ANNUAL REPORT FOR TOBOGGAN CREEK HATCHERY OPERATIONS IN 2009/2010

Prepared for : **Fisheries and Oceans Canada**

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Introduction

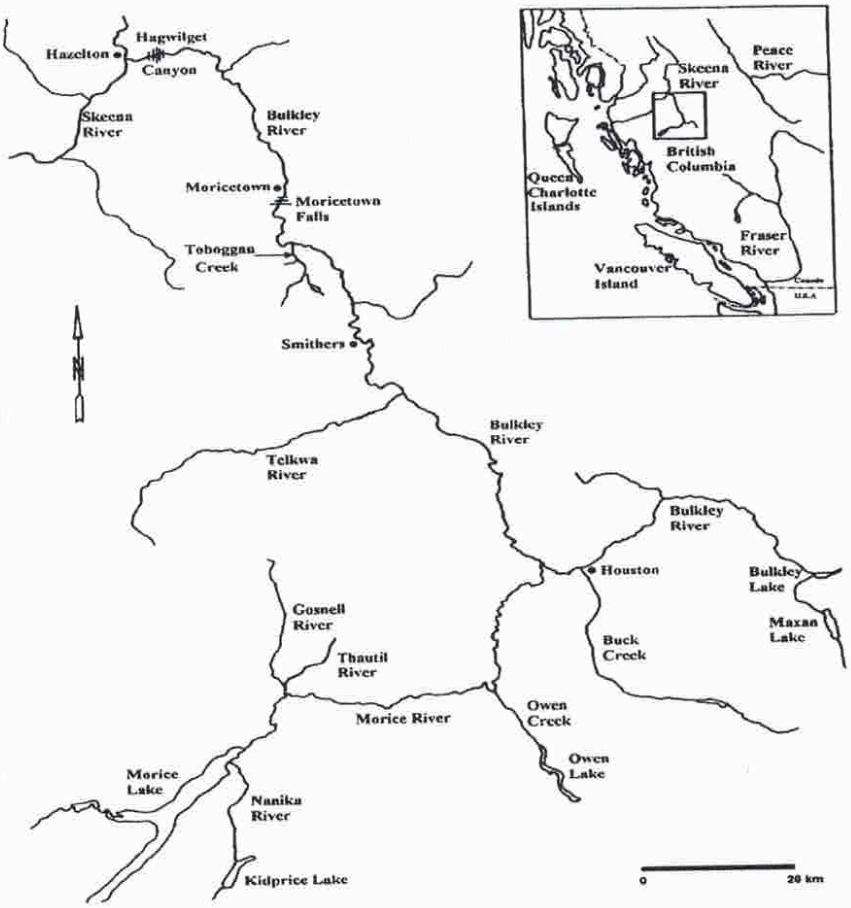
The Toboggan Creek Salmon Hatchery, under the direction of the Toboggan Creek Salmon and Steelhead Enhancement Society, has just completed its twenty-fifth year of successful operations. The Toboggan Creek Hatchery facility is located thirteen kilometers north-northwest of Smithers, British Columbia, on Highway 16 West (Fig. 1). The facility is located on C.N.R. right-of-way, which was purchased by the Society from C.N.R. in 1997. Base funding for the hatchery contract is provided yearly by the Department of Fisheries and Oceans under the Community Involvement Division, and the Habitat and Enhancement Branch, of the Salmonid Enhancement Program.

Over the past three or four decades, and in particular during the mid 1990's, stocks of Coho salmon native to the upper Skeena River tributaries were severely impacted by Alaskan and Canadian ocean fisheries. The situation became even more of an issue with Coho due to very poor ocean survivals in the 1997 return year. During the same period, Chinook stocks were showing increasing escapements. In more recent years however, since 2001, we have observed greatly improved Coho escapements and a decreasing trend for Chinook stocks. The upper Bulkley Chinook stock, a genetically unique population, had seen only 150 to 200 wild spawners in the mid 1980's. With enhancement this stock improved steadily until 2001, when 5,600 spawners escaped to the system. This stock has historically been impacted by in-river net fisheries, a gaff fishery at Moricetown Falls, and by angling pressure. It also suffers from severely degraded freshwater habitat conditions and extremely high water temperatures.

The Toboggan Creek facility, constructed during 1984/85, has been attempting to preserve and enhance stocks of both of the aforementioned salmon species. During the 2009/10 contract period our Society reared and released some 8,000 upper Bulkley River Chinook and 35,000 Toboggan Creek Coho salmon smolts from the 2007 brood year, as well as 10,000 surplus Coho fry from the 2008 brood year. We also released over 90,000 Morice River Chinook smolts in May, 2009 under a separate contract with the Pacific Salmon Commission. Successful rearing of another 4,000 Bulkley Chinook, 62,000 Morice Chinook and 35,000 Toboggan Coho from the 2008 brood continues, with these salmon being reared to smolt for release in the spring of 2010.

Egg takes from the 2009 brood Bulkley River Chinook return were very successful last August despite extremely low numbers of adult spawners escaping to the system. Our assessment of the escapement indicated just 160 Chinook returning to spawn. As a result of the very low adult return we surpassed our target of 20,000 eggs, and at present we have approximately 37,000 Chinook alevins still incubating at the hatchery. Recent low escapements continue to be a concern, with last year's return being the lowest in well over two decades.

Figure 1. Location of the Toboggan Creek Hatchery, situated on Toboggan Creek, 13 kilometers Northwest of Smithers, British Columbia.



Coho returns to the upper Skeena tributaries in 2009 were very strong. The Toboggan Creek escapement last fall was 6,130 Coho, representing our twelfth consecutive return surpassing 2,400 spawners. Our target of 40,000 Toboggan Creek Coho eggs was attained from broodstock collected at the counting fence and on the spawning grounds upstream.

The Toboggan Creek Hatchery has the capacity to rear 155,000 Coho and Chinook salmon smolts from the Bulkley River system on a yearly basis. Initial incubation is accomplished using moist incubators and eggs are transferred to Heath stacks at the eyed stage, egg to fry survivals are usually over 93.0 %. Ponding and initial rearing is done in Capilano troughs and the fingerlings are transferred to an earthen rearing channel prior to the winter period to make way for the ponding of fry from the following brood year. Smolt releases occur in April and May to coincide with the peak migration of wild smolts to the ocean. Ponding to release survivals usually exceed 95.0 %, over a period of 12 months. Two full-time personnel are required to operate the facility and extra manpower is hired during the summer and fall periods as needed.

The Coho counting fence panels were installed on August 8th this year. This enabled an accurate assessment of our twenty first major return of hatchery-produced Coho to Toboggan Creek. The fence data indicated hatchery returns of 1,508 coded-wire tagged (CWT) Toboggan Coho in 2009 and from a release of 37,436 smolts this is slightly over a 4.0% return, representing our third best CWT Coho return to date. The 2009 return is also the second best overall escapement (wild and hatchery) on record, surpassed only by the 1999 return of 9,222 Coho spawners. The 2009 data indicate a swing back towards high ocean productivity combined with moderate levels of exploitation. The data indicate a total adult recruitment of 2,687 Coho from the release, and at a 7.2% survival rate this is well above average. The rate of exploitation on the Toboggan CWT's was approximately 44% in 2009, with the Alaskan commercial catch accounting for over 66% of the landed mortalities. Previous exploitation rates, prior to 1998, had consistently ranged from 55% to well over 70%. In the eight years from 1998 to 2005 the average exploitation rate dropped to 34%. From 2006 through 2008 there was a sharp increase documented, for a three-year average exploitation of just over 51%. This year's estimate shows a leveling off of harvest pressure, possibly due to the large supply of salmon compared to the previous three years.

Around 25% of Toboggan Coho handled in 2009 were adipose-clipped salmon, and we estimate the makeup of the total spawning stock was approximately the same. As well, no CWT Coho kelts sampled upstream of the fence were identified as stray hatchery Coho from other stocks.

The Toboggan Creek Hatchery facility is frequented by 2,000 to 3,000 visitors on a yearly basis and our Society encourages the public to learn more about the salmonid resource in British Columbia. Our community appreciates the opportunity to be involved in these continued efforts.

Objectives

i) enhance stocks of anadromous fish species in the Bulkley-Morice drainage which are identified as being below historic levels.

ii) provide coded - wire tagged groups of salmon from Bulkley - Morice stocks to aid in identifying the movements, timing and exploitation of these fish through the various ocean and river fisheries.

iii) assess returns of both wild and hatchery-produced salmon to the stream of origin to determine escapement of adult spawners, and therefore aid in identifying smolt to adult survivals and total exploitation rates on these stocks.

iv) maintain a high public profile of the facility to inform the local population of the benefits and goals of both the Community Involvement Program and Salmonid Enhancement Program of Fisheries and Oceans Canada.

v) provide employment and training for local school students in the Bulkley Valley area.

vi) develop a core of qualified local people that can be depended upon to accomplish the various goals and objectives with respect to progressive fish culture and stock assessment in the upper Bulkley - Morice drainages.

Water Supplies (2009/10)

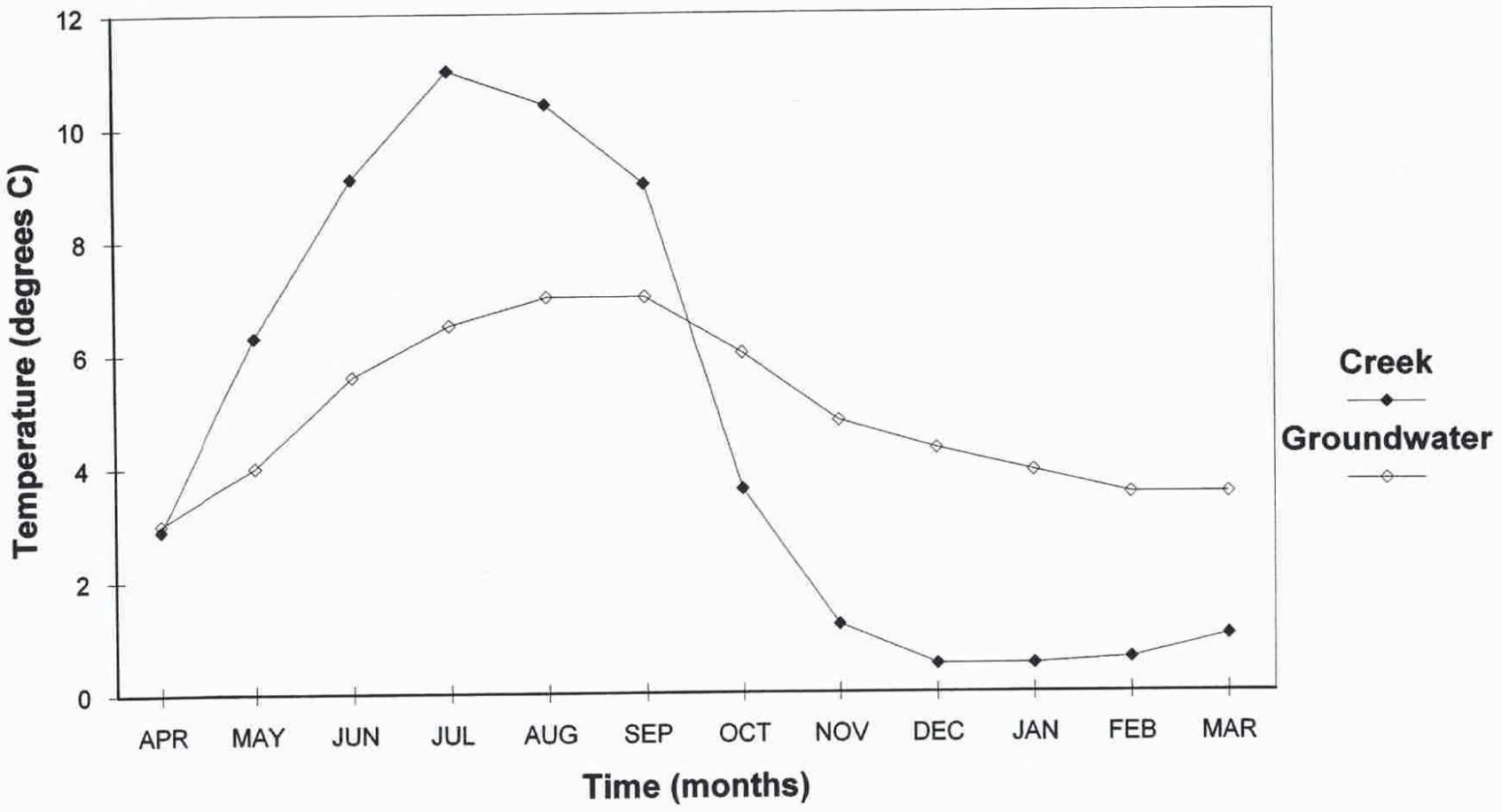
As for the previous years, the average daily temperatures of the three hatchery water sources were recorded and average weekly temperatures have been calculated. We depend on two of the water sources for egg incubation and fish rearing, ground water from an underground collection system and surface water from Toboggan Creek. The third water supply, surface water of Brandt Brook, has been used increasingly more often in recent years due to water quality concerns for the creek supply. The three water supplies have proven to be very dependable during the years and we have never experienced a fish loss due to an interruption of water flows.

The creek water supply is used for year-round rearing and has a maximum flow of approximately 4,500 liters per minute, and the normal operating flow is 1,600 to 1,800 liters per minute. In most cases the creek supply is also used for egg incubation, the exception being during periods of silty runoff flow when the ground water supply is utilized. In cases where we would like to manipulate egg development the ground water supply is used, as it is warmer in the winter period and colder during the spring and summer. The ground water supply has a maximum flow of 100 to 150 liters per minute and is used solely for incubation purposes and initial Chinook ponding.

Average water temperature patterns in 2009/10 were similar to those of recent years. The creek temperatures were cool in April but increased rapidly during May and June this year, peaking in July. Temperatures during the summer period were similar to most other years, but dropped off quickly in the fall (Fig. 2). On average, the creek supply fluctuates in between 0.5 and 15.0 degrees and the ground supply from 3.0 to 8.0 degrees Celsius on a yearly cycle.

Water levels and flows were relatively stable during the spring of 2009, but the summer period saw a prolonged stretch of high water due to the high snow pack in the mountains. The levels stayed high through most of the summer period, before dropping substantially prior to fall. The flows through the fall and winter period were much lower than normal and dewatering of Coho salmon redds may have again been a factor in 2009/10. Coho fry production should still be relatively good as a result of extensive spawning throughout the watershed, as was the case in 2008. Flows during the steelhead spawning period, early May through early June, were quite stable in 2009 which would have improved survival from the egg to fry stage of this species. Many steelhead adults and fry were observed in Toboggan Creek this past spring, summer and fall. Freshwater production of steelhead juveniles in 2009/10 should have been excellent.

Fig. 2 Temperatures at Toboggan Creek Hatchery (2009/10).



TOBOGGAN CREEK HATCHERY - SALMON BROOD YEAR SUMMARIES

Bulkley River Chinook (2007 brood)

Releases of the 2007 brood Chinook smolts were completed on May 7th and 8th, 2009. A total of 7,954 Chinook smolts were taken in batches of approximately 4,000 fish to the upper Bulkley River, near Houston, B.C. These smolts averaged 11.6 grams in weight. As river conditions were not good early in the spring we delayed releases for two weeks and divided the Chinook smolts between two sites: the groundwater site along Highway 16 West, and another upstream site at McQuarrie Creek. All of the smolts released were unclipped and untagged as per D.F.O.'s preference, and despite our Society's concerns raised with senior staff in southern B.C.

Locations and numbers of the smolt releases this spring are as follows:

McQuarrie Creek Confluence	4,000
Groundwater Site	3,954
Total Released in 2009	7,954

Releases took two work-days to complete this year, and we had just one crew and vehicle working. The releases took 2 individual trips to complete, and everything went very well during the releases. We have had good success using the 1,500 litre transport tank for releases, and we vary the amount of smolts taken on each trip depending on water temperatures and the length of the individual trip. Green egg to release survivals of this stock were 97.7 % over a 20 month period from late August of 2007 to early May of 2009. This group of smolts looked to be very healthy at the time of release.

This stock was enumerated prior to release by using standard sub-sampling techniques. Results of this enumeration verified that our book estimates were accurate and indicated predation was again not a factor in the outdoor channel this past year.

Bulkley River Chinook (2008 brood)

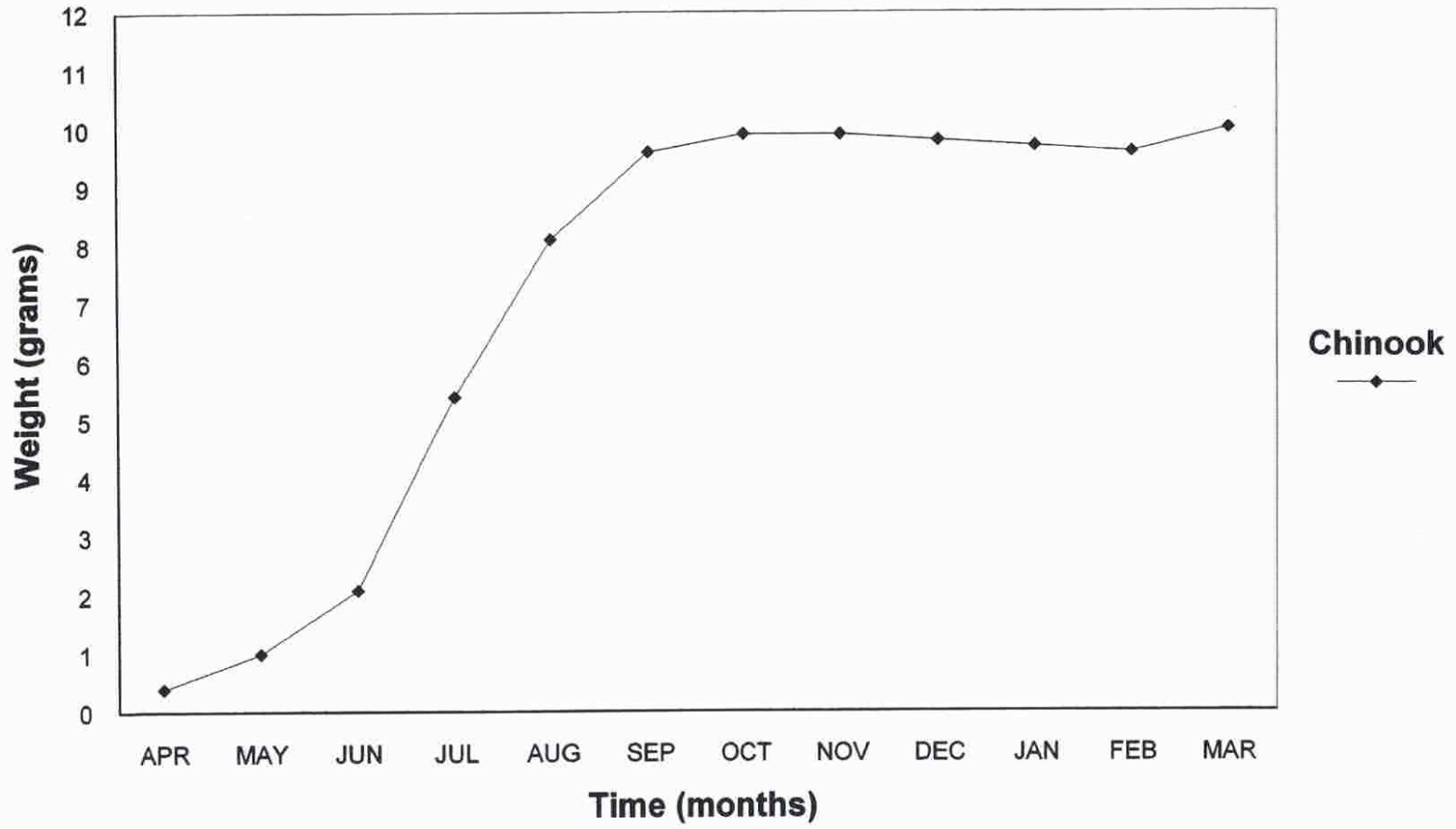
Ponding of the 2008 brood Bulkley River Chinook fry was completed on April 1st, 2009. These 0.40 gram fry were ponded in one Capilano trough and feeding was initiated with #0 Skretting starter. The Chinook got on the starter feed quickly and remained in one trough until late July. A total of 3,958 salmon fry were ponded and initial survivals were excellent. Green egg to ponding survivals were over 98%.

Growth of the 2008 brood Bulkley River Chinook fry increased rapidly, commencing in mid May, in conjunction with warming water temperatures and these fish continued to grow at a healthy pace through the summer period (Fig. 3). The rate of growth in 2009/10 was similar to past years and dropped off dramatically during the winter period as a result of prolonged cold temperatures and ice cover on the outdoor channel, which prevented feeding for over 5 months. At the present time these Bulkley River Chinook smolts average 10.2 grams in weight, and we hope to have them at 11.5 grams or larger prior to release in early May of 2010.

Densities were reduced in late July when this stock was moved to Circular Tub #1. These Chinook fry were coded-wire tagged (tag code 18-07-72) and adipose clipped in early August of 2009, and were transferred to compartment "A" of the rearing channel in early September. We did not experience any problems during the initial indoor rearing of the 2008 brood Chinook, and once they were moved outside everything went well.

Survivals since ponding have been excellent and presently are over 98%. Green egg to release survivals may exceed 96% and we presently have over 3,828 Bulkley River Chinook remaining.

Fig. 3 Growth of 2008 Brood Chinook Salmon in 2009/10.



Bulkley River Chinook (2009 brood)

Broodstock collection of the 2009 brood Upper Bulkley Chinook began on August 20th, 2009 and by August 28th we had attained over 36,000 eggs. A total of 9 female and 28 male Chinook had eggs or sperm collected from them, all of the males were then released back into the river after use. Eggs were transported unfertilized back to the hatchery and each female's eggs were then fertilized using sperm from up to 6 different males. Prior to incubation all eggs were rinsed, water hardened, disinfected and screened.

Chinook assessment was carried out in conjunction with these egg takes, including a helicopter count of salmon spawners on August 18, 2009. A total of only 150 Chinook were observed between the Morice River junction and the Bulkley Falls, with over 65% occupying the section of river from the Richfield Creek confluence downstream to the McQuarrie Creek groundwater area. Four Chinook (2 live and 2 dead) were observed upstream of the falls at the Foxy Creek/Maxan Creek confluence. Very few spawners were found in the lower end of the river this year (from the McQuarrie groundwater area downstream to the bridge crossing west of Houston). We sampled a total of 58 different Chinook (36% of the estimated escapement) during our broodstock collection and assessment activities, and we also had 3 additional Chinook recaptures identified by operculum punches. The overall composition of the sample this year was 45% wild and 55% adipose clips. Sex ratio of the Chinook sampled was 52% male and 48% female. The size of both male and female spawners this year was about normal for their age groupings, but there appeared to be a higher than usual proportion of six-year-old males present.

The physical condition of the spawning Chinook present during our broodstock collection and sampling activities was fairly good this year. Egg quality was reasonable, although some water-hardened eggs were present, but spawning was noticeably delayed for some reason. There were a few live heat-stressed fish observed in the upper reaches near the Richfield Creek confluence and above. It is possible that many of the Chinook that entered the river early (prior to the extremely hot weather in July and early August) did not survive to spawn, and may have been removed by predators due to a lethargic state of awareness.

Results of the helicopter count were as follows:

	Aug. 18th
Above Bulkley Falls	4 Chinook (2 dead)
Meanwhile Creek	19 Chinook
Topley	0 Chinook
Richfield Creek	43 Chinook
Perow Station	2 Chinook
McQuarrie Creek	0 Chinook
Below McQuarrie Creek	54 Chinook
Below Knockholt	0 Chinook
Houston	32 Chinook
in Buck Creek	0 Chinook
Total Observed on Flight	154 Chinook

Visibility during the assessment flight was excellent. Chinook were easily counted in the pools, as well as on the spawning riffles, due to the very good light conditions. As in previous years, we did a comparative ground count in the vicinity of McQuarrie and Richfield Creeks to verify the accuracy of the aerial count. Few, if any, Chinook were missed in this year's flight.

From these observations, and incorporating the ground count carried out during the same period, it is estimated that the live Chinook escapement present in the upper Bulkley River during the time of the count was approximately 160 adults (four to six year old Chinook). This is only 30% of the year 2004 escapement of 530. Bulkley Chinook are typically five years old at spawning.

Upon reviewing the Bulkley Chinook Summary from 2004 it should be noted that we estimated only 20 to 30 females successfully spawned that year. That, again, was due to extremely high water temperatures (24+ degrees Celsius). Many Chinook died pre-spawn, and most of the survivors were brain damaged with no capacity to spawn naturally.

The average length (POH) of the brood females collected in 2009 was 664 m.m. and the average weight was 7.3 kilograms, these salmon ranged from 620 m.m. to 720 m.m. in length.

Table I. Shocking and Picking Summary for the 2009 Brood Bulkley River Chinook Eggs Incubating at the Toboggan Creek Salmon Hatchery.

Tray #	Females	Pre-Shock	Post-Shock	50 ml Sample	Volume (mls)	Survival(%)
M1-1	2	9	212	125(2.50)	3,090	7,513(97.1)
M1-2	1	4	68	127(2.54)	1,740	4,352(98.4)
M1-3	1	5	51	125(2.50)	2,010	4,974(98.9)
M1-4	1	11	135	115(2.30)	1,800	4,005(96.5)
M1-5	2	77	270	119(2.38)	3,300	7,587(95.7)
M1-6	2	43	323	146(2.92)	3,250	9,157(96.1)
Totals	9	149(0.4%)	1,059(2.7%)	128(2.56)	15,190	37,595(96.9)

Toboggan Creek Coho (2007 brood)

Survivals were excellent during April and May of 2009, prior to this stock's release. A total of 34,872 coded-wire tagged smolts were released during the spring of 2009, the screens were pulled on May 19th and all of these 14.5 gram smolts had migrated out by June 1st. Growth of these Coho was excellent from April 1st until release, increasing from 10.8 grams to 14.5 grams.

Observations of smolts leaving the channel outflow in the evenings indicated peak movements during the last week of May. These Coho were in very good condition at time of release and were showing visible signs of smolting prior to the peak migration. There were only 150 unclipped Coho surplus to the tag group released in 2009/10.

Toboggan Creek Coho (2008 Brood)

Ponding of the 2008 brood Toboggan Coho was completed by May 12th, 2009. Growth of these Coho started slowly in the spring period but increased rapidly in the summer and fall of 2009, from 1.4 grams near the end of June up to 9.6 grams by late October (Fig. 4). This growth dropped right off during the winter period, from November through March. As the ice has now melted off of the outdoor channel we are able to feed again, and we expect growth to accelerate.

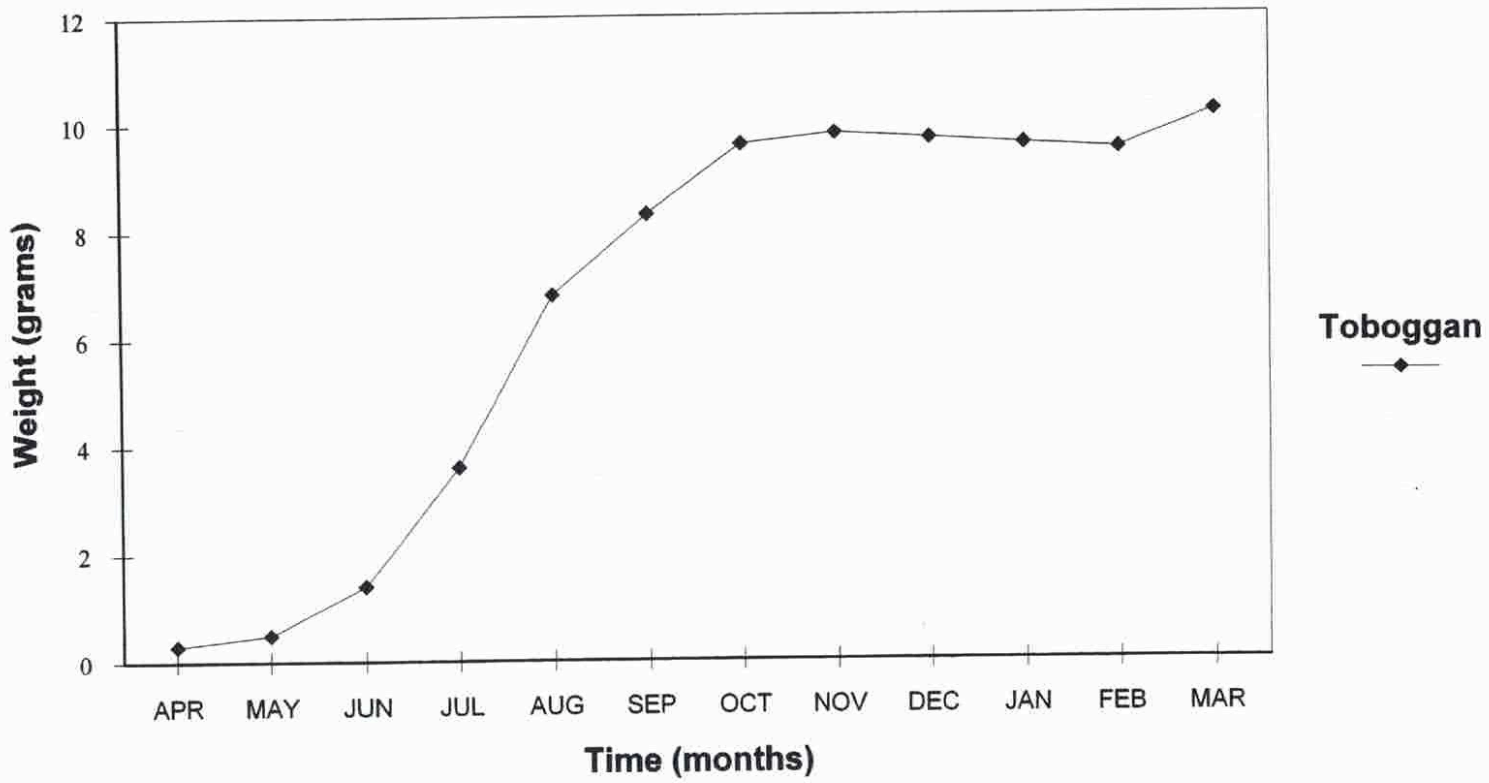
These Coho fry were split into two Capilano troughs in mid June, and split again into three troughs in July. We divided this stock into four troughs in August, and were able to keep these fry indoors until the tagging crew arrived. Overall health of this stock was excellent throughout the rearing cycle, and survivals from fry ponding in May, 2009 to smolt size in late March, 2010 were over 99 %. These are excellent survival rates for this Coho stock.

Coded-wire tagging of this stock was completed between August 13th and 18th, 2009. A total of 34,715 Coho salmon fry were tagged and adipose clipped for our smolt release group.

Tag Code	# Tagged
18-08-76	34,715
Total Tagged	34,715

Survivals of the smolt group were excellent after tagging and through the winter period and we expect to release well over 34,600 Toboggan Creek Coho smolts in the spring. We plan on pulling the channel screens in early to mid May of 2010. These smolts will then be able to migrate out on their own timing.

Fig. 4 Growth of 2008 Brood Coho Salmon in 2009/10.



Toboggan Creek Coho (2009 brood)

Most of the 2009 brood Coho eggs and sperm collected from Toboggan Creek last fall were taken from adult Coho intercepted at our fence operation. A total of 86 adult Coho spawners were collected and transported back to the hatchery for egg-take purposes. We conducted two egg takes; one on October 1st and one on October 7th, and all of the females surplus to our egg-take needs were released back into the stream shortly afterwards. These eggs were all disinfected with an iodine solution after fertilization, and prior to being placed in the moist incubators.

Eggs were taken from a total of 13 ripe female Coho and sperm was taken from 52 males. Each female's eggs were fertilized by using at least 6 different males and all eggs were water hardened for one hour prior to initial incubation in the moist incubators. Kidney samples were taken from the female broodstock and sent to the Pacific Biological Station for analysis, and all but two of these samples tested negative for BKD. The eggs from the two light-positive females may not be reared to smolt stage. Scales, weights and lengths were also taken from all of the brood females. Average weight was 2.5 kilograms, while overall the average length was 520 mm, which is smaller than average for this stock. A total of 50 random scale samples were collected from both female and male Coho, as requested by DFO's Stock Assessment Division. Of 49 readable scale samples, taken only from wild Coho spawners, 37 (75%) were three-year olds and 12 (25%) were four-year olds. This was very similar from the age classes observed in 2007, when 74% were three-year olds and 26% were aged at four. In 2008, over 56% were four-year olds.

Shocking and picking of the 2009 brood Toboggan Creek Coho eggs began on November 16th, 2009 and was completed on December 2nd. The Coho egg survivals to this stage were excellent (96.1%), and a total of 36,653 eggs survived (Table II). Fecundity of the Toboggan Coho averaged 2,930 eggs per female in 2009, as compared to 3,500 the year previous. This decrease is likely due to the lower proportion of four-year old females in the 2009 spawning escapement.

The 2009 brood Coho eggs began hatching at 400.0 A.T.U.'s and peak hatch occurred at 420.0 thermal units. The survivals during hatch were excellent, and ponding of this stock will likely occur in mid to late April of 2010.

Coho from these egg takes will be reared at the hatchery to a size of 12.0 to 14.0 grams and released as smolts in May of 2011. Up to 35,000 of these fish may be released into Toboggan Creek, as coded-wire tagged Coho smolts, depending on how many DFO decides to use in the tag group. Any surplus untagged Coho will be released into the Kathlyn Creek drainage after tagging is completed. The CWT tagging crew is scheduled to start up in early August to tag and clip the 2009 brood Coho stocks on hand.

Survivals of our Toboggan Coho since hatch have been excellent and they continue to appear very healthy. We presently have over 36,000 Coho alevins from this stock still incubating.

Table II. Shocking and Picking Summary for the 2009 Brood Toboggan Creek Coho Eggs Incubating at the Toboggan Creek Salmon Hatchery.

Tray #	Females	Pre-Shock	Post-Shock	50 ml Sample	Volume(mls)	Survival(%)
M2-3	3	37	193	160(3.20)	2,550	7,967(97.2)
M2-4	3	25	108	187(3.74)	2,570	9,504(98.6)
M2-5	4	146	660	177(3.54)	2,630	8,650(91.5)
M2-6	3	58	265	177(3.54)	3,050	10,532(97.0)
Totals	13	266(0.7%)	1,226(3.2%)	175(3.50)	10,800	36,653(96.1)

Assessment of Coho Escapement in 2009

Toboggan Creek Fence

The Toboggan Creek Coho counting fence commenced operation on August 8th, 2009. The fence was monitored a least twice daily from this date through to October 29th, at which time the aluminum panels were removed due to freezing conditions.

A total of 4,986 Coho were passed through the fence in 2009, with the first Coho captured on August 15th and with the spawning migration into the creek peaking from October 6th through to October 8th. In addition to our normal sampling, we floy tagged and operculum punched a large number of Coho. A total of 500 Coho were tagged at the fence in 2009, approximately one out of every ten Coho captured. This was done to allow for an accurate estimate in case the fence needed to be laid down, which did not happen. The complete Toboggan Creek escapement estimate in 2009 was 6,130 Coho; including natural spawners above the fence, broodstock removed at the fence by hatchery personnel, and salmon spawning downstream of the counting fence structure.

We collected 20 CWT heads from our hatchery returns. These were all taken from spawned-out kelts. We also collected a random sample of scales from 50 wild Coho to determine age composition. Of the 4,986 Coho spawners sampled in 2008 the sex ratio was 56% male and 44% female. This is similar to the ratios of both 2007 and 2008, at 53% male and 47% female.

As in previous years, we documented all of the Moricetown tags recaptured (642 Moricetown-tagged spawners observed in 2009, representing 12.9% of the total sample). Our survey of the spawning areas revealed very few Coho in the upper system that were not captured and sampled at the fence in 2009. As well, an estimate of the number of Coho to have spawned downstream of the fence this past fall was made based on this survey. The number of Coho spawning below the fence, and in the Bulkley River mainstem, was higher than normal in 2009.

Approximately 25% of the salmon handled at the fence were estimated to be coded-wire tagged hatchery returns from the 2006 brood Toboggan Creek smolt release group. This represents a total of 1,508 spawners returning from a release of 37,436 smolts, and a 4.0 % survival to spawn. Wild Coho made up 75% of the escapement in 2009, accounting for 4,622 spawners.

Coho Hatchery Returns (2006 brood)

All of the upper Skeena waters were closed to the harvest of Coho at the beginning of the 2009 season due to conservative management by DFO. When projections from Alaska in July indicated a very strong return of Toboggan Creek coded-wire tags, based on good in-season catches in their commercial fisheries, the DFO managers opened up various areas of the Skeena River, the Bulkley River and the Morice River to the retention of hatchery and wild Coho.

No creel surveys were conducted last fall but, based on head depot returns of coded-wire tagged Coho in 2009, a catch estimate was developed. There were 25 CWT-pinned heads turned in by anglers last fall, from a Coho captured in the Bulkley-Morice watershed. We estimated a participation rate of 35% (lower than most previous years due to the wider expanse of the area open to harvest) indicating a total harvest of 72 CWT's and 220 unmarked wild Toboggan Coho in 2009. The total angler harvest, as a direct result of the in-river retention opportunity this season, accounted for less than 4.3% of the total available Toboggan Creek Coho stock.

As a result of sampling done on the spawning grounds we were able to collect 20 Coho heads from marked adult spawners in Toboggan Creek during 2009. Of these 20 spawned-out kelts, 19 were found to carry pins (95%). The proportions of the Toboggan Creek smolt group in the sampling, by tag code, were as follows:

# of Coho	Tag Code
13	18-48-06
3	08-15-07
2	08-03-49
1	08-03-56

Of these 19 pinned heads, all were from 2006 brood Coho salmon reared and released at the Toboggan Creek Hatchery site.

Exploitation of Toboggan Coho in 2009

With groups of coded-wire tagged Coho returning to Toboggan Creek yearly, and having a fence installed on this stream, we are able to arrive at an accurate assessment of Coho escapement during each year. As well, the coded-wire tag sampling of the B.C. commercial catch, Alaskan commercial catch, and B.C. sport catch give an indication of exploitation rates by each group. The Native food fish catch has also been studied to some extent and gives insight in this regard.

Coho catch and escapement estimates have been provided and/or corroborated by the following agencies and groups:

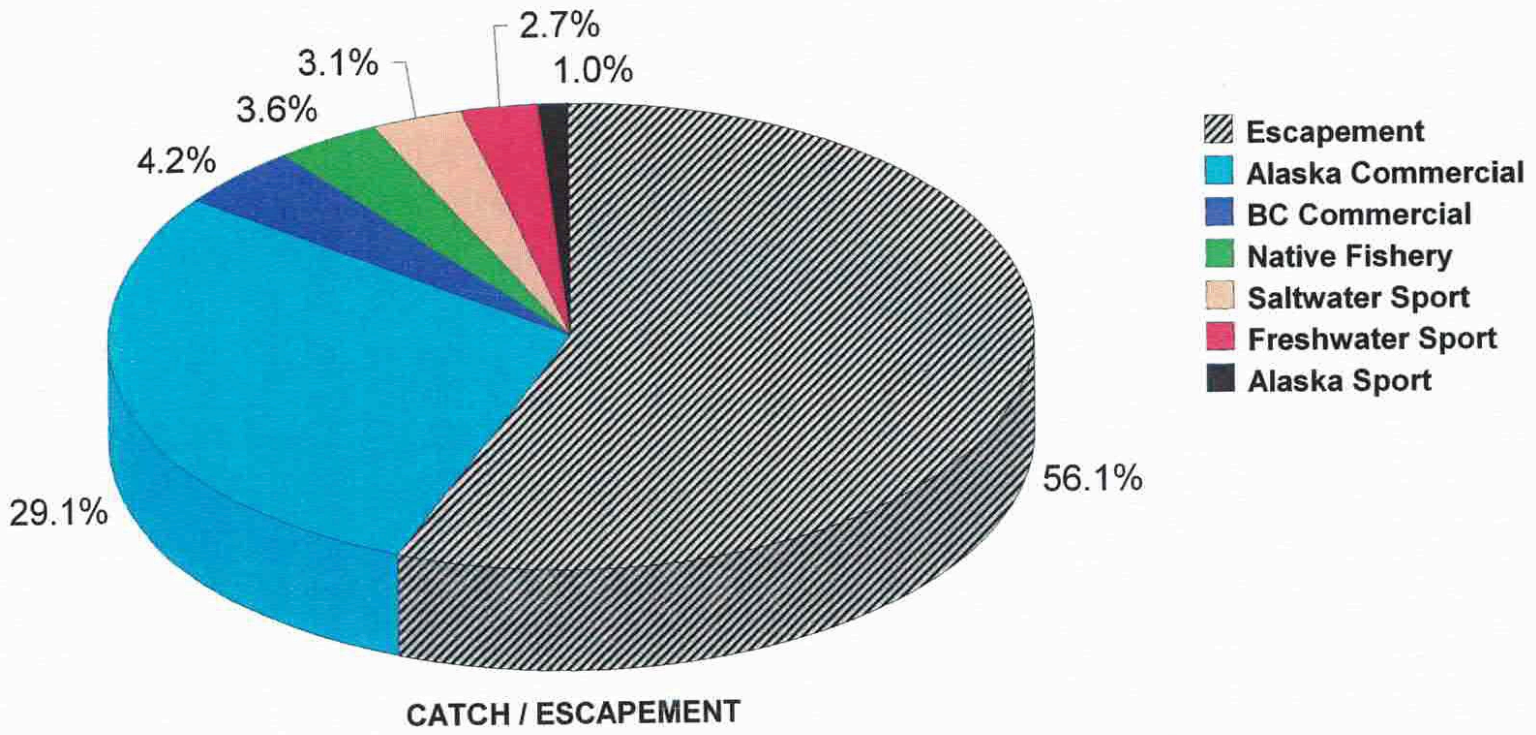
Escapement	-	Toboggan Creek Hatchery
B.C. Commercial	-	Fisheries & Oceans Canada / Toboggan Hatchery
Alaskan Commercial	-	Alaska Department of Fish and Game
B.C. Sport	-	Fisheries & Oceans Canada / Toboggan Hatchery
Alaskan Sport	-	Alaska Department of Fish and Game
Native Food	-	Wet'suwet'en Fisheries / Toboggan Hatchery

Exploitation rates indicated by the data suggest that coded-wire tagged Coho from the Toboggan Creek stock were harvested at a rate of approximately 44% in 2009 (Fig.5). Of this total catch of approximately 1,179 Toboggan Creek Coho in 2009 it is estimated that Alaskan commercial vessels harvested 66%, BC commercial fishermen took 10%, in-river Native food fisheries accounted for 8%, BC saltwater anglers were responsible for 7% of the catch, BC freshwater anglers took 6%, and Alaskan anglers took 3%. This result in 2009 represents a decrease in the exploitation rate from 2008 (documented at 49%), although the numbers caught more than tripled from 342 CWT's in 2008 to 1,179 in 2009. The Toboggan Creek coded-wire tagged spawning escapement, estimated at 1,508 Coho in 2009, represented just over 56% of the total adult stock produced from our 2006 brood smolt releases.

Alaskan commercial fishermen harvested many more Coho in 2009 than the estimated mortalities as a result of B.C. commercial fisheries, and it seems very few Skeena Coho were caught incidentally as net fisheries in Area 4 were virtually non-existent. Some Toboggan Creek CWT's were caught in Area 3 net fisheries targeting Sockeye, and the rest were taken in a troll fishery targeting Coho. These data indicate that Canadian interests were responsible for less than 20% of the ocean-based mortalities in 2009, including the catch from both the commercial and sport fisheries operating in saltwater areas. Including the wild Coho catch, Alaskan interests harvested over 3,200 Toboggan Creek Coho in the 2009 fishery.

Survivals of hatchery-produced Coho smolts from this facility were well above average in 2009. Assuming the catch rates are accurate we saw smolt to adult survivals of just under 7.2% for the 2006 brood, with about 2,687 adult Coho produced from a release of 37,436 Toboggan Creek smolts. These Coho survivals are the third highest we have seen in the last twenty years of sampling, and indicate an increase in ocean productivity. The 2009 sampling also documents the highest survival rate we have observed since 2001.

Fig. 5 Catch of Toboggan CWT Coho (2009)



Administration Report

This section covers hours spent from April 1st, 2009 to March 31, 2010.

The following table is a breakdown of hours spent carrying out the contract last year:

Activity	Man-hours
Project Management	322.0
Facility Operations	3,396.0
Broodstock Collection	394.0
Assessment	0.0
Coho Fence	554.0
Statutory Holidays	184.0
Total Hours in 2008/09	4,850.0

It is becoming more and more difficult to carry out the contract each year due to a lack of adequate funding, as we have not seen a reasonable increase in funds for over eighteen years. In 2009/10 our hours of work spent were similar in most categories except the Coho fence operations, where they were up somewhat due to the large number of returning spawners in the fall of 2009. Volunteer hours also contributed to our operations last year, but should not be depended on to function properly.

Total employment generated by the hatchery in 2009/2010 added up to 163 full work weeks, employing 13 different people for varying lengths of time during the twelve-month period. These last figures include separate contracts we have undertaken via the federally-funded Stock Assessment Division of DFO, as well as the bilaterally-funded Pacific Salmon Commission.

Labor costs were more than what was budgeted for in the contract period, as they were in the previous six contracts as well. Our Society has been in a deficit position for the same period. The base contract deficits are due to the fact that the hatchery program has been subsidized by other contracts taken on by the Toboggan Creek Enhancement Society in the past. Without taking on extra contracts, such as the Coho Smolt Survey and the Morice Chinook CWT Group, over the past few years we would be consistently running a larger deficit. While labor, overhead and supply costs have risen dramatically over the past 18 years our DFO base contract funding has remained unchanged.

The following is a summary of expenditures made in carrying out the 2009/2010 contract :

Category	Expenditures	Contract
Direct Labor	93,500.00	92,000.00
Overhead Costs	23,375.00	23,000.00
Capital Equipment	0.00	0.00
Operations	38,436.00	40,311.00
Totals	155,311.00	155,311.00

The labor and overhead portions of this table only include activities directly attributable to the main C.E.D.P. contract. They do not include time spent collecting additional broodstock and rearing Morice River Chinook for smolt planting, assessment of wild and hatchery juvenile Coho migration, and expanded assessment of adult Coho returns to Toboggan Creek.

A lack of adequate contract funding will eventually cause the entire Salmonid Enhancement Program to fail, in a time when salmon stocks are in broad decline on the Pacific Coast.

Development and Maintenance of the Facility

In addition to general maintenance carried out as part of the contract requirement we were involved in the following activities as well:

i) The outdoor rearing channel was again vacuumed out using a large sludge pump. The accumulation of fish waste and silt is difficult to move out of the channels and this appears to be the best way to address the problem. The channel abutments are in very poor condition, and need to be replaced. This has been an action item for a few years now, and if the structures fail it may result in the mixing or loss of stocks on hand.

ii) The settling pond was flushed again to spread out the sand that accumulates at the end of the inflow pipe. This has become an annual maintenance procedure and we try to remove the buildup before it becomes a problem.

iii) The dam below the creek intake requires regular maintenance as a result of flooding. Our intake structure is over 26 years old, and badly in need of replacement. Once again, failure of this structure could mean a loss of salmon stocks on hand.

iv) During ten consecutive years previous, 1993 through 2002, we have operated the Toboggan Creek counting fence for Steelhead enumeration. In 1993 we estimated an escapement of 435 Steelhead spawners, and in 1994 there were 237 Steelhead spawners identified. No funding was provided for the 1993 assessment, while funding came from M.O.E. via the Habitat Conservation fund for the 1994 count. In 1995 we identified 330 Steelhead above our counting fence, and that was done with H.C.F. funding to cover labor costs. In 1996 funding came from Skeena Green Plan for the count, which identified 120 Steelhead above the fence with many hundreds spawning below the fence. In 1997 we were unable to obtain funding but operated the fence again, 543 Steelhead were estimated. The 1998 count was funded by the Habitat Conservation Fund and an estimated 381 fish spawned above the fence and many more spawned below. In 1999, we identified an escapement of 357 Steelhead upstream of the fence, and in the year 2000 an estimated 286 Steelhead spawned above the fence. In 2001, the fence operations indicated 414 spawning Steelhead in the area upstream of the counting fence and in 2002 the estimate for the same area was 356 Steelhead spawners. The funding for this came from Fisheries Renewal BC for all of the last four Steelhead counts. Due to a lack of support by provincial Steelhead bureaucrats this program was discontinued in 2003, although the data generated has been referred to as the best and most consistent for the Skeena River watershed and its summer-run Steelhead stocks. We plan to operate the Steelhead counting fence in the spring of 2010 as the Society feels it is important to document accurate Steelhead numbers.

Operating Plan for 2010/2011

As in previous years we will begin releasing our salmon smolts in April. The 2008 brood Bulkley River Chinook will be the first to go in late April, followed by the Toboggan Creek Coho in mid to late May. As in past years we will enumerate the salmon smolts while they are being loaded into the transport tanks. We will be taking close to 4,000 Chinook smolts to the Upper Bulkley River and more than 34,600 Coho smolts will go into the Toboggan Creek system. As well, more than 62,000 Morice Chinook smolts will be released in May, 2010.

Our upper Bulkley River Chinook target has been reduced to 20,000 eggs and, with the support of the DFO Stock Assessment Division, we hope to coded-wire tag and adipose clip all of these releases in the future. We will continue with assessment of marked Chinook escapement until next year, when adult CWT returns will cease for two years. This year will be our nineteenth year of assessment of coded-wire tagged and total Chinook returns to the upper Bulkley River.

Coho egg targets have been reduced as well, and between 30,000-35,000 Toboggan Creek Coho eggs will be targeted in 2010. The Bulkley River Coho program was cancelled in 2005/06 due to a lack of adequate funding from DFO. As usual, the 2010 brood Coho will be reared to smolt size, at 12.0 to 15.0 grams, and released in the spring of 2012.

We will continue with our assessment activities with the Coho counting fence on Toboggan Creek and we will install the fence panels in early August this year, in an attempt to get a total count on Coho salmon. We will do a mark and recapture study to back up fence counts for Coho.

We had intended on continuing with enumeration of Steelhead trout spawners into Toboggan Creek two years ago, in the spring of 2007. Unfortunately a collection permit could not be acquired from the Ministry of Environment to do so. The spring of 2002 was our tenth consecutive year of assessing the Steelhead return to Toboggan Creek, and there seems to be little interest from the provincial Fisheries Branch to continue documenting the large escapements indicated by locally-initiated studies such as this. Steelhead tagged at Moricetown Canyon in recent years have also indicated very large runs of Steelhead present in the Bulkley-Morice escapement. We will carry out an independent and extensive Steelhead count in 2010.

As usual, we will attempt to keep the public in this area well informed of our activities, goals and accomplishments in the area of fish culture and assessment on the Bulkley/Morice system. We are open to public tours year round and encourage people to come out and view the facility, see the successes of the Society, and learn more about the salmon resource in the Bulkley Valley.

Recommendations

We have had a successful year, as in previous years, despite a lack of adequate funding for basic operations and repair of core structures. There are some areas where we believe changes can be made that will be beneficial to our operation, the public and the salmon resource:

i) The outdoor rearing channel is in desperate need of repair and upgrading. The treated wood abutments are rotting and heaving and need to be replaced. As well, the earthen channel is very hard to clean and disinfect after the smolts are released, and prior to the new fry being transferred in. Bacteria carryover is a large concern.

ii) Assessment of returning coded-wire tagged Chinook would be greatly improved if we could get more accurate data from the in-river First Nation's and licensed angling food fisheries in the summer season. Each year thousands of Chinook are landed by participants involved in both of these fisheries on the lower Skeena and Bulkley Rivers. While local angler participation in the Coho fishery has been good, we are seeing less participation in the Chinook head recovery program. The data realized from this program are very relevant and provide information on stock timing and survival. We have noticed in the food fishery that the people in the communities have taken a real interest in learning more about salmon escapements.

iii) We are raising over 55,000 Morice Chinook smolts per year with funding from the Pacific Salmon Commission. DFO has supported this initiative by allowing the use of half of our hatchery space for this initiative. Hopefully this will continue.

iv) Measures were taken in the past few years to reduce Coho exploitation and allow more spawners to reach the freshwater tributaries. Coho returns to many tributaries have shown up much stronger beginning in 1999 and carrying on through 2009, averaging close to 4,500 spawners in Toboggan Creek over the period. Each year more opportunities have been given for Coho harvest, especially in the ocean where large numbers of Coho were harvested in the saltwater sport fishery last year. Despite this, few CWT heads have been turned in by anglers and lodges participating in this ocean-based fishery. As well, losses of Coho through catch and release mortalities in all saltwater fisheries do not seem to be accounted for. In 2009 we saw the largest Coho return to Toboggan Creek since 1999, at 6,130 spawners. Ocean productivity seems to have picked up, at least temporarily. Meanwhile the recovery of CWT's remains very low in the ocean fishery and the net fishery will be regulated by a non-retention regulation in 2010, which will result in Coho mortalities being thrown overboard. This scenario does not bode well for understanding the limiting factors affecting Coho returns in the future. It would be of great benefit to improve the head recovery program for sport-caught salmon on the North Coast for 2010 and onward, as well as encouraging retention of badly damaged fish caught by anglers and commercial fishermen. Otherwise, these salmon will not show up in either the catch or the escapement.

These recommendations are very similar to past years. They are still the most important things that affect our long-term success, and will provide benefits to the resource and our communities.

Since this facility was constructed, and since the Toboggan Creek Salmon and Steelhead Enhancement Society took on the task of operating the hatchery, we have successfully reared and released 4,590,000 Salmon and Steelhead smolts and fry. Although exploitation has generally increased in recent years we continue to see reasonable returns of wild and hatchery-produced salmon to the Upper Bulkley River and Toboggan Creek systems. The Coho counting fence, which we operate on Toboggan Creek, is allowing for a better understanding of Coho smolt to spawning survivals on interior systems in Northwestern B.C. As a result of the previous coded-wire tag recoveries from commercial operations from B.C. and Alaska, in the early to mid 1990's, it may now be evident what the targeted rate of exploitation should be. Catch reductions were initiated in the late 1990's, as a result of documentation of the very high exploitation rates at the time, and wild Coho returns have been strong ever since.

Our Society is very appreciative for the opportunity to be part of the Salmon Enhancement Program in northwestern B.C. We also appreciate the support we receive on a yearly basis from various people from the Community Involvement Division, the Resource Restoration Unit, and especially the Stock Assessment Division of the Department of Fisheries and Oceans. Also, financial support from DFO, and other various initiatives, has allowed us to continue with some of our salmon enhancement and assessment operations in recent years. Funding levels are a large concern for our Society, having had no increase in our base contract for over 18 years, and this issue will need to be positively addressed in the near future.

Our greatest support still comes from the general public. We continue to receive encouragement from the many people that stop by the hatchery to learn about the salmon resource, and we in turn attempt to raise awareness of the resource during the many tours we give each year. Going into our twenty-sixth season of operation we continue to get a wide range of students, both past and present, who express a sincere gratitude for the SEP and CEDP initiatives. They have been exposed to the needs and requirements of salmon stocks, and are now strong advocates for conservation, habitat protection and enhancement. This is a very rewarding aspect of SEP.

We continue to look forward to our involvement with the program in the future.