SUMMARY OF THE KITIMAT RIVER ANADROMOUS CUTTHROAT STOCKING PROGRAM, 1985 to 1990

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1. INTRODUCTION

The Kitimat River, located on the north coast of B.C. near the community of Kitimat (Fig. 1), supports one of the province's most popular sport fisheries for anadromous salmonids. In recent years, fish production on the Kitimat has been augmented by a Department of Fisheries and Oceans (D.F.O.) hatchery situated near the mouth of the river. Hatchery operations have focused on chinook and coho as well as steelhead, cutthroat trout and chum salmon. Improved returns of anadromous sport fish to the Kitimat resulting from hatchery production have been accompanied by dramatic increases in angling effort (Loggia, 1989).

The following report provides a review of anadromous cutthroat stocking on the Kitimat system. The purpose of the report is to outline the program's methods and results, and to identify opportunities for improvement.

2. HISTORY

2.1 Objectives

Cutthroat stocking on the Kitimat River was initiated on an experimental scale in the spring of 1985. The program was developed in response to Recreational Fisheries Branch concerns regarding increased competition between wild cutthroat juveniles and stocked hatchery coho. A program target was set at 12,000 cutthroat smolts

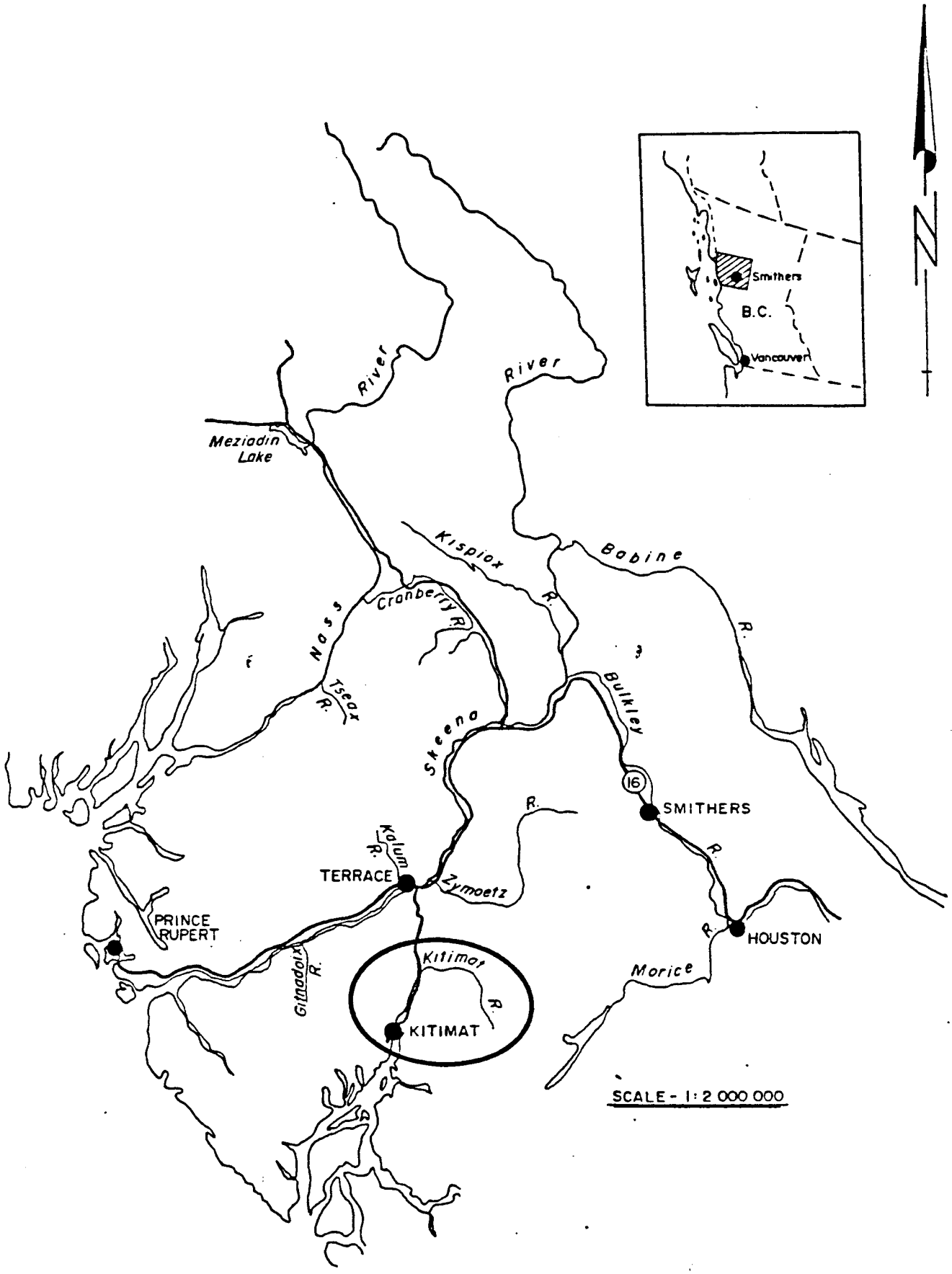

Figure I. Location of the Kitimat River System.

2.2 Brood Stock Collection and Holding

To date, cutthroat brood stock has been collected by angling in the mainstem of the Kitimat River. Most angling has been conducted on one day drift trips, employing a small inflatable boat. Depending on river conditions, any one of three separate drifts may be completed on each day of collection: first washout to Crown Z, Crown Z to Cable Car, or Cable Car to Kitimat Hatchery (Fig. 2). Fish were transported on the river in a small aluminum pen towed by the boat and, at the end of the drift, moved to an oxygenated transport tank and trucked to the Kitimat Hatchery.

During the first two years of the program, brood stock collection started in March or April. Inconsistent success at this time of year prompted a change in 1987 such that collection began in late November or early December. If the target was not reached during these months, collection continued incidentally during steelhead brood stock collection the following spring. The target of 14 females was reached only in 1987, 1988 and 1990 (Table 1).

Typically collection of adult cutthroat brood stock required four to six man days per year. Due to poor river conditions in 1989/90, the annual effort required to reach the target increased to 14 man days.

Adult cutthroat were held in atkin cells at the hatchery until ripe.

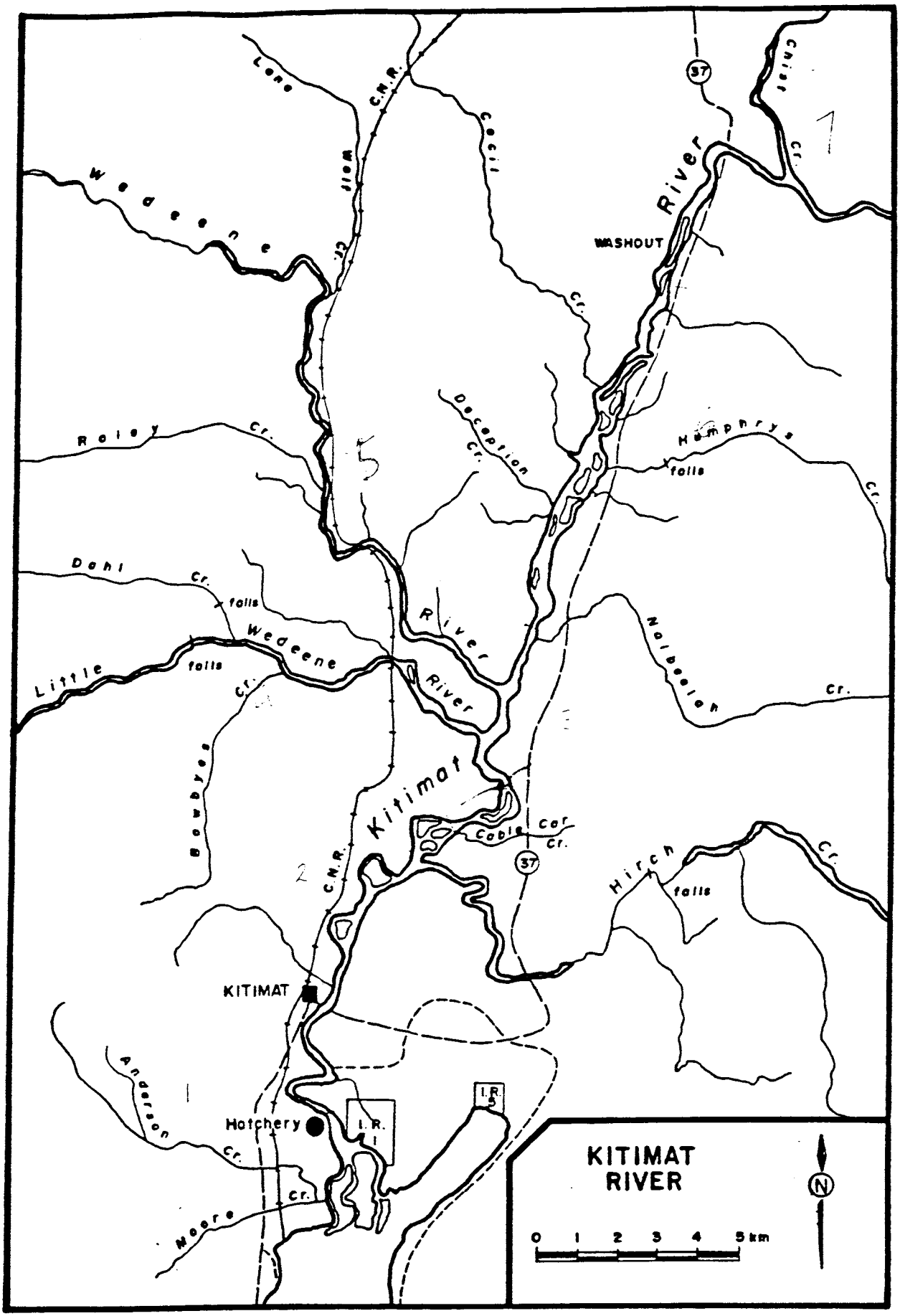

Figure 2. Tributaries of the Kitimat River.

Table 1. Summary of cutthroat brood stock collection, 1985-90.

Collection Date dd/mm/vy	Brood Year	Brood stock Male	Brood stock Female	Wild Sub Adults Released
11/12/89	1990	6	9	16
12/12/89		5	5	60
Total		11	14	76
08/12/88	1989	1	1	
09/12/88		1	3	
30/03/89		1	1	
06/04/89		2		
07/04/89		1		
Total		6	5	
01/12/87	1988	2	3	2
02/12/87		3	10	6
03/12/87		6	2	12
07/04/88				2
08/04/88				1
Total		11	15	23
19/11/86	1987	3	3	
09/12/86		2	5	
10/12/86		5	7	
Total		10	15	7
06/03/86	1986	1	1	
07/03/86		1	1	
12/03/86		2		
14/03/86		2		
Total		6	2	
05/03/85	1985	1		
06/03/85			2	
07/03/85		1	5	
Total		2	7	

Most fish are spawned between late February and mid April. Occasionally, a small proportion of the adult brood stock die each year during holding (up to 20% in 1985). Most of these mortalities have occurred immediately after sorting. In addition, some fish do not mature at the hatchery and are released unspawned. These fish were probably collected as juveniles and would not have matured until the following year.

2.3 Liberations

Smolts are released in early May, just prior to the spring freshet after approximately 13 months of incubation/rearing. From 1986 to 1988, all cutthroat were released at various sites in the Wedeene River system, but in 1989 they were released in four tributary creeks and two mainstem sites in the lower Kitimat River (Table 2, Fig. 2). Brood release has taken a maximum of one man day per year and has usually been done in conjunction with the steelhead smolt releases. One man day was saved in 1989 as Kitimat Hatchery staff completed the liberation.

2.4 Assessment of Adult Returns

The first adult hatchery cutthroat were expected to contribute to sport catches in 1988. In fact, the fall of 1988 did bring the first reports of such fish being caught. Although many reports were hearsay, two were well documented.

During November, 1988, Gordon Fossil (Kitimat Hatchery staff) reported catching four hatchery fish in one day of angling at the Cable Car river access point (Fig. 2). Scale readings on two of these fish revealed they were progeny of the initial 1985 brood stock. During brood stock collection by the Recreational Fisheries Branch in December, 1988, two of thirteen (15%) cutthroat caught were of hatchery origin. Both marked fish were caught in the mainstem Kitimat near Cecil Creek (Fig. 2).

More recently, Angelo Loggia (D.F.O., Kitimat) has observed many

Table 2. Dates and locations of cutthroat smolt liberations, in the Kitimat River system, 1986 — 89.

Release Date dd/mm/yy		Number Released	Release Location	Size at Release (g)
12/05/86		536	Raley Cr.	
		536	11. Mi. Cr.	
		536	Big Wedeene M.S.	
		536	Lower Lone Wolf Cr.	
		536	Lone Wolf Cr.	
	Total	**2,680**		37.8
12/05/87		232	Raley Cr. Mouth	
		232	Big Wedeene M.S.	
		232	Lower Lone Wolf Cr.	
	Total	**716**		37.2
10/05/88		2,185	Lone Wolf Cr.	
		2,185	Big Wedeene Bridge	
		2,185	Raley Cr. Mouth	
		2,185	Big Wedeene M.S.	
	Total	**8,740**		67.4
03/05/89		1,000	Duck Cr.	
		1,000	Goose Cr.	
		1,000	Hirsch Cr.	
		1,500	Crown "Z"	
		1,500	Humphries Cr.	
		872	Hatchery Outfall	
	Total	**6,872**		52.0
Total 86—89		**19,008**		

anglers targeting specifically on cutthroat. During 1989, almost every trout angler he spoke to from Cable Car to Cecil Creek had caught at least one hatchery cutthroat. Dieter Abrahms (Kitimat Hatchery staff) estimated from conversations with acquaintances that the hatchery : wild ratio of cutthroat caught in the mainstem Kitimat was 1:5 (0.2) in 1988 and 1989. Conversations with Mr. F. Winshey (Kitimat Sport Fish Advisory Committee) revealed apparent high concentrations of hatchery cutthroat in Goose Creek (Fig. 2). Four days of angling between December 24, 1989 and January 7, 1990

produced 48 cutthroat; 24 hatchery and 24 wild. The largest of the hatchery fish was a male weighing 1.6 kg. Mr. Winshey also reported catching a 2.4 kg wild cutthroat.

Direct observations of cutthroat during broodstock collection in 1989 indicated lower proportions of hatchery fish than the preceding reports would suggest. Two days of brood stock collection in December, 1989 produced 15 hatchery cutthroat of a total catch of 117, indicating a hatchery : wild ratio of 1:8 (13%)

Since 1986, D.F.O. has undertaken cursory angling surveys to estimate angling effort and catches of salmonids on the Kitimat River (Loggia, 1989). In 1986, an estimated 242 cutthroat were killed and 259 were released on the Kitimat. Estimated catch increased substantially in 1988, when an estimated 863 cutthroat were killed and 1470 were released. Approximately 65% of the total cutthroat catch occurred between Cable Car Creek and Cecil Creek (Loggia,1988). Unfortunately, no mention was made of a hatchery to wild ratio in this report. However, if the estimated hatchery to wild ratio of 2:13 observed during 1988 brood stock collection is applied to 1988 catch estimates, then 389 of 2333 cutthroat caught in the Kitimat River in 1988 were of hatchery origin. These hatchery fish represent some of the survivors of the 3400 fish released in 1986 and 1987.

Survival percentages cannot be determined as the ages of the catch are not known. However, considering the small number of juveniles released, smolt to adult survivals appear to be excellent. This could be attributed to three main factors: limited harvests, large smolt sizes, and the vast supply of food available throughout the year as a result of hatchery production.

3. RECOMMENDATIONS

3.1 Brood Stock Collection

Brood stock collection is clearly the most time consuming part of the Kitimat cutthroat stocking program for the Recreational Fisheries Branch. Past difficulties in reaching brood stock targets occurred as a result of extremely high water conditions or the absence of fish in the mainstem. Collection of brood stock might be better facilitated by angling in early October since river conditions are usually favourable at that time of year and the cutthroat are reportedly abundant. Dave McNeil (Manager, Kitimat Hatchery) feels confident, if handling is kept to a minimum, the adults would hold well until the following spring.

An increase in the number of adults taken during brood stock collection should also be considered. This would assist in offsetting losses incurred by adult or juvenile mortalities. Smolt release targets would therefore be easier to attain.

A few possibilities exist for other groups to collect brood stock for the program. These include collection by Kitimat Hatchery staff, public groups, by private contract or some combination of the aforementioned. However, after careful consideration it is apparent that the greatest benefit for the least amount of effort would come from continued collection by the Recreational Fisheries Branch Staff.

3.2 Liberations

The release of cutthroat smolts has required little or no Fisheries Branch staff time to date. Past releases in the Big Wedeene system seem to be successful, as catches of hatchery fish show that they are utilizing the most heavily fished portion of the Kitimat River (Cable Car Creek to Cecil Creek). The change in release sites in 1989 may reveal catches of hatchery cutthroat in new areas of the Kitimat system; proper assessment will tell. However, assuming the Wedeene River release points continue to be accessible by tank truck, assessments to date suggest releases in this tributary should be continued.

3.3 Assessment

Assessment of the Kitimat cutthroat stocking program has in the past been incidental during brood stock collection or in the form of hearsay. More accurate assessment could be facilitated by initiating one or a combination of the following recommended options:

i) differentially mark each year's brood to determine quickly and accurately the age of captured hatchery fish;

ii) in conjunction with an October brood stock collection, set up an intensive, short term, creel survey;

iii) request D.F.O. Officers to collect data on both wild and hatchery cutthroat during their annual Kitimat River creel survey;

iv) issue log books to interested Kitimat cutthroat anglers. Although similar attempts to conduct this for the Kitimat steelhead program resulted in minimal log returns, a more persistent, organized approach would likely fair better;

4. CONCLUSION

The first five years of anadromous cutthroat stocking on the Kitimat River have essentially been experimental. The first real chance to assess this work was in the spring of 1988. Although little formal assessment has been undertaken since then, cursory evidence suggests the program has successfully augmented wild stocks in heavily fished areas on the Kitimat River mainstem. However, the program could be improved by refining brood stock collection and assessment methods.

With hatchery returns generating good angling opportunities for sea run cutthroat close to Kitimat and Terrace, the possibility of wild stock overharvesting exists. The fishery should therefore be closely monitored to detect changes in the marked:unmarked ratio that might reflect a threat to the wild stock. Over the long term, a need for more conservative harvest quotas on wild stocks should be expected.

REFERENCES

Loggia, A. 1989. Kitimat Sub-District 1989 Annual Sport Fish Report. Department of Fisheries and Oceans, Kitimat.

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