15. Observed escapements of chinook salmon to the Unuk River, 1975-1992. Base-to-goal line shows linear rebuilding schedule, starting in 1981 at average escapement level during the base period (1975-1980) and ending at escapement goal of 1,800 large chinook salmon in 1995 (final year of the three-cycle rebuilding program).

Table 8. Peak escapements of chinook salmon to tributaries of the Chickamin River, 1960-1992.

Year[a]	South Fork Creek	Barrier Creek	Butler Creek	Leduc Creek	Indian Creek	Humpy Creek	King Creek	Clear Falls Creek	Total[c]
1960	-[b]	-	-	-	-	3 (A)	-	-	3
1961	-	36 (A)	77 (A)	42 (A)	5 (A)	120 (A)	48 (A)	-	328
1962	400 (A)	35 (A)	-	-	-	150 (A)	-	-	585
1963	350 (A)	115 (A)	-	-	-	3 (A)	200 (A)	-	668
1964	-	-	-	-	-	-	-	-	-
1965	-	-	-	-	-	-	75 (A)	-	75
1966	-	-	-	-	-	50 (F)	-	-	50
1967	-	-	-	-	-	-	45 (H)	-	45
1968	-	-	-	-	-	30 (H)	20 (H)	-	50
1969	-	-	-	-	-	10 (H)	45 (H)	-	55
1970	-	-	-	-	-	-	-	-	-
1971	-	-	-	-	-	-	-	-	-
1972	350 (A)	25 (A)	-	85 (A)	-	65 (A)	510 (A)	-	1,035
1973	-	-	-	-	-	14 (A)	65 (A)	-	79
1974	144 (H)	-	-	-	-	-	11 (H)	-	155
1975	141 (H)	9 (H)	66 (H)	6 (H)	90 (H)	7 (H)	30 (H)	-	370[c]
1976	46 (H)	10 (H)	15 (H)	12 (H)	9 (H)	-	-	-	157[c]
1977	52 (H)	66 (H)	30 (H)	26 (H)	53 (H)	0 (H)	-	-	363[c]
1978	21 (H)	94 (H)	4 (H)	42 (H)	20 (H)	-	-	-	308[c]
1979	63 (H)	17 (H)	29 (H)	0 (H)	31 (H)	-	-	-	239[c]
1980	56 (H)	62 (H)	104 (H)	17 (H)	22 (H)	-	-	-	445[c]
1981	51 (H)	105 (H)	51 (H)	25 (H)	12 (H)	4 (F)	105 (F)	31 (H)	384
1982	84 (H)	149 (H)	37 (H)	36 (H)	30 (F)	37 (F)	165 (F)	33 (H)	571
1983	28 (H)	138 (H)	91 (H)	30 (H)	47 (H)	-	212 (F)	30 (H)	599[c]
1984	185 (H)	171 (H)	124 (H)	15 (H)	103 (H)	88 (F)	388 (F)	28 (H)	1,102
1985	163 (H)	129 (H)	92 (H)	8 (H)	125 (H)	50 (H)	377 (H)	12 (H)	956
1986	562 (H)	168 (H)	203 (H)	20 (H)	120 (H)	-	564 (H)	40 (H)	1,745[c]
1987	261 (H)	76 (H)	120 (H)	19 (H)	115 (H)	26 (H)	310 (H)	48 (H)	975
1988	280 (H/F)	82 (H/F)	159 (H)	25 (H/F)	32 (H)	19 (H/F)	164 (H)	25 (H/F)	786
1989	226 (H/F)	90 (H)	137 (H)	57 (H)	84 (H)	22 (H/F)	224 (H)	94 (H)	934
1990	135 (F)	107 (H)	27 (H)	20 (H)	24 (H)	35 (H)	163 (H)	53 (H)	564
1991	125 (H)	18 (H)	49 (H)	14 (H)	38 (H)	13 (H)	185 (H)	45 (H)	487
1992	87 (H)	4 (H)	68 (H)	4 (H)	20 (H)	8 (H)	131 (H)	24 (H)	346

[a] Escapement counts conducted prior to 1975 may not be comparable due to differences in survey dates and counting methods.

[b] (F) = escapement surveyed by walking stream.
(H) = escapement surveyed by helicopter.
(A) = escapement surveyed by fixed-wing aircraft.
(H/F) = escapement surveyed by combination of walking and helicopter.
- = no survey conducted or data not comparable.

[c] Totals for 1975-1980, 1983 and 1986 expanded for unsurveyed index areas by 1981-1992 average % observed to those indices.

Table 9. Percentages of total escapements of chinook salmon to index tributaries of the Chickamin River for years when all index tributaries were surveyed.

Year	South Fork Creek	%	Barrier Creek	%	Butler Creek	%	Leduc Creek	%	Indian Creek	%	Humpy Creek	%	King Creek	%	Clear Falls Creek	%	Total
1981	51	13	105	27	51	13	25	7	12	3	4	1	105	27	31	8	384
1982	84	15	149	26	37	7	36	6	30	5	37	7	165	29	33	6	571
1984	185	17	171	16	124	11	15	1	103	9	88	8	388	35	28	2	1,102
1985	136	14	156	16	93	10	8	1	125	13	50	5	377	39	12	1	957
1987	261	27	76	8	120	12	19	2	115	12	26	3	310	32	48	5	975
1988	280	36	82	10	159	20	25	3	32	4	19	2	164	21	25	3	786
1989	226	24	90	10	137	15	57	6	84	9	22	2	224	24	94	10	934
1990	135	24	107	19	27	5	20	4	24	4	35	6	163	29	53	9	564
1991	125	22	18	3	49	9	14	2	38	7	13	2	185	33	45	8	487
Average	165	21	106	15	89	11	24	4	63	7	33	4	231	30	41	6	751
1992	87	15	4	1	68	12	4	1	20	4	8	1	131	23	24	4	346

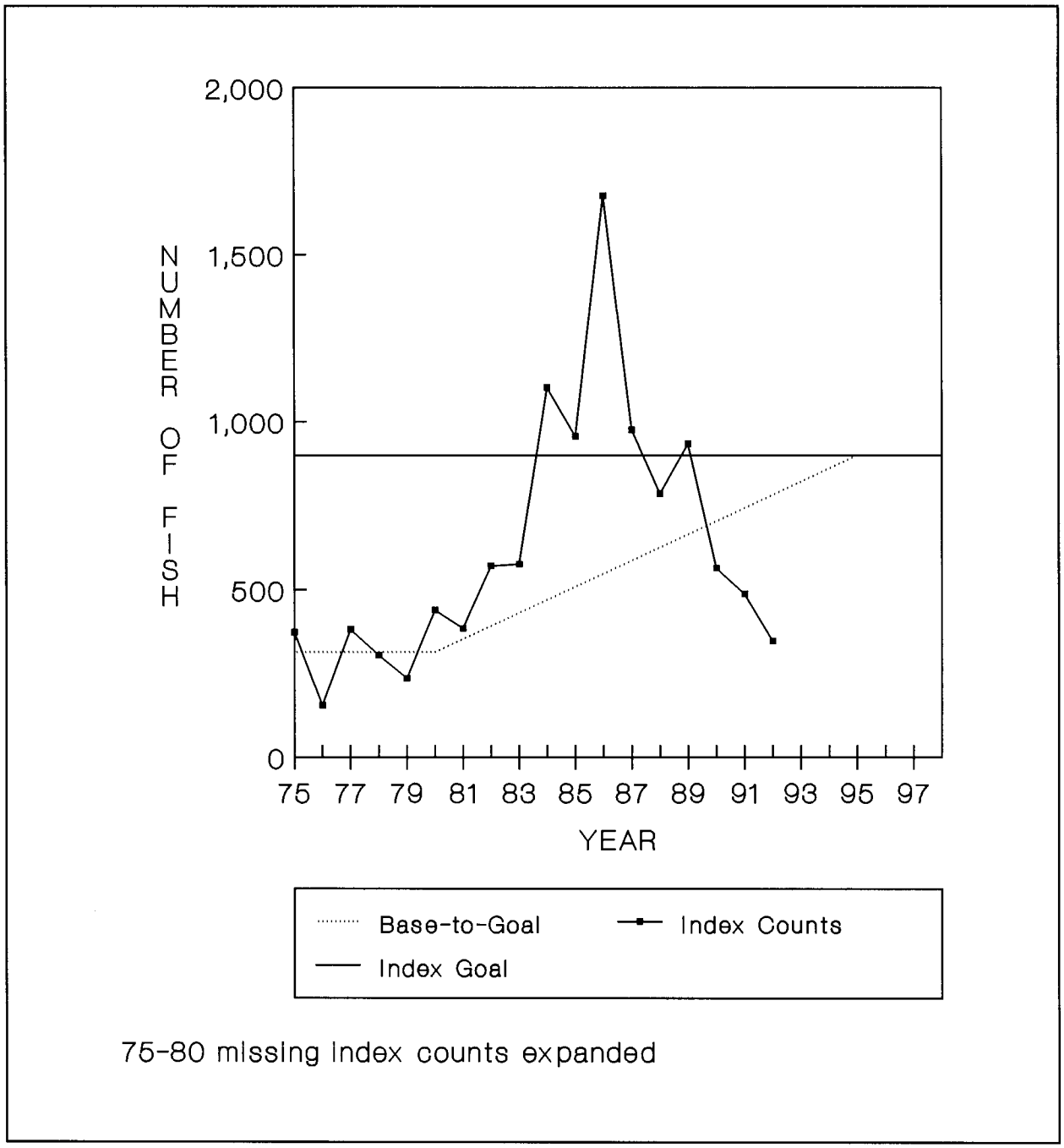

Figure 16. Observed escapements of chinook salmon to the Chickamin River, 1975-1992. Base-to-goal line indicates linear rebuilding schedule, starting in 1981 at average escapement level during the base period (1975-1980) and ending at escapement goal of 900 large chinook salmon in 1995 (final year of the three-cycle rebuilding program).

Table 10. Peak escapements of chinook salmon to index tributaries of the Chilkat River, 1960-1992.

Year[a]	Big Boulder Creek	Stonehouse Creek	Total
1960	316 (F)[b]	-	316
1961	88 (F)	-	88
1962	-	-	-
1963	-	-	-
1964	-	-	-
1965	-	-	-
1966	330 (F)	-	330
1967	150 (F)	-	150
1968	259 (F)	-	259
1969	-	-	-
1970	176 (F)	-	176
1971	56 (F)	-	56
1972	-	-	-
1973	-	-	-
1974	0 (F)	-	0
1975	21 (F)	-	21
1976	25 (F)	-	25
1977	25 (F)	-	25
1978	-	-	-
1979	-	-	-
1980	-	-	-
1981	187 (H/F)	69 (H)	256
1982	56 (H/F)	123 (H)	179
1983	121 (H/F)	126 (H)	247
1984	229 (H/F)	104 (H)	333
1985	70 (H/F)	50 (H)	120
1986	20 (F)	9 (H)	29
1987	98 (F)	190 (H)	288
1988	86 (F)	89 (H)	175
1989	74 (H)	231 (H)	305
1990	19 (H)	42 (H)	61
1991	59 (F)	126 (H)	185[c]
1992	36 (F)	39 (H)	75[d]

[a] Escapement counts prior to 1975 may not be comparable because of differences in survey dates and counting methods.

[b] (F) = escapement surveyed by walking stream.
(A) = escapement surveyed from fixed-wing aircraft.
(H) = escapement surveyed from helicopter.
(H/F)= escapement surveyed from helicopter and by walking portions of stream.
- = no survey conducted or data not comparable.

[c] Big Boulder count for 1991 includes 27 fish removed for egg take.

[d] Big Boulder count for 1992 includes 20 fish removed for egg take.

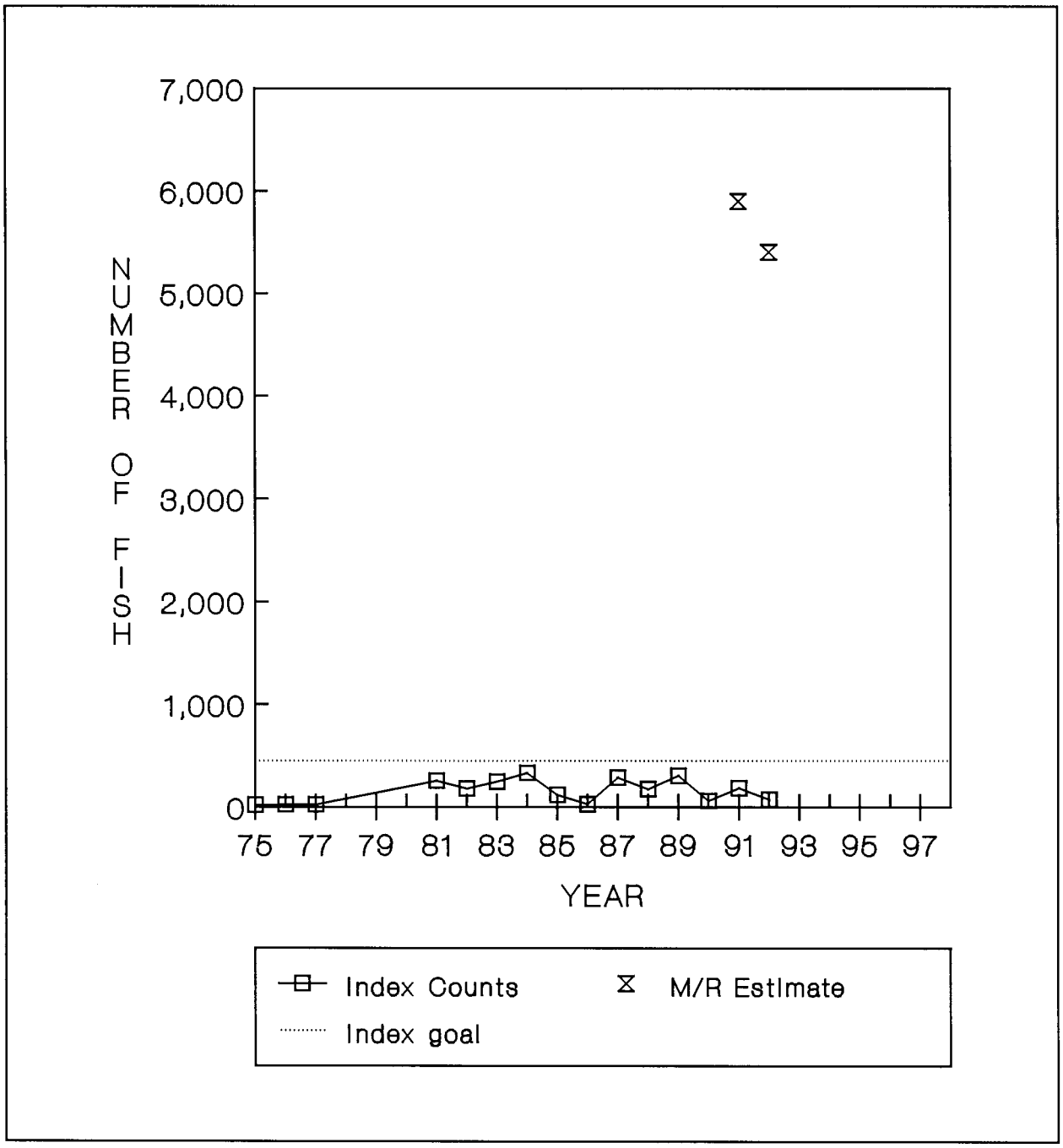

Figure 17. Observed escapements of chinook salmon to the Chilkat River, 1975-1992 and mark/recapture estimates of escapement 1991-1992 (Johnson et al. 1993).

Table 11. Peak escapement counts of chinook salmon for selected rivers in Behm Canal, 1948-1992.

Year[a]	Keta River	Blossom River	Wilson River	Marten River	Grant Creek	Klahini River	Total
1948	500 (F)[b]	-	-	-	-	-	500
1949	-	-	-	-	-	-	-
1950	210 (F)	-	-	-	-	-	210
1951	120 (F)	-	-	-	-	-	120
1952	462 (F)	-	-	-	-	-	462
1953	156 (F)	-	-	-	-	-	156
1954	300 (A)	-	-	-	-	-	300
1955	1,000 (A)	-	-	-	-	-	1,000
1956	1,500 (A)	-	-	-	-	-	1,500
1957	500 (A)	-	-	-	-	-	500
1958	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-
1961	44 (F)	68 (F)	-	22 (F)	40 (A)	-	174
1962	-	-	-	-	6 (A)	100 (A)	106
1963	-	450 (A)	375 (A)	-	15 (A)	-	840
1964	-	-	-	-	-	-	-
1965	-	-	50 (A)	43 (H)	-	-	93
1966	75 (A)	200 (A)	60 (A)	10 (A)	100 (A)	3 (A)	448
1967	86 (H)	-	8 (H)	7 (H)	15 (H)	-	116
1968	-	-	-	-	4 (H)	-	4
1969	200 (A)	-	10 (A)	10 (A)	69 (H)	3 (H)	292
1970	-	100 (H)	-	-	-	-	100
1971	-	-	-	-	-	-	-
1972	255 (A)	225 (A)	275 (A)	-	25 (A)	150 (A)	930
1973	-	-	30 (A)	-	38 (A)	7 (H)	75
1974	25 (H)	166 (H)	-	-	-	-	191
1975	203 (H)	146 (H)	7 (H)	15 (H)	-	-	371
1976	84 (H)	68 (H)	-	-	-	-	152
1977	230 (H)	112 (H)	-	-	-	-	342
1978	392 (H)	143 (H)	-	2 (A)	-	-	537
1979	426 (H)	54 (H)	36 (H)	-	-	-	516
1980	192 (H)	89 (H)	-	-	-	-	281
1981	329 (H)	159 (H)	76 (F)	-	25 (H)	42 (F)	631
1982	754 (H)	345 (H)	300 (B)	75 (F)	33 (F)	79 (F)	1,586
1983	822 (H)	589 (H)	178 (B)	138 (F)	8 (A)	10 (H)	1,745
1984	610 (H)	508 (H)	133 (F)	12 (B)	124 (F)	54 (F)	1,441
1985	624 (H)	709 (H)	420 (H)	69 (F)	55 (F)	20 (F)	1,897
1986	690 (H)	1,278 (H)	-	-	-	-	1,968
1987	768 (H)	1,349 (H)	-	270 (H)	33 (A)	-	2,420
1988	575 (H)	384 (H)	-	543 (H)	-	40 (H)	1,542
1989	1,155 (H)	344 (H)	-	133 (H)	-	-	1,632
1990	606 (H)	257 (H)	-	283 (H)	-	-	1,146
1991	272 (H)	239 (H)	-	135 (H)	-	-	646
1992	217 (H)	150 (H)	109 (H)	76 (H)	25 (H)	19 (H)	596

[a] Escapement counts prior to 1975 may not be comparable due to differences in survey dates or methods.

[b] (F) = escapement surveyed by walking stream.
(A) = escapement surveyed from fixed-wing aircraft.
(H) = escapement surveyed from helicopter.
(B) = escapement surveyed from boat.
- = no survey conducted or data not comparable.

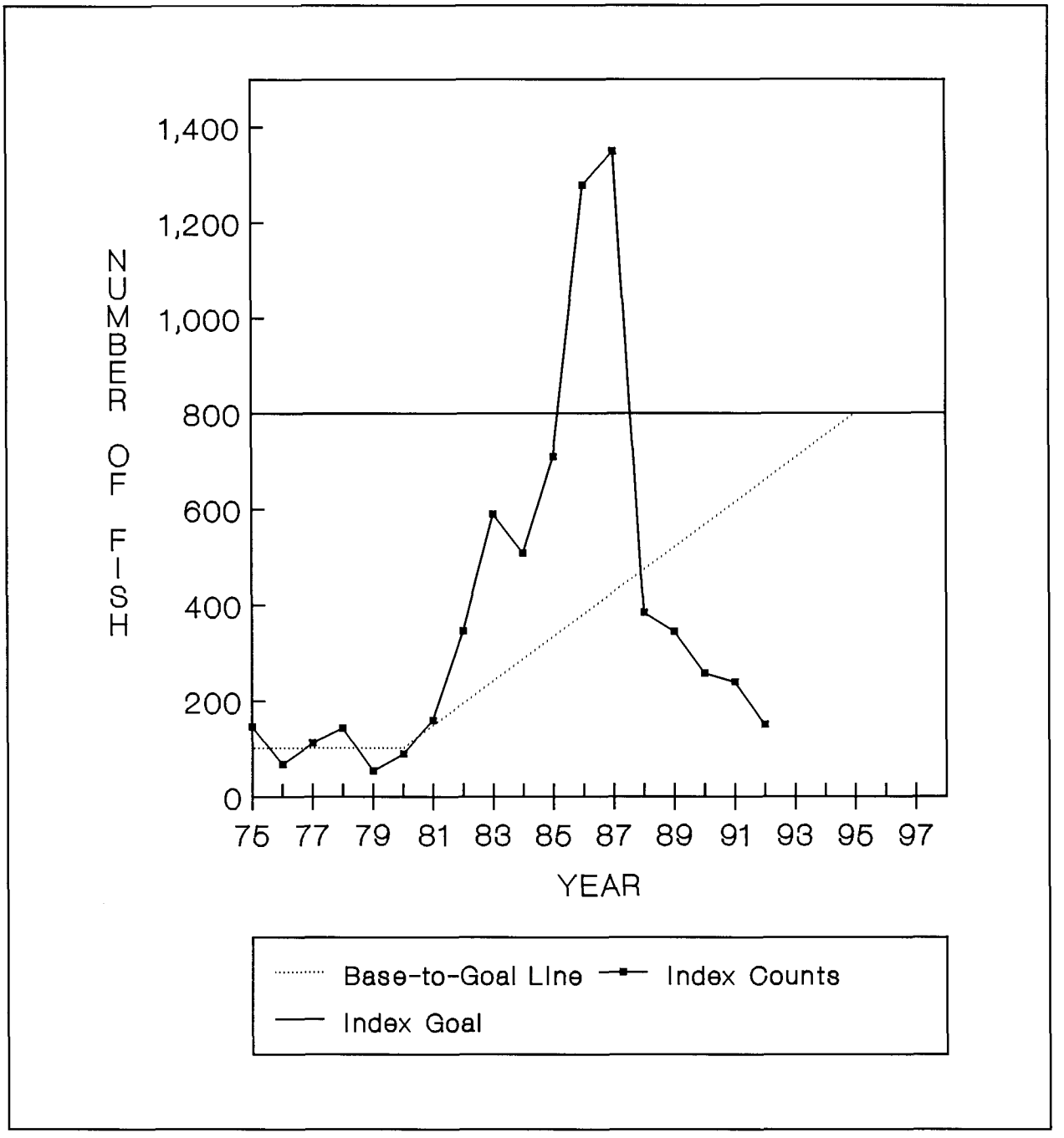

Figure 18. Observed escapements of chinook salmon to the Blossom River, 1975-1992. Base-to-goal line shows linear rebuilding schedule, starting in 1981 at average escapement level during the base period (1975-1980) and ending at escapement goal of 800 large chinook salmon in 1995 (final year of the three-cycle rebuilding program).

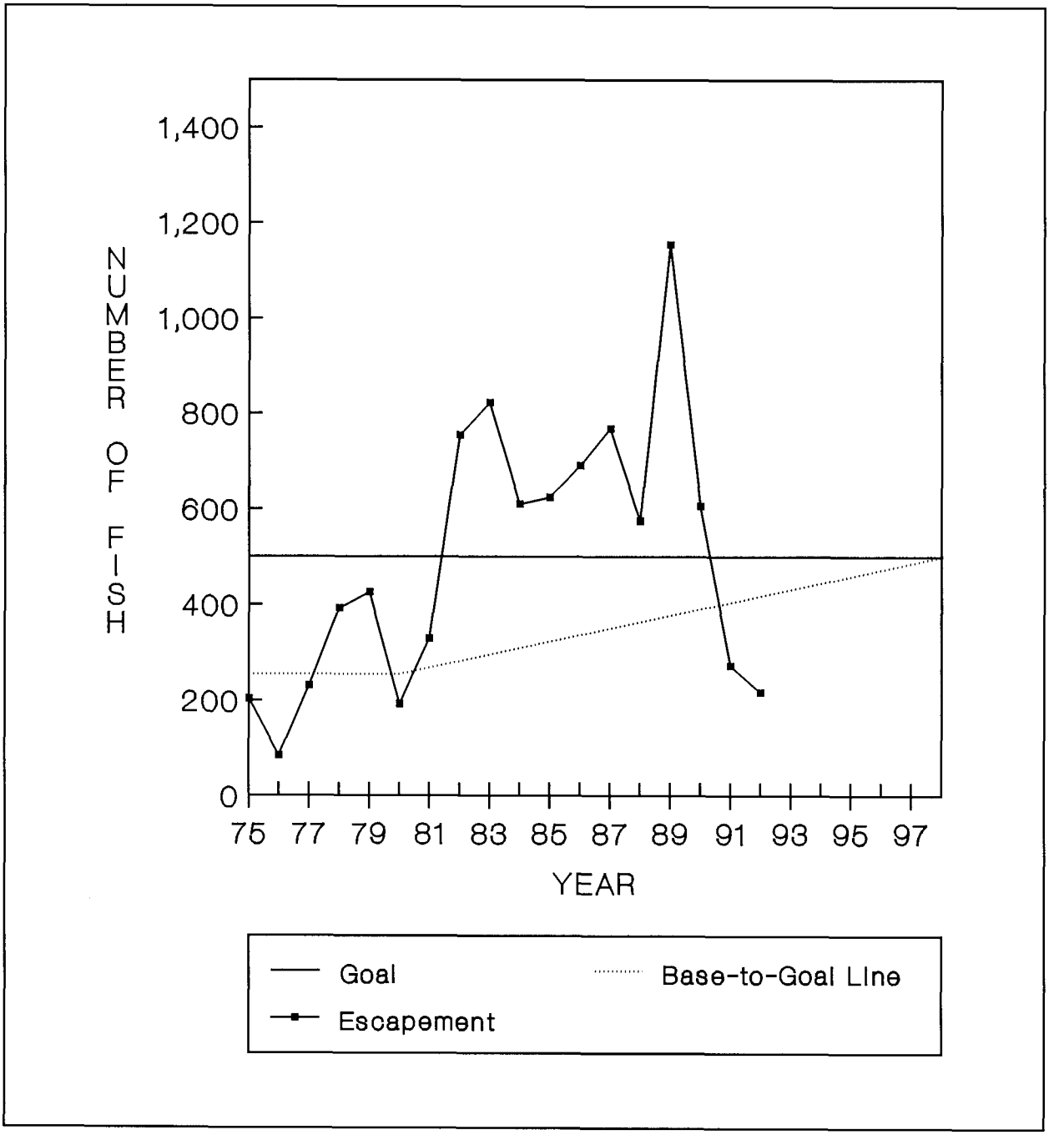

Figure 19. Observed escapements of chinook salmon to the Keta River, 1975-1992. Base-to-goal line shows linear rebuilding schedule, starting in 1981 at average escapement level during the base period (1975-1980) and ending at escapement goal of 500 large chinook salmon in 1995 (final year of the three-cycle rebuilding program).

and nine chinook salmon were observed in the Wilson River, 25 in the Grant and 19 in the Klahini River in 1992.

The 1991 weir count of 117 large chinook salmon to the King Salmon River was 24% below the 1991 escapement and the third decline in a row (Table 12). Eighteen large chinook salmon were taken for brood stock production at Little Port Walter hatchery, so 99 large chinook salmon spawned in the King Salmon River in 1992. Since 1983, chinook salmon escapements to the King Salmon River have been slightly below the management escapement goal of 250 large chinook salmon, and since 1990 have been below the linear rebuilding schedule (Figure 20). At the end of the 1992 season the weir was completely removed and will not be operated in the future. A foot survey was added in 1992 and will be carried out each year in addition to the aerial survey.

Escapements of chinook salmon to the Situk River in 1992 increased to 1,618 large chinook salmon (Table 13). The 1992 escapement was 85% higher than the 1991 escapement of 875 and 62% and 24% lower than the 1981-1985 and 1975-1980 average escapements of 995 and 1,299 fish, respectively. When the commercial, sport and subsistence harvests are combined with the escapement the 1992 estimated total chinook run size is the largest since the mid 40's. In 1991, the chinook salmon escapement goal to the Situk River was reduced to 600 large fish (ADF&G 1991) Escapements have exceeded the revised escapement goal since 1984 (Figure 21).

DISCUSSION

The index expansion method relies on the assumption that escapements to the index tributaries are a constant proportion of the total escapement and are, therefore, "indicative" of the total escapement to all systems. There is reason to question the validity of this assumption for at least the Taku and Chilkat Rivers. Mecum (1990) examined those years when all Taku River tributaries were surveyed and found that expansion of five or six index systems may give a more representative estimation of total escapement to the Taku River than the two systems then used. The Transboundary River Technical Committee of the PSC agreed in 1991 to a new escapement goal for the combined counts of all six index tributaries (PSC 1991b). This goal incorporates no expansion factors and refers to chinook actually observed on the surveys. Since terminal catches at this time are insignificant compared to escapement levels, the TBTC recommends that only escapement counts for the six index tributaries be used in assessing rebuilding. Expansion factors are necessary to compare different survey escapements with total weir counts, and total escapements are necessary to calculate exploitation rates and spawner/recruit relationships. However, since the accuracy of the expansion factors is unknown in most cases, the unexpanded counts are shown in Figures 11-21 and the expanded estimates of total escapement are shown only in Figure 22 and Appendix A2.

Modified expansion factors based upon the preliminary results of a two-year tagging study were used to expand the Taku River counts. These new expansion factors result in a increase in the escapement goal from 25,500 to 36,500 large chinook salmon.

Any change in survey methods must also take into account the comparability of historical data with new data. Year to year consistency and repeatability of index counts may be more important than their absolute accuracy to agencies that compare escapement estimates between years.

Table 12. Peak escapements and weir counts of chinook salmon for the King Salmon River, 1957-1992.

Year[b]	Aerial count[a] Below weir	Aerial count[a] Above weir	Aerial count as percent of weir count[c]	Total Snettisham egg take	Total weir count (adults)[d]	Total weir count (jacks)[e]	Spawners below weir (foot count)	Total return[f]	Total natural spawning[g]
1957	-	200 (F)	-	-	-	-	-	200	200
1960	-	20 (F)[h]	-	-	-	-	-	20	20
1961	-	117 (F)	-	-	-	-	-	117	117
1971	-	94 (F)	-	-	-	-	-	94	94
1972	-	90 (F)	-	-	-	-	-	90	90
1973	-	211 (F)	-	-	-	-	-	211	211
1974	-	104 (F)	-	-	-	-	-	104	104
1975	-	42 (H)	-	-	-	-	-	42	42
1976	-	65 (H)	-	-	-	-	-	65	65
1977	-	134 (H)	-	-	-	-	-	134	134
1978	-	57 (H)	-	-	-	-	-	57	57
1979	-	88 (H)	-	17	-	-	-	88	71
1980	-	70 (H)	-	-	-	-	-	70	70
1981	-	101 (H)	-	11	-	-	-	101	90
1982	-	259 (F)	-	30	-	-	-	259	229
1983	25	183 (H)	0.85	37	252	20	30	282	245
1984	14	184 (H)	0.77	61	299	82	12	311	250
1985	12	105 (H)	0.65	33	194	45	10	204	171
1986	9	190 (H)	0.83	36	264	72	17	281	245
1987	19	128 (H)	0.74	34	207	62	20	227	193
1988	5	94 (H)	0.50[i]	37	231	54	12	243	206
1989	34	133 (H)	0.64	40[j]	249	71	29	278	238
1990	34	98 (H)	0.61	30	190	32	8	198	168
1991	6	91 (H)	0.72	20	146	89	8	154	134
1992		58 (H)	0.59[k]	18	47	16	70	117	99

[a] (F) = escapement surveyed by walking stream.
(H) = escapement surveyed from helicopter.
- = no survey conducted or data not comparable.

[b] Escapement counts prior to 1975 may not be comparable due to differences in survey dates and counting methods.

[c] (Total aerial count above weir)/(total weir count excluding jacks - egg take).

[d] Includes adult spawners used for egg take.

[e] Minimum count as jacks could pass through weir.

[f] Total return (adults) = weir count + spawning below weir.

[g] Natural spawning (adults) = (weir count - egg take & mortality) + spawners below weir (83-89).

[h] Accuracy of count questionable (minimal number of spawners).

[i] Four females and two males were held but not spawned for egg take; % = 94/(231-37-6) = 50%

[j] Includes holding mortality of 4 males and 6 females for egg take.

[k] Peak survey was after weir was removed.

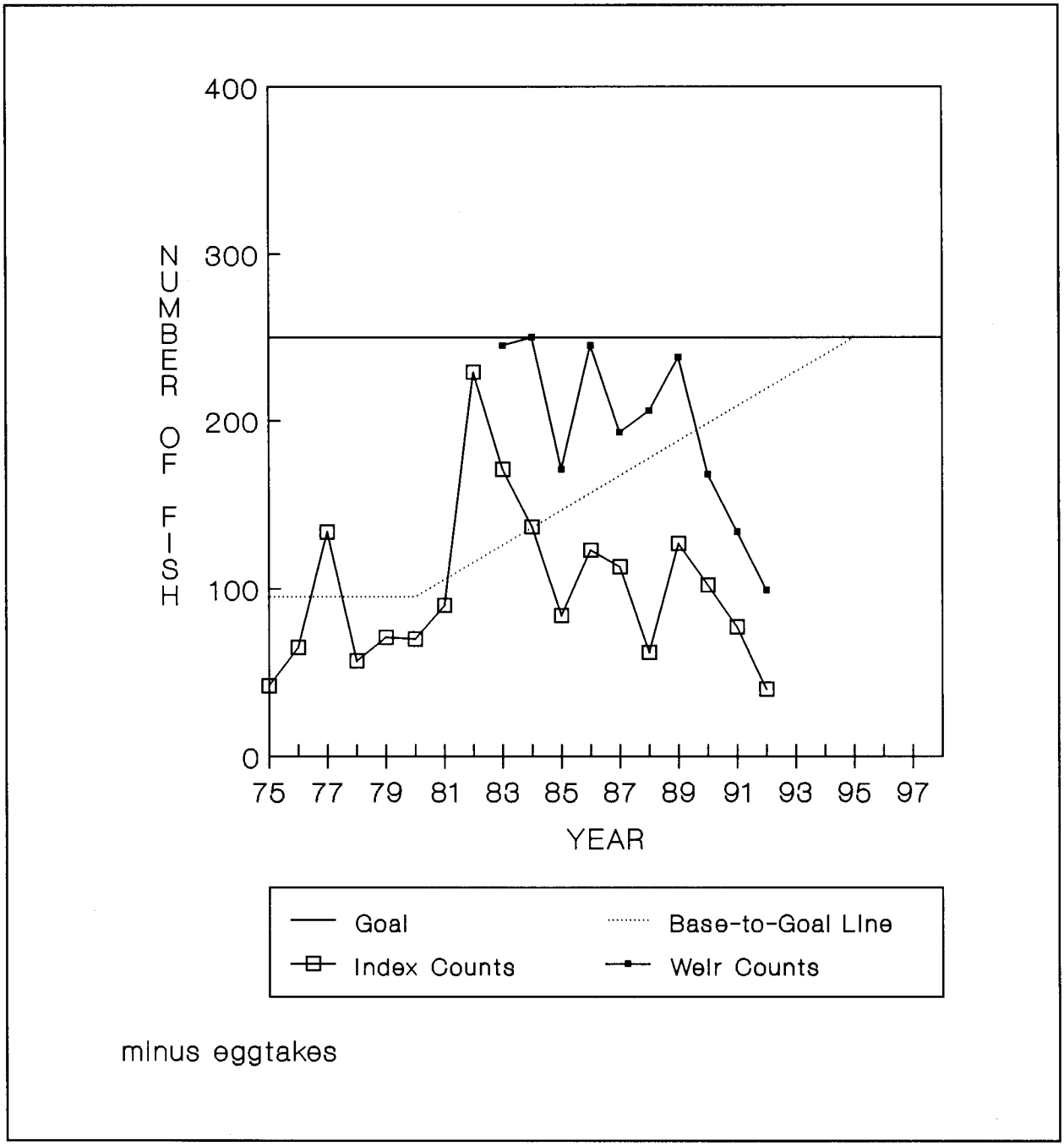

Figure 20. Observed escapements and weir counts of chinook salmon to the King Salmon River, 1975-1992. Base-to-goal line shows linear rebuilding schedule, starting in 1981 at average escapement level during base period (1975-1980) and ending at management escapement goal of 250 large chinook salmon in 1995 (final year of the three-cycle rebuilding program).

Table 13. Harvest, escapement, and minimum total run of Situk River chinook salmon, 1915-1992.

Year	Commercial chinook harvests: Yakutat Bay	Situk River: Commercial	Situk River: Subsistence	Recreational: Large	Recreational: Small	Escapement: Large chinook	Escapement: Small chinook	Escapement: Total	Total run size[a]: Large only	Total run size[a]: All chinook
1915	-	836	-	-	-	-	-	-	-	836
1916	-	931	-	-	-	-	-	-	-	931
1917	-	2,499	-	-	-	-	-	-	-	2,499
1918	-	1,036	-	-	-	-	-	-	-	1,036
1919	-	316	-	-	-	-	-	-	-	316
1920	-	782	-	-	-	-	-	-	-	782
1921	-	1,952	-	-	-	-	-	-	-	1,952
1922	-	2,118	-	-	-	-	-	-	-	2,118
1923	-	1,761	-	-	-	-	-	-	-	1,761
1924	-	1,351	-	-	-	-	-	-	-	1,351
1925	-	1,087	-	-	-	-	-	-	-	1,087
1926	-	1,851	-	-	-	-	-	-	-	1,851
1927	-	1,687	-	-	-	-	-	-	-	1,687
1928	-	-	-	-	-	-	-	1,224	-	1,224
1929	-	-	-	-	-	-	-	3,559	-	3,559
1930	-	-	-	-	-	-	-	1,455	-	1,455
1931	-	-	-	-	-	-	-	2,967	-	2,967
1932	-	-	-	-	-	-	-	1,978	-	1,978
1933	-	267	-	-	-	-	-	-	-	267
1934	-	450	-	-	-	-	-	1,486	1,936	1,936
1935	-	558	-	-	-	-	-	638	1,196	1,196
1936	-	-	-	-	-	-	-	816	-	816
1937	-	-	-	-	-	-	-	1,290	-	1,290
1938	-	1,220	-	-	-	-	-	2,668	3,888	3,888
1939	-	495	-	-	-	-	-	2,117	2,612	2,612
1940	-	164	-	-	-	-	-	903	1,067	1,067
1941	-	390	-	-	-	-	-	2,594	2,984	2,984
1942	-	430	-	-	-	-	-	2,543	2,973	2,973
1943	-	947	-	-	-	-	-	3,546	4,493	4,493
1944	-	844	-	-	-	-	-	2,906	3,750	3,750
1945	-	692	-	-	-	-	-	1,458	2,150	2,150
1946	-	1,468	-	-	-	-	-	4,284	5,752	5,752
1947	-	885	-	-	-	-	-	5,077	5,962	5,962
1948	-	694	-	-	-	-	-	3,744	4,438	4,438
1949	-	410	-	-	-	-	-	1,978	2,388	2,388
1950	-	378	-	-	-	-	-	2,011	2,389	2,389
1951	-	948	-	-	-	-	-	2,780	3,728	3,728
1952	-	225	-	-	-	-	-	1,459	1,684	1,684
1953	-	378	-	-	-	-	-	1,040	1,418	1,418
1954	-	314	-	-	-	-	-	2,101	2,415	2,415
1955	-	740	-	-	-	-	-	1,571	2,311	2,311
1956	-	1,867	-	-	-	-	-	-	-	1,867
1957	-	1,796	-	-	-	-	-	1,500	-	3,296
1958	-	187	-	-	-	-	-	300	-	487
1959	-	426	-	-	-	-	-	-	-	426
1960	24	312	-	-	-	-	-	500	-	812
1961	28	367	-	-	-	-	-	400	-	767
1962	99	337	-	-	-	-	-	1,000	-	1,337
1963	141	466	-	-	-	-	-	-	-	466
1964	115	706	-	-	-	-	-	725	-	1,431
1965	86	442	-	-	-	-	-	1,500	-	1,942
1966	43	411	-	-	-	-	-	800	-	1,211
1967	241	203	-	-	-	-	-	200	-	403
1968	31	312	-	-	-	-	-	700	-	1,012
1969	29	1,089	-	-	-	-	-	2,500	-	3,589

-continued-

Table 13. (Page 2 of 2).

Year	Commercial chinook harvests: Yakutat Bay	Commercial chinook harvests: Situk River Commercial	Commercial chinook harvests: Situk River Subsistence	Recreational: Large	Recreational: Small	Escapement: Large chinook	Escapement: Small chinook	Escapement: Total	Total run size[a]: Large only	Total run size[a]: All chinook
1970	119	927	-	-	-	-	-	1,100	-	2,027
1971	106	473	-	-	-	-	-	964	-	1,437
1972	115	303	-	-	-	-	-	400	-	703
1973	79	752	-	-	-	-	-	510	-	1,262
1974	64	791	-	-	-	-	-	702	-	1,493
1975	41	562	27	-	-	-	-	1,180	-	1,769
1976	69	1,002	41	200	-	1,433	509	1,942	2,676	3,185
1977	53	833	24	244	-	1,732	148	1,880	2,833	2,981
1978	108	382	50	210	-	814	289	1,103	1,456	1,745
1979	51	1,028	25	282	-	1,400	367	1,767	2,735	3,102
1980	164	969	57	353	-	905	220	1,125	2,284	2,504
1981	151	858	62	130	-	702	105	807	1,752	1,857
1982	419	248	27	63	0	434	177	611	772	949
1983	371	349	50	42	10	592	257	849	1,033	1,300
1984	145	512	50	146	5	1,726	475	2,201	2,434	2,914
1985	240	484	81	294	217	1,521	461	1,982	2,380	3,058
1986	211	202	87	0	37	2,067	505	2,572	2,356	2,898
1987	329	891	22	76	319	1,884	494	1,884	2,873	3,192
1988	196	299	81	185	3	885	193	1,078	1,450	1,646
1989	297	1	29	0	0	652	1,217	1,869	682	1,899
1990	304	0[b]	na	0	0	700	631[c]	1,331	923	1,741
1991	392	786	110	88	8	875	716[d]	1,591	1,859	2,583
1992	147	1,504	331[e]	200[f]	na	1,618	367[g]	1,985	3,643	4,010

[a] Total run = chinook escapement + Situk commercial, sport, and subsistence harvests.

[b] Non-retention regulation in effect for commercial fisheries in 1989 and 1990; estimated harvest of 223 large chinook in 1990.

[c] Small chinook includes 486 medium fish (>450mm<660mm MEF).

[d] Small chinook 1991 includes 132 medium fish.

[e] Preliminary count total subsistence catch Situk/Ahrnklin.

[f] Preliminary estimate of recreational harvest.

[g] Small chinook includes 236 medium fish in 1992.

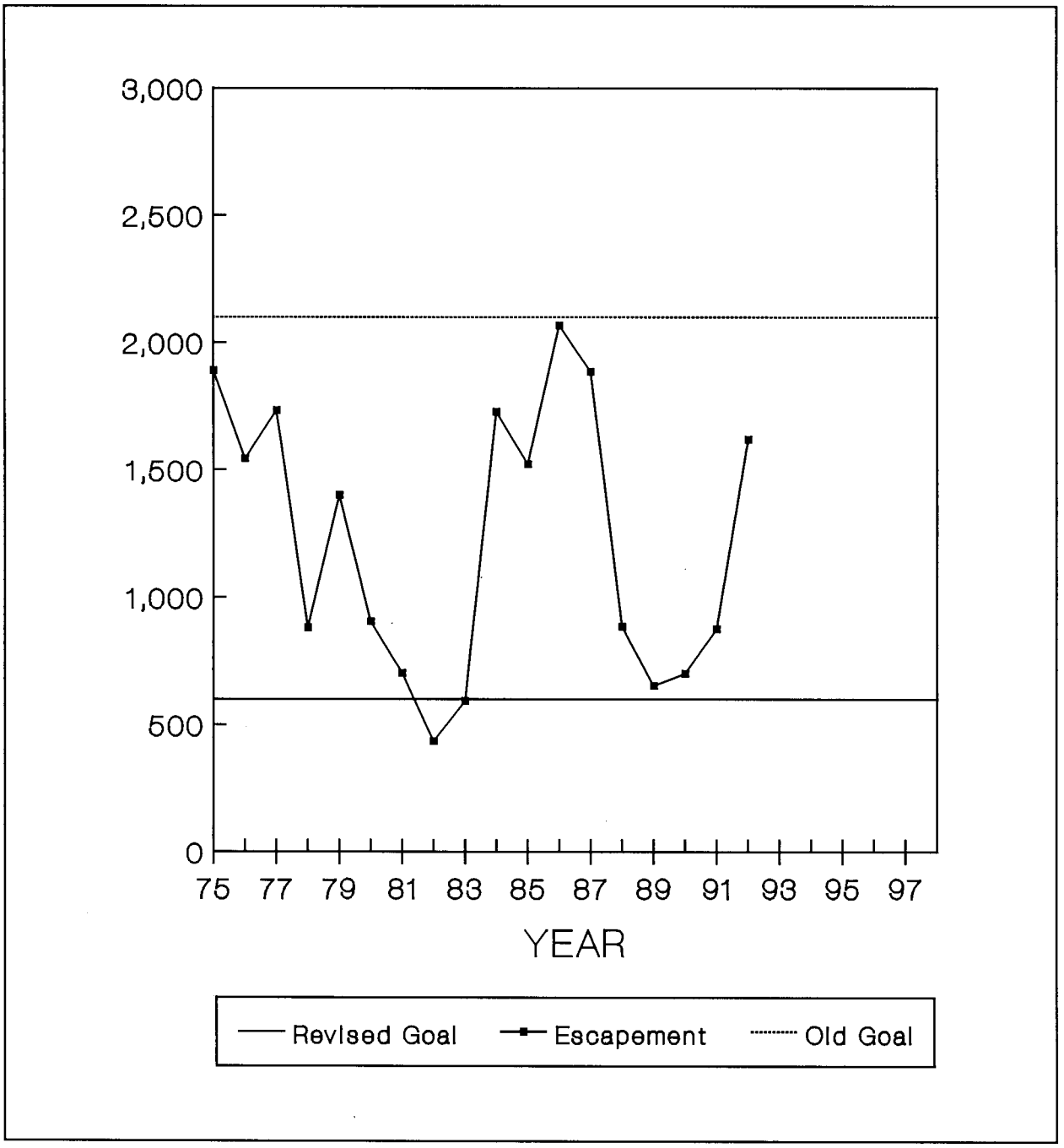

Figure 21. Observed escapements of chinook salmon to the Situk River, 1975-1992. 1981 management escapement goal of 2,100 large chinook salmon was revised in 1991 to 600.

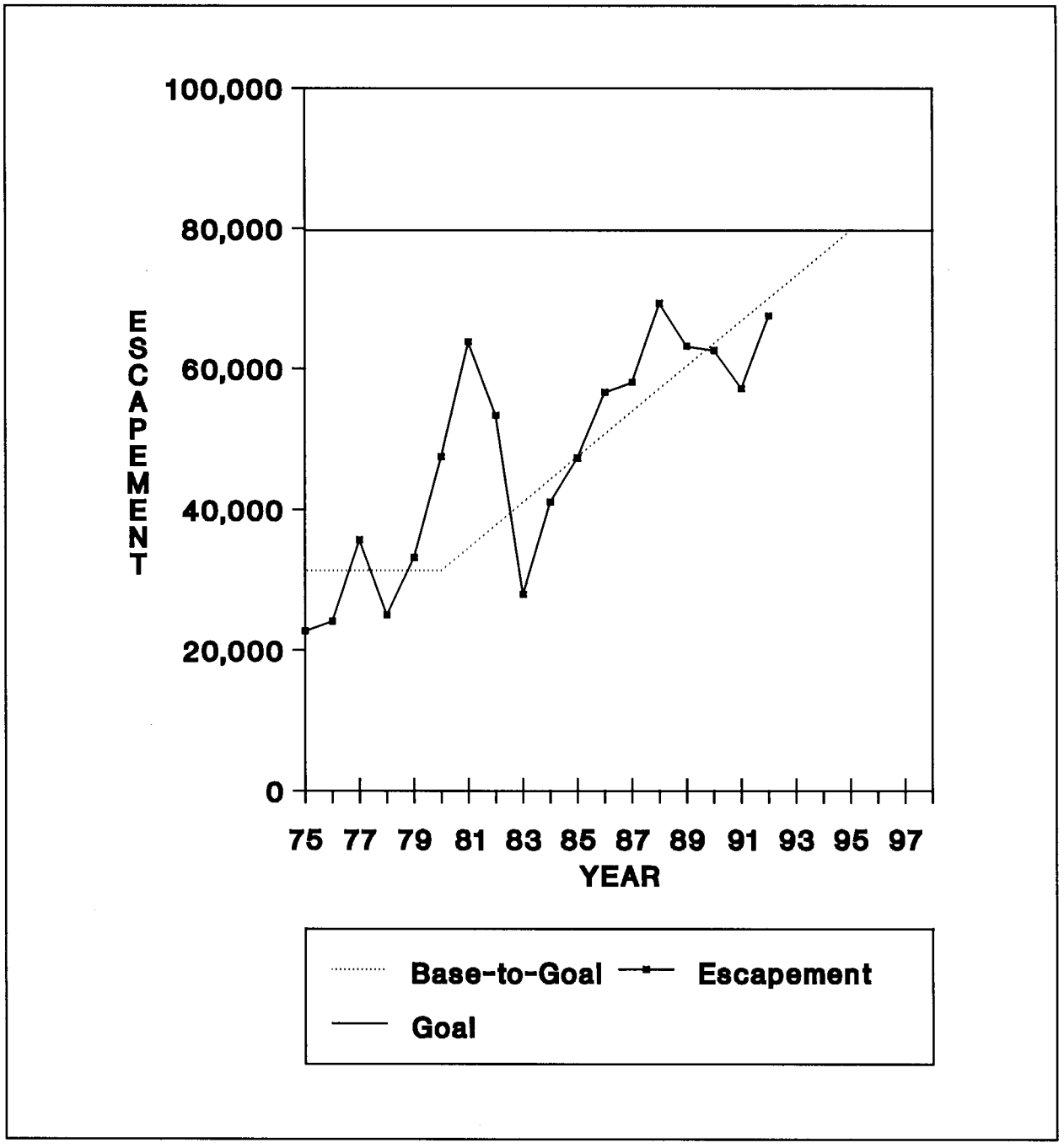

Figure 22. Estimated total escapement of chinook salmon to Southeast Alaska and transboundary river index systems, 1975-1992. Observed counts expanded by survey and tributary expansion factors. Base-to-goal line shows linear rebuilding schedule, starting in 1981 at average escapement level during base period (1975-1980) and ending at management escapement goal of 79,725 large chinook salmon in 1995 (final year of the three-cycle rebuilding program).

The estimated total escapement of chinook salmon for all Southeast Alaska and transboundary rivers increased from 58,087 fish in 1991 to 68,953 fish in 1992. This was the second highest escapement since the start of the program in 1975. The total escapement of chinook salmon in 1992 was 19%, or 10,860 fish, more than in 1991 and 84% of the revised escapement goal of 82,140 chinook salmon. The 1992 escapement represents an increase of approximately 116%, or 37,091 chinook salmon, over the 1975-1980 base period average of 31,859 chinook salmon and an increase of 46%, or 21,800 chinook salmon, over the 1981-1985 average of 47,114 chinook salmon (Appendix A2).

Although total escapements of chinook salmon increased in 1992, decreases were still observed in the Alsek (38%), Chickamin (29%), Blossom (37%), Keta (20%) and King Salmon Rivers (13%). Chinook salmon escapements declined in five of the ten index systems. The largest declines occurred in the Alsek River, where the 1992 escapement of 1,950 chinook salmon was 38% (1,215 fish) below the 1991 escapement of 3,165 fish, and in the Chickamin River, which declined 29% from 779 in 1991 to only 554 in 1992.

Total escapements of chinook salmon in Southeast Alaska have exhibited a strong trend towards rebuilding since 1984 (Figure 22). This is due primarily to the Taku and Stikine rivers. These two rivers make up 70% of the total Southeast Alaska escapement goal and made up 82% of the total 1992 escapement. Two of the index systems (the Alsek and Blossom rivers) have lagged behind the linear rebuilding schedule, and several others have slipped below the schedule in the last two years. Fluctuations in the annual escapement into an index area are expected. Water and weather conditions, pilot or observer experience and/or a change in the actual escapement can all affect the count. Multi-year trends are more significant than a given escapement count, and that is why the PSC concentrates on whether a stock's escapement trend is above or below the linear rebuilding schedule as shown in Figures 11-22.

The observed decline in escapements to the Alsek River was not expected, particularly since harvests of this stock in terminal net and recreational fisheries has been greatly reduced in recent years. Gmelch (1982) hypothesized that increased siltation and subsequent changes in channel morphology in the lower Alsek River estuary in Dry Bay may be contributing to the slow rebuilding progress of this stock. Other possible factors include: (1) the management escapement goals for the Alsek River is higher than it should be to achieve optimum sustained production; (2) Alsek River chinook salmon may be harvested to a greater extent in mixed stock domestic or high seas foreign gill net fisheries than previously believed; or (3) some combination of all of the factors listed above (Mecum and Kissner 1989). Recently initiated coded-wire tagging studies on the Alsek (Mecum 1989) and Situk rivers will provide information on migratory patterns and harvest rates and may provide insight into the primary reasons for the decline of this stock.

Based on spawner-recruit analysis, ADF&G in 1991 revised the management escapement goal for chinook salmon in the Situk River to 600 large fish, with a range of 450 to 900 (ADF&G 1991). This revised goal has been adopted by the PSC and was therefore used for assessment of rebuilding. The Alaska Board of Fisheries, approved a Situk River management plan in 1991 that incorporated the revised escapement goal through the Situk River weir of 600 large chinook salmon.

Chinook salmon escapements to the Unuk, Chickamin, Blossom, and Keta Rivers have declined substantially since 1987. Before 1987, the four stocks had been re-

building and were above the linear rebuilding schedules for each river. The cause of the recent decline in these stocks is unknown. The four rivers make up the major wild stocks of chinook salmon in southern Southeast Alaska. Several large Ketchikan area hatcheries use brood stock from the Unuk and Chickamin Rivers. These hatcheries provide significant returns of adult salmon which rear and migrate in similar areas to wild donor stocks (Mecum and Kissner 1989). Recent analysis of coded-wire tagging data has indicated that the escapement goals to these systems may be unreasonably high (Pahlke *In press*).

In 1991 and 1992, a mark/recapture study on the Chilkat River indicated an escapement of several thousand more chinook salmon than was estimated by the index area surveys (Johnson et al 1992). Many of the spawning areas in the Chilkat system are glacial and can not be surveyed in a standardized manner. The large tributary expansion factor was developed to reflect those uncounted fish, but in 1991 and 1992 it greatly underestimated the escapement. Continued research is required to determine if alternative methods can be developed.

The King Salmon River is unique in being the only island chinook system in Southeast Alaska and it may not be the best system to represent 21 other small mainland chinook systems. However, small systems are expensive to survey for very few fish and comprise a fairly small portion of the total escapement. In 1992, surveys were flown on the Wilson, Grant and Klahini Rivers to check the feasibility of adding some more small systems. Those rivers are all close to existing index areas and could be added without a great increase in flight time or expenses. The other medium and small unsurveyed systems are more difficult to address. Seven are in Yakutat, where no chinook surveys are flown and the others are located between the Taku and the Unuk Rivers. Run timing and fuel limitations make it difficult to "piggyback" any more surveys onto the existing program. Without additional funding it is unlikely that more small systems will be surveyed regularly. It may be more reasonable to expand the small systems by some proportion of the nearest surveyed systems rather than only the King Salmon River. However, almost no information exists for most of the unsurveyed systems and it is impossible to say if their run strength tracks that of other systems in the same geographic area.

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APPENDIX A

Appendix Table A1. Management escapement goals and survey and tributary expansion factors for Southeast Alaska and transboundary rivers. Category escapement goal equals sum of the survey escapement goal times survey and tributary expansion factors times the category expansion factor.

River system	Index tributaries surveyed	Survey escapement goal[a]	Survey expansion factor	Tributary expansion factor	System escapement goal	Category expansion factor	Category escapement goal
			Major Production Systems (Total = 3)				
Alsek	Klukshu	4,700 (W)	1/1	1/.64	7,344		
Taku	4 Tributaries	5,155 (H)	1/0.625	1/.52	15,862		
Taku	Nakina/Nahlin	8,055 (H)	1/.75	1/.52	20,654		
Stikine	Little Tahltan	5,300 (W)	1/1	1/.25	21,200		
Major category subtotal		23,210			65,059	3/3	62,643
			Medium Production Systems (Total = 9)				
Situk	All	600 (W)	1/1	1/1	600		
Chilkat	Big Boulder/Stonehouse	Removed from index system					
Andrew Cr.	All	470 (A)	1/0.625	1/1	752		
Unuk	All	1,800 (A)	1/0.625	1/1	2,880		
Chickamin	All	900 (A)	1/0.625	1/1	1,440		
Blossom	All	800 (A)	1/0.625	1/1	1,280		
Keta	All	500 (A)	1/0.625	1/1	800		
Medium category subtotal		5,070			7,752	9/6	11,628
			Minor Production Systems (Total = 22)				
King Salmon	All	250 (W)	1/1	1/1	250		
Minor category subtotal		250			250	22/1	5,500
All systems total		28,520			70,830		79,770

[a] (W) = weir count; (A) = aerial survey peak escapement estimate. Survey escapement goal = number of fish actually counted on survey, or through weir.

Appendix A2. Estimates of total escapements of chinook salmon to escapement indicator systems and to Southeast Alaska and transboundary (T) rivers, 1975-1992. Index escapements are expanded for survey counting rates and unsurveyed tributaries, using 1993 expansions and escapement goals.

Revised: 7/19/93 USING REVISED TRANSBOUNDARY GOALS AND 1993 NJS TAKU EXPANSIONS

YEAR	MAJOR SYSTEMS				MEDIUM SYSTEMS										MINOR SYSTEMS			TOTAL
	Alsek (T)	Taku (T)[c]	Stikine[a] (T)	Major Subt.	Situk	Chilkat (T)	Andrew[b]	Unuk (T)	Chick-amin(T)	Blos-som	Keta	Behm Subt.	Medium Unsurv.	Medium Subt.	King Salm.	Minor Unsurv.	Minor Subt.	ALL SYSTEMS
1975	4,214	5,854	5,800	15,868	1,510	187	416	1,469	588	234	325	2,616	1,351	6,080	53	1,113	1,166	23,114
1976	1,672	12,729	3,300	17,701	1,433	223	404	1,469	147	109	134	1,859	1,120	5,039	81	1,701	1,782	24,522
1977	4,363	15,259	6,600	26,222	1,732	223	456	1,558	363	179	368	2,468	1,394	6,273	168	3,528	3,696	36,191
1978	4,050	9,168	5,200	18,418	814	214	388	1,770	290	229	627	2,916	1,238	5,570	71	1,491	1,562	25,550
1979	6,101	11,353	9,328	26,782	1,400	214	327	922	224	86	682	1,914	1,101	4,956	89	1,869	1,958	33,696
1980	3,770	20,275	17,096	41,141	905	214	282	1,626	418	142	307	2,493	1,113	5,007	88	1,848	1,936	48,084
Average	4,028	12,440	7,887	24,355	1,299	213	379	1,469	338	163	407	2,378	1,219	5,487	92	1,925	2,017	31,859
1981	2,837	25,856	26,672	55,365	702	1,143	536	1,170	614	254	526	2,564	1,413	6,358	113	2,373	2,486	64,209
1982	3,078	12,810	22,640	38,528	434	799	672	2,162	914	552	1,206	4,834	1,925	8,664	286	6,006	6,292	53,484
1983	3,352	5,621	4,752	13,725	592	1,103	366	1,800	922	942	1,315	4,979	2,011	9,051	245	5,145	5,390	28,166
1984	2,038	10,748	10,352	23,138	1,726	1,487	389	2,939	1,763	813	976	6,491	2,884	12,977	250	5,250	5,500	41,615
1985	1,853	19,580	12,456	33,889	1,521	536	510	1,894	1,530	1,134	998	5,556	2,321	10,444	171	3,591	3,762	48,095
Average	2,632	14,923	15,374	32,929	995	1,014	495	1,993	1,149	739	1,004	4,885	2,111	9,499	213	4,473	4,686	47,114
1986-90 CHANGE FROM 1981-85																		
Number	684	8,517	3,884	13,084	243	(248)	518	434	431	417	210	1,492	573	2,577	(3)	(63)	(66)	15,596
Percent	26%	57%	25%	40%	24%	-24%	105%	22%	38%	56%	21%	31%	27%	27%	-1%	-1%	-1%	33%
Goals	7,300	36,515	21,200	65,015	600[d]	[e]	750	2,880	1,440	1,280	800	6,400	3,875	11,625	250	5,250	5,500	82,140
AVERAGE PERCENT OF GOAL																		
1975-80	55%	34%	37%	37%	217%		51%	51%	23%	13%	51%	37%	31%	47%	37%	37%	37%	39%
1981-85	36%	41%	73%	51%	166%		66%	69%	80%	58%	126%	76%	54%	82%	85%	85%	85%	57%
1986-90	45%	64%	91%	71%	206%		135%	84%	110%	90%	152%	100%	69%	104%	84%	84%	84%	76%

-continued-

Appendix A2. (Page 2 of 2).

YEAR	MAJOR SYSTEMS				MEDIUM SYSTEMS										MINOR SYSTEMS			TOTAL
	Alsek (T)	Taku (T)[c]	Stikine[a] (T)	Major Subt.	Situk	Chilkat (T)	Andrew[b]	Unuk (T)	Chick-amin(T)	Blos-som	Keta	Behm Subt.	Medium Unsurv.	Medium Subt.	King Salm.	Minor Unsurv.	Minor Subt.	ALL SYSTEMS
1986	3,966[f]	20,231	11,564	35,761	2,067	129	1,131	3,402	2,683	2,045	1,104	9,234	3,589	16,150	245	5,145	5,390	57,301
1987	3,598	15,530	19,132	38,260	1,884	1,286	1,261	3,157	1,560	2,158	1,229	8,104	3,581	16,116	193	4,053	4,246	58,622
1988	2,891	23,334	29,168	55,393	885	781	760	2,794	1,258	614	920	5,586	2,289	10,301	206	4,326	4,532	70,226
1989	3,399	25,481	18,860	47,740	652	1,362	848	1,838	1,494	550	1,848	5,730	2,455	11,047	238	4,998	5,236	64,023
1990	2,722	32,622	17,568	52,912	700	272	1,062	946	902	411	970	3,229	1,504	6,767	168	3,528	3,696	63,375
Average	3,315	23,440	19,258	46,013	1,238	766	1,012	2,427	1,579	1,156	1,214	6,377	2,684	12,076	210	4,410	4,620	62,709
1991	3,165	27,318	18,024	48,507	875	826	640	1,221	779	382	435	2,817	1,474	6,632	134	2,814	2,948	58,087
1992	1,950	30,142	26,508	58,600	1,400	-	1,245	1,400	554	240	347	2,541	2,593	7,779	117	2,457	2,574	68,953
1992 CHANGE FROM 1991																		
Number	(1,215)	2,824	8,484	10,093	525	0	605	179	(225)	(142)	(88)	(276)	1,119	1,147	(17)	(357)	(374)	10,866
Percent	-38%	10%	47%	21%	60%		95%	15%	-29%	-37%	-20%	-10%	76%	17%	-13%	-13%	-13%	19%

[a] Prior to Little Tahltan weir in 1985, Stikine estimate is 8 times aerial survey.

[b] Andrew Creek revised to include North Fork counts.

[c] Taku counts expanded for missing tributaries when all six not surveyed.

[d] Situk escapement goal revised downward from 2,100 to 600 in 1991.

[e] Chilkat excluded from medium goals.

[f] Using CTC calculations of Alsek escapement: escapement = (weir count/0.64)-sport (101) and IFF (84) harvest.

Appendix A3. Survey dates for indexing escapements by helicopter (h) or foot (f) during 1992. Dates are selected to encompass the historical dates of peak spawning.

Location	Survey dates	Survey type
TAKU RIVER		
Nakina River	29 July and 5 August	h
Nahlin River	19 and 29 July	h
Dudidontu River	30 July and 5 August	h
Tseta Creek	29 July and 5 August	h
Kowatua River	11 and 21 August	h
Tatsamenie River	21 and 26 August	h
STIKINE RIVER		
Little Tahltan River	30 July and 6 August	h
Tahltan River	6 August	h
Beatty Creek	30 July and 6 August	h
Andrew Creek	12 August	f
ALSEK RIVER		
Klukshu River	1 August	no survey
Blanchard River	1 August	h
Takhanne River	1 August	h
Goat Creek	1 August	h
BLOSSOM RIVER	19, and 28 August	h
KING SALMON RIVER	23 and 27 July	h
CHILKAT RIVER		
Big Boulder Creek	10 and 17 August	h/f
Stonehouse Creek	10 and 17 August	h
KETA RIVER	19, and 28 August	h
MARTIN RIVER	19 August	h
UNUK RIVER		
Cripple Creek	5 and 10 August	f
Eulachon Creek	21 and 28 August	h & f
Genes Lake Creek	21 August	f
Clear Creek	7 and 14 August	h & f
Lake Creek	7 and 14 August	h & f
Kerr Creek	7 and 14 August	h
CHICKAMIN RIVER		
South Fork	7 and 14 August	h
Barrier Creek	7 and 14 August	h
Butler Creek	7 and 14 August	h
Indian Creek	7 and 14 August	h
Humpy Creek	21 and 28 August	h
King Creek	21 and 28 August	h
Leduc Creek	7 and 14 August	h
Clear Falls Creek	7 and 14 August	h

Source: Kissner (1982).

Appendix A4. Detailed chinook salmon escapement surveys as entered into Commercial Fisheries Division Integrated Fisheries Database (IFDB).

Detailed Salmon Escapement Surveys
IFDB-SET-01 on 5/28/93 at 14:43

Number	Stream Name	Date	Type	Dist.	Species	Mouth	Tidal	Live	Dead	Total	Obs.	Visib.		Water	Tide	Remarks
101-30-030	Keta River	08/19/92	H	L	Chinook	0	0	217	0	217	KAP					
101-30-030	Keta River	08/25/92	H	L	Chinook	0	0	137	0	137	KAP					
101-30-030	Keta River	08/28/92	H	L	Chinook	0	0	166	0	166	KAP	P				
101-30-060	Marten River	08/19/92	H	L	Chinook	0	0	58	0	58	KAP					
101-30-060	Marten River	08/28/92	H	L	Chinook	0	0	76	0	76	SW					
101-45-078	Carroll Creek	07/23/92	F	L	Chinook	0	0	25	0	25	SW	E	L	L		
101-45-078	Carroll Creek	07/30/92	F	L	Chinook	0	0	58	0	58	SW	E	H	H		
101-45-078	Carroll Creek	08/20/92	F	L	Chinook	0	10	220	17	247	SW	E	L	L		
101-45-081	Falls Creek	08/01/92	A	I	Chinook	0	30	0	0	30	PD	E	L	I		
101-47-025	Ketchikan Creek	08/27/92	F	L	Chinook	0	0	6	10	16	MW	N	N	I		
101-55-020	Wilson River	08/19/92	H	L	Chinook	0	0	109	0	109	KAP				MANY PINKS	
101-55-040	Blossom River	08/19/92	H	L	Chinook	0	0	150	0	150	KAP					
101-55-040	Blossom River	08/25/92	H	L	Chinook	0	0	100	7	107	KAP					
101-71-04A	Barrier Creek	08/07/92	H	L	Chinook	0	0	2	0	2	KAP	N				
101-71-04A	Barrier Creek	08/14/92	H	L	Chinook	0	0	4	0	4	KAP	E				
101-71-04A	Barrier Creek	08/17/92	H	L	Chinook	0	0	2	0	2	KAP	E				
101-71-04B	Butler Creek	08/07/92	H	L	Chinook	0	0	68	0	68	KAP	E				
101-71-04B	Butler Creek	08/14/92	H	L	Chinook	0	0	56	0	56	KAP	E				
101-71-04B	Butler Creek	08/17/92	H	L	Chinook	0	0	57	0	57	KAP	E				
101-71-04C	Clear Creek	08/07/92	H	L	Chinook	0	0	24	0	24	KAP	E				
101-71-04C	Clear Creek	08/14/92	H	L	Chinook	0	0	24	0	24	KAP	E				
101-71-04C	Clear Creek	08/17/92	H	L	Chinook	0	0	11	0	11	KAP					
101-71-04H	Humpy Creek	08/19/92	H	L	Chinook	0	0	6	0	6	KAP	E				
101-71-04H	Humpy Creek	08/25/92	H	L	Chinook	0	0	8	0	8	KAP					
101-71-04I	Indian Creek	08/07/92	H	L	Chinook	0	0	20	0	20	KAP					
101-71-04I	Indian Creek	08/14/92	H	L	Chinook	0	0	2	3	5	KAP					
101-71-04I	Indian Creek	08/17/92	H	L	Chinook	0	0	4	3	7	KAP					
101-71-04K	King Creek	08/17/92	H	L	Chinook	0	0	83	0	83	KAP				schooled up	
101-71-04K	King Creek	08/19/92	H	L	Chinook	0	0	100	0	100	KAP	E				
101-71-04K	King Creek	08/25/92	H	L	Chinook	0	0	131	0	131	KAP					
101-71-04L	Leduc River	08/07/92	H	L	Chinook	0	0	3	0	3	KAP					
101-71-04L	Leduc River	08/14/92	H	L	Chinook	0	0	4	0	4	KAP					
101-71-04L	Leduc River	08/17/92	H	L	Chinook	0	0	0	0	0	KAP					
101-71-04S	South Fork Chickamin	08/07/92	H	L	Chinook	0	0	15	0	15	KAP	P				
101-71-04S	South Fork Chickamin	08/14/92	H	L	Chinook	0	0	72	0	72	KAP	E	L			
101-71-04S	South Fork Chickamin	08/17/92	H	L	Chinook	0	0	83	4	87	KAP	E	L			
101-75-010	Grant Creek	08/14/92	H	L	Chinook	0	0	25	0	25	KAP					
101-75-010	Grant Creek	08/19/92	H	L	Chinook	0	0	17	0	17	KAP		L			

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Number	Stream Name	Date	Type	Dist.	Species	Mouth	Tidal	Live	Dead	Total	Obs.	Visib.	Water	Tide	Remarks
101-75-015	Eulachon River	08/14/92	H	L	Chinook	0	0	15	0	15	KAP				
101-75-015	Eulachon River	08/17/92	H	L	Chinook	0	0	12	0	12	KAP				
101-75-015	Eulachon River	08/25/92	H	L	Chinook	0	0	55	0	55	KAP	E			10 above fork
101-75-015	Eulachon River	08/26/92	F	L	Chinook	0	0	57	0	57	DLM	E			11 above fork
101-75-015	Eulachon River	09/02/92	H	L	Chinook	0	0	34	0	34	KAP				observed cohos
101-75-03B	Boundary Cr.- Unuk R	08/06/92	H	L	Chinook	0	0	38	0	38	KAP				
101-75-03B	Boundary Cr.- Unuk R	08/09/92	F	L	Chinook	0	0	123	0	123	DLM				
101-75-050	Klahini River	08/06/92	H	L	Chinook	0	0	4	6	10	KAP				
101-75-050	Klahini River	08/17/92	H	L	Chinook	0	0	19	0	19	KAP				
101-75-30C	Clear Creek-Unuk R	08/06/92	H	L	Chinook	0	0	28	0	28	KAP				
101-75-30C	Clear Creek-Unuk R	08/14/92	H	L	Chinook	0	0	31	0	31	KAP				
101-75-30C	Clear Creek-Unuk R	08/17/92	H	L	Chinook	0	0	26	0	26	KAP				
101-75-30C	Clear Creek-Unuk R	08/18/92	F	L	Chinook	0	0	69	0	69	KAP				
101-75-30G	Genes Lake CreekUnuk	08/14/92	F	L	Chinook	0	0	360	0	360	DLM				
101-75-30K	Kerr Creek-Unuk R	08/14/92	H	L	Chinook	0	0	30	0	30	KAP				
101-75-30K	Kerr Creek-Unuk R	08/19/92	H	L	Chinook	0	0	5	1	6	KAP	P			
101-75-30L	Lake Creek-Unuk R	08/14/92	H	L	Chinook	0	0	31	0	31	KAP	N			
101-75-30L	Lake Creek-Unuk R	08/17/92	H	L	Chinook	0	0	20	0	20	KAP	P			past peak
101-75-30Q	Cripple Ck-Unuk R	08/18/92	W	L	Chinook	0	0	403	0	403	KAP				67 above weir, large only
101-80-070	Hatchery Ck-Yes Bay	08/21/92	F	L	Chinook	0	0	9	0	9	TZ	E	L		hatchery creek
101-80-070	Hatchery Ck-Yes Bay	08/31/92	F	L	Chinook	0	0	4	6	10	TZ	E	L		
101-90-039	Marguerite Creek	11/24/92	W	.75	Chinook	0	0	1	0	1	TZ				Marguerite Fish Pass
106-44-031	Crystal Creek	06/23/92	A	I	Chinook	0	0	0	0	0	WB	N	L	I	15 H TROLLERS
106-44-031	Crystal Creek	06/29/92	A	L	Chinook	3	30	0	0	33	WB	E	N	L	30 H TROLLERS & SPORT FISHER
107-40-005	Crittenden Creek	08/28/92	F	L	Chinook	0	0	4	0	4	RT	N	N	H	
107-40-006	E of Crittenden Ck	08/28/92	F	L	Chinook	0	0	0	1	1	RT	N	N	H	
107-40-022	Berg Creek	08/04/92	A	L	Chinook	0	0	5	0	5	WB	P	N	L	
107-40-024	Aaron Creek	08/04/92	A	L	Chinook	0	0	30	0	30	WB	P	N	L	11 ABV GLACIAL TRIB.
107-40-049	Harding River	08/04/92	A	L	Chinook	0	0	48	0	48	WB	P	N	L	SLIGHLTY GLACIAL
107-40-049	Harding River	08/18/92	A	L	Chinook	0	0	18	0	18	WB	P	L	L	
107-40-049	Harding River	08/23/92	F	L	Chinook	0	0	46	0	46	BGZ				INC 43 HANDLED FOR BROODSTK
107-40-052	Bradfield River N Fk	07/31/92	A	L	Chinook	0	0	6	0	6	BL	P	N	H	
107-40-055	Eagle R Bradfield	08/04/92	A	L	Chinook	0	0	12	0	12	WB	N	L	L	TO MANY PINKS/ GOOD COUNT
107-40-078	Earl West Creek	08/24/92	F	.5	Chinook	0	11	86	40	137	RT	N	N	L	MOST FISH IN LOWER SECTION
107-40-082	Channel Island Creek	08/14/92	F	1.5	Chinook	0	0	1	0	1	RT	N	L	I	FROM THE BRIDGE DOWN
108-40-010	North Arm Creek	08/04/92	A	L	Chinook	0	0	9	0	9	WB	N	N		TOO MANY PINKS TO SEE KINGS
108-40-010	North Arm Creek	08/10/92	F	L	Chinook	0	0	30	10	40	RT	E	L		
108-40-016	Kikahe River	08/04/92	A	L	Chinook	0	0	7	0	7	WB	N	N		
108-40-017	Goat Ck Stikine R	07/31/92	A	.5	Chinook	0	0	5	0	5	BL	E	N		
108-40-020	Andrews Creek	07/31/92	A	L	Chinook	0	0	90	0	90	BL	E	L		H2O VERY LOW
108-40-020	Andrews Creek	08/04/92	A	L	Chinook	380	0	370	0	750	WB	N	L		SCHOOLED, 370 ABV FORKS

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Number	Stream Name	Date	Type	Dist.	Species	Mouth	Tidal	Live	Dead	Total	Obs.	Visib.	Water	Tide	Remarks
108-40-020	Andrews Creek	08/10/92	A	L	Chinook	270	0	380	20	670	WB	N	L		POORER VIS THAN PREV SURVEY
108-40-020	Andrews Creek	08/10/92	F	L	Chinook	0	0	648	25	673	BL	E	L		INC.10 JKS,96 LV, 1 D N.FK
108-40-020	Andrews Creek	08/12/92	H	L	Chinook	0	0	753	25	778	KAP	E	L		217 in slu and N. Fork
108-40-040	Blind Slough Sumner	08/28/92	F	L	Chinook	0	0	112	40	152	TR	N	N	I	BRIDGE TO FALLS - 1 MI.
108-40-050	Ohmer Creek	08/24/92	F	1.0	Chinook	0	0	225	47	272	JE	N	N	H	STARTED FROM CAMPGROUND
108-40-13A	W of Hot Springs	08/04/92	A	L	Chinook	0	0	31	0	31	WB	N	N		
108-80-100	Tahltan River	07/30/92	H	L	Chinook	0	0	1891	0	1891	KAP	N	N		
108-80-115	Beatty Ck Tahltan R	07/30/92	H	L	Chinook	0	0	362	0	362	KAP				
108-80-115	Beatty Ck Tahltan R	08/05/92	H	L	Chinook	0	0	152	70	222	KAP	E	L		past peak
108-80-120	Little Talhtan River	07/30/92	H	L	Chinook	0	0	3607	0	3607	KAP	E	L		188 below weir
108-80-120	Little Talhtan River	08/05/92	H	L	Chinook	0	0	2034	0	2034	KAP	N			
108-80-120	Little Talhtan River	08/30/92	W	L	Chinook	0	0	6627	0	6627	CAN				Canadian Weir
108-80-120	Little Talhtan River	08/30/92	W	L	Chinook	0	0	131	0	131	CAN				jacks weir
110-14-007	Farragut River	07/30/92	A	L	Chinook	0	0	0	0	0	WB	P	H	L	FLOODING, EGG TAKE OCCURING
110-14-007	Farragut River	08/03/92	A	L	Chinook	0	0	0	0	0	WB	P	H	L	
110-14-007	Farragut River	08/24/92	F	L	Chinook	0	0	95	0	95	BGZ	P			TOTAL NO. HANDLED IN EGGTAKE
110-32-009	Chuck R Windham Bay	07/23/92	A	L	Chinook	0	0	15	0	15	WB	N	L	I	
110-32-009	Chuck R Windham Bay	07/30/92	A	L	Chinook	0	0	6	0	6	WB	P	H	I	
111-17-010	King Salmon River	07/23/92	H	L	Chinook	0	0	38	0	38	KAP	N	L		19 below weir, 19 above
111-17-010	King Salmon River	07/23/92	F	L	Chinook	0	0	30	0	30	KAP				ABOVE WEIR
111-17-010	King Salmon River	07/31/92	H	L	Chinook	0	0	58	0	58	KAP				many chum
111-32-220	Nakina River	07/29/92	H	L	Chinook	0	0	1840	0	1840	KAP	P	H		IA1
111-32-220	Nakina River	07/29/92	H	L	Chinook	0	0	410	0	410	KAP	P	H		IA2
111-32-220	Nakina River	07/29/92	H	L	Chinook	0	0	1140	0	1140	KAP	P	H		IA3
111-32-220	Nakina River	08/05/92	H	L	Chinook	0	0	1840	0	1840	KAP	N	N		IA1
111-32-220	Nakina River	08/05/92	H	L	Chinook	0	0	580	0	580	KAP	N	N		IA2
111-32-220	Nakina River	08/05/92	H	L	Chinook	0	0	1840	0	1840	KAP				IA3
111-32-220	Nakina River	08/05/92	H	L	Chinook	0	0	1490	0	1490	KAP				IA4
111-32-240	Kowatua Creek	08/12/92	H	L	Chinook	0	0	630	0	630	KAP	E	L		
111-32-240	Kowatua Creek	08/21/92	H	L	Chinook	0	0	782	0	782	KAP	N	N		most whitetails
111-32-255	Tatsamenie River	08/21/92	H	L	Chinook	0	0	1390	0	1390	KAP				420 above weir
111-32-255	Tatsamenie River	08/26/92	H	L	Chinook	0	0	1624	0	1624	KAP				604 above weir
111-32-270	Nahlin River	07/22/92	H	L	Chinook	0	0	579	0	579	KAP	E	L		IA1
111-32-270	Nahlin River	07/22/92	H	L	Chinook	0	0	1218	10	1228	KAP	E	L		IA3, many sockeye
111-32-270	Nahlin River	07/22/92	H	L	Chinook	0	0	483	0	483	KAP				MANY SOCKEYE, IA2
111-32-270	Nahlin River	07/29/92	H	L	Chinook	0	0	394	0	394	KAP	E			IA1
111-32-270	Nahlin River	07/29/92	H	L	Chinook	0	0	371	10	381	KAP	N			IA2
111-32-270	Nahlin River	07/29/92	H	L	Chinook	0	0	785	261	1046	KAP	N			IA3
111-32-275	Tseta Creek	07/29/92	H	L	Chinook	0	0	313	0	313	KAP	N	H		
111-32-275	Tseta Creek	08/05/92	H	L	Chinook	0	0	266	0	266	KAP				
111-32-280	Dudidontu River	07/30/92	H	L	Chinook	0	0	768	0	768	KAP	N			
111-32-280	Dudidontu River	08/05/92	H	L	Chinook	0	0	649	100	749	KAP				

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Number	Stream Name	Date	Type	Dist.	Species	Mouth	Tidal	Live	Dead	Total	Obs.	Visib.	Water	Tide	Remarks
111-50-069	Fish Creek-Douglas I	08/04/92	F	1.5	Chinook	0	0	5	0	5	W.L	N			
111-50-069	Fish Creek-Douglas I	08/11/92	F	1.5	Chinook	0	52	7	0	59	NB				52 in intertidal pond
111-50-069	Fish Creek-Douglas I	08/26/92	F	1.0	Chinook	0	4	82	31	117	MP				includes 14 live Jacks,
112-42-008	Indian River-Tenakee	08/27/92	F	.5	Chinook	0	1	5	0	6	KC				
113-41-043	REDOUBT LK OUTLET	09/03/92	W	L	Chinook	0	0	1	0	1	BC				
115-32-054	BIG BOULDER CREEK	08/06/92	H	L	Chinook	0	0	0	0	0	RE				
115-32-054	BIG BOULDER CREEK	08/13/92	H	L	Chinook	0	0	16	0	16	RE				
115-32-054	BIG BOULDER CREEK	08/20/92	H	L	Chinook	0	0	14	0	14	RJ				20 KILLED FOR EGG TAKE
115-32-301	STONEHOUSE CREEK	08/06/92	H	L	Chinook	0	0	25	0	25	RE				
115-32-301	STONEHOUSE CREEK	08/13/92	H	L	Chinook	0	0	35	0	35	RE				
115-32-301	STONEHOUSE CREEK	08/20/92	H	L	Chinook	0	0	39	0	39	RJ				
182-30-020	KLUCKSHU RIVER (CAN)	08/04/92	H	L	Chinook	0	0	261	0	261	KAP	P			windy
182-30-043	TAKHANNI RIVER (CAN)	08/04/92	H	L	Chinook	0	0	77	0	77	KAP				
182-30-045	GOAT CREEK	08/04/92	H	L	Chinook	0	0	16	0	16	KAP				
182-30-051	BLANCHARD LAKE (CAN)	08/04/92	H	L	Chinook	0	0	86	0	86	KAP				9 ABOVE BRIDGE
182-50-010	ITALIO RIVER	06/09/92	A	2M	Chinook	0	1	0	0	1	GW	E	L	I	
182-50-010	ITALIO RIVER	07/23/92	B	L	Chinook	0	0	3	0	3	VG	N	N		USFS float trip
182-70-010	SITUK RIVER	06/24/92	B	1M	Chinook	0	0	24	0	24	KW	N	H	I	Below weir
182-70-010	SITUK RIVER	06/29/92	A	1.0	Chinook	0	35	0	0	35	GW	E	L	H	below weir
182-70-010	SITUK RIVER	06/30/92	B	1M	Chinook	0	68	0	0	68	GS	E	L	I	weir to landing
182-70-010	SITUK RIVER	07/02/92	B	1M	Chinook	0	61	0	0	61	GS	E	L	I	weir to landing
182-70-010	SITUK RIVER	07/05/92	B	1M	Chinook	0	110	0	0	110	KW	N	N	H	weir to landing
182-70-010	SITUK RIVER	07/08/92	B	1.5	Chinook	0	30	0	0	30	MT	P	L	L	weir to landing
182-70-010	SITUK RIVER	07/09/92	B	1.5	Chinook	0	40	0	0	40	MT	N	L	H	weir to landing
182-70-010	SITUK RIVER	07/19/92	B	14M	Chinook	0	0	900	0	900	KW	N	N		9Mile to weir
182-70-010	SITUK RIVER	07/19/92	B	1.5	Chinook	0	25	0	0	25	KW	N	N		weir to landing
182-70-010	SITUK RIVER	08/11/92	B	10M	Chinook	0	0	900	0	900	BK	N	H		

Restrictions selected:
year = 1992 and species_code in ('410','411')