1982 COHO STUDIES
UPPER LILLOOET RIVER SYSTEM

PREPARED FOR

FRASER RIVER, NORTHERN BRITISH COLUMBIA
AND YUKON DIVISION
DEPARTMENT OF FISHERIES AND OCEANS

BY

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PREFACE

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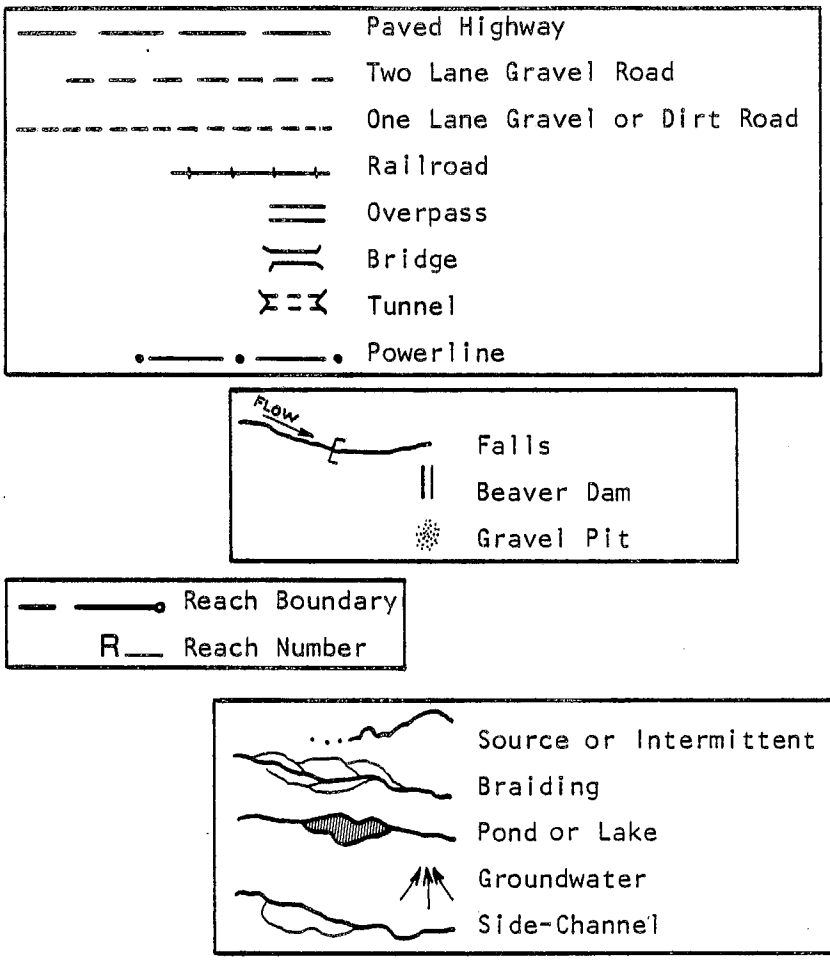
I N D E X

LIST OF TABLES

LIST OF FIGURES

LEGEND


Paved Highway
Two Lane Gravel Road
One Lane Gravel or Dirt Road
Railroad
Overpass
Bridge
Tunnel
Powerline
FLOW
Falls
Beaver Dam
Gravel Pit
Reach Boundary
R Reach Number
Source or Intermittent Stream
Braiding
Pond or Lake
Groundwater
Side-Channel
Light - Heavy Spawning
Adult Coho Holding Area
Winter Trapping Site
Winter and Summer Trapping Site
Summer Trapping Site
Town
Village
Station

SUMMARY

Juvenile and adult coho surveys were conducted on the Birkenhead and Lillooet Rivers between August 17th, 1982 and January 8th, 1983. A juvenile tagging program was also carried out on the Birkenhead.

Juvenile Program

During the summer survey, 512 coho were caught in the Birkenhead and 21 in the Lillooet. Overwintering fry accounted for 5.8% of those caught in the Birkenhead, but none in the Lillooet.

The total coho catch during the juvenile tagging program on the Birkenhead was 55,535. Two tag codes were applied: 2-22-9 on 44,530 underyearings, and 2-23-26 on 3,534 coho thought to be overwintering fry. Scale analysis later showed that 40.3% of the latter were actually underyearlings. Tag loss was less than 0.5% on both tag groups, while unsatisfactory adipose fin clips were observed on less than 3%. Diseases and anomalies occurred in 6.4% of the fish checked.

Adult Program

The cumulative dead count plus the final live count totalled 236 coho on the Birkenhead. One was 2 sub 2 and one, 4 sub 3 in the sample, but 97.8% were 3 sub 2. The

average length of the carcasses was 50.7cm. Sex was determined on 110 coho: 53.6% were males and 46.4%, females. Of the females, 88% were spawned out.

On tributaries of the Lillooet system, only 18 live and 59 dead were observed. The 53 carcasses sampled were 83.3% age 3 sub 2, and 16.7% age 4 sub 3. Sex determination showed 28 males to 25 females. All but one of the females were spawned out.

INTRODUCTION

The Birkenhead and Upper Lillooet rivers near Pemberton, B. C. are important producers of sockeye, coho and chinook. Sockeye and chinook have been studied in the system for several years, but no coho investigations have been carried out. Under the joint sponsorship of the Department of Fisheries and Oceans and the Unemployment Insurance Commission through the Employment Bridging Assistance Program, juvenile and adult coho were studied on the two rivers from August 17th, 1982 to January 8th, 1983.

During August, both rivers were surveyed to determine the feasibility of a juvenile coho tagging program, and one was conducted on the Birkenhead between September 15th and November 19th, 1982.

When the tagging program was completed, adult reconnaissance on the two rivers enumerated and sampled spawning coho until December 21st, 1982. A final survey was made on the Birkenhead River only, in early January, 1983. From the information collected, age and sex composition, size distribution, egg retention rates and escapement estimates were determined.

Information from this program will provide data useful for coho stock management.

This report describes the tagging program conducted on the Birkenhead River, and the juvenile and adult surveys conducted there and on the Lillooet River.

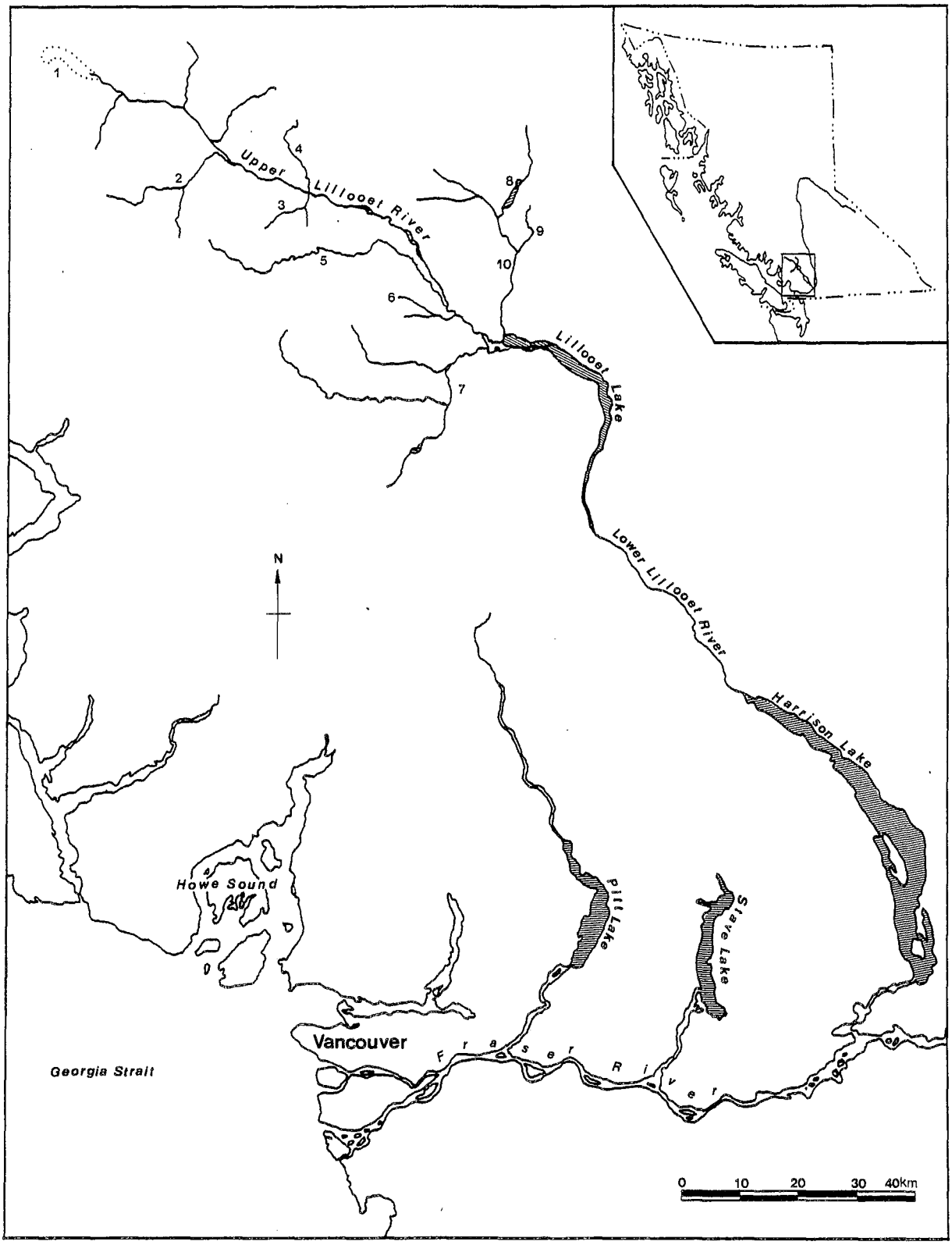


Figure1 Lillooet River System

1. Lillooet Glacier
2. Meager Creek
3. South Creek
4. North Creek
5. Ryan River
6. Miller Creek
7. Green River
8. Birkenhead Lake
9. Poole Creek
10. Birkenhead River

BIOPHYSICAL DESCRIPTION

General Study Area

The Birkenhead and Lillooet rivers rise in the Coast Mountains north of Pemberton (Fig. 1). The Birkenhead flows south to the town of Mt. Currie and then east to the northern end of Lillooet Lake. The Lillooet River flows southeast to Pemberton and then east, emptying into Lillooet Lake one kilometre south of the Birkenhead River outlet. Drainage from Lillooet Lake into the Fraser River is via the lower Lillooet River, Harrison Lake and the Harrison River.

Fishery Resource

Three of the five Pacific salmon species spawn in the Birkenhead and upper Lillooet rivers: coho (*Oncorhynchus kisutch*), sockeye (*O. nerka*), and chinook (*O. tshawytscha*). Escapement estimates for sockeye are available from the International Pacific Salmon Fisheries Commission (IPSFC) and for chinook, from the Department of Fisheries and Oceans (DFO).

Coho arrive in the Birkenhead at the end of September. Spawning begins in late October, peaks in late November and ends in mid January (App. 1). Over the past thirty years, annual coho escapement to the river has ranged from 15,000 fish in 1952 to 750 in 1954 (App. 2). The average escapement for 1977 to 1981 was 2,600 adults to the Birkenhead and 170 to Poole Creek, the major tributary of the Birkenhead.

The total population of Birkenhead River coho cannot be determined at present. No distinguishing tags were applied prior to 1982; therefore, sport and commercial catches at sea cannot be estimated. An Indian Food Fishery conducted at the mouth of the Birkenhead netted 2,318 adult coho between late September and late November. River sport fishing is common but under DFO regulations, anglers may not keep adult coho.

In the Lillooet River system, timing of the coho spawning run varies from stream to stream (App. 1). Estimation of escapement is difficult because much of the system is inaccessible except by microskiff from mid November until Spring and the water remains turbid until December or January. Annual estimates for the whole system have ranged from 19,350 coho in 1952 to 525 in 1957. The average escapement for 1977 to 1981 was 5,500 adults (App. 2).

Other fish species found in the two river systems include residual and anadromous forms of rainbow trout (Salmo gairdneri) and coastal cutthroat trout (S. clarki clarki), Dolly Varden (Salvelinus malma), Rocky Mountain whitefish (Prosopium williamsoni), coast range sculpin (Cottus aleuticus) and river lamprey (Lampetra ayresi).

Birkenhead River

Study Area

The Birkenhead River flows southeast for 54km from Sun God Mountain in the Coast Range to Lillooet Lake (Fig. 1). It drains an area of 596 square kilometres (Brown, 1979). The annual mean discharge, recorded at the town of Mt. Currie, was 23.9cms, measured over a 27 year period ending in 1972. Maximum monthly discharge, in June, averaged 70.7cms while minimum discharge, in March, averaged 7.45cms (Environment Canada, 1980).

A gravel road follows the Birkenhead River between the town of Mt. Currie and Lillooet Lake. Above Mt. Currie, the paved road to D'Arcy provides the main river access, along the west side to Twin Bridges and then follows the east bank to Poole Creek. The upper west bank is followed by a logging road which joins the D'Arcy Road 400 metres southwest of Twin Bridges (Fig. 2 and 3).

Reach Descriptions

Reach 1 extends 7.4km from the mouth of the Birkenhead River to its confluence with "Warbonnet" Creek (Fig. 2). The substrate is alluvial silt, unsuitable for spawning. There is cover for juveniles under overhanging shrubs along both banks, but summer survey catches were poor.

Reach 2 consists of the 2.3km section of the Birkenhead from "Warbonnet" Creek to a wooden bridge spanning the river below Birkenhead Hatchery (Fig. 2 and App. 3). "Warbonnet" Creek is 4km long and has a gradient less than 1%. The substrate of silt, mud and decomposing plants is unsuitable for spawning. Overhanging trees and shrubs and various water plants provide excellent rearing habitat. Unfortunately, only the upper 2km of this productive creek were trapped because access to the 2km on reservation land was denied by the Mt. Currie Indian Band Council. A short side channel of the Birkenhead was also trapped during the tagging program and although the substrate appeared suitable, no adults were seen.

Reach 3, the 5km section from Reach 2 to the rapids .5km downstream of Twin Bridges (Fig. 2) is mainly fast flowing with a boulder substrate and an overall slope less than 2%. Neither rearing nor spawning potential is good in this reach.

Reach 4 extends 2.8km from Reach 3 to a series of rapids 1.3km below Lookout Point (Fig. 2). Throughout the reach, the river flows in a single channel with a gradient of 1%. The substrate is mixed gravel and cobble with boulders in the fast sections. A deep pool below Twin Bridges provides a favourable holding area for coho adults and, while most fish moved on upstream, some spawned there in fine gravel.

Reach 5 is 1.3km long, ending at Lookout Point (Fig. 2 and App. 4). The Birkenhead is fast flowing in a single channel over a cobble and boulder substrate. "Nelson" Slough has a substrate of silt and decomposing plant material. Overhanging trees and instream log debris provide cover for rearing juveniles. Conditions in both river and slough are unsuitable for spawning.

Reach 6 is a .8km section of river between Lookout Point and the mouth of Cool Creek (Fig. 3 and App. 5). Here the river is braided and has a slope less than 1%. The substrate is mainly gravel and cobble. Three creeks enter the west side of the river. "Adam" Creek is 50m long and averages 20cm deep and one metre wide. Although it has gravel

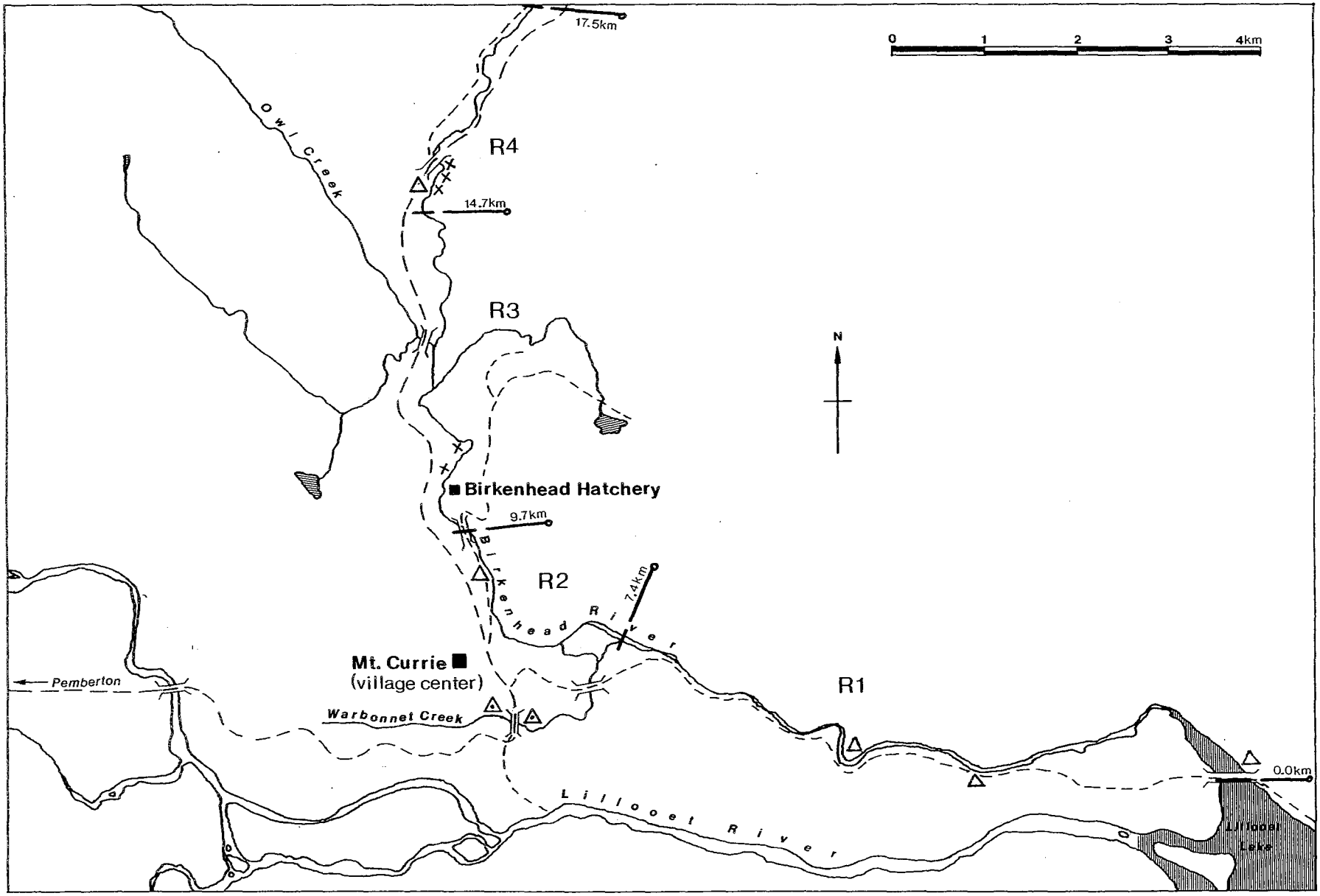


Figure 2 Birkenhead River, Reaches 1 to 4

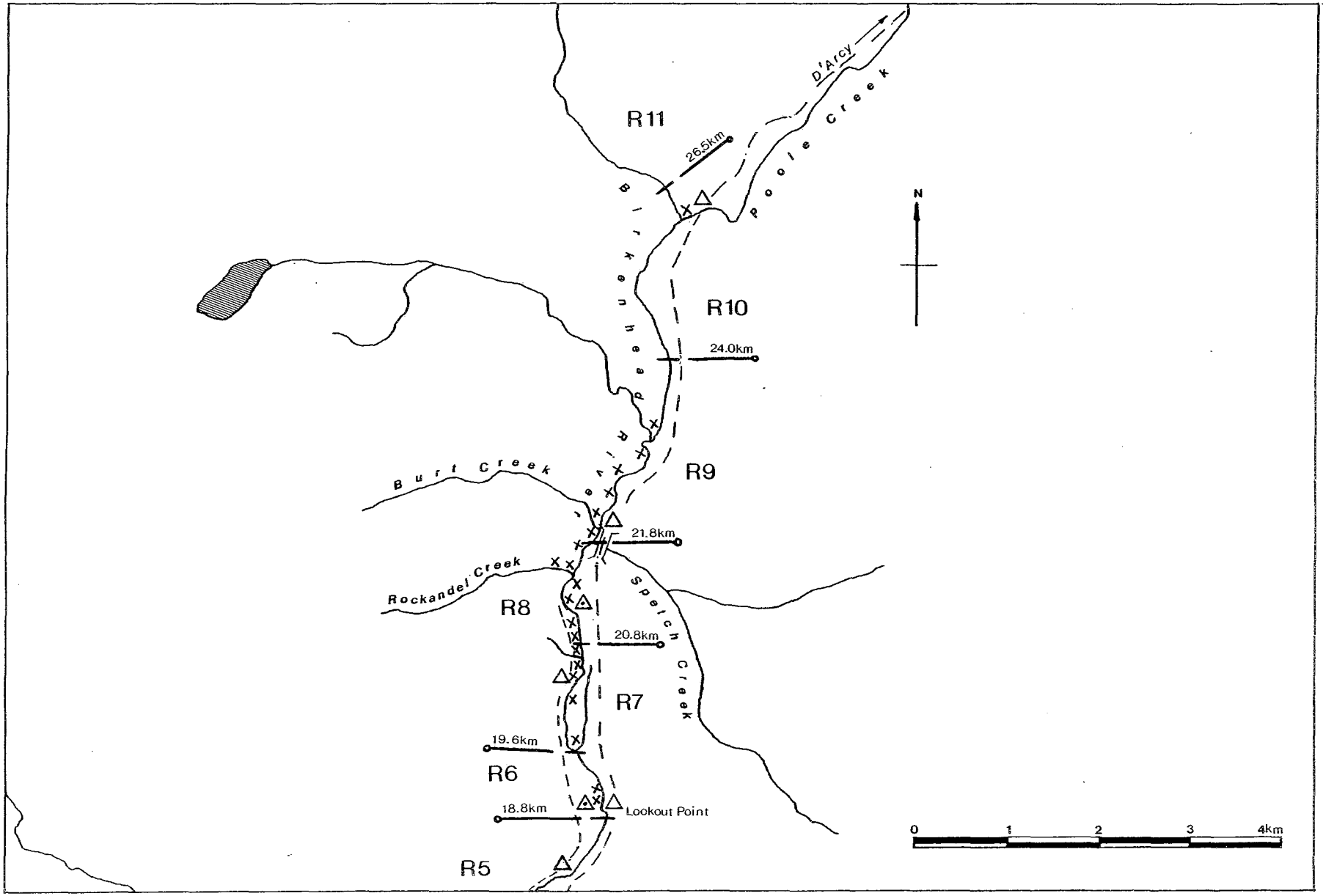


Figure 3 Birkenhead River, Reaches 5 to 11

substrate, no spawners were observed. Overhanging shrubs provide cover for rearing juveniles. "Lantz" Creek is 100m long, two to three metres wide, and up to two metres deep. Its substrate is mainly gravel and cobble, but log jams restrict spawner access to the lower 35 metres. Juvenile rearing habitat is plentiful. "Barb" Creek is the largest of the three, with two main branches totalling 250m. During the survey, average width and depth were 3m and .5m. Substrate in the upper section is silt, changing to gravel in the lower 60 metres where spawning was observed. Log jams, overhanging bushes and deep pools create a productive rearing habitat. Coho also spawn in gravel in side channels on the west side and at the mouth of Cool Creek.

Reach 7 covers the next 1.3km of river upstream of the mouth of Cool Creek. In this reach, the Birkenhead is braided and flows gently over a slope of less than 1%. There are extensive gravel and cobble beds with some boulders in the faster sections. Banks are undercut and there is plenty of instream log debris, especially near the Reach 6 break. Coho spawn in large numbers in all the side channels. Here there are three main creeks: "Fee" Creek is one kilometre long and flows into Reach 6 before seeping under the B.C.R. tracks to join the Birkenhead River. The tracks form a barrier to spawners but some juveniles were found in the upper 300m during the tagging program. Cool Creek is 850m long, averaging one metre wide and .5 metres deep. It has a silt substrate and is overhung with trees and shrubs. Here the water temperature averages $2^{\circ}C$ lower than in the main river, resulting in the name. A log jam 10 metres from the mouth prevents adult but not juvenile passage. "Bussell" Creek, on the west side, is 700m long and averages two to three metres wide and .75 metres deep. The substrate is mainly silt and decomposing plant material in the lower section, changing to silt and gravel above. Overhanging trees and bushes and instream debris provide an excellent habitat for juveniles but no adults were seen in the creek.

Reach 8 extends for one kilometre upstream of Reach 7 to the Spetch Creek confluence (Fig. 3 and App. 7). The river is again braided and has a gentle slope. The substrate is mixed gravel, cobble and boulder, with bushes overhanging the banks. Spawning was observed in the side channels and juveniles were trapped above a beaver dam on the east side. "Rockandel" Creek, on the west side, was found during the adult survey. Its substrate is silt, gravel and cobble, suitable for spawning. Overhanging bushes and instream log debris indicate that this stream may be a productive rearing area.

Reach 9 consists of the 2.2km section of river upstream of the mouth of Spetch Creek (Fig. 3 and App. 8). As in the previous three reaches, the river is braided and has an overall

slope less than 1%. Substrate is mixed gravel and cobble with some boulders. Most of the spawning occurs in a gravel side channel, 200m upstream of Spetch Creek. This channel also produced juveniles, although the only available cover consists of boulders along the east bank. "Burt" Creek, a possible juvenile rearing area on the west side, had almost dried up during the adult survey.

Reach 10 extends 2.5km to the Birkenhead Canyon, and includes Poole Creek (Fig. 3 and App. 9). The Birkenhead is a single, swiftly flowing channel with a boulder substrate except for a section downstream from the Poole Creek confluence, where it splits into three channels. Although there are deep pools where the substrate is cobble and gravel, no coho spawners were seen in this area and no juvenile trapping was undertaken.

Poole Creek is 11km long (Brown, 1979) and averaged two metres wide and .75 metres deep during the survey. In the lower 100m and upstream of the road crossing, the gradient is less than 1% with a slightly faster section between. Substrate is a mixture of silt, gravel and cobble. A two to three metre waterfall and log jam, coupled with ice up to 25cm thick, confined most spawning to the lower 250m of the stream. Instream log debris and overhanging trees and shrubs should provide cover for juveniles, but none were caught during the summer survey. A slough 2km upstream of the mouth appears to be a potential rearing area and should be checked during any subsequent study.

Reach 11 comprises the upper 26.5km of the Birkenhead (Fig. 1). It begins at the canyon, a one kilometre section with a gradient averaging 7%. No spawners of any species have been recorded above this area. Above the canyon, the slope is less steep, ranging from 1% to 5%, with a gravel and cobble substrate. The only easily accessible area 5km upstream of the canyon was checked, and no evidence of spawners was found.

Upper Lillooet River

Study Area

Meltwater from Lillooet Glacier in the Coast Range forms the source of the Lillooet River (Fig. 1). The river flows southeast through mountainous wooded areas for the first 70km growing steadily larger as many glacier-fed streams join it. For the next 30km, the river flows south through farmlands to the town of Pemberton. It then turns east and flows for 13km

before entering Lillooet Lake, one kilometre south of the Birkenhead River outlet.

The total length of the Lillooet is 113km, and it drains an area of 6,475 square kilometres (Brown, 1979). The mean annual discharge, recorded at Pemberton, has been 126cms over the last 60 years. The maximum monthly discharge, usually occurring in July, averages 316cms, while the minimum monthly discharge, occurring in February, averages 30cms (Environment Canada, 1980).

Access to the Lillooet system northwest of Pemberton is via the Pemberton Meadows Road. This road is paved for 25km to the Salmon Creek Bridge, and then continues unpaved on the south side to Meager Creek (Fig. 4 and 5). Just upstream of Salmon Creek, a single-lane logging bridge spans the Lillooet River. From this bridge, another gravel road follows the north side of the Lillooet River, recrossing the river above the outlet of Meager Creek, and continues up to the Meager Creek hot springs.

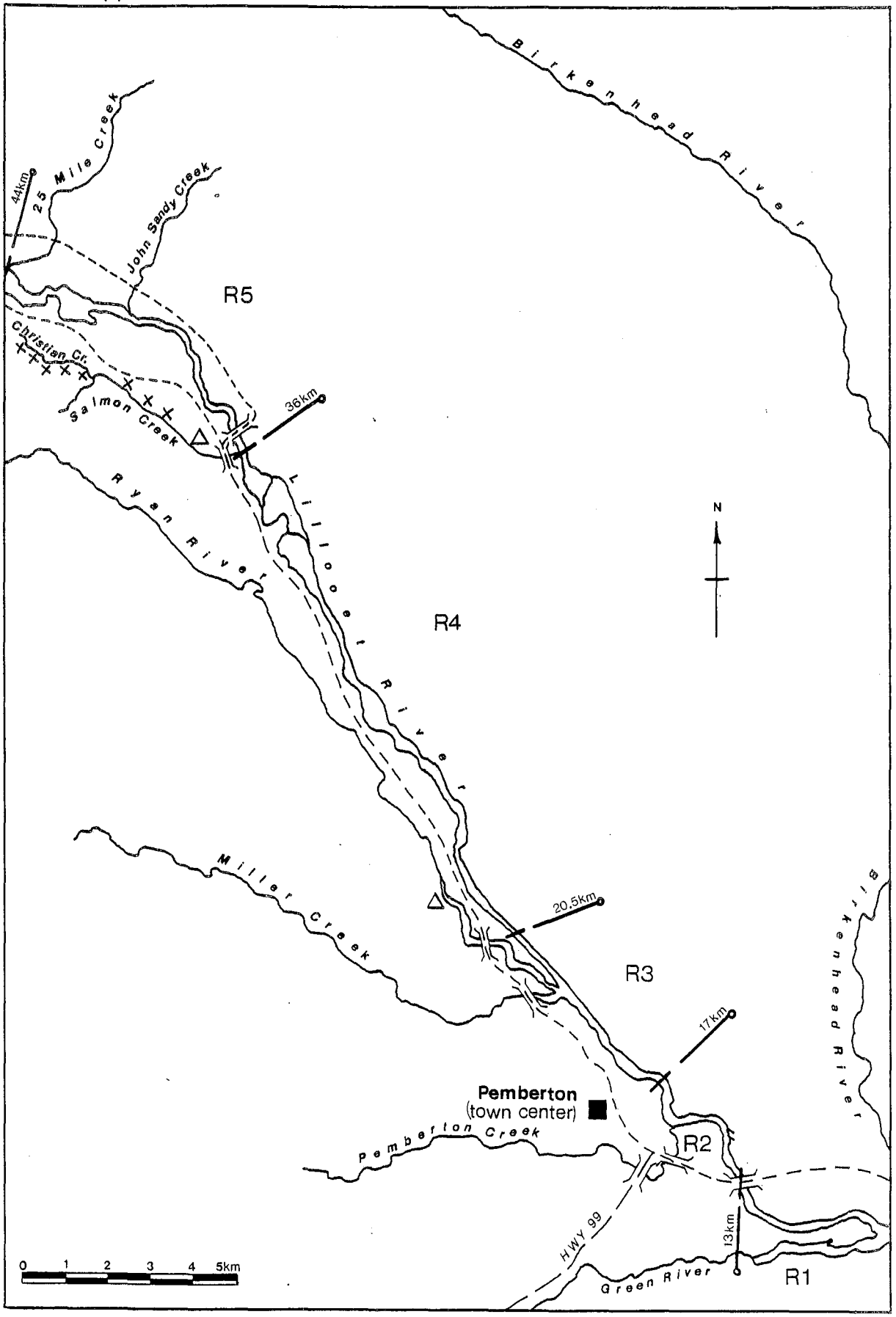
Reach Descriptions

Reach 1 extends for 13km from the mouth of the Lillooet River to the Pemberton/Mt. Currie road crossing and the mouth of Green River (Fig. 4). The river here is 75m wide and very silty, and was still not clear by January in the winter of 1982/83. Most of this reach is in the Mt. Currie Indian Reserve and, therefore, was not surveyed.

Reach 2, the four kilometre section of river upstream of Reach 1, includes the Green River and Pemberton Creek (Fig. 4). The Lillooet River is as described in Reach 1: 75m wide and turbid, with a mud bottom showing along either bank at low water levels. Green River rises at Green Lake and flows north for 26km, joining the Lillooet River 13km upstream of Lillooet Lake. It drains an area of 855 square kilometres (Brown, 1979). The annual discharge, measured at Pemberton over a 38 year period ending in 1951, was 48cms. Maximum monthly discharge, which usually occurred in June, averaged 112cms, while minimum monthly discharge, usually in February, averaged 12.8cms. The lower kilometre of the Green was checked during the summer survey and found to be 25m wide and opaque. Seven kilometres upstream of the mouth, the Nairn Falls form a block to further salmon passage.

Pemberton Creek, in Reach 2, rises at Ipsoot Mountain and flows east for 13km, passing through the town of Pemberton before joining the Lillooet River. The lower three kilometres

Figure 4 Upper Lillooet River, Reaches 1 to 5



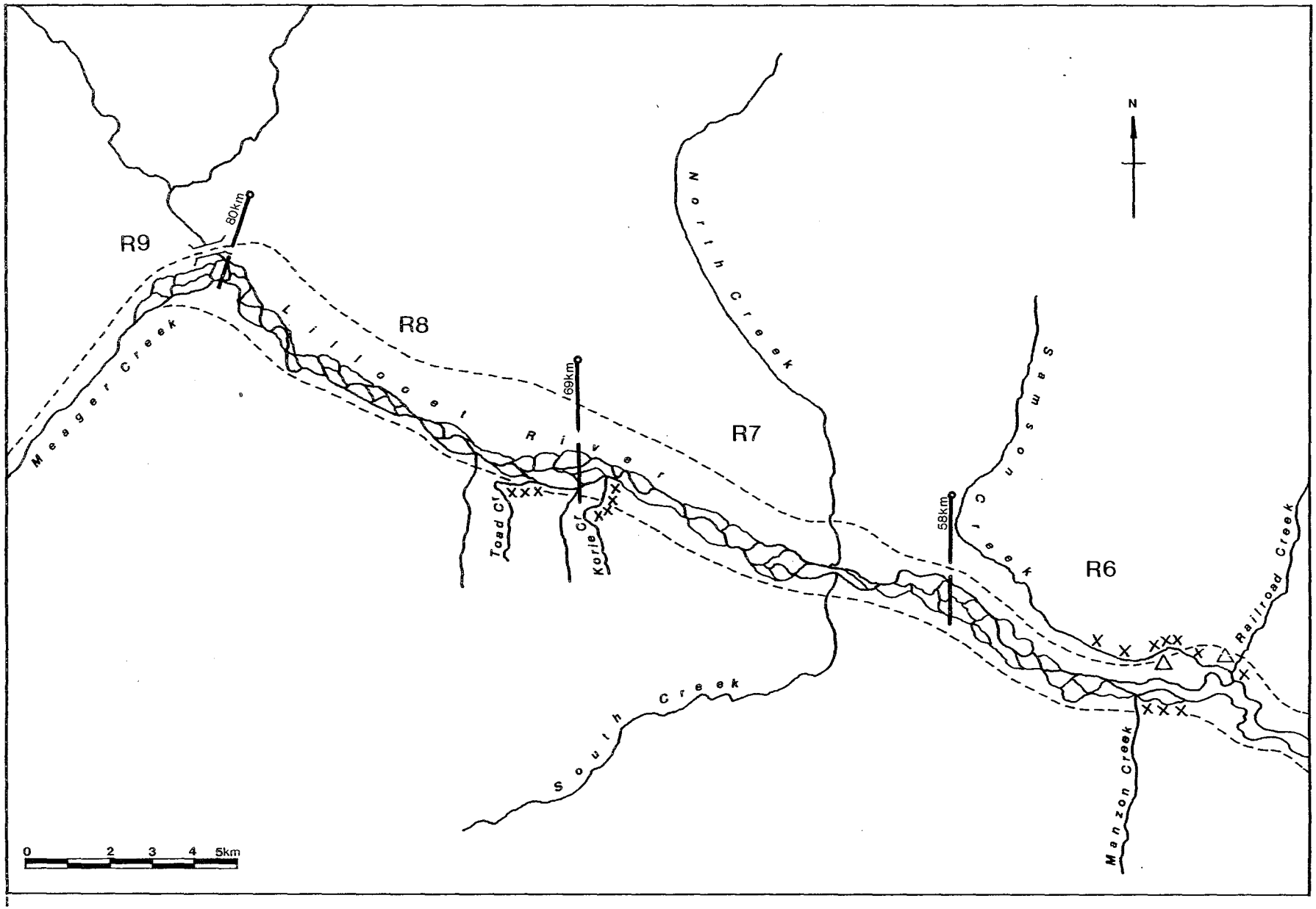


Figure 5 Upper Lillooet River, Reaches 6 to 9

have been dredged and dyked, leaving unprotected banks and a boulder and cobble substrate. Above the dredged section, the gradient increases to 13%. When surveyed in December, the lower section was partly frozen over with anchor ice in the middle. No spawning or rearing coho were seen.

Reach 3 covers the 3.5km from Reach 2 to the Ryan River Bridge (Fig. 4). Again, the Lillooet is 75m wide and heavy with silt for much of the year. The only tributary in this reach, 15km long Miller Creek, has been dyked and dredged, leaving it with a boulder substrate and unprotected banks. The gradient is quite steep, 3% in the lower two kilometres, rising to 13% in the next six kilometres. During the winter survey, the lower section of the creek was frozen over; neither spawning nor rearing coho were seen.

Reach 4 extends from the Ryan River Bridge 15.5km upstream to the mouth of Salmon Creek (Fig. 4). This reach was not fully surveyed, but at the Lillooet bridge crossing, the river was 70m wide and opaque with silt, even in mid December. A slough 13km upstream of Reach 3 has a substrate of mud and decomposing plants, and was frozen over during the winter. No rearing juveniles were trapped during the summer survey. The Ryan is the largest tributary in the upper Lillooet system, with a length of 58km. The lower three kilometres have been dredged and dyked, and are 25m wide. This section was frozen over during the adult survey. A side slough one kilometre upstream of the bridge has a substrate of mud and decomposing plant material, and is overhung with grasses and shrubs. At the Valleau Road Bridge, 15km upstream of the Ryan/Lillooet confluence, the gradient is 2% and the substrate is mixed gravel, cobble and boulder. Juvenile traps were set only in the side slough, with poor results. No juveniles or adults were seen in the section below the Valleau Road bridge.

Reach 5 consists of the eight kilometre section from the Salmon/Lillooet confluence to the mouth of 25 Mile Creek (Fig. 4). The Lillooet was not surveyed in this reach. Salmon Creek, also known as Salmon Slough, is six kilometres long and averages two metres wide and one metre deep. Its gradient is less than 1% except in the upper .5km, where it is 30%. The substrate consists of silt in the lower two kilometres, with gravel and cobble above. Stream banks are undercut and have overhanging trees and shrubs. Trapping near the road crossing yielded no coho but Bob Lawrence, the B. C. Department of the Environment Conservation Officer in the area, has seen juvenile coho further upstream. During the adult survey, the lower section of the creek was frozen over and covered with snow. A 500m section, three kilometres upstream of the mouth was walked, and adult coho were seen through the ice.

A tributary, Christian Creek, joins Salmon Creek .5km below its source (Fig. 4). It is 1.5km long and averages 1.5m wide and 1m deep. The water flows over a gently sloping bottom which consists of silt and gravel. Bushes and trees growing on either bank meet overhead, forming a protective screen. During the adult survey, there was no ice formation and the creek was full of spawning coho. No juvenile surveying was done, but rearing potential appears good.

On the north side of Reach 5, John Sandy Creek and 25 Mile Creek are reported by Fisheries Officers to support spawning. In both cases, the spawning areas are downstream of the road one to two kilometres, and heavy snow hindered access. The lower section of 25 Mile Creek was viewed from a small bridge during a reconnaissance trip in December with Bob Lawrence. It is two metres wide, with a gradient of less than 1%, and with overhanging vegetation. There appears to be potential for both spawning and rearing.

Reach 6 extends for 14km to the end of Salmon Creek. (Fig. 5). A one kilometre long side channel at the mouth of "Manzon" Creek has a gradient of less than 1%, with a gravel and cobble substrate. Stream banks in the upper section have overhanging vegetation, but the lower section has exposed cobble banks. Some coho were seen spawning in the side channel, but not in "Manzon" Creek. Samson Creek is a 14.5km tributary of Railroad Creek. The lower 8.5km has a gradient of less than 1% while the upper 6km section has a 20% gradient. In the section surveyed .5km up and downstream of the road crossing, the streambed consists of mixed mud, gravel and cobble. The creek is characterized by instream vegetation and log debris, undercut banks and overhanging shrubs. During the juvenile survey, the best catches in the Lillooet system were obtained in this creek. It is also a well used spawning area. Railroad Creek escapement estimates include those from Samson Creek (App. 2). Railroad Creek itself is too steep for spawning (20% gradient) above its lowest kilometre.

Reach 6 formed the upper limit of juvenile surveying, due to lack of time. Adult surveying on the north side of the Lillooet was also limited to this reach by heavy snow.

Reach 7, the next 11km of the Lillooet, includes North, South and "Korie" creeks (Fig. 5). The Lillooet was not surveyed in this reach. North and South creeks have gradients of 4% and 8% in their lower sections, unsuitable for either spawning or rearing. "Korie" Creek is 3.3km long, of which 700m were surveyed. In this section, the slope was less than 1% and the substrate was mixed silt,

gravel and cobble. Above the road, the streambanks have overhanging shrubs, but below they are grassy. Adults were abundant and there is potential for juvenile rearing.

Reach 8 is eleven kilometres long, ending at the Meager Creek/Lillooet River confluence (Fig. 5). There are numerous creeks and side channels in this reach, but only "Toad" Creek, nine kilometres downstream of Meager, was surveyed. It is 3.5km long, with a gradient of less than 1% in its lower section. Mixed silt, gravel and cobble made up the substrate. Adult coho and potential rearing habitat were noted in the 300m section surveyed.

Reach 9 extends 33km from the mouth of Meager Creek to the Lillooet River source (Fig. 1 and 5). This reach was not surveyed, due to lack of time during the summer and impassable snows during the winter. No spawning has been reported for Meager Creek or any tributary upstream of it, possibly due to inaccessibility rather than to the lack of spawning.

METHODS

Summer Survey

The Birkenhead and Lillooet rivers were surveyed for juvenile coho between August 17th and 25th, 1982. Fine-meshed Gee's minnow traps were baited with salmon roe, and set for two to four hours in potential rearing areas. All fish were removed from the traps, identified and counted. Nose-fork lengths, eye diameters and average weights were measured and scales were taken from up to 50 coho in each area.

Juvenile Tagging

Juvenile coho were trapped and tagged in the Birkenhead between September 15th and November 19th, 1982. Using information collected during the survey, the river was divided into 11 reaches. 'A' and 'B' refer to the east and west sides, which were trapped separately. Gee's minnow traps were baited with salmon roe and set around log jams and under overhanging banks in each reach. These traps were collected at least once, but usually twice daily. Juvenile coho were transported to holding sites while other species were identified, counted and released.

Juvenile coho were tagged as described in Armstrong and Argue, 1977. Using information on age and eye diameter gathered during the summer survey, the fish were separated into underyearling or 0+ fry (those with eye diameters of 5.5mm or less), and overwintering or 1+ fry (those with eye diameters greater than 5.5mm). After anaesthetizing the fish with MS-222 (tricane methane sulfonate), fry under 45mm long were released, and 0+ coho were adipose fin-clipped and tagged with code 2-22-9. Fry aged 1+ were assigned code 2-23-26.

The tagged fish were held for one to six days and then released throughout each reach to avoid excessive predation and intraspecies competition. During each day's tagging, samples of up to 350 fish were set aside from each age group. These samples were checked after 24 to 72 hours for tag retention, quality of fin-clipping, post-tag mortality, and incidence of disease and anomalies.

Sampling in each reach included 50 age 0+ fry over 45mm in length, 50 age 1+ fry, and 100 fry of mixed ages and sizes. Nose-fork lengths and eye diameters were measured on each fish, and they were then weighed in groups of 25. Scales taken from both sides of each fish were sent to the lab for age determination.

During the trapping program, some coho were recovered which had been tagged earlier in the Fall. These fish were counted and tag retention checked.

Petersen checks were used in an effort to determine the juvenile coho population. Five to 11 days after fish had been released, fine-meshed minnow traps were set. Coho were removed from the traps and checked for presence or absence of the adipose fin.

Daily minimum and maximum water temperatures were taken between August 18th, 1982 and January 10th, 1983, with a thermograph installed by IPSFC 100m upstream of Twin Bridges on the Birkenhead. Spot water temperatures were also taken to ensure that fish did not suffer temperature shock when transported from one area to another.

Winter Survey

Additional juvenile studies were conducted on November 30th, 1982 and from January 6th to 8th, 1983. Traps were set in "Warbonnet" Creek, Reach 6 and Reach 8. The trapped coho were sampled as described above and checked for presence or absence of adipose fins.

RESULTS AND DISCUSSION

Birkenhead River

Summer Survey

Trapping over a five day period produced 512 coho, 34.4% in Reach 8 (App. 10). Only two other species were caught, Dolly Varden and Cottus aleuticus (App. 13). A total of 291 coho were sampled; 278 scales were readable of which 94.2% were underyearling or 0+, and 5.8% were overwintering fry or 1+ (App. 17 and 18). Average length and eye diameter of 0+ fry ranged from 49.8mm and 4.0mm in Reach 5 to 74.1mm and 5.2mm in "Warbonnet" Creek in Reach 2. Few 1+ fry were trapped in any part of the river. Ten caught in Reach 7B had an average length and eye diameter of 83.2mm and 6.2mm.

Juvenile Tagging

The total coho catch during the tagging program was estimated at 55,535 (App. 11). Reach 7, where the largest number of spawning coho were seen, produced 55% of the total catch. Other species consisted mainly of salmonids and some sculpins, caught only in Reach 2, and river lamprey (App. 13).

Coded-wire tag code 2-22-9 was applied to 44,875 underyearlings. After correction for post-tag mortalities and tag loss, the number released was 44,530 (App. 14). A total of

3,534 fry thought to be 1+ were released with code 2-23-26 (App. 15). Scale analysis later showed that only 59.7% of these were 1+ and the other 40.3%, 0+. The actual numbers of of 0+ and 1+ fish released with the two tag codes are shown in Table 1.

Table 1: Revised Information
Coho Tagged and Released

Tag Code	Tagged Fish Released	
	0+	1+
2-22-9	44,530	
2-23-26	1,424	2,110
TOTAL	45,954	2,110

Biological sampling revealed a large variation in size from reach to reach (App. 17 and 18). In the 0+ fry, the smallest average length, 49.2mm, was measured in Reach 7B while the largest, 74.0mm, was measured in "Warbonnet" Creek. These figures do not include those fish tagged as 1+ but later found to be 0+ because they had been separated out by size. The smallest average eye diameter was 4.1mm in Reach 7A, and the largest was 5.2mm in "Warbonnet" Creek. In the 1+ fry, the smallest average length was 82.6mm in Reach 7B while the largest was 102.0mm in Reach 7A. The smallest eye diameter, 6.5mm, occurred in Reach 5, and the largest, 6.8mm, in Reach 7A.

Pre-tag mortalities amounted to 189 coho, with another 200 after tagging (App. 14 and 15). Most of the post-tagging mortalities occurred over one weekend due to placement of a holding pen.

Tag loss checked 24 hours after tagging was .4% for 0+ and .2% for 1+ fish (App. 14 and 15). The few checks made 48 to 72 hours after tagging showed no loss. Among the 0+ and 1+ fry checked, the quality of 2.1% and 2.7% of adipose fin clips was considered unsatisfactory (App. 16).

Diseases and anomalies were also noted during tag retention checks (App. 16). Nose abrasion was the main problem, occurring in 4.4% of all fish checked. Other anomalies occurred at a rate of less than 2%. Only 26 fish were released untagged due to severe disease or damage.

Recaptured tagged coho were checked for tag loss. The average loss for 0+ fry was 1.7%, while in the small sample of 1+ fry, it was 7.7% (App. 14 and 15). These fish were recaptured from one to nine weeks after tagging, and could have migrated several kilometres during that time.

Results of Petersen checks made after tagging cannot be used to determine the total juvenile coho population in the river, although they indicate trapping efficiency in some reaches. Electro-shocking in closed off areas and further study is necessary before attempting an estimate.

Those areas with the highest proportion of tagged coho, such as Reach 6 (86.1%), Cool Creek in Reach 7A (81%) and Reach 8 (90.5%), were not open to easy fish migration (App. 12). Traps set in open side channels in Reach 9 and the rest of Reach 7A resulted in catches of only 49.6% and 49.4% tagged fish.

Minimum daily water temperatures in the Birkenhead during the juvenile program ranged from 12°C in August to 1.5°C in November. Maximum temperatures ranged from 16°C to 3°C. Appendix 17 lists minimum, maximum and mean water temperatures from August 18th, 1982 to January 10th, 1983. Water temperatures taken by hand differed by no more than 2°C in areas where fish were transported (App. 11).

Winter Survey

Some surveying for overwintering fry was conducted in late November, 1982 and January, 1983. On November 30th, 182 coho were caught; 69.8% were recaptures. In January, 397 were caught; 53.4% were recaptures (App. 12). The difference in catch per trap-hour for the two "Warbonnet" Creek samples reflects a much shorter set time in November than in December. In the Chilliwack River system, trap efficiency decreased with set time after a few hours (Fedorenko, 1982).

A total of 150 coho were sampled, 100 from "Warbonnet" Creek. Scale samples were readable from 128 fish; 98.4% were 1+ and 1.6% were 2+. Average lengths, weights and eye diameters appear in App. 17 and 18. No change in size was discernible from August, 1982 to January, 1983.

Lillooet River

Summer Survey

Traps were set in four reaches of the Lillooet River, resulting in a catch of only 21 coho, 18 in Samson Creek in Reach 7 (App. 20). One sculpin was also caught.

The fish sampled in Reach 4 and 7 averaged 65.3mm and 53.4mm, and had average eye diameters of 4.8mm and 4.2mm (App. 21). All 21 scale samples were read as 0+.

Water temperatures, taken by hand, were 13°C in the morning and 16°C in the afternoon on August 24th (App. 20).

CONCLUSIONS AND RECOMMENDATIONS

Birkenhead River

The Birkenhead is a highly productive river that is fairly easily surveyed. It would be useful to continue the juvenile tagging program here since it can be used as an indicator stream for the rest of the Upper Lillooet system which is less accessible. Any further juvenile tagging program should take the following recommendations into account:

1) Trapping should begin in early August since freeze-up could be a problem in some areas by late October. In mid-August, 1982, most juvenile coho were over the 45mm minimum tagging size.

2) Efforts should be made to gain permission to trap on the Mt. Currie Indian Reservation, especially in "Warbonnet" Creek. The best way to approach the problem may be through Rodger Stewart, Fishery Biologist for the Central Indian Tribal Council.

Lillooet River

Trapping results in the Lillooet system during the summer survey were very poor. Production for the system as a whole may be high but the rearing juveniles are spread out over a very large area. A Fall juvenile tagging program of less than three months duration would require two trapping crews, one on each side of the river, and a mobile tagging crew.

METHODS

Enumeration of spawning coho in the Birkenhead commenced November 1st, 1982 with sporadic checks during breaks in juvenile trapping. After the juvenile program ended, the river was surveyed on a regular basis, usually three times a week, from November 29th to December 21st. Two crews of two people walked the reaches, moving upstream on the river banks where possible to avoid disturbing spawning fish. Live fish were counted, and all obtainable fish dead pitched. Those that were not too badly decomposed were sampled. A final check was made from January 6th to 8th, 1983.

No work was done in the Upper Lillooet system until the end of the juvenile tagging program. The crew checked several areas in December but due to time restrictions, these areas were surveyed only once each. Live and dead coho were counted and sampled as in the Birkenhead.

Coho carcasses were checked first for condition and then sampled if not too badly decomposed. The post orbital hypural lengths (POHL) were measured to the nearest millimetre. Where possible, five scales were taken from each side of the fish for later age determination. The sex of each fish was determined and spawning success in females was estimated. When sampling was completed, the carcasses were cut in two to prevent resampling.

RESULTS AND DISCUSSION

Birkenhead River

Population Size, Timing and Distribution

Coho first entered the river at the end of September. They were caught in the Indian Food Fishery at the mouth of the Birkenhead in the week ending October 3rd, 1982.

Approximately 60% of the spawning area was surveyed, and an estimated 20% of the spawners in this area were recovered. The cumulative dead and final live count was 236 coho (App. 20). Using this figure, divided by the estimated dead pitch success and spawning area covered, an escapement of 2,000 coho to the Birkenhead River system was determined. DFO escapement estimates for 1982 are listed in App. 2.

Spawning began in late October, and the first carcasses were sampled November 2nd. Peak live and dead counts indicated that peak spawning occurred approximately the end of November to the beginning of December. During the final survey from January 6th to 8th, 1983, 23 live fish were counted. Spawning apparently continues until at least mid January.

Coho were observed from Reach 3 to Reach 10, but 35.6% of them were in Reach 7 (Table 2). In Poole Creek, Reach 10, spawning was mostly limited to the lower .5km because of a log jam and ice formation.

Table 2: Birkenhead River Spawning Distribution

Coho Observed	Birkenhead River Reaches							
	3	4	6	7	8	9	10	TOTAL
N	3	39	19	84	44	22	25	236
%	1.3	16.5	8.1	34.6	18.6	9.3	10.6	

Age, Length, Sex and Spawning Success

Scale samples were taken from 100 coho, of which 91 were readable. One male was 2 sub 2 and one female was 4 sub 3, but 97.8% were 3 sub 2. Average lengths for males and females were 47.7cm and 54.1cm (Table 3). Of 110 coho whose sex was determined, 53.6% were male and 46.4% were female. When checked for spawning success, 43 females were spawned out, four were 50% spawned and two had not spawned before dying (App. 23).

Lillooet River

Population Size, Timing and Distribution

Peak spawning was finished before the crew began working and each area was surveyed only once; therefore, escapement estimates for the Upper Lillooet system were not made. Data for live coho and carcass recoveries are presented in App. 24.

Timing is also difficult to determine. Peak spawning was over before the crew began working in the Lillooet. There were few live fish left in early to mid December; therefore, spawning probably finishes by the end of December. Timing estimated in past years by Fisheries Officers is listed in Appendix 1.

Most of the spawning appeared to take place in Reach 5 (37.7%) and Reach 6 (35.1%), but the survey was not extensive enough to form an accurate picture of distribution in the system (Table 4).

Table 3: Summary of Birkenhead River Adult Coho
Age, Length and Sex Composition

Age Class	Sex	Length Distribution 25.1-30.0 n	%	30.1-35.0 n	%	35.1-40.0 n	%	40.1-45.0 n	%	45.1-50.0 n	%	50.1-55.0 n	%	55.1-60.0 n	%	60.1-65.0 n	%	Sub-Total n	%	Total n	%
2/2	M	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1		
	F	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
3/2	M	0	0	5	5	4	4	7	7	7	7	10	10	9	9	3	3	45	45		
	F	0	0	0	0	2	2	2	2	1	1	15	15	23	23	1	1	44	44	89	89
4/3	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	F	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	1	1
R	M	0	0	1	1	0	0	2	2	0	0	0	0	1	1	0	0	4	4		
	F	0	0	0	0	0	0	1	1	0	0	1	1	1	1	2	2	5	5	9	9
Sub-Total	M	1	1	6	6	4	4	9	9	7	7	10	10	10	10	3	3	50	50		
	F	0	0	0	0	2	2	3	3	1	1	16	16	25	25	3	3	50	50		
TOTAL		1	1	6	6	6	6	12	12	8	8	26	26	35	35	6	6			100	100

Table 4: Lillooet River Spawning Distribution

Coho Observed	Lillooet River Reaches							
	2	3	4	5	6	7	8	TOTAL
N	0	0	0	29	27	19	2	77
%	0	0	0	37.7	35.1	24.7	2.6	

Age, Length, Sex and Spawning Success

Scale samples were taken from 52 coho, and 48 were readable. Of these, 40 were age 3 sub 2 and eight were 4 sub 3, a higher proportion of the older age group than was found in the Birkenhead. Lengths of males and females averaged 48.2cm and 54.0cm (Table 5). A total of 53 fish were dead pitched; 28 were male and 25 were female. The females were all checked for spawning success and 24 were spawned out, while one had not spawned (App. 25).

Table 5: Summary of Lillooet River Adult Coho
Age, Length and Sex Composition

Age Class	Sex	Length Distribution 35.1-40.0 n	%	40.1-45.0 n	%	45.1-50.0 n	%	50.1-55.0 n	%	55.1-60.0 n	%	60.1-65.0 n	%	Sub-Total n	%	Total n	%
3/2	M	2	3.8	6	11.5	6	11.5	3	5.8	2	3.8	1	1.9	20	38.5		
	F	1	1.9	0	0.0	2	3.8	9	17.3	8	15.4	0	0.0	20	38.5	40	76.9
4/3	M	0	0.0	0	0.0	1	1.9	2	3.8	0	0.0	0	0.0	3	5.8		
	F	0	0.0	0	0.0	0	0.0	2	3.8	3	5.8	0	0.0	5	9.6	8	15.4
R	M	1	1.9	0	0.0	2	3.8	0	0.0	1	1.9	0	0.0	4	7.7		
	F	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	4	7.7
Sub-Total	M	3	5.8	6	11.5	9	17.3	5	9.6	3	5.8	1	1.9	27	51.9		
	F	1	1.9	0	0.0	2	3.8	11	21.2	11	21.2	0	0.0	25	48.1		
TOTAL		4	7.7	6	11.5	11	21.2	16	30.8	14	26.9	1	1.9			52	100

CONCLUSIONS AND RECOMMENDATIONS

Birkenhead River

An efficient adult coho survey could be carried out on the Birkenhead. All areas are easily accessible during low discharge and the water is very clear. Surveying should commence in early October and continue to mid January. Petersen tagging is probably feasible since spawners could be caught and tagged in several holding areas, particularly at the large pool at Twin Bridges, downstream of the main spawning grounds. Some clearance of log jams, especially on Poole Creek, would increase the available spawning area.

Lillooet River

Size and poor access make this system more difficult than the Birkenhead to survey for adult coho. Trail clearing and the use of equipment such as snowmobiles and snowshoes would facilitate access. Surveying should run from late September to late December. Petersen tagging would be almost impossible because the water remains turbid until December or later.

INDEX OF APPENDICES

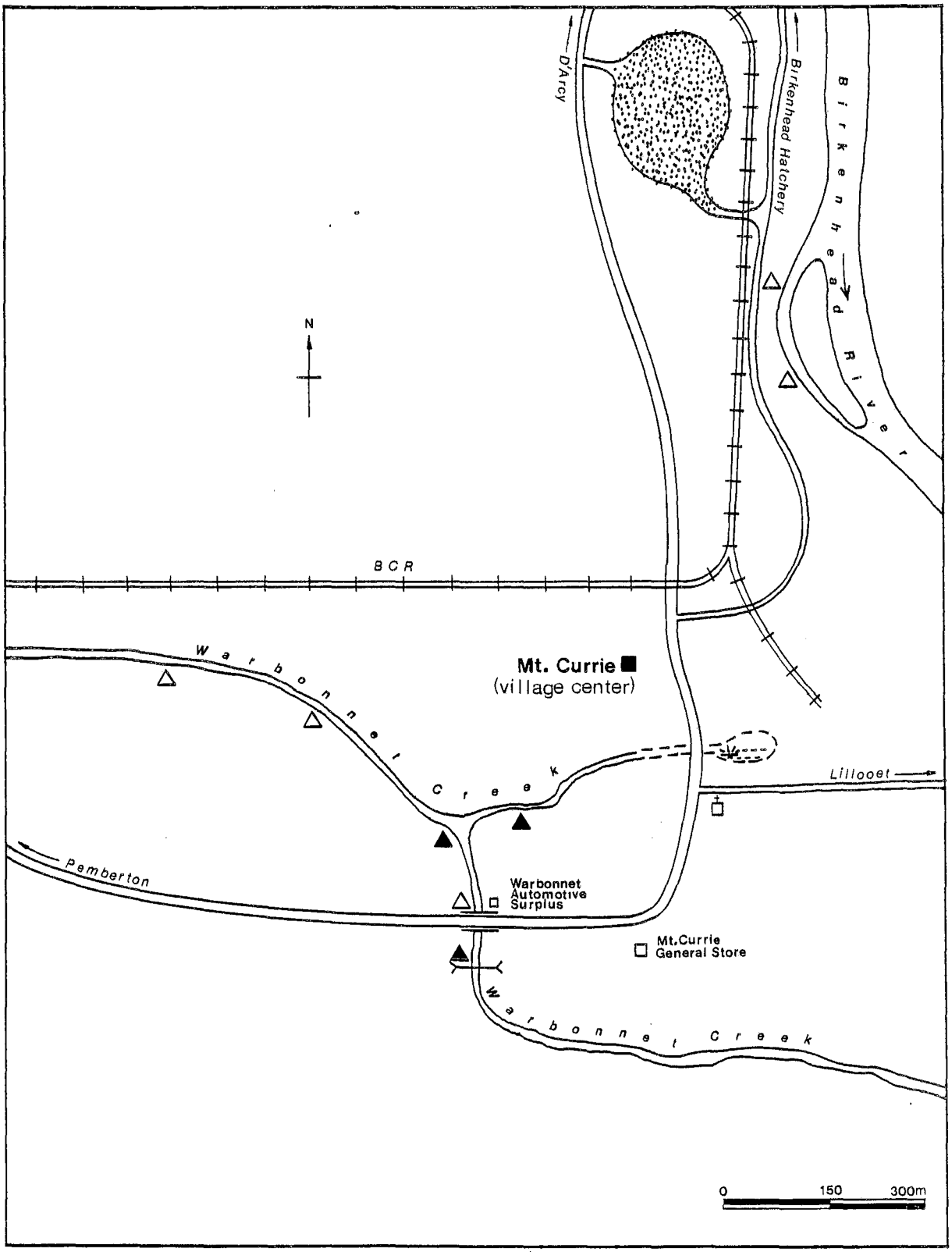
Appendix 1: Timing of Coho Spawning in the Upper Lillooet River System (Brown, 1979 unless otherwise noted)

Timing	Birkenhead River	Green River	John Sandy Creek	Lillooet River	Miller Creek	Pember-ton Cr.	Rail-road Creek	Ryan River	Salmon Slough	25 Mile Creek
Arrival	End Sept.[1]	Early Oct.	Oct.	Oct.	Early Oct.	Late Oct.	Oct.	Mid Oct.	Oct.	Oct.
Start	Late Oct.[1]	Mid Oct.	Nov.	Oct.	Oct.	Mid Nov.	Nov.	Mid Nov.	Nov.	Nov.
Peak	End Nov./ Mid Dec.[1]	Late Oct.	Dec.	End Nov./ Early Dec.[1]	Nov.	Early Dec.	Early Dec.[1]	Mid Dec.	Early Dec.[1]	Dec.
End	Mid Jan.[1]	Late Nov.	Jan.	Dec.	Dec.	Mid Dec.[1]	Jan.	Early Jan.	Jan.	Jan.

[1]Timing data from 1982/83 dead pitch conducted on Birkenhead and Lillooet Rivers

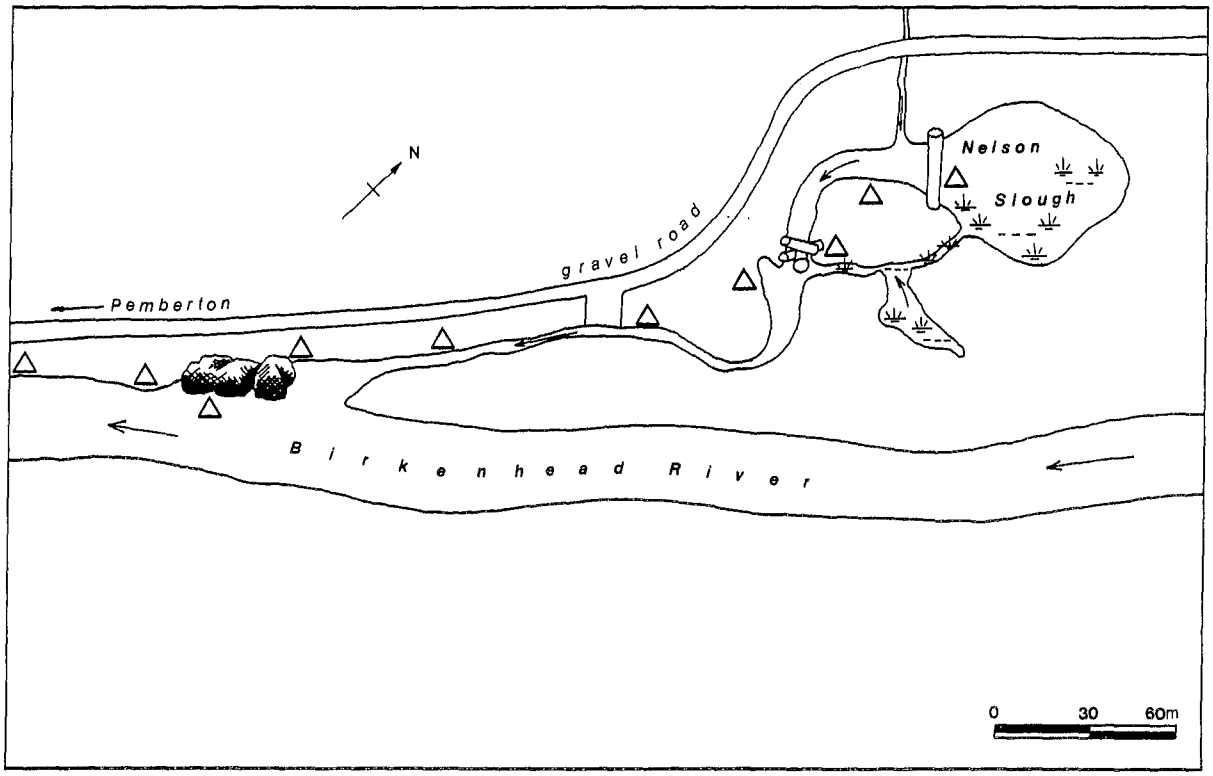
Appendix 2: Coho Escapement to the Upper Lillooet River System 1951 to 1982

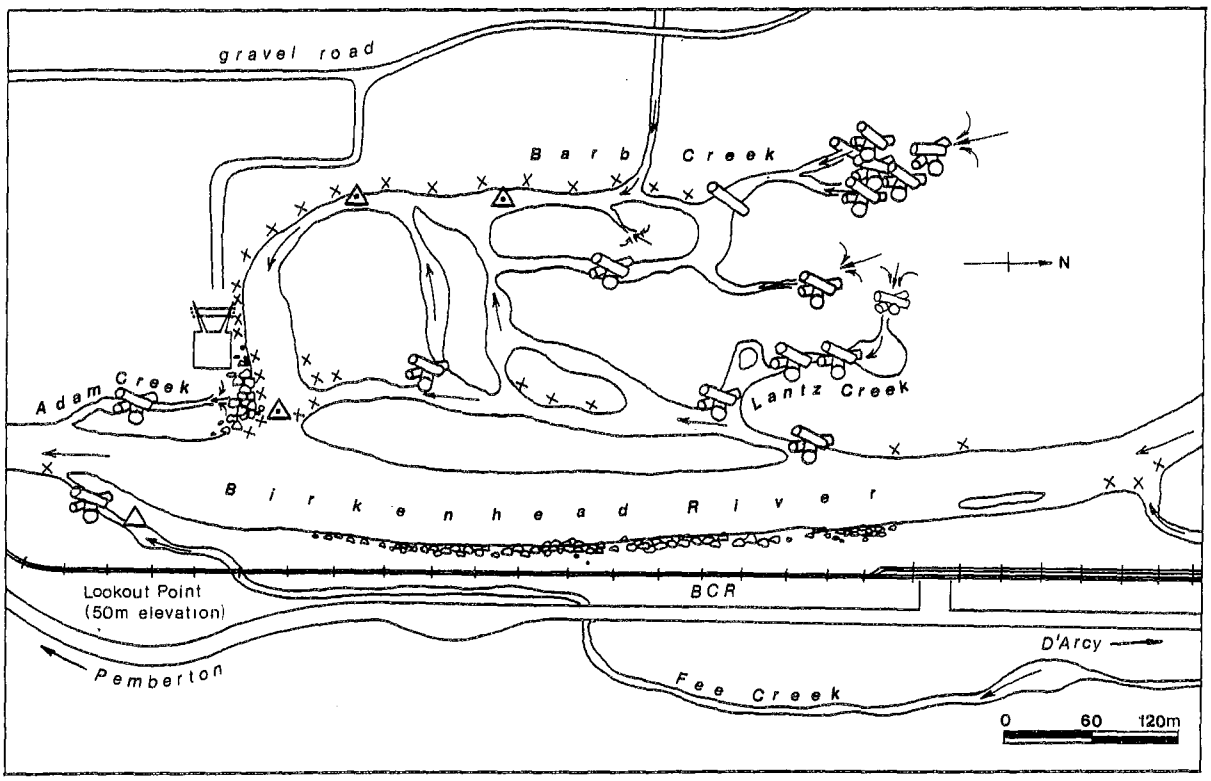
YEAR	BIRKEN HEAD R	GREEN R	JOHN SANDY R	LIL-LOOET R	MC-KENZIE R	MILLER CR	PEM-BERTON CR	POOLE CR	RAIL ROAD CR	RYAN CR	SALMON SLOUGH	TWENTY FIVE MILE CR	TOTAL
1951	7500	25	N/R	7500	N/0	25	25	750	N/R	75	25	N/R	15925
1952	15000	25	N/R	15000	400	200	25	750	N/R	3500	200	N/R	35100
1953	3500	25	N/R	1500	N/0	25	25	200	N/R	200	400	N/R	5875
1954	750	400	N/R	200	75	75	25	75	N/0	200	200	N/R	2000
1955	1500	200	N/R	25	25	25	25	200	N/0	200	75	N/R	2275
1956	3500	25	N/R	200	N/0	25	N/0	25	25	25	25	25	3875
1957	1500	25	N/R	200	25	25	N/0	50	25	25	200	N/R	2075
1958	2000	75	25	75	25	25	25	75	25	200	75	25	2650
1959	2000	75	N/R	75	N/0	25	25	25	25	200	200	N/R	2650
1960	3500	200	25	200	25	25	25	25	25	200	75	75	4400
1961	2500	750	N/0	75	25	PRES	25	75	25	400	75	75	4025
1962	2500	750	N/0	400	N/0	25	25	75	75	400	75	200	4525
1963	3500	400	N/0	750	N/0	N/0	25	75	25	400	75	75	5325
1964	3500	400	75	75	N/0	N/0	25	200	200	400	200	N/R	5075
1965	3500	400	75	75	25	25	25	200	200	400	200	200	5325
1966	3500	200	N/0	750	N/0	25	25	200	75	400	200	N/R	5375
1967	3000	500	50	300	N/0	50	50	200	100	250	200	N/R	4700
1968	3500	300	100	200	N/0	N/0	50	200	50	250	150	75	4875
1969	1200	600	N/0	800	N/0	50	50	470	270	900	900	N/R	5240
1970	3000	1500	N/R	1500	N/0	75	400	400	750	700	N/0	N/R	8325
1971	3500	2500	150	2500	N/0	150	200	700	1200	400	400	N/R	11700
1972	3500	400	75	750	N/0	75	25	200	200	200	200	N/R	5625
1973	1500	400	25	750	N/0	75	25	200	200	200	75	N/R	3450
1974	7500	400	25	750	N/0	25	25	200	750	400	75	25	10175
1975	3500	400	25	3500	N/0	75	25	400	400	200	1500	25	10050
1976	1500	400	N/0	400	N/0	25	25	75	75	75	1500	25	4100
1977	1500	PRES	25	3500	N/0	25	25	75	400	400	700	150	6800
1978	3500	PRES	25	3500	N/0	25	25	400	200	200	400	25	8300
1979	3500	PRES	25	1500	N/0	25	25	75	75	75	750	100	6150
1980	1500	PRES	PRES	6500	N/0	25	25	100	400	300	500	200	9550
1981	3000	400	PRES	4000	N/0	50	200	200	250	200	300	100	8700
1982	3500	250	25	6500	N/R	25	20	100	75	175	200	25	10895
51-60	4075	108	25	2498	96	48	25	218	25	483	148	42	7683
61-70	2970	580	75	493	25	42	70	210	177	450	231	125	5279
71-80	3100	750	47	2365	N/0	53	43	243	390	245	610	79	7590
78-82	3000	325	25	4400	N/0	30	59	175	200	190	430	90	8719



Appendix 3 Birkenhead River, Reach 2

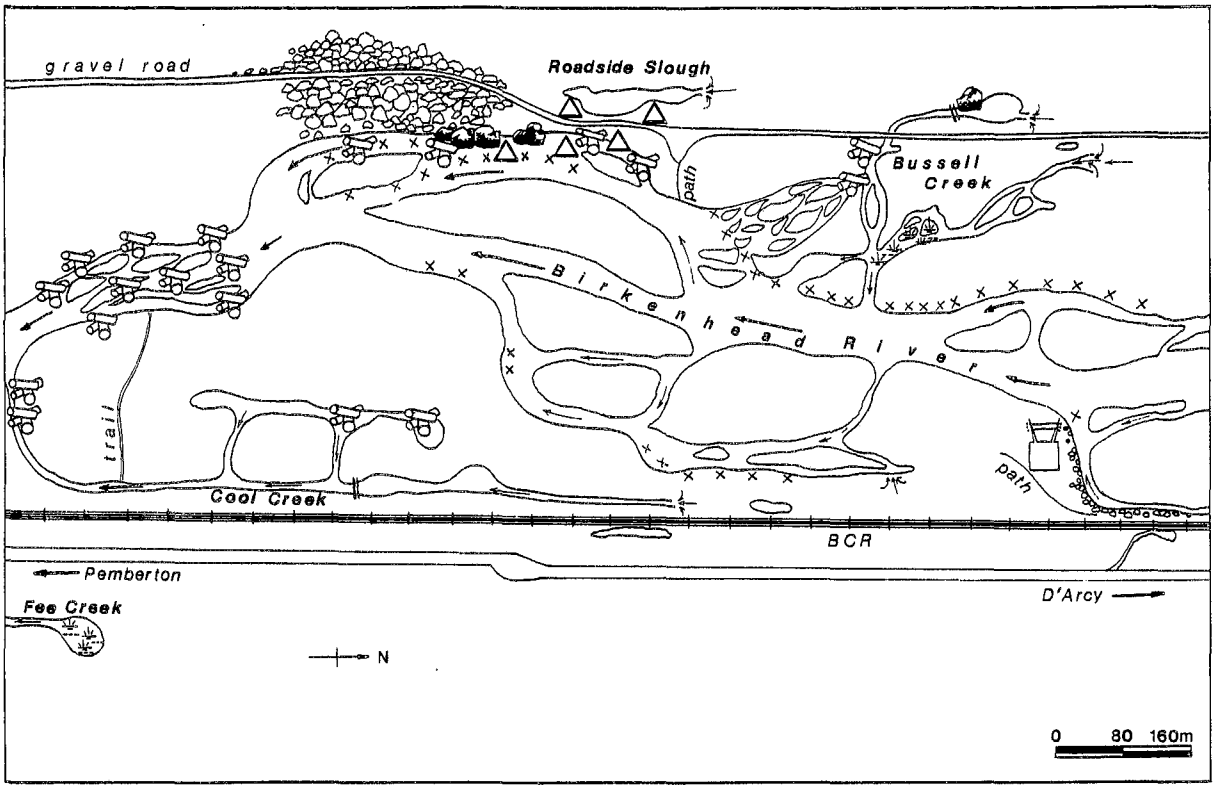
Appendix 4 Birkenhead River, Reach 5

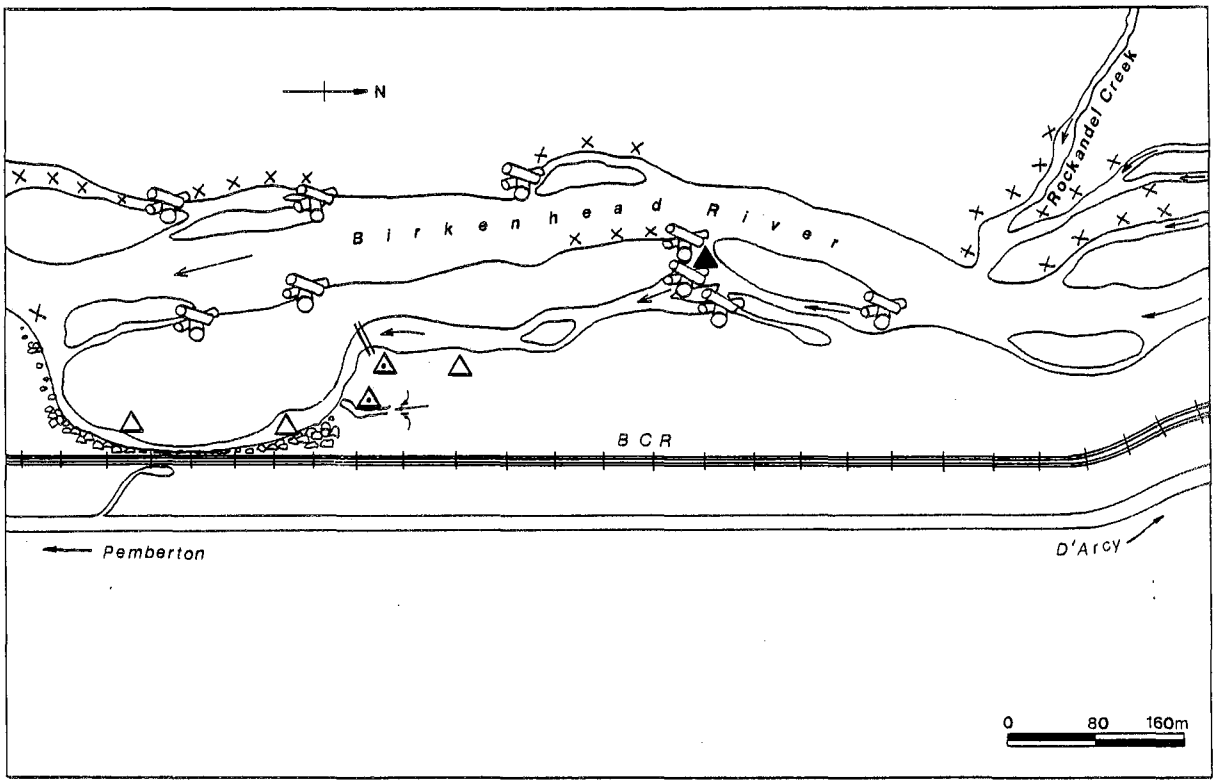




Appendix 5 Birkenhead River, Reach 6

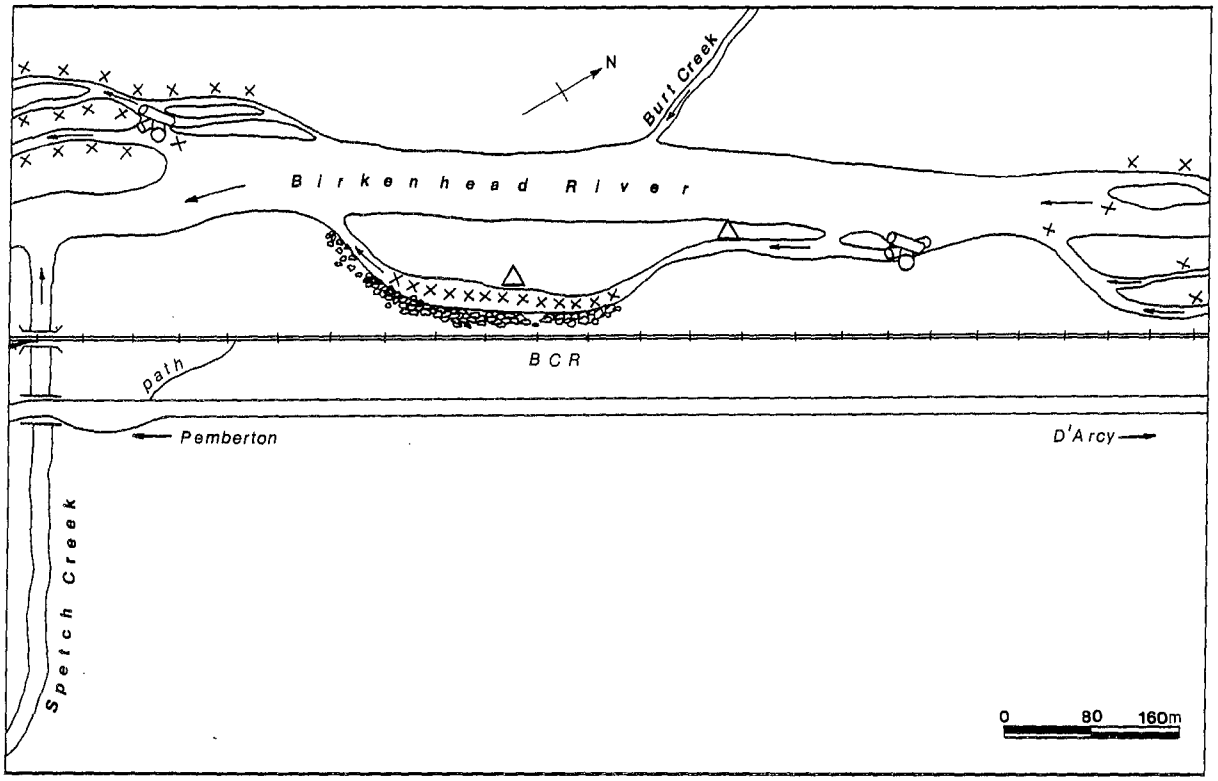
Appendix 6 Birkenhead River, Reach 7

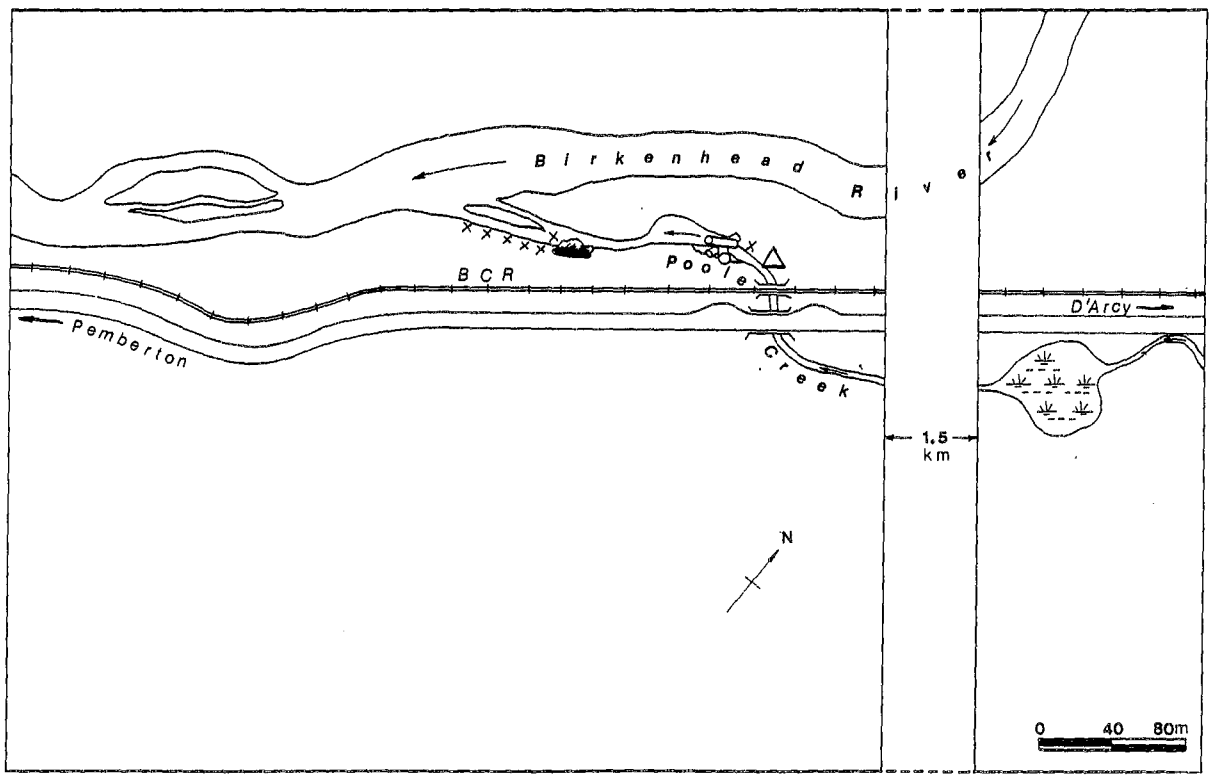




Appendix 7 Birkenhead River, Reach 8

Appendix 8 Birkenhead River, Reach 9





Appendix 9 Birkenhead River and Poole Creek, Reach 10

Appendix 10: Coho Catch, Summer Survey, Birkenhead River

Date	Reach	Temp °C	Time In	Hours	# Traps	Total Trap Hours	Coho Catch	Coho Catch/ Trap Hour
Aug/ 1982								
19	6A	10.0	15:30	3.0	1	3.0	2	0.67
19	8A	-	14:20	2.5	5	12.5	176	14.08
19	9A	13.0	14:10	2.0	2	4.0	10	2.5
19	10A	10.0	13:15	2.5	2	5.0	0	0
20	6B	-	12:00	4.25	2	8.5	80	9.41
20	6B	10.0	12:20	4.5	1	4.5	53	11.78
20	7B	10.0	11:20	3.75	3	11.25	63	5.60
20	7B	10.0	11:40	4.0	2	8.0	18	2.25
21	4	14.5	14:30	1.75	2	3.5	0	0
21	5B	12.0	9:30	2.0	5	10.0	37	3.70
21	5B	12.0	10:10	3.75	5	18.75	21	1.12
23	2	14.0	11:45	2.75	6	16.5	23	1.39
23	2	13.0	12:10	3.75	3	11.25	14	1.24
24	3	12.0	18.30	2.25	2	4.5	4	0.89
25	1	12.0	10:15	2.75	14	38.5	11	0.29
TOTAL					55	159.55	512	

Appendix 11: Coho Catch, Juvenile Tagging Program, Birkenhead River

Date	Reach	Temp °C	Time In	Hours	# Traps	Total Trap Hours	Coho Catch	Coho Catch/ Trap Hour
Sept/ 1982								
15	9A	11.0	9:30	4.0	9	36.0	372	10.33
15	8A	10.0	10:15	4.0	63	252.0	1961	7.78
15	9A	11.0	13:30	19.5	9	175.5	167	0.95
15	8A	10.0	14:15	19.25	55	1058.75	1460	1.38
16	9A	11.0	9:15	3.5	9	31.5	43	1.37
16	8A	10.0	9:45	3.25	65	211.25	695	3.29
16	9A	11.0	12:45	20.5	9	184.5	98	0.53
16	8A	10.0	13:15	20.0	72	1440.0	968	0.67
17	8A	10.0	9:15	4.5	32	144.0	662	4.60
20	7A	10.0	9:15	4.25	30	127.5	1270	9.96
20	7A	10.0	13:30	19.5	38	741.0	950	1.28
21	7A	10.0	9:00	5.0	38	190.0	428	2.25
21	7A	9.5	11:00	3.5	21	73.5	457	6.22
21	7A	10.0	14:00	19.0	32	608.0	607	1.0
21	7A	8.0	14:30	18.5	21	388.5	504	1.30
22	7A	10.0	9:15	24.0	53	1272.0	772	0.61
22	7A	8.0	13:00	22.0	10	220.0	115	0.52
23	7A	11.0	9:30	3.0	29	87.0	109	1.25
23	7A	-	9:30	4.5	21	94.5	65	0.69

cont'd.

Date	Reach	Temp °C	Time In	Hours	# Traps	Total Trap Hours	Coho Catch	Coho Catch/ Trap Hour
Sept/ 1982								
23	7A	-	11:00	4.0	10	40.0	40	1.0
23	7A	-	15:15	18.25	6	109.5	50	0.46
27	7A	8.5	10:00	3.5	71	248.5	1831	7.37
27	7A	9.0	13:45	2.5	5	12.5	204	16.32
27	7A	9.0	14:00	20.0	72	1440.0	1676	1.16
28	7A	8.0	10:30	3.5	43	150.5	460	3.06
28	7A	8.5	14:00	19.0	65	1235.0	1735	1.40
29	7A	7.5	9:00	4.25	65	276.25	339	1.23
29	7A	-	13:30	20.0	40	800.0	1000	1.25
30	7A	-	9:30	24.0	25	600.0	480	0.80
Oct/ 1982								
4	7B	9.0	9:45	3.25	52	169.0	1492	8.83
4	7B	9.0	13:00	20.75	64	1328.0	1674	1.26
5	7B	8.0	9:45	3.5	48	168.0	375	2.23
5	7B	8.0	13:30	21.0	35	735.0	686	0.93
6	7B	-	10:30	1.5	29	43.5	1228	28.23
12	7B	-	9:30	3.5	49	171.5	2579	15.04
12	7B	8.5	13:00	20.75	42	871.5	1794	2.06
12	7B	-	13:00	23.75	7	166.25	127	0.76
13	7B	7.5	10:00	4.5	30	135.0	507	3.76

cont'd.

Date	Reach	Temp °C	Time In	Hours	# Traps	Total Trap Hours	Coho Catch	Coho Catch/ Trap Hour
Oct/ 1982								
13	7B	8.5	14:15	19.5	41	799.5	630	0.79
13	7B	8.5	13:00	21.0	7	147.0	50	0.34
14	7B	7.5	10:00	3.0	14	42.0	400	9.52
14	7B	7.5	10:00	4.75	10	47.5	355	7.47
14	7B	-	13:00	20.0	13	260.0	300	1.15
14	7B	-	14:45	18.25	25	456.25	738	1.62
19	7B	-	9:45	23.5	46	1081.0	1385	1.28
20	7B	6.0	9:15	4.25	63	267.75	1146	4.28
20	7B	6.0	13:30	20.25	65	1316.25	1196	0.91
21	7B	6.0	9:45	3.75	57	213.75	662	3.10
21	7B	-	13:30	20.25	59	1194.75	286	0.24
25	5B	-	10:00	2.5	40	100.0	598	5.98
25	5B	8.0	13:00	44.25	31	1371.75	713	0.52
27	5B	8.0	10:15	1.75	11	19.25	225	11.69
27	5B	8.0	9:15	2.75	31	85.25	140	1.64
27	5B	8.0	12:00	22.0	11	242.0	203	0.84
27	5B	8.0	12:00	21.5	33	709.5	304	0.43
28	5B	8.0	10:00	5.0	11	55.0	37	0.67
28	5B	8.0	9:30	4.75	24	114.0	142	1.25
28	5B	8.0	14:15	20.25	6	121.5	98	0.81

cont'd.

Date	Reach	Temp °C	Time In	Hours	# Traps	Total Trap Hours	Coho Catch	Coho Catch/ Trap Hour
Nov/ 1982								
1	6B	-	9:30	4.0	36	144.0	1342	9.32
1	6B	7.0	13:30	20.0	37	740.0	1394	1.88
2	6B	7.0	9:30	4.0	58	232.0	980	4.22
2	6B	8.0	13:30	20.5	59	1209.5	1169	0.97
3	6B	8.5	10:00	4.0	44	176.0	389	2.21
3	6B	8.0	14:00	19.5	32	624.0	341	0.55
4	6B	8.0	9:30	24.0	20	480.0	286	0.60
9	2	-	9:30	2.5	30	75.0	101	1.35
9	2	2.5	10:45	3.75	2	7.5	0	0
9	2	4.0	12:00	21.5	30	645.0	350	0.54
10	2	5.5	9:45	3.75	25	93.75	1280	13.65
10	2	3.0	9:15	3.0	17	51.0	28	0.55
10	2	-	13:00	20.0	17	340.0	155	0.46
10	2	-	13:30	19.75	25	493.75	1210	2.45
11	2	5.5	9:15	4.5	9	40.5	297	7.33
15	2	2.0	9:30	4.5	21	94.5	78	0.83
15	2	5.5	10:00	4.0	25	100.0	971	9.71
15	2	-	9:45	4.0	2	8.0	36	4.50
15	2	3.0	14:00	20.25	21	425.25	191	0.45
15	2	5.0	14:00	20.0	25	500.0	1250	2.50

cont'd.

Date	Reach	Temp °C	Time In	Hours	# Traps	Total Trap Hours	Coho Catch	Coho Catch/ Trap Hour
Nov/ 1982								
16	2	6.0	10:00	2.25	28	63.0	604	9.59
16	2	6.0	12:15	21.25	40	850.0	1485	1.75
17	2	6.0	9:30	5.0	67	335.0	741	2.21
17	2	6.0.	14:30	18.75	58	1087.5	1265	1.16
TOTAL					2700	33494.0	55535	

cont'd.

Appendix 12: Coho Catch, Petersen Checks and Winter Survey, Birkenhead River

Date	Reach	Temp °C	Time In	Hours	# Traps	Total Trap Hours	Coho Catch Marked	Coho Catch Unmarked	Coho Catch/ Trap Hour
Sept.29/82	9A	-	10:15	4.0	3	12.0	60	61	10.08
Sept.30	8A	8.0	9:30	4.75	4	19.0	419	44	24.37
Oct. 1	7A	9.5	9:15	4.0	4	16.0	77	79	9.75
Oct. 6	7A	8.0	9:30	3.75	4	15.0	238	56	19.60
Oct. 29	7B	6.0	9:30	5.0	6	30.0	346	346	23.07
Nov. 4	5B	-	9:45	5.25	4	21.0	72	25	4.62
Nov. 10	6B	7.0	11:00	4.0	6	24.0	173	28	8.38
Nov. 30	2	-	9:30	5.0	3	15.0	127	55	12.13
Jan. 6/83	2	-	16:30	19.5	3	58.5	90	73	2.79
Jan. 7	8A	-	14:00	19.5	3	58.5	36	73	1.86
Jan. 7	6B	-	16:00	18.75	3	56.25	86	39	2.22
TOTAL					43	325.25	1724	879	

Appendix 13: Catch of Other Species, Birkenhead River

1982	Reach	Species					
		RBT	CTT	DVD	WTF	COT	LMP
Aug. 19	6A			1			
23	2					11	
25	1					2	
Sept. 15	9A	8		1			
15	8A	5		28			1
16	9A	1		1			
16	8A	2		5			1
17	8A	2					
21	7A		2				
23	7A		2				
27	7A		2				
28	7A	2	5				
30	7A				1		
Oct. 4	7B	6		1			
5	7B	2	1	2			1
6	7B			1			
12	7B	2		3			
13	7B			2			
14	7B	1		1			
19	7B			2			
20	7B			1			
21	7B	3	2	2			
25	5B	2	8	1			
27	5B	1	1				1
28	5B	1					
Nov. 1	6B	9			1		
3	6B	3	2	1			
4	6B		2	1			
9	2				52		

cont'd.

1982	Reach	Species					
		RBT	CTT	DVD	WTF	COT	LMP
Nov. 10	2						1
15	2					9	
17	2					3	1
TOTAL		50	27	54	2	77	6

RBT - rainbow trout
CTT - cutthroat trout
DVD - dolly varden
WTF - rocky mountain whitefish
COT - sculpin
LMP - river lamprey

Appendix 14: Daily Tagging Summary for 0+ Coho Tagged with Code 2-22-9

1982	Pre-tag Morts	Under-sized	Recaptures		Number Tagged	Mortalities	Tag Retention			No. Released	
			Total	Tag Loss			No. Held	No. Rejected	% Rejected	Tagged	Untagged
Sept.20	15	60	0		2189	0	0	0	0.4*	2181	8
Sept.21	24	112	0		2912	1	350	1	0.3	2903	8
Sept.22	5	676	0		3109	16	350	0	0.0	3093	0
Sept.23	6	153	0		1871	3	0	0	0.4*	1861	7
Sept.24	4	127	0		1695	1	350[1]	0	0.0	1694	0
Sept.29	2	314	35	1	2387	4	350	2	0.6	2369	14
Sept.30	19	380	55	2	3239	8	350	2	0.6	3213	18
Oct. 1	8	476	43	1	1987	0	0	0	0.4*	1980	7
Oct. 7	6	529	83	0	2990	4	350	3	0.9	2960	26
Oct. 13	7	633	93	0	1515	1	357	1	0.3	1510	4
Oct. 14	5	661	46	0	1700	2	350	1	0.3	1693	5
Oct. 15	8	704	35	0	1780	0	350	0	0.0	1780	0
Oct. 18	16	547	25	2	1347	109	350	2	0.6	1231	7
Oct. 21	6	654	515[2]		1486	30	353	3	0.8	1444	12
Oct. 27	7	286	122	0	431	0	0	0	0.4*	429	2
Oct. 28	2	497	133	1	2169	3	350	0	0.0	2166	0
Oct. 29	1	8	0		77	0	0	0	0.4*	77	0

Nov. 3	3	293	62	1	1751	0	355	4	1.1	1731	20
Nov. 4	5	296	110	4	2155	1	350	0	0.0	2154	0
Nov. 5	4	150	104	4	1624	1	350	0	0.0	1623	0
Nov. 18	3	0	2	0	3898	1	350	1	0.3	3886	11
Nov. 19	3	0	1	0	2563	2	0	0	0.4*	2552	9
TOTAL	159	7556	1464	16	44875	187	5615	20	0.4	44530	158

*Average % rejection

[1]Tag loss was checked on mixed group of 0+ and 1+ fish

[2]Tag retention was not checked

Appendix 15: Daily Tagging Summary for 1+ Coho Tagged with Code 2-23-26

1982	Pre-tag Morts	Under-sized	Recaptures		Number Tagged	Mortalities	Tag Retention			No. Released	
			Total	Tag Loss			No. Held	No. Rejected	% Rejected	Tagged	Un-Tagged
Sept.23	2		0		620	0	351	1	0.3	618	2
Sept.24	2		0		260	0	0[1]	0	0.0	260	0
Oct. 1	4		1	0	226	0	224	1	0.4	225	1
Oct. 7	1		1	0	278	1	276	1	0.4	276	1
Oct. 14	2		3	0	352	0	348	0	0.0	352	0
Oct. 18	7		3	0	431	12	350	0	0.0	419	0
Oct. 22	1		12	2	173	0	0	0	0.2	173	0
Oct. 27	1		1	0	52	0	0	0	0.2	52	0
Oct. 28	1		0		195	0	201[2]	6[2]	0.2	195	0
Oct. 29	1		0		13	0	0	0	0.2	13	0
Nov. 4	2		0		292	0	292	1	0.3	291	1
Nov. 5	3		5	0	247	0	242	0	0.0	247	0
Nov. 19	3		0		414	0	0	0	0.2	413	1
TOTAL	30		26	2	3553	13	2284	10	0.2	3534	6

[1]Tag loss for Sept. 24/82 was checked on a mixed group of 0+ and 1+ fish, and found to be 0%.

[2]A malfunctioning Q.C.D. incorrectly sorted untagged fish dropped by a new tagger. The 195 fish originally counted retained their tags after 24 hours; therefore tag loss was set at 0%.

Appendix 16: Anomalies and Adipose Fin Clip Quality

1982	Age	Number Checked	Number Clips Rejects	Anomalies						
				Nat. Ad.	Pop Eye	Fog Eye	Scale Loss	Fin Rot	Nose Abrasion	General Damage[1]
Sept.22	0+	350	1	3			1			
Sept.23	0+	350	0		1		2			
Sept.23	1+	351	2			1	10		129	4
Sept.24	0+) 1+)	350[2]	6				2		19	4
Sept.29	0+	350	5							3
Sept.30	0+	350	7							
Oct. 1	1+	224	1				4		16	1
Oct. 7	0+	350	2				3			4
Oct. 7	1+	276	1			1	9		1	4
Oct. 13	0+	357	0							2
Oct. 14	0+	350	13					1		4
Oct. 14	1+	348	16				4		52	
Oct. 15	0+	350	28					2	4	3
Oct. 18	0+	350	13						2	4
Oct. 18	1+	350	10				1		112	3
Oct. 21	0+	353	2				1			4

cont'd.

1982	Age	Number Checked	Number Clips Rejects	Anomalies						
				Nat. Ad.	Pop Eye	Fog Eye	Scale Loss	Fin Rot	Nose Abrasion	General Damage[1]
Oct.28	0+	350	8				2			13
Oct.28	1+	201	1				2			1
Nov. 3	0+	355	7							2
Nov. 4	0+	350	10				1			2
Nov. 4	1+	293	27				12			14
Nov. 5	0+	350	8				1		2	5
Nov. 5	1+	242	12				1		29	2
Nov.18	0+	350	7				1			1
TOTAL		7900	187	3	1	2	57	3	366	80

[1]General damage includes damage to eyes, tail and operculum

[2]These 350 were mixed 0+ and 1+

Appendix 17: Mean Length and Eye Diameter Summary by Age Group, Birkenhead River

Date	Reach	Age Group	0+ Length n	0+ Length L (mm)	0+ Length sd	0+ Eye Diameter E (mm)	0+ Eye Diameter sd	1+ Length n	1+ Length L (mm)	1+ Length sd	1+ Eye Diameter E (mm)	1+ Eye Diameter sd
Aug. 19	6A	M	2	82.50								
	8	M	71	49.80	8.42	-		3	81.67	7.09	-	
	9	M	9	52.11	8.84	-						
Aug. 20	6B	M	49	51.47	6.61	4.20	0.47					
	7B	M	37	54.05	7.34	4.35	0.50	10	83.20	10.64	6.20	0.48
Aug. 21	5	M	50	49.80	9.71	4.01	0.55	3	83.0	3.61	6.33	0.29
Aug. 23	2[1]	M	20	50.05	10.42	4.20	0.57					
	2[2]	M	13	74.08	7.71	5.23	0.44					
Aug. 25	1	M	11	50.18	4.92	4.0	0.32					
Sept.23	8	0+	86	52.57	8.65	4.37	0.47					
	8	1+	9	79.78	4.12	6.0	-	57	85.93	9.43	6.67	0.33
Sept.30	7A	0+	46	49.30	4.82	4.16	0.24					
	7A	1+	46	81.78	4.67	5.91	0.28	3	102.0	2.65	6.83	0.29
	7A	M	98	49.60	7.56	4.14	0.48	1	105.0		7.0	
Oct. 8	7B	0+	42	55.0	7.87	4.62	0.41					
	7B	1+	5	76.6	6.80	6.20	0.27	30	82.63	8.09	6.57	0.31
Oct. 18	7B	0+	49	56.06	8.73	4.63	0.57					

cont'd.

Date	Reach	Age Group	0+ Length n	0+ Length L (mm)	0+ Length sd	0+ Eye Diameter ED (mm)	0+ Eye Diameter sd	1+ Length n	1+ Length L (mm)	1+ Length sd	1+ Eye Diameter ED (mm)	1+ Eye Diameter sd
Oct. 18	7B	1+	1	88.0		6.0		1	104.0		6.5	
Oct. 19	7B	M	58	49.17	10.33	4.24	0.62	5	96.0	11.87	6.6	0.42
Oct. 29	5	0+	48	56.54	7.85	4.86	0.46					
	5	1+	15	79.13	5.84	6.17	0.36	26	86.0	8.40	6.62	0.36
	5	M	88	54.48	10.45	4.64	0.70	9	89.67	7.55	6.5	0.43
Nov. 8	6B	0+	6	55.83	9.68	4.67	0.52					
	6B	1+	2	87.50		6.0		0				
	6B	M	67	53.91	9.29	4.38	0.62					
Nov. 19	2[2]	0+	4	55.75	5.19	4.50	0.41					
	2[2]	1+	1	80.0		6.0		0				
	2[2]	M	58	68.95	10.91	5.16	0.52					
Nov. 30	2[2]	M	45	65.56	6.61	5.21	0.43					
Jan.7/83	2[2]	M						49	74.04	9.70	5.46	0.49
Jan. 8	6B	M						15	54.87	11.21	4.57	0.78
	8	M						19	67.53	9.67	5.16	0.58

[1]Reach 2 - Birkenhead River sample

[2]Reach 2 - "Warbonnet" Creek sample

Appendix 18: Biological Samples of Juvenile Coho, Birkenhead River (1)

PROJECT: LILLOOET DATE: AUGUST 19/82 SPECIES: COHO

LOCATION: BIRKENHEAD RIVER

REACH: 9 REACH: 8

SCALE BK.# 1	EYE DIAMETER M.M	LENGTH M.M	AGE MIXED	SCALE BK.# 2	EYE DIAMETER M.M.	LENGTH M.M.	AGE MIXED
1		45	0	1		88	1
2		59	0	2		83	1
3		64	0	3		56	0
4		62	0	4		75	0
5		47	0	5		55	0
6		48	0	6		45	0
7		56	0	7		58	0
8		37	0	8		66	0
9		59		9		55	0
10		51	0	10		56	0
11				11		43	0
12				12		61	0
13				13		54	0
14				14		48	0
15				15		53	0
16				16		45	0
17				17		44	0
18				18		51	0
19				19		38	0
20				20		37	0
21				21		48	0
22				22		44	0
23				23		43	0
24				24		47	0
25				25		47	0

LENGTHS		LENGTHS	
SUM OF LENGTHS	528		1340
AVERAGE	52.8		53.6
S.D.	8.612652		12.88086

WEIGHTS		WEIGHTS	
SAMPLE #	10		25
TARE + FISH	269.7		321.4
TARE	253.3		257.1
FISH	16.4		64.3
# FISH/KG.	609.7561		388.8025

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:			
AVERAGE			
S.D.			

PROJECT: LILLOOET DATE: AUGUST 19/82 SPECIES: COHO

LOCATION: BIRKENHEAD RIVER

REACH: 8 REACH: 8

SCALE BK.# 3	EYE DIAMETER M.M	LENGTH M.M	AGE MIXED	SCALE BK.# 4	EYE DIAMETER M.M.	LENGTH M.M.	AGE MIXED
1		63	0	1		38	0
2		50	0	2		56	0
3		44	0	3		40	0
4		58	0	4		58	0
5		59	0	5		60	0
6		63	0	6		51	0
7		46	0	7		68	0
8		60	0	8		55	0
9		54	0	9		36	0
10		51	0	10		38	0
11		41	0	11		65	0
12		47	0	12		41	0
13		43	0	13		45	0
14		74	1	14		52	0
15		53	0	15		47	0
16		59	0	16		45	0
17		43	0	17		36	
18		45	0	18		40	0
19		40	0	19		59	0
20		49	0	20		46	0
21		48	0	21		43	0
22		46	0	22		50	0
23		41	0	23		44	0
24		44	0	24		43	0
25		41	0	25		59	0

LENGTHS		LENGTHS	
SUM OF LENGTHS	1262		1215
AVERAGE	50.48		48.6
S.D.	8.766033		9.269124

WEIGHTS		WEIGHTS	
SAMPLE #	50		
TARE + FISH	373.3		
TARE	258.8		
FISH	114.5		
# FISH/KG.	436.6812		

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:			
AVERAGE			
S.D.			

PROJECT: LILLOOET DATE: AUGUST 19/82 SPECIES: COHO

LOCATION: BIRKENHEAD RIVER

REACH: 6A REACH:

SCALE BK.# 5	EYE DIAMETER M.M	LENGTH M.M	AGE MIXED	SCALE BK.#	EYE DIAMETER M.M.	LENGTH M.M.	AGE
1		86	0	1			
2		79	0	2			
3				3			
4				4			
5				5			
6				6			
7				7			
8				8			
9				9			
10				10			
11				11			
12				12			
13				13			
14				14			
15				15			
16				16			
17				17			
18				18			
19				19			
20				20			
21				21			
22				22			
23				23			
24				24			
25				25			

LENGTHS		LENGTHS	
SUM OF LENGTHS	165		
AVERAGE	82.5		
S.D.	4.949747		

WEIGHTS		WEIGHTS	
SAMPLE #	2		
TARE + FISH	286.6		
TARE	269.5		
FISH	17.1		
# FISH/KG.	116.9591		

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:			
AVERAGE			
S.D.			

Appendix 18: Biological Samples of Juvenile Coho, Birkenhead River (2)

PROJECT: LILLOOET DATE: AUGUST 20/82 SPECIES: COHO
LOCATION: BIRKENHEAD RIVER
REACH: 7B REACH: 7B

SCALE BK.# 6	EYE DIAMETER M.M	LENGTH M.M	AGE MIXED	SCALE BK.# 7	EYE DIAMETER M.M.	LENGTH M.M.	AGE MIXED
1	6.5	96	1	1	6.5	86	1
2	4	50	0	2	5	62	0
3	4.5	64	0	3	5.5	82	
4	6.5	98	1	4	6.5	70	1
5	4.5	58	R	5	6.5	84	1
6	4	50	0	6	4	52	0
7	4.5	53	0	7	6.5	80	1
8	6	89	1	8	4.5	56	0
9	6	84	1	9	6	82	1
10	4.5	63	0	10	4.5	52	0
11	4	55	0	11	4.5	56	0
12	5.5	68		12	5.5	65	0
13	5	63	1	13	4.5	62	0
14	4.5	57	0	14	5.5	65	0
15	4	55	0	15	4.5	60	0
16	5	66	0	16	5	61	0
17	5	62	0	17	4.5	55	0
18	4.5	53	0	18	4	50	0
19	4.5	53	0	19	4.5	54	0
20	3.5	48	0	20	4.5	60	0
21	4	41	0	21	4.5	57	0
22	4.5	51	0	22	4	49	0
23	4	43	0	23	3.5	44	0
24	3.5	37	0	24	3.5	43	0
25	4	44	0	25	4	52	0

LENGTHS		LENGTHS
SUM OF LENGTHS	1501	1539
AVERAGE	60.04	61.56
S.D.	16.28517	12.54685

WEIGHTS		WEIGHTS
SAMPLE #	25	25
TARE + FISH	284.1	349.5
TARE	204.1	260.2
FISH	80	89.3
# FISH/KG.	312.5	279.9552

EYE DIAMETER		EYE DIAMETERS
SUM OF DIAMETERS:	116.5	122
AVERAGE	4.66	4.88
S.D.	.8504901	.9385272

PROJECT: LILLOOET DATE: AUGUST 20/82 SPECIES: COHO
LOCATION: BIRKENHEAD RIVER
REACH: 6B REACH: 6B

SCALE BK.# 8	EYE DIAMETER M.M	LENGTH M.M	AGE MIXED	SCALE BK.# 9	EYE DIAMETER M.M.	LENGTH M.M.	AGE MIXED
1	4	52	0	1	4.5	53	0
2	4.5	68	0	2	4.5	59	0
3	4.5	54	0	3	4.5	53	0
4	5	65	0	4	4.5	56	0
5	4.5	49	0	5	4	43	0
6	5.5	70	0	6	4	49	0
7	4.5	50	0	7	4	49	0
8	4	45	0	8	4	48	0
9	4.5	52	0	9	5	63	0
10	4	51	0	10	4	49	0
11	4.5	54	0	11	4.5	51	0
12	4.5	49	0	12	4.5	58	0
13	5	63	0	13	4	47	0
14	4	49	0	14	4	52	0
15	4	48	0	15	4	54	0
16	4	36	0	16	4.5	57	0
17	4	49	0	17	4.5	49	0
18	4.5	51	0	18	4.5	55	0
19	3.5	50	0	19	3.5	48	0
20	4	51	0	20	4	48	0
21	4.5	57	0	21	3.5	42	0
22	4	48	0	22	3.5	47	0
23	4.5	53	0	23	3.5	45	0
24	3	42	0	24	4	48	0
25				25	3.5	43	0

LENGTHS		LENGTHS
SUM OF LENGTHS	1256	1266
AVERAGE	52.33333	50.64
S.D.	7.760920	5.314132

WEIGHTS		WEIGHTS
SAMPLE #	24	25
TARE + FISH	248.9	266.9
TARE	203.1	227.4
FISH	45.8	39.5
# FISH/KG.	524.0175	632.9114

EYE DIAMETER		EYE DIAMETERS
SUM OF DIAMETERS:	103	103
AVERAGE	4.291667	4.12
S.D.	.5089774	.4153312

PROJECT: LILLOOET DATE: AUGUST 21/82 SPECIES: COHO
LOCATION: BIRKENHEAD RIVER
REACH: 5 REACH: 5

SCALE BK.# 10	EYE DIAMETER M.M	LENGTH M.M	AGE MIXED	SCALE BK.# 11	EYE DIAMETER M.M.	LENGTH M.M.	AGE MIXED
1	3.5	49	0	1	3.5	39	0
2	5	68	0	2	4	50	0
3	5	64	0	3	4	46	0
4	4.5	61	0	4	4	46	
5	4.5	57	0	5	5	61	
6	3	35	0	6	4	48	0
7	3.5	38	0	7	3.5	43	0
8	3.5	38	0	8	4	44	0
9	3.5	38	0	9	3.5	42	0
10	4.5	56	0	10	4	44	0
11	4	44	0	11	4	45	0
12	4.5	52	0	12			
13	4	46		13			
14	5.5	74	0	14			
15	3.5	43	0	15			
16	4.5	57	0	16			
17	3.5	39	0	17			
18	3.5	43	0	18			
19	3.5	44	0	19			
20	5	65		20			
21	5	67	0	21			
22	3.5	41	0	22			
23	4.5	56	0	23			
24	4.5	54	0	24			
25	4	46	0	25			

LENGTHS		LENGTHS
SUM OF LENGTHS	1275	508
AVERAGE	51	46.18182
S.D.	11.10180	5.723953

WEIGHTS		WEIGHTS
SAMPLE #	36	
TARE + FISH	314.6	
TARE	254.5	
FISH	60.1	
# FISH/KG.	599.0017	

EYE DIAMETER		EYE DIAMETERS
SUM OF DIAMETERS:	103.5	43.5
AVERAGE	4.14	3.954545
S.D.	.6695770	.4156047

Appendix 18: Biological Samples of Juvenile Coho, Birkenhead River (3)

PROJECT: LILLOOET DATE: AUGUST 21/82 SPECIES: COHO

LOCATION: BIRKENHEAD RIVER

REACH: 5 REACH:

SCALE BK.# 12	EYE DIAMETER M.M	LENGTH M.M	AGE MIXED	SCALE BK.#	EYE DIAMETER M.M.	LENGTH M.M.	AGE
1	6.5	84	1	1			
2	6	86	1	2			
3	4.5	59	0	3			
4	5	67	0	4			
5	4.5	57	0	5			
6	6.5	79	1	6			
7	4.5	60	0	7			
8	4.5	53	0	8			
9	3.5	47	0	9			
10	4	49	0	10			
11	4	49	0	11			
12	4	49	0	12			
13	4	53	0	13			
14	4	51	0	14			
15	3.5	39	0	15			
16	3.5	43	0	16			
17	3.5	42	0	17			
18	4	54	0	18			
19	3.5	42	0	19			
20	3.5	40	0	20			
21	3.5	41	0	21			
22				22			
23				23			
24				24			
25				25			

LENGTHS		LENGTHS	
SUM OF LENGTHS	1144		
AVERAGE	54.47619		
S.D.	13.99507		

WEIGHTS		WEIGHTS	
SAMPLE #	21		
TARE + FISH	275.7		
TARE	223.4		
FISH	52.3		
# FISH/KG.	401.5296		

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:	90.5		
AVERAGE	4.309524		
S.D.	.9549370		

PROJECT: LILLOOET DATE: AUGUST 23/82 SPECIES: COHO

LOCATION: BIRKENHEAD RIVER

REACH: 2 REACH: 2

SCALE BK.# 13	EYE DIAMETER M.M	LENGTH M.M	AGE MIXED	SCALE BK.# 14	EYE DIAMETER M.M.	LENGTH M.M.	AGE MIXED
1	5	70	0	1	5.5	79	0
2	5.5	77	0	2	6	89	0
3	7	105		3	5.5	75	0
4	4.5	51	0	4	5.5	81	0
5	4.5	58		5	5.5	78	0
6	4	48	0	6	5	65	0
7	5	60	0	7	5.5	78	0
8	3.5	39	0	8	5	71	0
9	4.5	53	0	9	5	69	0
10	5	61		10	5.5	75	
11	3.5	38	0	11	4.5	70	0
12	4.5	56	0	12	5.5	78	0
13	4.5	55	0	13	5	71	0
14	4	50	0	14	4.5	59	0
15	4	44	0	15			
16	4	43	0	16			
17	3.5	40	0	17			
18	4.5	55	0	18			
19	4	45	0	19			
20	4	45	0	20			
21	4.5	53	0	21			
22	3.5	38	0	22			
23	3.5	41	0	23			
24				24			
25				25			

LENGTHS		LENGTHS	
SUM OF LENGTHS	1225		1038
AVERAGE	53.26087		74.14286
S.D.	15.11837		7.409528

WEIGHTS		WEIGHTS	
SAMPLE #	23		14
TARE + FISH	263.5		264.4
TARE	208.9		191.2
FISH	54.6		73.2
# FISH/KG.	421.2454		191.2568

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:	100.5		73.5
AVERAGE	4.369565		5.25
S.D.	.8008148		.4274252

PROJECT: LILLOOET DATE: AUGUST 25/82 SPECIES: COHO

LOCATION: BIRKENHEAD RIVER

REACH: 1 REACH:

SCALE BK.# 18	EYE DIAMETER M.M	LENGTH M.M	AGE MIXED	SCALE BK.#	EYE DIAMETER M.M.	LENGTH M.M.	AGE
1	4	52	0	1			
2	4.5	58	0	2			
3	4	53	0	3			
4	4	50	0	4			
5	4	49	0	5			
6	4	51	0	6			
7	4.5	58	0	7			
8	3.5	47	0	8			
9	4	46	0	9			
10	3.5	43	0	10			
11	4	45	0	11			
12				12			
13				13			
14				14			
15				15			
16				16			
17				17			
18				18			
19				19			
20				20			
21				21			
22				22			
23				23			
24				24			
25				25			

LENGTHS		LENGTHS	
SUM OF LENGTHS	552		
AVERAGE	50.18182		
S.D.	4.915652		

WEIGHTS		WEIGHTS	
SAMPLE #	11		
TARE + FISH	238		
TARE	221.1		
FISH	16.9		
# FISH/KG.	650.8876		

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:	44		
AVERAGE	4		
S.D.	.3162278		

Appendix 18: Biological Samples of Juvenile Coho, Birkenhead River (4)

PROJECT: LILLOOET DATE: SEPTEMBER 21/82 SPECIES: COHO

LOCATION: BIRKENHEAD RIVER

REACH: B REACH: B

SCALE BK.# 19	EYE DIAMETER M.M	LENGTH M.M	AGE 0	SCALE BK.# 20	EYE DIAMETER M.M.	LENGTH M.M.	AGE 0
1	4	50	0	1	5	61	0
2	5	71	0	2	4	51	0
3	4	50	0	3	4.5	62	0
4	4.5	59		4	4.5	65	0
5	5	62	0	5	4.5	60	0
6	5.5	71	0	6	4.5	61	0
7	5	67	0	7	4.5	52	0
8	4	43	0	8	4	42	0
9	5	60	0	9	4.5	52	0
10	4	47	0	10	4.5	53	0
11	4.5	52	0	11	4	46	0
12	4.5	55		12	4.5	57	0
13	4.5	55	0	13	3.5	35	0
14	4	46	0	14	4	46	0
15	4.5	54	0	15	4.5	53	
16	4	49	0	16	4.5	46	0
17	4.5	52	0	17	5	61	0
18	4.5	65	0	18	5	62	
19	4	44	0	19	4	49	0
20	4	49	0	20	4	45	0
21	4	47	0	21	4	44	0
22	4	45	0	22	4	45	0
23	4	45	0	23	4	42	0
24	4	56	0	24	4.5	50	0
25	4	55	0	25	4	46	0

LENGTHS		LENGTHS	
SUM OF LENGTHS	1349		1286
AVERAGE	53.96		51.44
S.D.	8.253686		7.916649

WEIGHTS		WEIGHTS	
SAMPLE #	25		25
TARE + FISH	254.9		235.1
TARE	208.2		195.7
FISH	46.7		39.4
# FISH/KG.	535.3319		634.5178

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:	109		108
AVERAGE	4.36		4.32
S.D.	.4453463		.3785939

PROJECT: LILLOOET DATE: SEPTEMBER 23/82 SPECIES: COHO

LOCATION: BIRKENHEAD RIVER

REACH: B REACH: B

SCALE BK.# 21	EYE DIAMETER M.M	LENGTH M.M	AGE 0	SCALE BK.# 22	EYE DIAMETER M.M.	LENGTH M.M.	AGE 0
1	5	59	0	1	5.5	72	0
2	4.5	55	0	2	5.5	76	0
3	5	59	0	3	5.5	77	0
4	4	44	0	4	3.5	45	0
5	4.5	51	0	5	4.5	53	
6	4.5	54	0	6	4.5	53	
7	4.5	55	0	7	5	59	0
8	4.5	52	0	8	5	67	0
9	5	60	0	9	4	43	0
10	4.5	50	0	10	5	72	0
11	4.5	52	0	11	4.5	58	0
12	4.5	54	0	12	5	62	
13	4.5	51	0	13	4	50	0
14	5	54	0	14	4.5	48	0
15	4.5	50	0	15	5	59	
16	4.5	49	0	16	5	56	
17	4	46	0	17	4.5	50	
18	4.5	50	0	18	4.5	50	
19	4	48	0	19	4.5	53	0
20	4	48	0	20	5	54	
21	4	46	0	21	4	44	0
22	4	47	0	22	4	44	0
23	4	45	0	23	4	46	
24	4	43	0	24	3.5	43	0
25	3.5	42	0	25	4.5	53	

LENGTHS		LENGTHS	
SUM OF LENGTHS	1264		1387
AVERAGE	50.56		55.48
S.D.	4.941997		10.37674

WEIGHTS		WEIGHTS	
SAMPLE #	25		25
TARE + FISH	226.5		240.8
TARE	190.7		190
FISH	35.8		50.8
# FISH/KG.	698.3240		492.1260

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:	109.5		114.5
AVERAGE	4.38		4.58
S.D.	.3894440		.5715476

PROJECT: LILLOOET DATE: SEPTEMBER 23/82 SPECIES: COHO

LOCATION: BIRKENHEAD RIVER

REACH: B REACH: B

SCALE BK.# 23	EYE DIAMETER M.M	LENGTH M.M	AGE 1	SCALE BK.# 24	EYE DIAMETER M.M.	LENGTH M.M.	AGE 1
1	6.5	73	1	1	7	83	R
2	7.5	99	1	2	6.5	90	1
3	6.5	72	1	3	6.5	78	1
4	7	91	R	4	6.5	90	1
5	7	96	R	5	6.5	75	1
6	7	90	1	6	6	72	0
7	6.5	76	1	7	6	86	0
8	7	85	R	8	6	84	1
9	6.5	75	1	9	6.5	87	1
10	6.5	79	1	10	6.5	88	R
11	6.5	83	R	11	7	95	1
12	6	78	1	12	7	93	1
13	6	70	1	13	7	92	1
14	6.5	79	1	14	6.5	88	1
15	6.5	85	1	15	7	96	1
16	7	98	1	16	7	102	1
17	6.5	87	1	17	7	105	1
18	6.5	81	R	18	6.5	90	1
19	6	79	R	19	6	82	0
20	6.5	71	1	20	6.5	84	1
21	6.5	76	1	21	7	80	1
22	6.5	72	1	22	7	83	1
23	6.5	78	1	23	6.5	73	1
24	6	83	0	24	6	81	0
25	6	70	R	25	6.5	84	1

LENGTHS		LENGTHS	
SUM OF LENGTHS	2026		2161
AVERAGE	81.04		86.44
S.D.	8.609491		8.144937

WEIGHTS		WEIGHTS	
SAMPLE #			25
TARE + FISH			479.7
TARE			284.8
FISH			194.9
# FISH/KG.			128.2709

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:	163.5		164.5
AVERAGE	6.54		6.58
S.D.	.3796929		.3730505

Appendix 18: Biological Samples of Juvenile Coho, Birkenhead River (5)

PROJECT: LILLOOET DATE: SEPTEMBER 23/82 SPECIES: COHO
LOCATION: BIRKENHEAD RIVER
REACH: 8 REACH: 8

SCALE BK.# 25	EYE DIAMETER M.M	LENGTH M.M	AGE 1	SCALE BK.# 26	EYE DIAMETER M.M.	LENGTH M.M.	AGE 1
1	7	96	1	1	7	94	1
2	6.5	75	1	2	6.5	98	1
3	6.5	83	1	3	6.5	85	
4	6.5	91	1	4	6.5	79	1
5	6.5	81	R	5	6.5	85	
6	7	89	1	6	6	81	0
7	6.5	89		7	7	92	
8	7	97	1	8	6.5	81	R
9	7	96	1	9	6.5	80	
10	6.5	90	1	10	6.5	84	1
11	7	94		11	6.5	80	1
12	6.5	80		12	7.5	100	1
13	7	87	1	13	7	99	1
14	7	98		14	7	96	
15	6	78	0	15	6.5	83	
16	7	95		16	6.5	81	
17	6.5	89		17	6.5	82	
18	6.5	81		18	6.5	73	R
19	7	106	1	19	7	85	1
20	6.5	81	1	20	6	81	
21	6	76	0	21	6.5	76	
22	6.5	78		22	6	71	
23	6	79		23	6	79	0
24	6	77		24	6.5	86	1
25	6.5	88		25	6	75	1

LENGTHS		LENGTHS	
SUM OF LENGTHS	2174		2106
AVERAGE	86.96		84.24
S.D.	8.314044		8.032642

WEIGHTS		WEIGHTS	
SAMPLE #	25		25
TARE + FISH	408.2		409.5
TARE	251		241.4
FISH	157.2		168.1
# FISH/KG.	159.0331		148.7210

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:	165		163.5
AVERAGE	6.6		6.54
S.D.	.3535534		.3796929

PROJECT: LILLOOET DATE: SEPTEMBER 30/82 SPECIES: COHO
LOCATION: BIRKENHEAD RIVER
REACH: 7A REACH: 7A

SCALE BK.# 27	EYE DIAMETER M.M	LENGTH M.M	AGE MIXED	SCALE BK.# 28	EYE DIAMETER M.M.	LENGTH M.M.	AGE MIXED
1	5	63	0	1	4	46	0
2	4	42	0	2	4	47	0
3	4	47	0	3	5.5	73	0
4	4	42	0	4	4	48	0
5	4	46	0	5	4	49	0
6	4	50	0	6	5	66	0
7	4.5	51	0	7	4.5	52	0
8	4.5	48	0	8	4	49	0
9	3.5	41	0	9	4	48	0
10	3.5	42	0	10	4	43	0
11	4	49	0	11	4	42	0
12	5	62	0	12	4	47	0
13	4	47	0	13	3.5	43	0
14	4	49	0	14	4	45	0
15	3.5	39	0	15	3.5	40	0
16	4	45	0	16	3.5	42	0
17	4.5	51	0	17	4	45	0
18	4	46	0	18	4	43	0
19	3.5	43	0	19	4	53	0
20	4	46	0	20	4	50	0
21	5	64	0	21	4.5	59	0
22	4	45	0	22	4	47	0
23	4.5	49	0	23	4	43	0
24	4.5	49	0	24	4	49	0
25				25	3.5	42	0

LENGTHS		LENGTHS	
SUM OF LENGTHS	1156		1211
AVERAGE	48.16667		48.44
S.D.	6.585007		7.665290

WEIGHTS		WEIGHTS	
SAMPLE #	24		25
TARE + FISH	287.3		231.6
TARE	254.4		199.2
FISH	32.9		32.4
# FISH/KG.	729.4833		771.6049

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:	99.5		101.5
AVERAGE	4.145833		4.06
S.D.	.4539481		.4406435

PROJECT: LILLOOET DATE: SEPTEMBER 30/82 SPECIES: COHO
LOCATION: BIRKENHEAD RIVER
REACH: 7A REACH: 7A

SCALE BK.# 29	EYE DIAMETER M.M	LENGTH M.M	AGE MIXED	SCALE BK.# 30	EYE DIAMETER M.M.	LENGTH M.M.	AGE MIXED
1	4	43	0	1	7	105	1
2	5	61	0	2	4.5	62	0
3	4	42	0	3	5	61	0
4	4	44	0	4	4	50	0
5	4	53	0	5	4.5	52	0
6	4	43	0	6	4	51	0
7	4	48	0	7	4	54	0
8	4	51	0	8	4.5	52	0
9	4	47	0	9	4	49	0
10	4	48	0	10	4	50	0
11	4	46	0	11	4	44	0
12	4	45	0	12	4.5	50	0
13	4.5	59	0	13	4	51	0
14	3.5	40	0	14	4	44	0
15	3.5	45	0	15	4	46	0
16	4	45	0	16	3.5	42	0
17	4	56	0	17	4.5	57	0
18	4	49	0	18	5.5	73	0
19	4	50	0	19	4	50	0
20	3.5	45	0	20	3.5	44	0
21	4	49	0	21	4.5	54	0
22	4	45	0	22	4	46	0
23	4.5	60	0	23	5	60	0
24	4.5	55	0	24	5.5	81	0
25	4	47	0	25	4.5	55	0

LENGTHS		LENGTHS	
SUM OF LENGTHS	1216		1383
AVERAGE	48.64		55.32
S.D.	5.750942		13.68308

WEIGHTS		WEIGHTS	
SAMPLE #	25		25
TARE + FISH	241.5		266.4
TARE	209.4		211.8
FISH	32.1		54.6
# FISH/KG.	778.8162		457.8755

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:	101		110.5
AVERAGE	4.04		4.42
S.D.	.3201562		.7455423

Appendix 18: Biological Samples of Juvenile Coho, Birkenhead River (6)

PROJECT: LILLOOET DATE: SEPTEMBER 30/82 SPECIES: COHO
LOCATION: BIRKENHEAD RIVER
REACH: 7A

SCALE BK.# 31	EYE DIAMETER M.M	LENGTH M.M	AGE	SCALE BK.# 32	EYE DIAMETER M.M.	LENGTH M.M.	AGE
					REACH: 7A		
1	4.5	52	0	1	4.5	55	0
2	4.5	52	0	2	3.5	49	R
3	4.5	54	0	3	4	49	0
4	4	51	R	4	4	45	0
5	4	48	0	5	4	50	0
6	4	42	0	6	4	46	0
7	4	46	0	7	4.5	51	0
8	4	44	0	8	4	47	0
9	4	42	0	9	4.5	57	0
10	4	53	0	10	4	44	0
11	4	50	0	11	4	42	0
12	5	63		12	4	45	0
13	4.5	61	0	13	4.5	52	0
14	4	57	0	14	4.5	52	0
15	4.5	50	0	15	4.5	54	0
16	4	44	R	16	4	46	0
17	4	45	0	17	4	49	0
18	4.5	58	0	18	4	52	0
19	4	48	0	19	4	44	0
20	4	45	0	20	4	50	0
21	4	47	0	21	4	48	0
22	4	46	0	22	4.5	54	0
23	4	45	0	23	4.5	58	0
24	4	45	0	24	4	49	0
25	4	43	0	25	4.5	52	0

LENGTHS		LENGTHS
SUM OF LENGTHS	1235	1240
AVERAGE	49.4	49.6
S.D.	5.923119	4.173328

WEIGHTS		WEIGHTS
SAMPLE #	25	25
TARE + FISH	282.5	246.3
TARE	250.2	212.4
FISH	32.3	33.9
# FISH/KG.	773.9938	737.4631

EYE DIAMETER		EYE DIAMETERS
SUM OF DIAMETERS:	104	104
AVERAGE	4.16	4.16
S.D.	.2783882	.2783882

PROJECT: LILLOOET DATE: OCTOBER 1/82 SPECIES: COHO
LOCATION: BIRKENHEAD RIVER
REACH: 7A

SCALE BK.# 33	EYE DIAMETER M.M	LENGTH M.M	AGE	SCALE BK.# 34	EYE DIAMETER M.M.	LENGTH M.M.	AGE
					REACH: 7A		
1	6	86	0	1	6.5	104	1
2	5.5	80	0	2	6	85	0
3	6	79	0	3	6	78	0
4	6	86	0	4	6	89	0
5	6	89	0	5	6.5	81	0
6	5	68	0	6	6	84	0
7	5.5	82	0	7	7	99	1
8	5.5	80	0	8	6	80	0
9	5.5	76	0	9	6	81	0
10	6	81	0	10	7	103	1
11	6	78	0	11	6.5	91	0
12	5.5	76	0	12	6	82	0
13	5.5	75	0	13	6	82	0
14	6	82	0	14	6	84	0
15	5.5	87	0	15	6	87	0
16	6	84	0	16	6	84	0
17	6	78	0	17	6	88	0
18	6	78	0	18	6	78	0
19	6.5	89	0	19	6	86	0
20	6	80	0	20	6	83	0
21	6	79	0	21	5.5	74	0
22	6	83	0	22	6	77	0
23	6	86	0	23	5.5	81	0
24	6	83	0	24	6	86	0
25	5.5	68		25	6	76	0

LENGTHS		LENGTHS
SUM OF LENGTHS	2013	2123
AVERAGE	80.52	84.92
S.D.	5.455273	7.664420

WEIGHTS		WEIGHTS
SAMPLE #	25	25
TARE + FISH	474.6	437.3
TARE	315.4	253.3
FISH	159.2	184
# FISH/KG.	157.0352	135.8696

EYE DIAMETER		EYE DIAMETERS
SUM OF DIAMETERS:	145.5	152.5
AVERAGE	5.82	6.1
S.D.	.3188521	.3535534

PROJECT: LILLOOET DATE: OCTOBER 8/82 SPECIES: COHO
LOCATION: BIRKENHEAD RIVER
REACH: 7B

SCALE BK.# 35	EYE DIAMETER M.M	LENGTH M.M	AGE	SCALE BK.# 36	EYE DIAMETER M.M.	LENGTH M.M.	AGE
					REACH: 7B		
1	5.5	76	0	1	5	56	0
2	4.5	56	0	2	5	60	0
3	5	74	0	3	4.5	49	0
4	5	64		4	5	67	0
5	5	61	R	5	4.5	59	0
6	4	47	0	6	5	57	0
7	4.5	46	0	7	4.5	53	0
8	5.5	70		8	4	46	0
9	5.5	72	0	9	4.5	46	0
10	4	51	0	10	4	49	0
11	5	54	0	11	5	58	0
12	4.5	51	0	12	4	49	0
13	4.5	48	0	13	4.5	49	0
14	4.5	55		14	5.5	70	0
15	4.5	47		15	4.5	61	0
16	5	57	R	16	5	57	0
17	4.5	48	0	17	4.5	56	0
18	4	55	0	18	5	62	0
19	5	54		19	5	60	0
20	4.5	51	0	20	5	58	0
21	4.5	58	0	21	4.5	52	0
22	4.5	52	0	22	4.5	56	0
23	4.5	47	0	23	4.5	48	0
24	4	47	0	24	4.5	48	0
25	4.5	49	R	25	4.5	49	0

LENGTHS		LENGTHS
SUM OF LENGTHS	1390	1377
AVERAGE	55.6	55.08
S.D.	9.055385	6.486653

WEIGHTS		WEIGHTS
SAMPLE #	25	25
TARE + FISH	239.1	270.2
TARE	183.5	228.6
FISH	55.6	41.6
# FISH/KG.	449.6403	600.9615

EYE DIAMETER		EYE DIAMETERS
SUM OF DIAMETERS:	116.5	116.5
AVERAGE	4.66	4.66
S.D.	.4500000	.3741657

Appendix 18: Biological Samples of Juvenile Coho, Birkenhead River (7)

PROJECT: LILLOOET DATE: OCTOBER 8/82 SPECIES: COHO

LOCATION: BIRKENHEAD RIVER

REACH: 7B REACH: 7B

SCALE BK.# 37	EYE DIAMETER M.M	LENGTH M.M	AGE 1	SCALE BK.# 38	EYE DIAMETER M.M.	LENGTH M.M.	AGE 1
1	7	85	1	1	7.5	107	R
2	6.5	81	R	2	7	102	
3	6.5	93	1	3	6.5	86	1
4	7	83	1	4	6	77	1
5	6.5	93	1	5	6.5	73	1
6	6.5	79	R	6	6.5	81	1
7	6.5	79	1	7	6.5	80	1
8	7	82	R	8	6.5	73	0
9	7	89	R	9	6.5	89	1
10	6.5	80	1	10	6.5	78	R
11	6.5	85	1	11	6.5	77	1
12	6.5	81	1	12	7	90	1
13	7	95	1	13	6.5	81	1
14	6	83	0	14	6.5	93	
15	6.5	84	0	15	6	69	R
16	7	96	R	16	7	91	R
17	6.5	75	1	17	6	77	1
18	6.5	81	1	18	6.5	79	1
19	6.5	81	1	19	6.5	77	
20	6.5	85	1	20	6.5	72	1
21	6	73	1	21	7	83	1
22	6	75	0	22	6	68	0
23	6.5	87	1	23	7	89	R
24	6.5	84	R	24	6.5	85	R
25	6.5	69	1	25	7.5	109	1

LENGTHS		LENGTHS	
SUM OF LENGTHS	2078		2086
AVERAGE	83.12		83.44
S.D.	6.647807		10.89755

WEIGHTS		WEIGHTS	
SAMPLE #	25		25
TARE + FISH	398.9		431.5
TARE	231.9		274.1
FISH	167		157.4
# FISH/KG.	149.7006		158.8310

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:	164		165
AVERAGE	6.56		6.6
S.D.	.3		.4082483

PROJECT: LILLOOET DATE: OCTOBER 18/82 SPECIES: COHO

LOCATION: BIRKENHEAD RIVER

REACH: 7B REACH: 7B

SCALE BK.# 39	EYE DIAMETER M.M	LENGTH M.M	AGE 0	SCALE BK.# 40	EYE DIAMETER M.M.	LENGTH M.M.	AGE 0
1	5.5	69	0	1	5.5	68	0
2	5.5	73	0	2	5	65	0
3	6	80	0	3	4.5	53	0
4	5	64	0	4	5	64	0
5	5.5	65	0	5	4.5	58	0
6	5.5	66	0	6	4	45	0
7	4	45	0	7	4	45	0
8	5.5	65	0	8	4.5	47	0
9	4.5	51	0	9	4	50	0
10	4	47	0	10	4	48	0
11	4.5	51	0	11	5	61	0
12	4	47	0	12	4	46	0
13	5	60	0	13	4	49	0
14	5.5	68	0	14	4	46	0
15	4	45	0	15	4	47	0
16	4	47	0	16	5	70	0
17	4	47	0	17	4.5	62	0
18	4	48	0	18	5	56	0
19	4.5	51	0	19	5	62	0
20	4.5	50	0	20	4.5	57	0
21	4	52	0	21	5	57	0
22	4.5	57	0	22	5	59	0
23	5.5	68	R	23	5	59	0
24	4.5	57	0	24	5	57	0
25	4.5	58	0	25	4.5	53	0

LENGTHS		LENGTHS	
SUM OF LENGTHS	1431		1384
AVERAGE	57.24		55.36
S.D.	9.976138		7.549172

WEIGHTS		WEIGHTS	
SAMPLE #	25		25
TARE + FISH	296.9		189.2
TARE	240		139.2
FISH	56.9		50
# FISH/KG.	439.3673		500

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:	118		114.5
AVERAGE	4.72		4.58
S.D.	.6626965		.4716991

PROJECT: LILLOOET DATE: OCTOBER 18/82 SPECIES: COHO

LOCATION: BIRKENHEAD RIVER

REACH: 7B REACH: 7B

SCALE BK.# 41	EYE DIAMETER M.M	LENGTH M.M	AGE 1	SCALE BK.# 42	EYE DIAMETER M.M.	LENGTH M.M.	AGE 1
1	7	102		1	6.5	97	R
2	6	85		2	6	73	R
3	6.5	87		3	7	96	R
4	6.5	83	R	4	6.5	84	R
5	6	92	R	5	6	88	
6	5.5	79	R	6	6.5	92	
7	6	96		7	6	83	
8	5.5	75	R	8	6.5	78	
9	6	100		9	6.5	83	
10	6.5	104	1	10	6	83	R
11	6.5	92		11	7	93	R
12	6.5	105		12	7	103	
13	6	69	R	13	7.5	104	
14	6.5	93	R	14	6.5	89	
15	6	82	R	15	6.5	86	
16	6.5	90		16	7	105	
17	6	78		17	7	89	
18	6.5	95	R	18	7	99	
19	6.5	92	R	19	6.5	84	
20	6	82		20	6.5	86	
21	6.5	85		21	7	93	
22	6.5	92		22	6.5	84	
23	6.5	89	R	23	7	86	
24	5.5	85		24	6	88	0
25	6.5	86		25	6	87	R

LENGTHS		LENGTHS	
SUM OF LENGTHS	2218		2233
AVERAGE	88.72		89.32
S.D.	8.942036		7.961993

WEIGHTS		WEIGHTS	
SAMPLE #	25		25
TARE + FISH	381.5		398.8
TARE	194.9		188.5
FISH	186.6		210.3
# FISH/KG.	133.9764		118.8778

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:	156		164.5
AVERAGE	6.24		6.58
S.D.	.3851407		.4252450

Appendix 18: Biological Samples of Juvenile Coho, Birkenhead River (8)

PROJECT: LILLOOET DATE: OCTOBER 19/82 SPECIES: COHO

LOCATION: BIRKENHEAD RIVER

REACH: 7B REACH: 7B

SCALE BK.# 43	EYE DIAMETER M.M	LENGTH M.M	AGE MIXED	SCALE BK.# 44	EYE DIAMETER M.M.	LENGTH M.M.	AGE MIXED
1	7	104	1	1	6.5	87	1
2	7	113	1	2	6.5	95	
3	6	89	1	3	5.5	84	0
4	5	69	0	4	5.5	69	
5	4	51	0	5	6	75	0
6	3.5	44	0	6	5	71	0
7	4.5	55	0	7	5	59	0
8	4	43	0	8	5	59	0
9	3.5	41	0	9	4	40	0
10	4.5	57	0	10	3.5	42	0
11	4	49	0	11	5	83	0
12	4.5	54	0	12	4.5	59	
13	4	45	0	13	4.5	56	0
14	3.5	43	0	14	4	41	0
15	4	45	0	15	4.5	56	0
16	4.5	47	0	16	3.5	39	0
17	4	44	0	17	3.5	41	0
18	4	44	0	18	4.5	49	0
19	4	44	0	19	3.5	40	0
20	4	43	0	20	4	48	0
21	4	46	0	21	4.5	52	0
22	4	43	0	22	3.5	40	0
23	3.5	39	0	23	4.5	57	0
24	3.5	41	0	24	4	48	0
25	4	43	0	25	4.5	49	0

LENGTHS		LENGTHS	
SUM OF LENGTHS	1336		1439
AVERAGE	53.44		57.56
S.D.	19.69577		16.66103

WEIGHTS		WEIGHTS	
SAMPLE #	25		25
TARE + FISH	321.1		325
TARE	253.4		259.4
FISH	67.7		65.6
# FISH/KG.	369.2762		381.0976

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:	108.5		115
AVERAGE	4.34		4.6
S.D.	.9652288		.8897565

PROJECT: LILLOOET DATE: OCTOBER 19/82 SPECIES: COHO

LOCATION: BIRKENHEAD RIVER

REACH: 7B REACH: 7B

SCALE BK.# 45	EYE DIAMETER M.M	LENGTH M.M	AGE MIXED	SCALE BK.# 46	EYE DIAMETER M.M.	LENGTH M.M.	AGE MIXED
1	7	105		1	7	87	
2	6.5	87	1	2	7	84	
3	7	89		3	7.5	107	
4	7.5	96		4	6.5	84	
5	7	81		5	6.5	83	
6	6.5	77		6	6.5	89	
7	6.5	88		7	7	88	
8	6	74		8	6	72	
9	6.5	86		9	5.5	64	
10	6.5	81		10	5	59	
11	4	43	0	11	5.5	69	
12	6.5	75		12	5	65	
13	6.5	72		13	5	64	
14	5.5	63		14	4.5	54	
15	6	74		15	4.5	48	
16	5.5	61		16	4.5	54	0
17	6	65		17	5.5	64	
18	5	56	0	18	4	45	
19	5.5	54	0	19	4	47	
20	5.5	54	0	20	4	44	
21	5	43	0	21	3	41	0
22	4.5	40	0	22	4.5	50	0
23	4.5	41	0	23	3.5	46	0
24	4	42	0	24	4	44	0
25	4.5	43	0	25	3.5	42	0

LENGTHS		LENGTHS	
SUM OF LENGTHS	1690		1594
AVERAGE	67.6		63.76
S.D.	19.27217		18.58826

WEIGHTS		WEIGHTS	
SAMPLE #	25		26
TARE + FISH	374.7		310.5
TARE	268		221.6
FISH	106.7		88.9
# FISH/KG.	234.3018		292.4634

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:	145.5		129.5
AVERAGE	5.82		5.18
S.D.	.9987492		1.281926

PROJECT: LILLOOET DATE: OCTOBER 28&29/82 SPECIES: COHO

LOCATION: BIRKENHEAD RIVER

REACH: 5 REACH: 5

SCALE BK.# 47	EYE DIAMETER M.M	LENGTH M.M	AGE MIXED	SCALE BK.# 48	EYE DIAMETER M.M.	LENGTH M.M.	AGE MIXED
1	4.5	57	0	1	5.5	68	0
2	6	91	0	2	7	90	1
3	4.5	56	0	3	7	93	1
4	4	53		4	5	59	0
5	5	74		5	6.5	82	1
6	3.5	44	0	6	6	70	0
7	4	47	0	7	5.5	68	0
8	5	57	0	8	6.5	92	1
9	4.5	56	0	9	6	73	0
10	4	51	0	10	5.5	71	0
11	4	44	0	11	4.5	51	0
12	5	58	0	12	5	61	0
13	4.5	58	0	13	5.5	78	0
14	4	56	0	14	5	56	0
15	4.5	47	0	15	6	77	0
16	4	45	0	16	5.5	64	0
17	4	47	0	17	5	61	0
18	4.5	57	0	18	5.5	69	0
19	3.5	42	0	19	6	76	0
20	4.5	56	0	20	5	54	0
21	3.5	44	0	21	4.5	45	0
22	3.5	44	0	22	4.5	52	0
23	3.5	41	0	23	4.5	49	0
24	3.5	38	0	24	5	55	0
25	4	48	0	25	5	49	0

LENGTHS		LENGTHS	
SUM OF LENGTHS	1311		1663
AVERAGE	52.44		66.52
S.D.	11.22898		13.85977

WEIGHTS		WEIGHTS	
SAMPLE #	25		25
TARE + FISH	275.9		304.6
TARE	230		218.2
FISH	45.9		86.4
# FISH/KG.	544.6623		289.3519

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:	105.5		137
AVERAGE	4.22		5.48
S.D.	.6137318		.7427427

Appendix 18: Biological Samples of Juvenile Coho, Birkenhead River (9)

PROJECT: LILLOOET DATE: OCTOBER 29/82 SPECIES: COHO

LOCATION: BIRKENHEAD RIVER

REACH: 5 REACH: 5

SCALE BK.# 49	EYE DIAMETER M.M	LENGTH M.M	AGE MIXED	SCALE BK.# 50	EYE DIAMETER M.M.	LENGTH M.M.	AGE MIXED
1	5.5	68	0	1	6.5	98	1
2	5.5	66	R	2	6.5	85	1
3	6.5	89	1	3	5.5	66	0
4	5.5	60	0	4	5	60	0
5	4.5	47	0	5	5	54	0
6	5	63	0	6	5.5	101	1
7	5	55	0	7	5.5	74	0
8	4	45	0	8	6.5	77	1
9	4.5	46	0	9	4.5	57	0
10	4.5	57	0	10	5.5	68	0
11	5	58	0	11	5.5	59	0
12	4	41	0	12	4.5	48	0
13	3.5	42	0	13	5.5	65	0
14	3.5	40	0	14	5	60	0
15	3.5	41	0	15	5	54	0
16	4	44	0	16	4.5	56	0
17	4	46	0	17	4	47	0
18	4.5	46	0	18	5	53	0
19	4.5	49	0	19	4	49	0
20	4.5	53	0	20	4	46	0
21	4.5	50	0	21	4.5	48	0
22	4.5	49	0	22	4.5	47	0
23	4.5	56	0	23	4.5	43	0
24	5	55	0	24	3	36	0
25	5	60	0	25	4	43	0
							0

LENGTHS		LENGTHS	
SUM OF LENGTHS	1326		1494
AVERAGE	53.04		59.76
S.D.	10.97907		16.58634

WEIGHTS		WEIGHTS	
SAMPLE #	25		
TARE + FISH	289.8		
TARE	239		
FISH	50.8		0
# FISH/KG.	492.1260		ERROR

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:	115		123.5
AVERAGE	4.6		4.94
S.D.	.7071068		.8578073

PROJECT: LILLOOET DATE: OCTOBER 29/82 SPECIES: COHO

LOCATION: BIRKENHEAD RIVER

REACH: 5 REACH: 5

SCALE BK.# 51	EYE DIAMETER M.M	LENGTH M.M	AGE 0	SCALE BK.# 52	EYE DIAMETER M.M.	LENGTH M.M.	AGE 0
1	4.5	39	0	1	5	67	0
2	5.5	73	0	2	5	67	0
3	4.5	55	0	3	5.5	73	0
4	5	68	0	4	4.5	61	0
5	4.5	49	0	5	5	65	0
6	4.5	62	0	6	4.5	61	0
7	5.5	59	0	7	4.5	48	0
8	5	55	0	8	5	56	0
9	5	58	0	9	5	53	R
10	4	57	0	10	4.5	55	R
11	4.5	49	0	11	5.5	64	0
12	5	46	0	12	5	60	0
13	5	63	0	13	6	71	0
14	5	50	0	14	6	65	0
15	4.5	53	0	15	5	61	0
16	4.5	55	0	16	5	57	0
17	4.5	57	0	17	4.5	50	0
18	4.5	48	0	18	5	54	0
19	5	57	0	19	5	63	0
20	5	51	0	20	5	51	0
21	5.5	63	0	21	4.5	47	0
22	4	54	0	22	4	49	0
23	5	57	0	23	4.5	50	0
24	5	48	0	24	5.5	56	0
25	4.5	43	0	25	4.5	49	0

LENGTHS		LENGTHS	
SUM OF LENGTHS	1369		1453
AVERAGE	54.76		58.12
S.D.	7.655499		7.540557

WEIGHTS		WEIGHTS	
SAMPLE #	25		25
TARE + FISH	268.6		266.3
TARE	220.7		210.8
FISH	47.9		55.5
# FISH/KG.	521.9207		450.4505

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:	119.5		123.5
AVERAGE	4.78		4.94
S.D.	.4102845		.4856267

PROJECT: LILLOOET DATE: OCTOBER 29/82 SPECIES: COHO

LOCATION: BIRKENHEAD RIVER

REACH: 5 REACH: 5

SCALE BK.# 53	EYE DIAMETER M.M	LENGTH M.M	AGE 1	SCALE BK.# 54	EYE DIAMETER M.M.	LENGTH M.M.	AGE 1
1	6.5	93	R	1	6.5	81	1
2	6	76	0	2	6	81	0
3	7	93	1	3	6.5	95	1
4	6.5	87	R	4	6	75	1
5	6.5	90	1	5	6.5	75	1
6	6.5	91	1	6	6	81	0
7	6	75	0	7	6	74	0
8	7	95	1	8	7	86	R
9	6.5	94	R	9	6	72	0
10	6.5	87	R	10	7	88	1
11	6.5	87	1	11	7	85	0
12	6	74	0	12	7.5	102	1
13	7	96	R	13	7	82	0
14	7	101	1	14	6.5	75	1
15	6.5	82	1	15	7	94	1
16	6.5	87	1	16	6.5	92	R
17	6	81	0	17	6.5	80	1
18	7	99	1	18	6	73	1
19	6.5	89	0	19	6	81	1
20	7	89	1	20	7	87	R
21	6	78	0	21	6.5	89	1
22	6.5	81	1	22	6.5	81	1
23	6.5	84	1	23	6	91	0
24	6	73	0	24	6	75	0
25	6.5	78	1	25	6	70	R

LENGTHS		LENGTHS	
SUM OF LENGTHS	2150		2065
AVERAGE	86		82.6
S.D.	8.041559		8.200610

WEIGHTS		WEIGHTS	
SAMPLE #	25		25
TARE + FISH	423.4		399.1
TARE	243.6		232.7
FISH	179.8		166.4
# FISH/KG.	139.0434		150.2404

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:	162.5		161.5
AVERAGE	6.5		6.46
S.D.	.3535534		.4546061

Appendix 18: Biological Samples of Juvenile Coho, Birkenhead River (10)

PROJECT: LILLOOET DATE: NOVEMBER 8/82 SPECIES: COHO

LOCATION: BIRKENHEAD RIVER

REACH: 6B REACH: 6B

SCALE BK.# 55	EYE DIAMETER M.M	LENGTH M.M	AGE MIXED	SCALE BK.# 56	EYE DIAMETER M.M.	LENGTH M.M.	AGE MIXED
1	5	59	0	1	5	77	
2	5.5	72	0	2	4	49	0
3	4.5	65		3	3.5	49	0
4	5	63		4	4.5	65	0
5	4.5	56	R	5	4.5	50	0
6	5	55		6	4.5	62	0
7	4.5	47	0	7	5	78	0
8	4	41	0	8	5	75	0
9	5.5	60	0	9	4.5	67	
10	6	71	0	10	3.5	48	0
11	4.5	49		11	4.5	67	
12	5	62		12	4.5	54	0
13	5	49		13	3.5	45	0
14	5	50		14	4	51	0
15	5	52		15	4.5	62	R
16	5	50		16	4	53	0
17	4.5	50		17	4	47	R
18	5	50		18	4	51	0
19	4.5	44	0	19	4	49	0
20	5.5	60	0	20	4	48	0
21	4.5	50	0	21	4	50	0
22	4	46	0	22	4	49	0
23	4.5	45		23	3.5	46	0
24	4.5	48		24	4	54	0
25	4	43	0	25	3.5	42	0

LENGTHS		LENGTHS
SUM OF LENGTHS	1337	1388
AVERAGE	53.48	55.52
S.D.	8.485871	10.48062

WEIGHTS		WEIGHTS
SAMPLE #	25	25
TARE + FISH	267.5	281
TARE	221.5	230.7
FISH	46	50.3
# FISH/KG.	543.4783	497.0179

EYE DIAMETER		EYE DIAMETERS
SUM OF DIAMETERS:	120	104
AVERAGE	4.8	4.16
S.D.	.5000000	.4725816

PROJECT: LILLOOET DATE: NOVEMBER 8/82 SPECIES: COHO

LOCATION: BIRKENHEAD RIVER

REACH: 6B REACH: 6B

SCALE BK.# 57	EYE DIAMETER M.M	LENGTH M.M	AGE MIXED	SCALE BK.# 58	EYE DIAMETER M.M.	LENGTH M.M.	AGE MIXED
1	5.5	70		1	5	66	0
2	5	72	0	2	5	67	0
3	5	62		3	5.5	74	0
4	4.5	57	0	4	5	68	
5	4	61		5	5.5	74	
6	5	54	R	6	4.5	61	0
7	5	58	0	7	4.5	67	0
8	5	62		8	5	68	R
9	5	58		9	5	67	
10	4.5	55	0	10	4.5	60	
11	4.5	57	0	11	5	62	
12	5.5	69	0	12	5	58	0
13	3	50	0	13	5	59	0
14	3	46	0	14	4.5	54	0
15	3.5	40	0	15	4	46	0
16	4	42	0	16	4	46	
17	4.5	47	0	17	4.5	59	
18	4	45	0	18	4.5	60	0
19	4.5	52	0	19	5	58	0
20	4.5	52	0	20	4.5	58	
21	4	46	0	21	4	50	0
22	4	46	0	22	4	49	0
23	4.5	43	0	23	4.5	53	0
24	4.5	54		24	4	47	0
25	4	46	0	25	4.5	52	0

LENGTHS		LENGTHS
SUM OF LENGTHS	1344	1483
AVERAGE	53.76	59.32
S.D.	8.903557	8.270026

WEIGHTS		WEIGHTS
SAMPLE #	27	25
TARE + FISH	282.6	341.7
TARE	233.8	283.7
FISH	48.8	58
# FISH/KG.	553.2787	431.0345

EYE DIAMETER		EYE DIAMETERS
SUM OF DIAMETERS:	110.5	116.5
AVERAGE	4.42	4.66
S.D.	.6563790	.4500000

PROJECT: LILLOOET DATE: NOVEMBER 8/82 SPECIES: COHO

LOCATION: BIRKENHEAD RIVER

REACH: 6B REACH: 6B

SCALE BK.# 59	EYE DIAMETER M.M	LENGTH M.M	AGE 0	SCALE BK.# 60	EYE DIAMETER M.M.	LENGTH M.M.	AGE 0
1	5.5	72		1	6	82	
2	4.5	63		2	5	74	
3	5	69		3	5.5	73	0
4	5.5	74		4	5	66	
5	4.5	61		5	5.5	67	
6	5	70		6	5.5	69	
7	5	60		7	5.5	70	
8	5.5	73		8	5.5	70	
9	4.5	60		9	5.5	66	
10	5	71		10	5.5	67	
11	4.5	60	0	11	5	56	0
12	4.5	58		12	5	62	
13	5	59		13	4.5	63	
14	4.5	56		14	5	66	
15	4.5	49		15	5	59	
16	4	47		16	5	56	
17	4	48		17	4.5	51	
18	4	51		18	5	57	
19	4.5	53		19	4.5	55	
20	4.5	48	0	20	4.5	58	
21	4.5	56		21	4	52	
22	4	48		22	4.5	52	
23	4.5	51		23	4.5	52	
24	4.5	46		24	4	48	0
25	4.5	50	0	25	4	45	

LENGTHS		LENGTHS
SUM OF LENGTHS	1453	1536
AVERAGE	58.12	61.44
S.D.	9.125605	9.151867

WEIGHTS		WEIGHTS
SAMPLE #	25	25
TARE + FISH	300.4	273
TARE	259.9	208
FISH	40.5	65
# FISH/KG.	617.2840	384.6154

EYE DIAMETER		EYE DIAMETERS
SUM OF DIAMETERS:	116	123.5
AVERAGE	4.64	4.94
S.D.	.4453463	.5461990

Appendix 18: Biological Samples of Juvenile Coho, Birkenhead River (11)

PROJECT: LILLOOET DATE: NOVEMBER 8/82 SPECIES: COHO

LOCATION: BIRKENHEAD RIVER

REACH: 6B REACH: 6B

SCALE BK.# 61	EYE DIAMETER M.M	LENGTH M.M	AGE 1	SCALE BK.# 62	EYE DIAMETER M.M.	LENGTH M.M.	AGE 1
1	6	81		1	6	95	R
2	6.5	72		2	7	97	
3	6.5	89		3	7	85	
4	6.5	83		4	6.5	86	R
5	7	95		5	7	93	
6	6.5	90		6	7	98	
7	5.5	89		7	6.5	87	
8	6	81		8	6.5	90	
9	6	78		9	6.5	92	
10	6.5	79		10	6.5	92	
11	6.5	78		11	6	85	
12	6.5	81		12	6.5	89	
13	6.5	85	R	13	5.5	80	
14	5	79	0	14	5.5	85	
15	7	88		15	6	82	
16	6.5	91		16	5.5	77	
17	7	87		17	6	85	
18	6	81		18	5.5	76	
19	6	81		19	6.5	80	
20	6.5	83		20	6	83	
21	5.5	72		21	5.5	77	R
22	6	78		22	7	96	0
23	6	77		23	7	94	
24	6.5	79		24	6	90	
25	6	78		25	5	85	

LENGTHS		LENGTHS	
SUM OF LENGTHS	2055		2179
AVERAGE	82.2		87.16
S.D.	5.787918		6.465807

WEIGHTS		WEIGHTS	
SAMPLE #	25		25
TARE + FISH	387.8		397
TARE	238.8		214
FISH	149		183
# FISH/KG.	167.7852		136.6120

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:	156.5		156
AVERAGE	6.26		6.24
S.D.	.4813176		.5972158

PROJECT: LILLOOET DATE: NOVEMBER 19/82 SPECIES: COHO

LOCATION: BIRKENHEAD RIVER

REACH: WARBONNET CREEK R2 REACH: WARBONNET CREEK R2

SCALE BK.# 63	EYE DIAMETER M.M	LENGTH M.M	AGE 0	SCALE BK.# 64	EYE DIAMETER M.M.	LENGTH M.M.	AGE 0
1	6	71		1	5	70	
2	6	72		2	4.5	54	
3	6	73		3	5	63	
4	5	75		4	5.5	80	
5	6	76		5	5	62	
6	5	66		6	5.5	71	
7	5	67		7	5	57	
8	5	62	0	8	5.5	67	
9	5.5	66		9	5.5	70	
10	5	58		10	5	67	
11	4.5	54		11	5	61	
12	4.5	58		12	5	67	
13	5.5	72		13	5	60	
14	4.5	54		14	5	61	
15	5	62		15	4.5	53	
16	4.5	51	0	16	5	68	
17	5	60		17	4	52	0
18	5	67		18	4.5	58	0
19	5	66		19	5	58	
20	5	63		20	4.5	53	
21	5	56		21	5	63	
22	5	63		22	5.5	69	
23	5	65		23	5	58	
24	5	59		24	5	56	
25	4.5	56		25	5	60	

LENGTHS		LENGTHS	
SUM OF LENGTHS	1592		1558
AVERAGE	63.68		62.32
S.D.	6.986415		6.884282

WEIGHTS		WEIGHTS	
SAMPLE #	25		25
TARE + FISH	285.5		258
TARE	210		190
FISH	75.5		68
# FISH/KG.	331.1258		367.6471

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:	127.5		124.5
AVERAGE	5.1		4.98
S.D.	.4787136		.3674235

PROJECT: LILLOOET DATE: NOVEMBER 19/82 SPECIES: COHO

LOCATION: BIRKENHEAD RIVER

REACH: WARBONNET CREEK R2 REACH: WARBONNET CREEK R2

SCALE BK.# 65	EYE DIAMETER M.M	LENGTH M.M	AGE 1	SCALE BK.# 66	EYE DIAMETER M.M.	LENGTH M.M.	AGE 1
1	6.5	103		1	6.5	91	
2	6	72		2	6.5	106	
3	6	82		3	6	90	
4	6	81		4	6.5	88	
5	6	86		5	6	86	
6	5.5	72		6	6	85	
7	6	80	0	7	6	87	
8	6.5	97		8	6	78	
9	6	76		9	6	78	
10	5.5	72		10	6.5	91	
11	6	80		11	6	88	
12	6	88		12	6	85	
13	6	80		13	6	84	
14	6	87		14	6	85	
15	6	80		15	6	88	
16	6	74		16	5.5	81	
17	6	82		17	6	85	
18	6	75		18	6	91	
19	6	82		19	6	88	
20	6	94		20	6	82	
21	6	80		21	5.5	81	
22	6	80		22	6	80	
23	6	83		23	5.5	83	
24	6	75		24	6	83	
25	6	86		25	5.5	79	

LENGTHS		LENGTHS	
SUM OF LENGTHS	2047		2143
AVERAGE	81.88		85.72
S.D.	7.709950		5.813203

WEIGHTS		WEIGHTS	
SAMPLE #	25		25
TARE + FISH	429.5		421.9
TARE	237.5		242.2
FISH	192		179.7
# FISH/KG.	130.2108		139.1208

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:	150		150
AVERAGE	6		6
S.D.	.2041241		.2886751

Appendix 18: Biological Samples of Juvenile Coho, Birkenhead River (12)

PROJECT: LILLOOET DATE: NOVEMBER 20/82 SPECIES: COHO
LOCATION: BIRKENHEAD RIVER
REACH: WARBONNET CREEK R2

SCALE BK.# 67	EYE DIAMETER M.M	LENGTH M.M	AGE MIXED	SCALE BK.# 68	EYE DIAMETER M.M.	LENGTH M.M.	AGE MIXED
1	5	66	0	1	5	68	
2	4.5	59	0	2	5	64	0
3	5.5	71	0	3	5.5	70	
4	5	65		4	4.5	61	
5	5.5	69	0	5	5	65	
6	5.5	69	0	6	5.5	62	
7	5	64	0	7	5	61	
8	4.5	57	0	8	5	66	0
9	5.5	76	R	9	5	60	
10	5.5	75	0	10	5.5	70	0
11	5.5	78	0	11	5	63	0
12	5.5	74	0	12	5.5	70	R
13	5	75		13	5	69	
14	4.5	63		14	5	68	R
15	6	86		15	6	86	
16	5.5	70		16	5	70	R
17	5.5	69		17	5.5	74	
18	5	68	0	18	5.5	78	0
19	5	66	0	19	5	71	0
20	5.5	71		20	5	57	
21	4.5	56		21	6	81	0
22	5	69		22	6	79	0
23	5	63	0	23	4.5	55	0
24	4.5	57	0	24	4.5	57	0
25	5	61		25	5	60	0

LENGTHS		LENGTHS
SUM OF LENGTHS	1697	1685
AVERAGE	67.88	67.4
S.D.	7.207172	7.089867

WEIGHTS		WEIGHTS
SAMPLE #	25	25
TARE + FISH	346.1	322.2
TARE	278.9	236
FISH	67.2	86.2
# FISH/KG.	372.0238	290.0232

EYE DIAMETER		EYE DIAMETERS
SUM OF DIAMETERS:	128.5	129.5
AVERAGE	5.14	5.18
S.D.	.4213075	.4301163

PROJECT: LILLOOET DATE: NOVEMBER 20/82 SPECIES: COHO
LOCATION: BIRKENHEAD RIVER
REACH: WARBONNET CREEK R2

SCALE BK.# 69	EYE DIAMETER M.M	LENGTH M.M	AGE MIXED	SCALE BK.# 70	EYE DIAMETER M.M.	LENGTH M.M.	AGE MIXED
1	5.5	85	0	1	6.5	96	0
2	5	64	0	2	5	64	0
3	5	73	0	3	5	69	0
4	5.5	86	0	4	5	67	0
5	5	65	0	5	5.5	76	
6	6.5	110	0	6	5	57	
7	5	66	0	7	6	80	0
8	6	97		8	6	85	0
9	5	66		9	6	79	0
10	5.5	71		10	5.5	78	R
11	5	62	0	11	5	66	0
12	4.5	67	0	12	5	76	0
13	4.5	56	0	13	5.5	70	0
14	5	67	0	14	4.5	57	0
15	4.5	58		15	5.5	79	
16	5	55	0	16	5	60	0
17	5.5	68	0	17	5	59	
18	5	77	0	18	5	68	
19	4.5	64	0	19	6	90	0
20	5.5	76		20	5.5	76	
21	4.5	56	0	21	5.5	66	0
22	5	68		22	5.5	73	
23	4.5	56	0	23	5	61	0
24	4.5	57		24	5	75	
25	4.5	56	0	25	5.5	68	R

LENGTHS		LENGTHS
SUM OF LENGTHS	1726	1795
AVERAGE	69.04	71.8
S.D.	13.57535	10.02912

WEIGHTS		WEIGHTS
SAMPLE #	25	25
TARE + FISH	297.9	345
TARE	197.8	240.6
FISH	100.1	104.4
# FISH/KG.	249.7502	239.4636

EYE DIAMETER		EYE DIAMETERS
SUM OF DIAMETERS:	126	134
AVERAGE	5.04	5.36
S.D.	.5188127	.4681524

PROJECT: LILLOOET DATE: NOVEMBER 30/82 SPECIES: COHO
LOCATION: BIRKENHEAD RIVER
REACH: WARBONNET CREEK R2

SCALE BK.# 71	EYE DIAMETER M.M	LENGTH M.M	AGE MIXED	SCALE BK.# 72	EYE DIAMETER M.M.	LENGTH M.M.	AGE MIXED
1	5	68	0	1	5	71	0
2	6	75		2	5.5	67	0
3	5	66	0	3	5.5	72	0
4	5.5	69	0	4	5.5	74	0
5	6	71	0	5	5	70	0
6	5	72	0	6	5.5	64	0
7	5.5	65	0	7	5.5	71	0
8	5	59	0	8	5	67	R
9	5.5	67	0	9	5	62	0
10	5.5	73	0	10	5	63	0
11	6	84	0	11	4.5	59	0
12	5	64	0	12	5	70	0
13	6	75	0	13	4.5	65	
14	5	65		14	5.5	66	0
15	5	59	0	15	5.5	71	0
16	5.5	65	0	16	6	72	0
17	5.5	73	0	17	5.5	71	0
18	5	59	0	18	4.5	53	0
19	5	54	0	19	5.5	66	0
20	4.5	53		20	5	62	0
21	4.5	56	0	21	5	63	0
22	6	72	0	22	4.5	59	0
23	5	62	0	23	4.5	58	0
24	5	56	0	24	4.5	58	0
25	5	60	0	25	5	59	0

LENGTHS		LENGTHS
SUM OF LENGTHS	1642	1633
AVERAGE	65.68	65.32
S.D.	7.668768	5.617829

WEIGHTS		WEIGHTS
SAMPLE #	25	25
TARE + FISH	263.2	256.7
TARE	193.6	176.5
FISH	69.6	80.2
# FISH/KG.	359.1954	311.7207

EYE DIAMETER		EYE DIAMETERS
SUM OF DIAMETERS:	132	127.5
AVERAGE	5.28	5.1
S.D.	.4582576	.4330127

Appendix 18: Biological Samples of Juvenile Coho, Birkenhead River (13)

PROJECT: LILLOOET DATE: JANUARY 7/83 SPECIES: COHO

LOCATION: BIRKENHEAD RIVER

REACH: WARBONNET CREEK R2 REACH: WARBONNET CREEK R2

SCALE BK.# 73	EYE DIAMETER M.M	LENGTH M.M	AGE MIXED	SCALE BK.# 74	EYE DIAMETER M.M.	LENGTH M.M.	AGE MIXED
1	5.5	77	1	1	4.5	67	1
2	5	74	1	2	5	63	1
3	5	66	1	3	5	60	1
4	5.5	79	1	4	5	62	1
5	6.5	91	1	5	5.5	80	1
6	5	66	1	6	7	99	2
7	5	68	1	7	5.5	76	1
8	5.5	77	1	8	5.5	74	1
9	5	64	1	9	6.5	86	1
10	6	87	1	10	6	79	1
11	6	86	1	11	5.5	75	1
12	6	85	1	12	6.5	89	1
13	6	90	1	13	5	72	1
14	5.5	84	1	14	5	60	1
15	5.5	79	1	15	5	70	1
16	6	84	1	16	5.5	65	1
17	5	71	1	17	5.5	71	1
18	5.5	75	1	18	5.5	78	1
19	5.5	76	1	19	6.5	99	1
20	5	59	1	20	5.5	75	1
21	6	78	1	21	5	56	1
22	5	67	1	22	5	60	1
23	6	79	1	23	5.5	67	1
24	5.5	74	1	24	5.5	79	1
25	5	67	1	25	5	62	1

LENGTHS		LENGTHS	
SUM OF LENGTHS	1903		1824
AVERAGE	76.12		72.96
S.D.	8.603875		11.59914

WEIGHTS		WEIGHTS	
SAMPLE #	25		
TARE + FISH	365.8		
TARE	250.3		
FISH	115.5		
# FISH/KG.	216.4502		

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:	137.5		137
AVERAGE	5.5		5.48
S.D.	.4564355		.6034622

PROJECT: LILLOOET DATE: JANUARY 8/83 SPECIES: COHO

LOCATION: BIRKENHEAD RIVER

REACH: 8 REACH: 6B

SCALE BK.# 75	EYE DIAMETER M.M	LENGTH M.M	AGE MIXED	SCALE BK.# 76	EYE DIAMETER M.M.	LENGTH M.M.	AGE MIXED
1	5	72	1	1	5	59	
2	5.5	71	1	2	5	59	1
3	6	72	1	3	4.5	51	1
4	4.5	57	1	4	4	43	1
5	4.5	52		5	4.5	59	1
6	4	46	1	6	4	48	1
7	7	101	2	7	4.5	56	1
8	5.5	74	1	8	4.5	47	1
9	5.5	69	1	9	5	67	1
10	4.5	55	1	10	5	63	1
11	5	59	1	11	4	52	1
12	6.5	89	1	12	4.5	47	1
13	5	69	1	13	4	49	1
14	5.5	66	1	14	4	48	1
15	5	70	1	15	7	87	1
16	5.5	80	1	16	4	52	
17	5	67	1	17	5	64	
18	5.5	77	R	18	4	47	1
19	5	62	R	19	4.5	49	
20	5	71	1	20	4.5	47	
21	4.5	58	1	21	5	72	
22	5.5	74	1	22	4.5	67	
23	4.5	60		23	5	58	
24	5	64	1	24	4.5	46	
25	4	49		25	4.5	56	

LENGTHS		LENGTHS	
SUM OF LENGTHS	1684		1393
AVERAGE	67.36		55.72
S.D.	12.18907		10.15923

WEIGHTS		WEIGHTS	
SAMPLE #	25		25
TARE + FISH	344		329.5
TARE	258.1		280.7
FISH	85.9		48.8
# FISH/KG.	291.0361		512.2951

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:	128.5		115
AVERAGE	5.14		4.6
S.D.	.7000000		.6291529

Appendix 19: Water Temperatures, Birkenhead River
I.P.S.F.C. Thermograph

1982	Min. Temp. °C	Max. Temp. °C	Mean Temp. °C	1982	Min. Temp. °C	Max. Temp. °C	Mean Temp. °C
Aug. 18	9.5	14.0	11.75	Oct. 1	7.5	10.5	9.0
19	10.0	14.5	12.25	2	9.5	10.5	10.0
20	11.0	14.5	12.75	3	8.0	9.5	8.75
21	11.0	15.0	13.0	4	6.5	10.5	8.5
22	11.0	14.5	12.75	5	7.0	9.0	8.0
23	11.5	15.5	13.5	6	8.0	8.5	8.25
24	11.5	16.0	13.75	7	7.0	9.0	8.0
25	11.5	15.5	13.5	8	6.5	9.0	7.75
26	12.0	15.5	13.75	9	7.0	9.0	8.0
27	12.0	13.0	12.5	10	6.5	9.5	8.0
28	11.5	13.5	12.5	11	8.0	10.0	9.0
29	11.0	13.0	12.0	12	7.0	9.5	8.25
30	11.5	13.5	12.5	13	9.5	9.5	9.5
31	11.5	14.0	12.75	14	9.0	10.0	9.5
				15	9.5	10.0	9.75
Sep. 1	11.0	14.5	12.75	16	7.0	10.0	8.5
2	11.0	15.0	13.0	17	9.0	10.0	9.5
3	11.5	14.0	12.75	18	4.5	6.5	5.5
4	11.5	13.0	12.25	19	5.0	6.5	5.75
5	11.5	13.5	12.5	20	4.5	6.5	5.5
6	11.0	13.0	12.0	21	6.0	6.5	6.25
7	11.5	12.0	11.75	22	6.5	6.5	6.5
8	11.0	12.0	11.5	23	5.5	6.5	6.0
9	10.0	11.0	10.5	24	6.0	6.5	6.25
10	9.5	11.5	10.5	25	6.5	8.0	7.25
11	9.5	10.5	10.0	26	6.5	6.5	6.5
12	9.0	12.0	10.5	27	6.0	6.5	6.25
13	9.5	12.0	10.75	28	6.0	6.5	6.25
14	9.0	12.0	10.5	29	5.0	6.0	5.5
15	9.5	10.5	10.0	30	4.5	5.5	5.0
16	9.5	13.5	11.5	31	5.5	6.0	5.75
17	10.0	13.5	11.75				
18	10.0	13.5	11.75	Nov. 1	5.0	6.0	5.5
19	10.5	13.5	12.0	2	4.0	5.0	4.5
20	10.0	13.0	11.5	3	4.0	5.5	4.75
21	11.0	14.0	12.5	4	5.5	5.5	5.5
22	10.5	13.5	12.0	5	5.0	5.5	5.25
23	10.0	13.5	11.75	6	4.5	5.0	4.75
24	10.5	14.0	12.25	7	4.5	5.0	4.75
25	11.0	14.5	12.75	8	4.0	5.0	4.5
26	9.5	12.0	10.75	9	3.0	4.0	3.5
27	10.0	11.0	10.5	10	2.0	3.5	2.75
28	9.5	11.0	9.75	11	2.0	3.5	2.75
29	8.5	11.0	9.75	12	2.5	4.0	3.25
30	8.0	11.0	9.5	13	2.0	3.5	2.75

Appendix 19: Water Temperatures, Birkenhead River
I.P.S.F.C. Thermograph

1982	Min. Temp. °C	Max. Temp. °C	Mean Temp. °C
Nov.14	1.5	3.0	2.25
15	1.5	3.0	2.25
16	3.0	3.5	3.25
17	3.5	4.0	3.75
18	3.0	3.5	3.25
19	2.0	3.0	2.5
20	2.0	2.5	2.25
21	0	1.0	0.5
22	-0.5	0.5	0
23	-0.5	0.5	0
24	0	0.5	0.25
25	0	1.0	0.5
26	1.0	1.5	1.25
27	1.5	2.0	1.75
28	2.0	3.0	2.5
29	3.0	3.5	3.25
30	3.0	3.5	3.25
Dec. 1	2.5	3.5	3.0
2	3.0	3.5	3.25
3	1.5	2.0	1.75
4	2.0	3.0	2.5
5	1.5	2.0	1.75
6	1.0	1.5	1.25
7	0.5	1.0	0.75
8	0.5	1.5	1.0
9	0.5	1.0	0.75
10	0	1.0	0.5
11	0.5	1.5	1.0
12	1.0	2.0	1.5
13	2.0	2.5	2.25
14	2.0	3.0	2.5
15	2.0	2.5	2.25
16	1.5	2.0	1.75
17	1.0	3.0	2.0
18	3.0	3.0	3.0
19	2.5	3.0	2.75
20	2.0	2.0	2.0
21	2.0	2.0	2.0
22	1.5	2.0	1.75
23	2.0	2.5	2.25
24	1.5	3.0	1.75
25	3.0	3.0	3.0

1982	Min. Temp. °C	Max. Temp. °C	Mean Temp. °C
Dec.26	2.0	2.0	2.0
27	0	1.0	0.5
28	0	-	-
29	-	-	-
30	-	-	-
31	-	-	-
1983			
Jan. 1	-	-	-
2	-	-	-
3	-	-	-
4	-	3.0	-
5	2.0	3.0	2.5
6	2.0	3.0	2.5
7	3.0	3.0	3.0
8	2.0	3.0	2.5
9	2.0	2.0	2.0
10	2.0	3.5	2.75

Missing Temperatures result from malfunctioning in thermograph.

Appendix 20: Coho Catch, Summer Survey
Lillooet River

1982	Reach	Temp. °C	Time In	Hours	# Traps	Total Trap Hours	Coho Catch	Coho Catch/ Trap Hour
Aug. 24	4	16.0	15:30	1.75	3	5.25	3	0.57
Aug. 24	5	-	14:30	2.0	3	6.0	0	0
Aug. 24	7	14.0	10.45	2.5	2	5.0	8	1.60
Aug. 24	7	12.0	11:15	2.75	2	5.5	10	1.82
TOTAL					10	21.75	21	

Appendix 21: Biological Samples of Juvenile Coho, Lillooet River

PROJECT: LILLOOET DATE: AUGUST 24/82 SPECIES: COHO

LOCATION: SAMSON CREEK

REACH: 6 REACH: 6

SCALE BK.# 15	EYE DIAMETER M.M	LENGTH M.M	AGE	SCALE BK.# 16	EYE DIAMETER M.M.	LENGTH M.M.	AGE
1	5	71	0	1	4	47	0
2	4	53	0	2	4.5	58	0
3	4	54	0	3	6.5	93	0
4	4	54	0	4	4	46	0
5	3.5	43	0	5	4.5	61	0
6	3.5	48	0	6	4	46	0
7	3.5	41	0	7	4.5	55	0
8	3.5	42	0	8	5	63	0
9				9	3.5	44	0
10				10	3.5	43	0
11				11			
12				12			
13				13			
14				14			
15				15			
16				16			
17				17			
18				18			
19				19			
20				20			
21				21			
22				22			
23				23			
24				24			
25				25			

LENGTHS		LENGTHS	
SUM OF LENGTHS	406		556
AVERAGE	50.75		55.6
S.D.	9.823441		15.05693

WEIGHTS		WEIGHTS	
SAMPLE #	8		10
TARE + FISH	223.6		226.8
TARE	209.4		198.7
FISH	14.2		28.1
# FISH/KG.	563.3803		355.8719

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:	31		44
AVERAGE	3.875		4.4
S.D.	.5175492		.8755950

PROJECT: LILLOOET DATE: AUGUST 24/82 SPECIES: COHO

LOCATION: RYAN RIVER

REACH: 4 REACH:

SCALE BK.# 17	EYE DIAMETER M.M	LENGTH M.M	AGE	SCALE BK.#	EYE DIAMETER M.M.	LENGTH M.M.	AGE
			MIXED				
1	6	96	0	1			
2	4.5	57	0	2			
3	4	43	0	3			
4				4			
5				5			
6				6			
7				7			
8				8			
9				9			
10				10			
11				11			
12				12			
13				13			
14				14			
15				15			
16				16			
17				17			
18				18			
19				19			
20				20			
21				21			
22				22			
23				23			
24				24			
25				25			

LENGTHS		LENGTHS	
SUM OF LENGTHS	196		
AVERAGE	65.33333		
S.D.	27.46513		

WEIGHTS		WEIGHTS	
SAMPLE #	3		
TARE + FISH	221.9		
TARE	205.6		
FISH	16.3		
# FISH/KG.	184.0491		

EYE DIAMETER		EYE DIAMETERS	
SUM OF DIAMETERS:	14.5		
AVERAGE	4.833333		
S.D.	1.040833		

Appendix 22: Summary of Daily Adult Coho Data
Birkenhead River

1982	Reach	Live Count	Dead Count				Samples Taken**			Comments
			M	F	Unk.	Total	M	F	Total	
Nov. 1	6*	9	0	0	0	0	0	0	0	Sunny; Water clear
1	7*	16	0	0	0	0	0	0	0	
2	6*	8	1	1	0	2	0	0	0	Sunny; Water clear
2	7*	40	0	0	0	0	0	0	0	
3	6*	7	0	0	0	0	0	0	0	Cloudy; Water clear
3	7*	20	1	1	0	2	1	0	1	
3	9*	8	0	0	0	0	0	0	0	
4	4	2	1	0	0	1	1	0	1	Raining; Water rippled but clear
4	6*	28	1	0	0	1	1	0	1	
4	7*	13	0	0	0	0	0	0	0	
4	9*	7	0	0	0	0	0	0	0	
4	10	4	0	0	0	0	0	0	0	
5	6*	30	0	0	0	0	0	0	0	Raining; Water clear
9	8*	16	0	0	0	0	0	0	0	Sunny; Water clear
9	9*	7	0	0	0	0	0	0	0	
10	6*	4	0	1	0	1	0	0	0	Sunny; Windy; Water rippled
10	7*	51	0	0	0	0	0	0	0	
11	4	6	2	0	0	2	1	0	1	Sunny; Water clear
11	6*	4	0	0	0	0	0	0	0	
11	7*	41	0	0	0	0	0	0	0	
11	9*	11	0	0	0	0	0	0	0	
11	10	3	0	0	2	2	0	0	0	Water turbid
15	8*	24	5	3	0	8	3	2	5	Snowing; Water clear
16	4	30	4	4	3	11	2	1	3	Snowing and raining; Water rippled
16	9*	19	0	0	0	0	0	0	0	
16	10	4	1	0	0	1	1	0	1	
17	4	20	1	1	0	2	1	0	1	Raining a.m., clear p.m.
17	7*	5	0	0	0	0	0	0	0	
17	8*	44	0	1	0	1	0	1	1	
18	3	9	2	0	0	2	2	0	2	Several condition 5 fish unsampled

Appendix 22: Summary of Daily Adult Coho Data - Birkenhead River
continued

1982	Reach	Live Count	Dead Count				Samples Taken**			Comments
			M	F	Unk.	Total	M	F	Total	
Nov.26	8	11	3	3	1	7	3	3	6	
29	7	15	3	3	0	6	3	3	6	Cloudy; Water clear and calm
30	4	30	1	1	6	8	1	1	2	
30	9	21	0	5	0	5	0	5	5	
30	10	15	1	1	0	2	1	1	2	
Dec. 1	6	65	6	1	1	8	6	1	7	Cloudy, some rain; Water moderately
1	7	86	3	4	12	17	3	4	7	clear and calm
1	8	38	4	0	2	6	4	0	4	
2	3	0	0	0	1	1	0	0	0	Cloudy; Water clear and calm
2	9	15	0	1	0	1	0	1	1	
2	10	20	0	0	0	0	0	0	0	
6	4	45	1	1	0	2	1	1	2	Sunny; Water rippled
6	7	58	1	1	0	2	1	1	2	
6	9	16	0	0	0	0	0	0	0	Sunny; Water clear and calm
6	10	18	4	2	0	6	4	2	6	Four eagle kills
8	3	0	0	0	0	0	0	0	0	Sunny; Water clear and calm
8	4	40	0	0	0	0	0	0	0	
8	6	36	0	0	1	1	0	0	0	
8	7	50	1	0	0	1	1	0	1	
8	8	20	0	1	0	1	0	1	1	
8	9	30	2	0	0	2	0	0	0	
8	10	25	0	0	0	0	0	0	0	Most of Poole Creek frozen over
10	4	50	0	0	0	0	0	0	0	Sunny; Water rippled
10	7	52	1	1	0	2	0	1	1	
10	8	10	0	0	0	0	0	0	0	
10	9	16	0	0	0	0	0	0	0	
10	10	20	0	0	0	0	0	0	0	Most of Poole Creek frozen over
13	4	16	0	0	0	0	0	0	0	Light poor; Water rippled
13	7	40	2	2	0	4	2	2	4	Cloudy; Water moderately clear/calm

Appendix 22: Summary of Daily Adult Coho Data - Birkenhead River continued

1982	Reach	Live Count	Dead Count				Samples Taken**			Comments
			M	F	Unk.	Total	M	F	Total	
Dec. 13	8	29	1	4	2	7	1	4	5	
13	9	11	1	0	0	1	1	0	1	
15	4	22	0	0	1	1	0	0	0	Raining; Water rippled
15	6	54	2	1	1	4	2	1	3	
15	7	45	4	3	0	7	3	3	6	One male half-eaten
15	8	40	0	2	0	2	0	2	2	
15	9	17	1	0	0	1	1	0	1	
15	10	20	0	0	0	0	0	0	0	
17	4	20	0	0	2	2	0	0	0	Cloudy; Water clear/calm
17	8	44	0	4	0	4	0	1	1	Three females half-eaten
17	9	23	0	0	0	0	0	0	0	
20	7	15	4	4	5	13	4	3	7	Some fish partly eaten; Cloudy/windy
20	8	44	0	0	0	0	0	0	0	
20	9	13	0	4	0	4	0	4	4	
20	10	20	0	0	3	3	0	0	0	Three heads
21	4	10	0	0	0	0	0	0	0	Cloudy; Water clear/calm
21	6*	2	1	0	0	1	1	0	1	
1983										
Jan. 6	4	5	-	-	-	-	-	-	-	Raining; Water very clear
6	9	4	-	-	-	-	-	-	-	
6	10	3	-	-	-	-	-	-	-	
7	6	0	0	0	2	2	0	0	0	Raining; Water clarity poor due to rippling
7	8	2	2	4	3	9	0	0	0	
7	9	2	0	0	4	4	0	0	0	
7	10	1	3	2	3	8	3	2	5	
8	4	1	0	0	5	5	0	0	0	
8	7	9	5	6	10	21	0	0	0	
TOTAL		1804	76	71	70	217	59	51	110	

* partial survey

** samples are included in dead count

Appendix 23: Biological Samples of Adult Coho
Birkenhead River

1982	Reach	POHL (cm)	Sex	Age	Fish Cond.	% Spawned	Comments
Nov. 3	7	52.0	M	3/2	2		
4	4	52.1	M	3/2	1		
4	6	41.1	M	3/2	2		
11	4	39.8	M	-	2		No scales left
15	8	47.4	F	3/2	1	50	
15	8	40.3	M	3/2	2		
15	8	55.0	M	3/2	2		
15	8	38.4	M	3/2	1		
15	8	56.4	F	3/2	3	99	
16	4	39.7	F	3/2	1	50	
16	4	48.7	M	-	3		No scales taken
16	4	52.9	M	-	3		No scales taken
16	10	44.5	M	-	2		No scales taken
17	4	34.1	M	3/2	2		
17	8	52.1	F	3/2	2	50	
18	3	62.4	M	3/2	2		
18	3	45.0	M	-	3		No scales left
26	8	55.0	F	3/2	2	99	
26	8	45.0	F	R	1	99	
26	8	57.6	M	-	3		No scales taken
26	8	56.5	F	-	1	99	No scales taken
26	8	55.0	M	-	2		No scales taken
26	8	57.5	M	-	4		No scales taken
29	7	55.2	F	3/2	1	99	
29	7	31.7	M	3/2	2		
29	7	56.4	F	3/2	2	99	
29	7	59.4	M	3/2	2		
29	7	50.3	F	3/2	3	99	
29	7	37.5	M	3/2	1		
30	4	44.4	M	3/2	3		
30	4	62.2	F	R	4	99	
30	9	57.5	F	3/2	1	99	
30	9	50.2	F	3/2	3	0	
30	9	56.0	F	3/2	2	50	
30	9	57.5	F	3/2	3	99	
30	9	56.6	F	3/2	1	99	
30	10	38.5	M	3/2	1		
30	10	53.2	F	3/2	2	99	
Dec. 1	6	50.2	M	3/2	2		
1	6	32.4	M	3/2	2		
1	6	49.0	M	3/2	2		
1	6	41.2	M	3/2	2		
1	6	57.9	M	3/2	3		
1	6	52.0	F	3/2	2	99	
1	6	52.1	M	3/2	2		
1	7	55.1	F	3/2	1	99	

Appendix 23: Biological Samples of Adult Coho
Birkenhead River (2)

1982	Reach	POHL (cm)	Sex	Age	Fish Cond.	% Spawned	Comments
Dec. 1	7	57.1	F	3/2	1	99	
1	7	56.9	F	3/2	1	99	
1	7	60.8	M	3/2	2		
1	7	50.2	M	3/2	1		
1	7	41.5	M	3/2	2		
1	7	56.8	F	3/2	1	99	
1	8	33.0	M	R	1		
1	8	41.3	M	R	4		
1	8	44.2	M	3/2	2		
1	8	59.4	M	3/2	2		
2	9	54.6	F	3/2	1	99	
6	4	60.2	F	R	2	99	
6	4	47.6	M	3/2	2		
6	7	56.0	M	3/2	3		
6	7	53.6	F	3/2	2	99	
6	10	46.5	M	3/2	2		
6	10	56.7	F	3/2	3	99	
6	10	39.4	F	3/2	1	0	Eagle kill
6	10	52.9	M	3/2	1		Eagle kill
6	10	50.5	M	3/2	1		Eagle kill
6	10	45.5	M	3/2	1		Eagle kill
8	7	47.6	M	3/2	1		
8	8	58.0	F	3/2	1	99	
10	7	53.0	F	3/2	2	99	
13	7	25.4	M	2/2	3		Jack
13	7	53.1	F	3/2	1	99	
13	7	43.3	F	3/2	1	99	
13	7	36.7	M	-	4		No scales left
13	8	56.9	F	3/2	2	99	
13	8	51.3	F	3/2	2	99	
13	8	56.6	F	3/2	3	99	
13	8	43.6	F	3/2	1	99	Half-eaten
13	8	48.4	M	3/2	1		Half-eaten
13	9	34.2	M	3/2	2		
15	6	55.3	F	R	2	99	
15	6	49.5	M	R	2		
15	6	60.5	M	3/2	2		
15	7	50.0	M	3/2	2		
15	7	54.9	M	3/2	3		
15	7	55.1	F	3/2	3	99	
15	7	55.8	M	3/2	3		
15	7	56.6	F	3/2	3	99	
15	7	57.3	F	3/2	3	99	
15	8	53.0	F	R	2	99	Half-eaten
15	8	53.0	F	3/2	1	99	
15	9	56.6	M	3/2	1		

Appendix 23: Biological Samples of Adult Coho
Birkenhead River (3)

1982	Reach	POHL (cm)	Sex	Age	Fish Cond.	% Spawned	Comments
Dec.17	8	56.8	F	3/2	3	99	
20	7	54.5	F	3/2	3	99	
20	7	52.2	F	3/2	2	99	
20	7	51.7	M	3/2	1		
20	7	55.1	M	3/2	2		
20	7	57.1	M	3/2	1		
20	7	55.8	M	R	2		
20	7	61.6	F	3/2	3	99	
20	9	56.5	F	4/3	1	99	Half-eaten
20	9	54.7	F	3/2	2	99	Half-eaten
20	9	55.7	F	3/2	3	99	
20	9	57.6	F	3/2	2	99	
21	6	44.0	M	3/2	2		
1983							
Jan. 7	10	59.4	M	3/2	2		
7	10	57.3	F	3/2	3	-	
7	10	56.7	F	3/2	3	-	
7	10	34.4	M	3/2	3		
7	10	37.2	M	3/2	3		

Appendix 24: Summary of Daily Adult Coho Data - Lillooet River

1982	Reach	Live Count	Dead Count				Samples Taken*			Comments
			M	F	Unk.	Total	M	F	Total	
Dec. 2	7	3	7	7	2	16	7	7	14	"Korie" Creek - raining; water clear and calm
2	8	0	1	0	1	2	1	0	1	"Toad" Creek - snowing; water clear and calm
3	6	0	0	0	0	0	0	0	0	"Manzon" Creek - raining; water rippled
3	6	0	1	1	0	2	1	1	2	Side channel at "Manzon" Creek mouth
7	6	2	0	0	0	0	0	0	0	Side channel at "Manzon" Creek mouth
7	6	5	9	6	3	18	9	6	15	Samson Creek - sunny; water clear
9	2	0	0	0	0	0	0	0	0	Pemberton Creek - sunny; creek partly frozen
9	3	0	0	0	0	0	0	0	0	Miller Creek - frozen over
9	4	0	0	0	0	0	0	0	0	Ryan River - partly frozen
9	5	3	0	0	0	0	0	0	0	Salmon Slough - frozen over
16	5	5	10	11	0	21	10	11	21	Christian Creek - raining; water silty
TOTAL		18	28	25	6	59	28	25	53	

*samples are included in dead count

Appendix 25: Biological Samples of Adult Coho
Lillooet River

1982	Reach	POHL (cm)	Sex	Age	Fish Cond.	% Spawned	Comments
Dec. 2	7	57.6	M	3/2	2		
2	7	59.4	F	3/2	3	99	
2	7	58.2	M	R	2		
2	7	57.8	F	3/2	2	99	
2	7	57.2	F	3/2	2	99	
2	7	58.8	F	3/2	2	99	
2	7	47.4	M	R	2		
2	7	60.2	M	3/2	2		
2	7	55.4	F	3/2	2	99	
2	7	54.7	F	3/2	2	99	
2	7	46.0	M	3/2	1		
2	7	39.4	M	3/2	1		
2	7	58.0	F	3/2	2	99	
2	7	38.7	M	3/2	1		
2	8	44.9	M	3/2	1		
3	6	38.0	F	3/2	1	99	
3	6	44.1	M	3/2	1		
7	6	59.3	M	3/2	1		
7	6	50.0	M	3/2	3		
7	6	42.0	M	3/2	2		
7	6	52.9	M	-	3		No scales left
7	6	53.5	M	4/3	2		
7	6	55.5	F	3/2	3	99	
7	6	58.8	F	4/3	2	99	
7	6	40.6	M	3/2	1		
7	6	51.1	M	3/2	2		
7	6	47.0	M	3/2	2		
7	6	52.1	F	4/3	3	99	
7	6	53.5	F	3/2	2	99	
7	6	54.5	M	3/2	3		
7	6	53.8	F	4/3	2	99	
7	6	46.8	F	3/2	2	99	
16	5	52.0	F	3/2	2	99	All Reach 5 samples
16	5	59.6	F	4/3	3	99	were from Christian
16	5	45.2	M	4/3	2		Creek, a tributary
16	5	52.8	M	4/3	2		of Salmon Slough
16	5	54.0	F	3/2	2	99	
16	5	54.0	F	3/2	3	99	
16	5	51.6	F	3/2	2	99	
16	5	40.3	M	3/2	2		
16	5	54.8	F	3/2	3	0	
16	5	44.0	M	3/2	2		
16	5	49.5	M	3/2	3		
16	5	56.4	F	3/2	4	99	
16	5	37.4	M	R	2		

Appendix 25: Biological Samples of Adult Coho
Lillooet River (2)

1982	Reach	POHL (cm)	Sex	Age	Fish Cond.	% Spawned	Comments
Dec.16	5	55.1	F	4/3	2	99	
16	5	46.5	M	R	2		
16	5	46.6	M	3/2	2		
16	5	53.4	F	3/2	2	99	
16	5	47.3	M	3/2	2		
16	5	52.0	F	3/2	2	99	
16	5	47.9	F	3/2	3	99	
16	5	52.8	M	3/2	3		

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