Investigation of Juvenile Chinook Salmon *(Oncorhynchus tshawytscha)* Use of Off-channel and Mainstem Habitats in Two Upper Fraser River Watersheds

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INVESTIGATION OF JUVENILE CHINOOK SALMON (*Oncorhynchus tshawytscha)* USE OF OFF-CHANNEL AND MAINSTEM HABITATS IN TWO UPPER FRASER RIVER WATERSHEDS

by

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Field studies were conducted in 1997 and 1998 to investigate the relative importance of off-channel and mainstem habitats to rearing stream-type chinook salmon. Two upper Fraser River tributaries, Baker Creek and Dome Creek, were repetitively surveyed in spring, summer and fall conditions to assess habitat utilisation in off-channel and mainstem habitats by all species of fish. Results indicated that rearing chinook salmon heavily utilised all the off-channel habitats surveyed, and some were present in off-channel areas at least until November. In Dome Creek, chinook fry rearing densities in the off-channel sample sites peaked in July at 1.33 fry/m^2 and decreased to 0.45 fry/m^2 in October. Mainstem chinook fry rearing densities observed in Dome Creek were 0.01 and 0.26 fry/m^2 in July and September, respectively. In Baker Creek, off-channel densities also peaked in July at 0.75 fry/m^2 and decreased to 0.27 fry/m^2 in November. Mainstem chinook fry rearing densities peaked in September at 0.41 fry/m^2 and decreased to 0.11 fry/m^2 in November. Chinook fry achieved more than 70% of their pre-smolt growth during their first spring and summer rearing months and condition coefficients generally exceeded a value of 1.0. There was evidence of habitat partitioning between salmonid and non-salmonid species, especially in the late spring-early summer high water period when chinook salmon dominated fish populations in off-channel habitats and non-salmonids dominated in the mainstem. Chinook densities were decreasing in off-channel habitats and increasing in mainstem habitats by September. Information on seasonal growth rates for different habitats was confounded by the likelihood of emigration into downstream areas.

RÉSUMÉ

Taccogna, G.S., and Hillaby, J.E. 2011. Investigation of juvenile chinook salmon *(Oncorhynchus tschawytscha)* use of off-channel and mainstem habitats in two Upper Fraser River watersheds. Can. Manuscr. Rep. Fish. Aquat. Sci. 2848: v + 85 p.

En 1997 et en 1998, une série d'études *in situ* a été effectuée pour établir l'importance relative des cours d'eau affluents (au niveau du chevelu) et des cours d'eau collecteurs de deux bassins du haut Fraser, pour le cycle de croissance des saumons quinnats juvéniles de type « dulcicole ». Le programme portait sur deux bassins tributaires du haut Fraser - Baker Creek et Dome Creek - et a fait intervenir des recensements visant à caractériser les conditions printanières, estivales et automnales, et le taux d'utilisation relatif des cours d'eau collecteurs et affluents, toutes espèces de poissons confondues. Les résultats ont indiqué une forte présence de saumons quinnats juvéniles dans tous les cours d'eau affluents, allant en diminuant jusqu'au mois de novembre. Dans le chevelu du bassin de la Dome Creek, on a observé que le pic de fréquentation des jeunes quinnats survenait en juillet, avec une densité de 1,33 individu/m^2, contre 0,45/m^2 en octobre. Dans le cours d'eau collecteur du même bassin, les densités de fréquentation observées allaient de 0,01 quinnat juvénile/m^2 en juillet à 0,26/m^2 en septembre. Pour le bassin de la Baker Creek, les pics de densité observés au niveau du chevelu survenaient également en juillet (0,75 quinnat juvénile/m^2) pour passer progressivement à 0,25 individu/m^2 en novembre. Dans l'artère collectrice du même bassin, on a observé que le pic de fréquentation survenait en septembre (0,41 quinnat juvénile/m^2) pour passer progressivement à 0,11 individu/m^2 en novembre. L'étude a aussi permis d'établir que plus de 70 % de la phase de croissance initiale (pré-smolt) s'accomplissait durant la période printanière et estivale initiale, et que le « coefficient de croissance » des sujets excédait généralement 1,0. On a également observé une prédilection pour l'un ou l'autre des deux types d'habitat (affluents du chevelu vs artères collectrices) selon qu'on était en présence de salmonidés ou d'espèces allogènes, en particulier à l'époque des crues printano-estivales, où les quinnats prédominaient dans le chevelu alors que les autres espèces étaient en majorité dans les artères collectrices. On a observé qu'à compter de septembre, les densités de quinnat diminuaient dans le chevelu pour augmenter dans les artères collectrices. Signalons que les données recueillies sur les taux de croissance saisonniers relatifs, selon les divers types d'habitat, doivent être relativisées en raison des occurrences probables d' « émigration » en provenance de l'amont.

1.0. INTRODUCTION

The Habitat Restoration and Salmon Enhancement Program (HRSEP) was a 5-year program that was established in 1996/97. The objective of the federally funded HRSEP was to revitalize salmonid populations in the Pacific Region through habitat restoration, stock rebuilding and resource and watershed stewardship. The program annually funded over 100 projects operated and administered by a variety of community and fishing groups, First Nations and agencies.

In the upper Fraser River watershed, communities from Quesnel upstream to Dome Creek submitted funding applications to undertake habitat restoration work on small to medium sized natal chinook salmon streams. The types of projects which qualified for funding included stabilizing stream banks, improving fish access and water flows, building side-channels, fencing, planting riparian vegetation and improving spawning and rearing habitats. While community groups sponsored many of these projects, Department of Fisheries and Oceans (DFO) Habitat and Enhancement Branch staff were called upon to provide technical support and guidance to the projects.

However, in the Upper Fraser, program development was hampered by a general lack of information on habitat utilisation by juvenile chinook salmon. Since the 1950's, government's knowledge of Upper Fraser chinook populations was limited to annual spawning ground inspections, primarily for fishery management purposes. By the 1970's, some watersheds in the Upper Fraser were proposed for hydroelectric dams and the companion studies on fish habitat use indicated that some of the assumptions about chinook freshwater life history may not have been accurate (Tutty, 1979). In particular, it was felt that some juvenile chinook salmon were typically spending one full year in freshwater prior to their out-migration, rather than migrating directly to the ocean as previously thought (Tutty and Yole, 1978). In the early 1980's, other field studies were conducted on a number of chinook salmon populations to determine the basic population parameters of adults and juveniles, such as numbers of fish, relative size, and migration timing. Variation in stream-type life history patterns between streams and successive years of study were noted (Shepherd et al., 1986). When chinook salmon hatcheries were constructed (notably on the Quesnel River, and Shuswap River), they were charged with developing techniques for chinook salmon enhancement in the upper Fraser watershed. These facilities realized some success by releasing yearling chinook smolts, but were unable to successfully integrate chinook salmon fry into freshwater habitats and were subsequently closed by the mid 1990's (Fraser River Action Plan, 1995). By this time, directed research on juvenile chinook life history was underway in the upper Fraser River and its tributaries. This work identified chinook salmon overwintering in the larger mainstem channels (Levings and Lauzier, 1991), but also showed a pattern of rearing migration (Scrivener et al., 1994) where juvenile chinook used refuge habitats in non-natal streams for short periods of time when mainstem habitats became unsuitable. Other work on the ontogeny of downstream migratory behaviour of chinook salmon fry (Bradford et al, 1997) indicated that there was considerable variation among individuals, as well as among populations from stream to stream. In summary, identification of the freshwater habitats that regulate productivity of Upper Fraser chinook salmon remains a

challenge, but a better understanding is required to protect productive habitats and to implement habitat improvement, development or restoration projects.

Two candidate streams for HRSEP funding included Dome and Baker Creeks (Figure 1). In 1997, a field program was undertaken to better understand juvenile chinook habitat preferences during their early freshwater life history phase in these two watersheds. Of particular interest in this study, was the role of side-channels and very small non-natal tributaries (< 2 meter channel width) as chinook rearing habitats in the Dome and Baker Creek watersheds. Streamside development activities, including road and rail development, agriculture, forestry, placer mining and urban development have eliminated or restricted access to these types of habitats in a number of upper Fraser River tributaries, including Dome and Baker Creeks (McDonald et al, 1995; Northwest Hydraulics Ltd., and Hamilton, 1992).

In this study, sampling stations on both Dome and Baker Creeks were established in side channel and adjacent mainstem locations and electrofished or beach seined periodically between May 1997 and March 1998. Chinook juvenile densities, lengths and weights were determined in both the off-channel and mainstem sampling locations at different periods of the year. Catch biomass, lengths and weights were also determined for other salmonid and non-salmonid species.

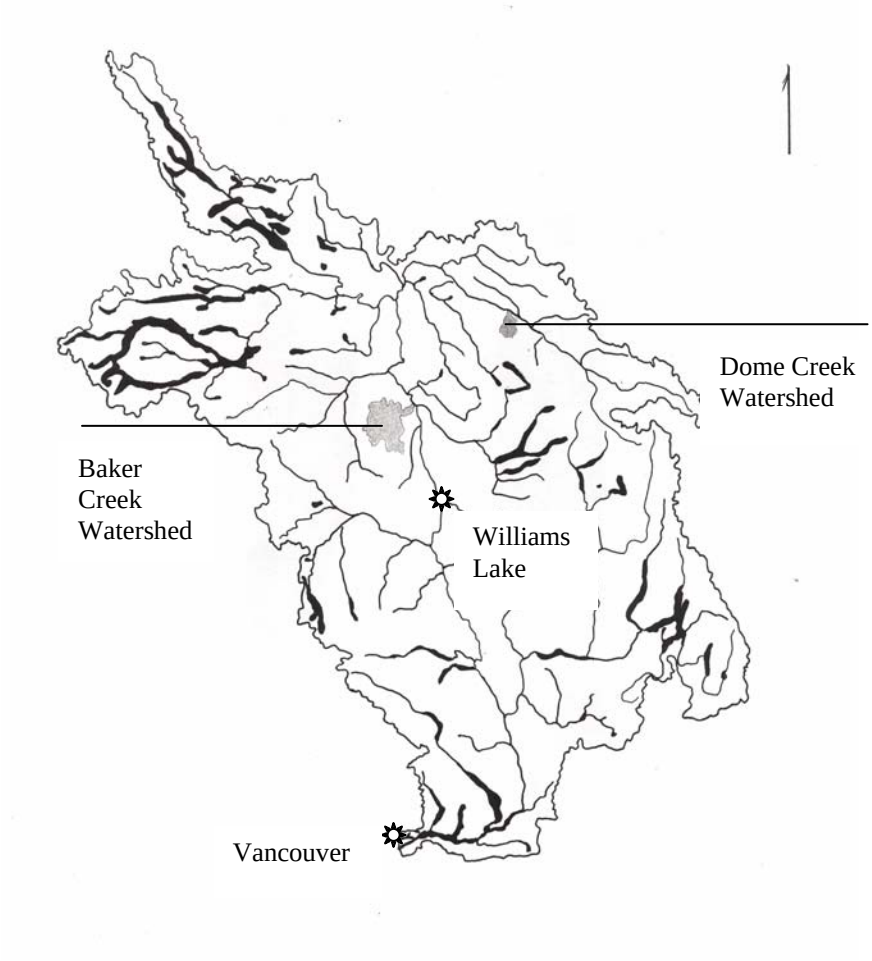

Figure 1. Fraser River watershed, showing Dome Creek and Baker Creek tributaries.

2.0. STUDY AREA

2.1. DOME CREEK WATERSHED

Dome Creek is a fourth order stream that flows northward into the Fraser River at the community of Dome Creek, approximately 130 km east of Prince George (Figure 2). It drains a watershed area of approximately 273 km^2, and has a mainstem length of approximatey 32 km, most of which is accessible to spawning chinook salmon. It is fed by eighteen minor tributaries and two gazetted creeks, Evans Creek and Shiko Creek, located 8.7 km and 12.5 km, respectively, upstream from the mouth (St. Hilaire, 1997). The watershed encompasses four Biogeoclimatic Zones, including Sub Boreal Spruce, Interior Cedar-Hemlock, Engelmann Spruce-Sub Alpine Fir, and Alpine Tundra (MacDonald et al. 1995).

Dome Creek itself is channelized and diked through the town of Dome Creek, and there are on-going problems with deposition and channel changes within the alluvial fan. There is some agriculture in the lower watershed, with localized impacts on the riparian condition. The lower reaches are also impacted by linear corridor development, including logging roads, a rail line, Highway 16, and their associated rights-of-way, gravel removal and infrastructure. As of 1994, approximately 11% of the watershed had been logged, with extensive riparian harvest concentrated in the upper reaches (MacDonald et al. 1995). Dome Creek is considered to be a watershed that contains sensitive physical features such as problematic soil types, landslide-prone slopes in the Cariboo Mountain headwaters, a high potential for flashy flows and glacial sediment delivery, and concerns for overall channel stability. The potential for high suspended sediment loads into fish-bearing waters is of particular interest and watershed planning profiles have outlined the need to maintain natural watershed hydrologic characteristics and stream flow regime (MacDonald et al. 1995).

Dome Creek contains several hundred chinook salmon, spawning throughout most of its mainstem length. There is a partial barrier at 8.9 km in the form of an old log booming dam that is a probable migration barrier at certain flows. Chinook salmon have access to most of the 32 km mainstem, and escapements have averaged about 500 fish from 1991 to 2000 (Table 1, R. Bailey, personal communication). In addition to chinook, bull trout (*Salvelinus confluentus*) are found throughout the watershed into the headwaters, and rainbow trout (*Oncorhynchus mykiss*) distribution is indicated from the confluence to Shiko Creek, including stocking in Hawk Lake.

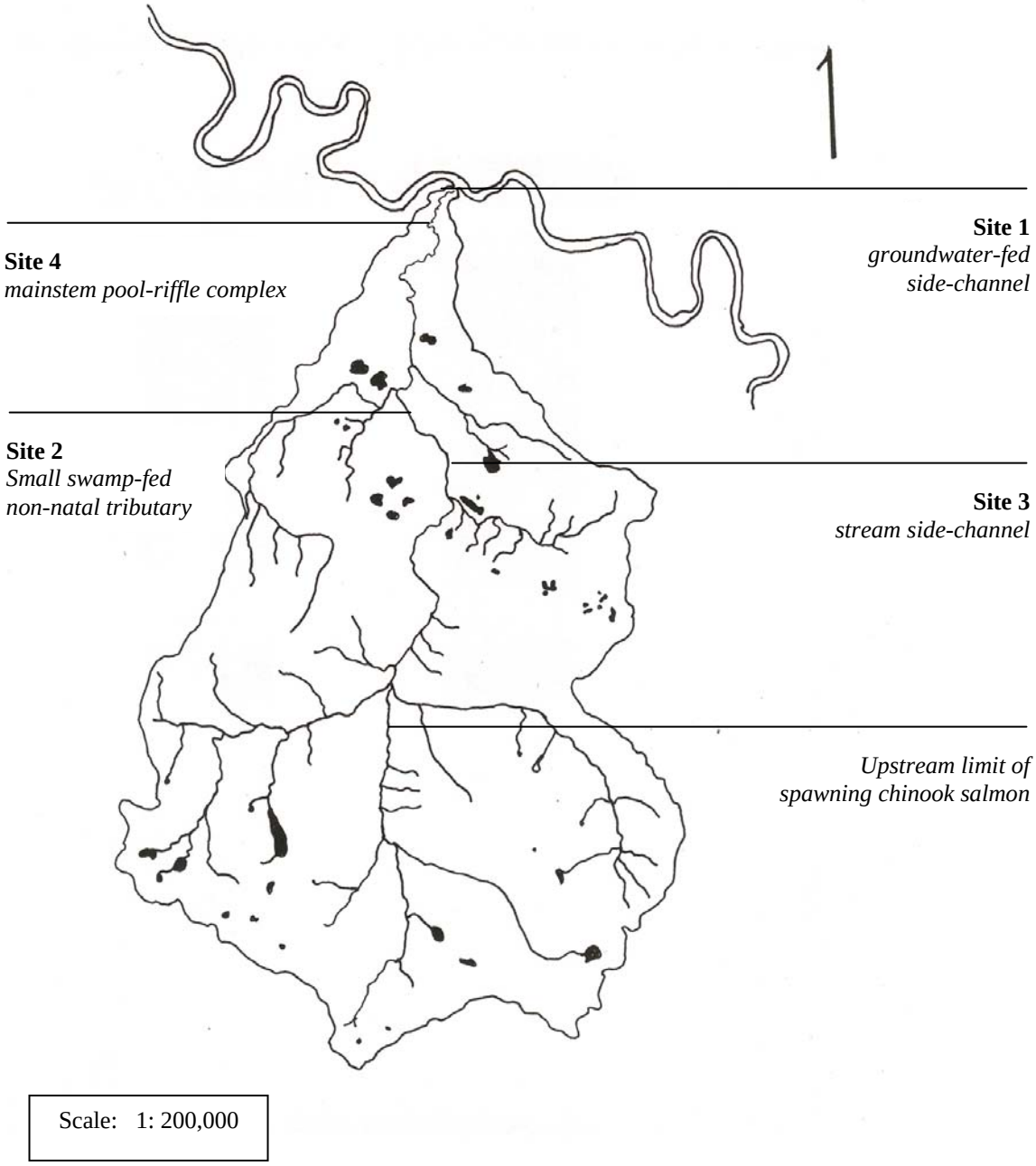

Figure 2. Sketch of the Dome Creek watershed, showing sample site locations and upstream limit of spawning chinook salmon.

2. 2. BAKER CREEK WATERSHED

Baker Creek is a fifth order stream that flows north and then east into the Fraser River at the city of Quesnel, approximately 110 km south of Prince George (Figure 3), and drains a watershed area of approximately 1,570 km^2 (Northwest Hydraulics and Hamilton, 1992). The watershed is located within the Subboreal Spruce biogeoclimatic zone, and includes eight major tributaries and six major lakes (Imhof and Sutherland, 1996). It has a mainstem length of approximately 114 km, of which the lower 59 km is accessible to anadromous salmon.

The lower 3.4 km of Baker Creek flows east through urban development in the City of Quesnel, and is mostly channelized. Through this lower section, problems with diking, bank stabilisation and pipeline crossings are recognised (Northwest Hydraulics and Hamilton, 1992). The middle reaches, from 6 to 40 km, flow east through a canyon section with characteristic pinnacle landforms and a complex of metamorphic and sedimentary rock with variable erosion resistance. Upstream of the canyon, Baker Creek consists of lower-gradient pool-riffle sequences and flows north, gathering lake outflows and tributaries through cultivated ranch land and logged areas (Taccogna and Dafoe, 1999). These upper reaches flow through an area that is intensively managed for forest harvesting, and by 1997 at least 15% of the total Baker Creek watershed was expected to be logged (Northwest Hydraulics and Hamilton, 1992), mostly in the upper watershed. The surrounding ranch land uses flood irrigation extensively, and is characterised by beaver dams and swamp meadows, connected by old logging roads and bridges. Baker Creek has many water licences serving domestic, irrigation, waterworks and industrial users, and is considered to be highly sensitive to effects from summer low flows, elevated peak flows, and the cumulative effects of logging in the watershed (Northwest Hydraulics and Hamilton, 1992).

Baker Creek contains excellent pool and riffle-type low gradient fish habitat throughout its length, and in most of its tributaries. Chinook salmon have unobstructed access in the mainstem through the central canyon to the falls at 59 km, and are sometimes able to ascend further under optimum flow conditions. Most spawning is concentrated in the 20 km downstream of the falls (Taccogna and Dafoe, 1999) and number about 230 spawners annually (R. Bailey, personal communication). Pink salmon are also present, but do not migrate upstream beyond the lower reach near the City of Quesnel. Rainbow trout are widely distributed, as well as bull trout and several species of non-salmonids (Imhoff and Sutherland, 1996).

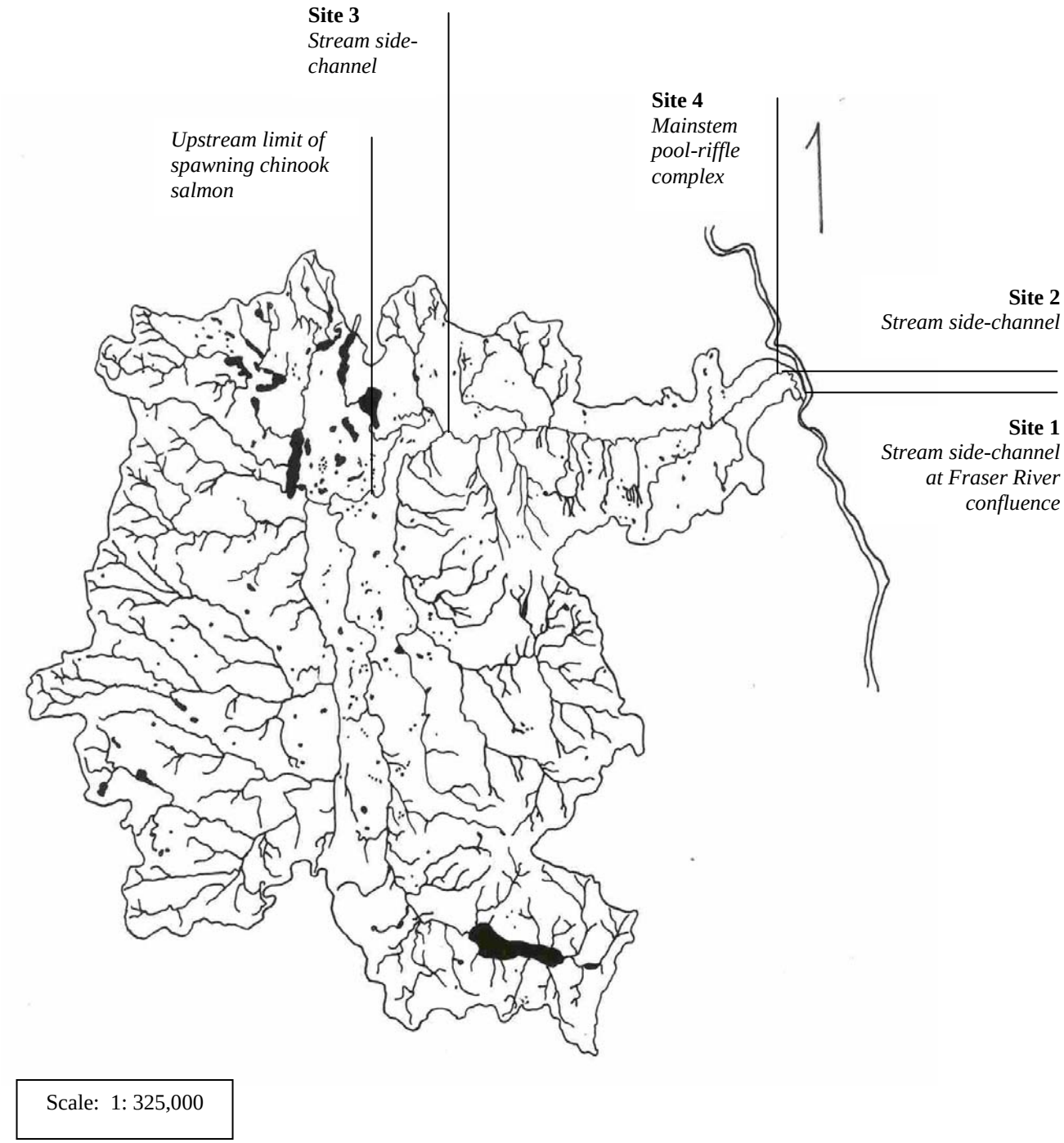

Figure 3. Sketch of the Baker Creek watershed, showing sample site locations and upstream limit of spawning chinook salmon.

Table 1 . Annual chinook escapement for Dome Creek and Baker Creek[1].

Year	Dome Creek[2]	Baker Creek[3]
1991	523	400
1992	458	250
1993	575	300
1994	530	250
1995	550	250
1996	571	150
1997	625	292
1998	400	420
1999	337	47
2000	198[4]	282
Average 1996-2000	426	238

[1] Unpublished data from Fisheries and Oceans Canada Stock Assessment Division, Kamloops.
[2] Fence counts.
[3] Peak live counts.
[4] Fence counts not available; escapement estimate derived from peak live count.

3.0. METHODS

3.1. FIELD SAMPLE SITES

During the week of May 19, 1997, an electrofishing crew undertook a reconnaissance exercise in the two watersheds to determine the location of off-channel habitats and the presence and relative abundance of chinook fry at various locations in the watersheds. Prior to the reconnaissance trip, air photos, maps and chinook spawning reports were reviewed and local DFO staff and the community groups working in the watersheds were interviewed. Members of the community groups also accompanied the field crew on the initial reconnaissance trip.

While road networks provided relatively easy access to both streams along most of the stream length where chinook spawner distribution had been recorded, off-channel habitats selected for this survey had to meet two criteria: 1) accessible to chinook fry, and 2) protected from high water events in the mainstem. All of the accessible off-channel habitats checked for species presence during the May reconnaissance trip were supporting rearing chinook fry.

Three off-channel sampling stations and one mainstem sampling station were selected for each watershed. The off-channel stations were generally located in the lower reaches of the watershed where chinook spawning densities were highest. The recorded upstream limit of chinook spawner distribution in Dome and Baker Creeks is 24 and 59 km upstream of the Fraser River confluence, respectively. The upstream-most sampling stations in Dome and Baker Creeks were located 10.8 and 39.5 km upstream of the Fraser River confluence, respectively. The mainstem sampling stations were located at a mainstem pool-riffle complex in close proximity to the off-channel habitat having the greatest abundance of rearing chinook fry during the May reconnaissance trip.

3.1.1. Dome Creek Sampling Stations

On Dome Creek, off-channel sites 1, 2 and 3 were located 0.4, 9.3 and 10.8 km upstream of the Fraser River confluence, respectively. The mainstem sampling station, site 4, was located 0.8 km upstream of the Fraser River confluence. Figure 2 shows the sample site locations and a brief description follows:

3.1.1.1. Dome Site 1

This station was located in a groundwater-fed side-channel on the river right bank of Dome Creek. The channel confluence with Dome Creek was 275 m upstream of the Dome Creek and Fraser River confluence. The downstream end of the sample station was 98 m upstream of the channel's confluence with Dome Creek. The length and average wetted width of the sample area during peak flows were 24.5 m and 4.5 m, respectively, for a total sample area of 110 m^2. The average maximum water depth of the sample area during the spring freshet sampling period-was approximately 30 cm.

3.1.1.2. Dome Site 2

This station was located in a very small swamp-fed non-natal tributary on the river left bank of Dome Creek. The tributary confluence with Dome Creek was 9.3 km upstream of the Dome Creek and Fraser River confluence. The downstream end of the sample station was located at the tributary's confluence with Dome Creek. The length and average wetted width of the sample area during peak flows were 21.4 m and 1.6 m, respectively, for a total sample area of 34 m^2. The average maximum water depth of the sample area during spring freshet sampling period was approximately 30 cm.

3.1.1.3. Dome Site 3

This station was located in a stream side-channel on the river left bank of Dome Creek, 10.8 km upstream of the Dome Creek and Fraser River confluence. The downstream end of the sample station was located near the side-channel's downstream confluence with Dome Creek. The length and average wetted width of the sample area during peak flows were 24 m and 6.7 m, respectively, for a total sample area of 161 m^2. The average maximum water depth of the sample area during spring freshet sampling period was approximately 45 cm.

3.1.1.4. Dome Site 4

This station was located in a mainstem pool-riffle complex of Dome Creek, 0.8 km upstream of the Dome Creek and Fraser River confluence. The length and average wetted width of the sample area during peak flows were 22 m and 10 m, respectively, for a total sample area of 220 m^2. The average maximum water depth of the sample area during spring freshet sampling period was approximately 2 m.

Site 1 – groundwater-fed side channel

Site 2 – swamp-fed non-natal tributary

Site 3 – side channel on the left bank of Dome Creek

Site 4 – mainstem pool-riffle complex.

Figure 4. Dome Creek sample sites. Sites one, two and three represent off-channel habitats, site 4 represents mainstem habitat.

3.1.2. Baker Creek Sampling Stations

On Baker Creek, off-channel sites 1, 2 and 3 were located at the Fraser River confluence, 3.2 and 39.5 km upstream of the Fraser River confluence, respectively. The mainstem sampling station, site 4, was located 3.2 km upstream of the Fraser River confluence. Figure 3 shows the sample site locations and a brief description of the sampling stations follows:

3.1.2.1. Baker Site 1

This station was located in a stream side-channel on the river right bank of Baker Creek, near its confluence with the Fraser River. The downstream end of the sample station was located at the side-channel's downstream confluence with the Fraser River. The length and average wetted width of the sample area during spring freshet sampling period were 36 m and 4.7 m respectively, for a total sample area of 169 m^2. The average maximum water depth of the sample area during spring freshet sampling period was approximately 40 cm.

3.1.2.2. Baker Site 2

This station was located in a stream side-channel on the right bank of Baker Creek, 3.2 km upstream of the Baker Creek and Fraser River confluence. The upstream end of the sample station was located near the side-channel's upstream confluence with Baker Creek. The length and average wetted width of the sample area during peak flows were 33 m and 2.7 m, respectively, for a total sample area of 89 m^2. The average maximum water depth of the sample area during spring freshet sampling period was approximately 20 cm.

3.1.2.3. Baker Site 3

This station was located in a stream side-channel on the river right bank of Baker Creek, 39.5 km upstream of the Baker Creek and Fraser River confluence. The downstream end of the sample station was located near the side-channel's downstream confluence with Baker Creek. The length and average wetted width of the sample area during peak flows were 19 m and 3.7 m, respectively, for a total sample area of 70 m^2. The average maximum water depth of the sample area during spring freshet sampling period was approximately 30 cm.

3.1.2.4. Baker Site 4

This station was located in a mainstem pool-riffle complex of Baker Creek, 3.2 km upstream of the Baker Creek and Fraser River confluence and adjacent to side-channel Site 2. The length and average wetted width of the sample area during spring freshet sampling period were 31 m and 10 m, respectively, for a total sample area of 310 m^2. The average maximum water depth of the sample area during peak flows was approximately 2 m.

All fin fish captured in both the Dome Creek and Baker Creek sample sites were identified to species (except cottids, which were identified to family), weighed and measured. Descriptions of the species captured and their reference codes are presented in Appendix Table 1**.**

Site 1 – stream side channel

Site 2 – stream side channel

Site 3 – stream side channel

Site 4 – mainstem pool-riffle complex.

Figure 5. Baker Creek sample sites. Sites 1, 2 and 3 represent off-channel habitats, Site 4 represents mainstem habitat.

3.2. SURVEY TIMING AND PHYSICAL PARAMETERS

In order to determine juvenile chinook habitat utilisation during the critical first growing season, electrofishing and beach seining surveys were conducted at designated sampling stations on five dates in the Dome Creek watershed, and on four dates in the Baker Creek watershed:

Table 2. Timing of field surveys in Dome and Baker Creeks.

Dome Creek	Baker Creek
June 10, 1997	June 12, 1997
July 23 – 25, 1997	July 15 – 18, 1997
September 9 – 11, 1997	September 16 – 17, 1997
October 17 – 19, 1997	November 3 – 4, 1997
March 9, 1998	

At each sampling station, the upstream and downstream site boundaries were flagged so that the same stream area was sampled on each successive survey date throughout the survey period. A cross-section station was established at a representative section of each site where the wetted channel was measured during each survey date as an indicator of flow conditions. The channel cross-section was divided into at least five equal segments using a 30 m Eslon tape and water depth was recorded in each segment using a folding metre rule. Dissolved oxygen and water temperatures were also recorded with an Oxyguard meter at the cross-section station during each survey date. These data represent spot measurements.

In Dome Creek, off-channel site 1 was the only site sampled during the March 1998 survey date. Being groundwater-fed, it was ice-free while all the other sites in both the Dome Creek and Baker Creek watersheds were covered in ice. Site 4 was not sampled during the June and October survey dates as the stream was in flood as a result of snow melt in June and a rain-on-snow event in October.

In Baker Creek, off-channel Site 3 and the mainstem site were not sampled during the June survey date as the stream was in flood. Off-channel Site 1 dried up in July and consequently, was not sampled during the September and November survey periods.

3.3. ELECTROFISHING SURVEYS

The off-channel sites were sampled using a Smith Root Model 12 backpack electrofisher. Stop nets were anchored across the channel at both the downstream and upstream boundaries of the sample site. The nets varied in length from 2 to 10 m depending on channel width, were 1.5 m deep and had a mesh size of 0.3 cm stretched.

A crew of three conducted these surveys, including the electrofisher operator, a dip-netter working beside the electrofisher operator and a technician on shore processing the catch. A 2 pass procedure was used. Each pass started at the downstream stop net and worked methodically upstream to the upstream stop net, capturing stunned fish along the way. The crew would then work back downstream to the downstream stop net where any stunned fish in the stop net were captured. The same procedure was repeated for the second pass.

Chinook juvenile population estimates were calculated using the following 2-sample removal estimate formula (Seber, 1982):

Population Estimate: $$N = \frac{n_1^2}{(n_1 - n_2)}$$

Sampling Variance: $$V(N) = \frac{(n_1 n_2)^2 (n_1+n_2)}{(n_1-n_2)^4}$$

where:

N = total population estimate
n_1 = total # of fish captured in 1st pass
n_2 = total # of fish captured in 2nd pass

On occasion, the second pass catch exceeded the first pass catch. This occurred at Site 2 on Dome Creek during both the July and October survey dates, as this was a particularly difficult electrofishing site with instream roots and overhanging vegetation hindering fish capture. It also occurred at Sites 1 and 2 on Baker Creek during the June survey period due to high flow conditions. As the above formula cannot be used in these instances, the catch from both passes was totalled and divided by a catch efficiency estimate of 0.6 for the Dome Creek site and 0.5 for the Baker Creek sites. Catch efficiency was estimated based on operator experience and observations of numbers of fish eluding electrofisher capture.

3.4. BEACH SEINING SURVEYS

The mainstem sites were sampled with a 50 m x 3 m beach seine having a mesh size of 0.6 cm stretched. All sets were conducted on foot by a three-person crew with two people suspending the net above the water while walking one end of the net to the far side of the channel at the upstream end of the sample site. The third person anchored the other end of the net on shore. On signal, the net was dropped into the water and swept downstream over the length of the sample site with the lead end being pulled back around to the anchor end side of the channel at the downstream end of the sample site. At least two or three sets were conducted until the catch approached zero. All chinook were marked by clipping 1mm off the upper lobe of the caudal fin with a pair of surgical scissors. After sampling, fish were placed in a screened bucket in the stream and upon recovery were released back to the sample site. On the following day, the crew returned

to the site and repeated the above seining and fish sampling procedure, recording mark recaptures in the process.

Chinook juvenile population estimates and sampling variance were calculated using the following single census adjusted Peterson estimate (Ricker 1975):

Population Estimate:

$$N = \frac{(M+1)(C+1)}{(R+1)}$$

Sampling Variance:

$$V(N) = \frac{N^2(C-R)}{(C+1)(R+2)}$$

where:

N = total population estimate
M = number of fish marked
C = catch or sample taken for census
R = number of recaptured marks in the sample

3.5 FISH SIZE, CONDITION AND POPULATION DENSITY

All fish captured were anesthetized in a bucket using a solution of 5 g of "Bromoseltzer" in 5 L of stream water. Each fish was identified to species and a maximum of 30 individuals of each species were weighed to the nearest tenth of a gram on an Ohaus electronic field scale and fork length recorded to the nearest tenth of a centimetre using a fry board. Chinook juveniles were also identified by age class using fork lengths. After sampling, fish were placed in a screened bucket in the stream and upon recovery were released back to the sample site. The data recorded for individual fish are presented in Appendix Tables 2 (Dome Creek) and 3 (Baker Creek).

As a measure of the overall condition of chinook fry, condition factors were calculated using the following formula (Vanstone and Markert, 1968), where "K" is the ratio of fish weight to the length cubed, multiplied by 100:

$$K = \frac{W}{L^3} \times 100$$

K = condition factor
W = weight in grams
L = fork length in centimeters

Most sample sites were located in remote areas and field logistics did not always allow complete length-weight sampling of the entire catch. While every effort was made to reduce the likelihood of size selectivity, where there were excessive number of juvenile chinook at least 30 were randomly selected for sampling, and the remainder released. This resulted in a sampling rate of 65% in the Dome Creek watershed, and 90% in the Baker Creek watershed.

Biomass of the catch was calculated for each watershed, site, sampling period and species as a simple means of describing the biodiversity present in off-channel and mainstem habitats. Note that this does not describe rearing density, simply relative species abundance in the catch composition.

Estimates of chinook fry rearing densities were also derived for each sample station during each survey period as follows:

$$\frac{\text{Sample site population estimate (number of fry)}}{\text{Sample site area (in square metres)}}$$

4.0. RESULTS

4.1. DOME CREEK

4.1.1. Catch Summaries

During the period of the study, 13 electrofishing surveys were conducted at the three off-channel sampling stations and two beach seining surveys were conducted at the mainstem sampling station. Table 3 describes the species captured, which includes chinook salmon, rainbow trout, bull trout, mountain whitefish (*Prosopium williamsoni*) , white sucker (*Catastomus commersoni*), and unidentified sculpin.

Table 3. Catch summary for off-channel and mainstem sites in Dome Creek.

Species and Stage	Number captured in Off-Channel Sites	Number captured in Mainstem Site
Chinook salmon fry	728	16
Chinook salmon yearling	21	0
Rainbow trout	4	0
Bull trout	15	0
Mountain whitefish	0	61
White sucker	0	1
Sculpin species	13	3
Total all species	781	81

4.1.2. Wetted area, temperature and dissolved oxygen

A channel cross-section station was established at all of the sample sites and on each survey date wetted channel cross-section dimensions, water temperature and dissolved oxygen levels were recorded (Table 4).

Table 4. Channel cross-section dimensions, water temperature and dissolved oxygen levels at Dome Creek sample sites.

Date 1997-1998	Site Number	Description	Wetted Width (m)	Maximum Depth (m)	Temperature (^{o}C)	Dissolved Oxygen (mg/l)
June 10	1	Groundwater side channel	3.0	0.18	7.9	8.1
June 10	2	Swamp, non-natal tributary	0.7	0.18	16.0	7.0
June 10	3	Stream-fed side channel	6.7	0.45	7.3	11.3
June 10	4	Mainstem pool-riffle	In flood	In flood	7.0	12.0
July 23-25	1	Groundwater side channel	3.4	0.31	8.8	7.5
July 23-25	2	Swamp, non-natal tributary	0.8	0.15	12.4	8.2
July 23-25	3	Stream-fed side channel	6.7	0.43	9.9	10.5
July 23-25	4	Mainstem pool-riffle	10.0	1.0 – 2.0[5]	8.7	10.9
September 9 – 11	1	Groundwater side channel	2.7	0.30	8.4	8.6
September 9 – 11	2	Swamp, non-natal tributary	0.6	0.08	13.1	8.2
September 9 – 11	3	Stream-fed side channel	6.0	0.28	14.2	9.7
September 9 – 11	4	Mainstem pool-riffle	9.0	1.0 – 2.0[6]	12.0	9.7
October 17 – 19	1	Groundwater side channel	2.7	0.26	5.6	8.7
October 17 – 19	2	Swamp, non-natal tributary	1.6	0.27	6.0	10.0
October 17 – 19	3	Stream-fed side channel	6.6	0.39	4.3	10.8
October 17 – 19	4	Mainstem pool-riffle	In flood	In flood	4.0	12.0
March 9	1	Groundwater side channel	2.3	0.23	0.3	12.0

[5] Depth estimated.
[6] Depth estimated.

During the survey period, all of the off-channel sites continued to have adequate flows through the October survey date. Flow in the groundwater-fed channel increased between the June and July survey dates, reached its maximum level on the July survey date, and then gradually decreased over the fall and winter months. Both the stream-fed side channel and swamp-fed non-natal tributary had relatively constant flows through the June and July survey dates, diminished to their lowest flows in September and then increased again during the fall rains in October. A similar pattern was observed at the mainstem site. Both the stream-fed side-channel and swamp-fed non-natal tributary froze and dried up by December, while the mainstem site iced over but continued to flow through the winter. The groundwater-fed side channel did not ice over and continued to flow through the winter. On the March 1998 survey date, the channel was still open and flowing.

Water temperatures were generally colder in the mainstem site than in the off-channel sites through the entire survey period. The only exception was the September survey date when the groundwater-fed side-channel had the coldest water temperature of the four sites. The temperature of the off-channel sites ranged from a high of 16.0^{o}C in June to a low of 4.3^{o}C in October, during the June to October survey period. The temperature of the mainstem site over the same period ranged from a high of 12.0^{o}C in September to a low of 4.0^{o}C in October. None of the recorded temperatures were high enough to be associated with avoidance behaviour in juvenile salmonids.

Dissolved oxygen levels during the survey period were near saturation for all sites, with the exception of the groundwater-fed side channel. Dissolved oxygen levels in the groundwater channel were approximately 20% to 25% below saturation and ranged from a low of 7.5 mg/l in July to a high of 8.7 mg/l in October, during the June to October period. Dissolved oxygen levels at the other three sites ranged from a low of 7.0 mg/l in June to a high of 12.0 mg/l in October over the same period.

4.1.3. Species composition and relative abundance

Table 5 summarizes the area sampled, effort, catch, and biomass of all species captured in the Dome Creek system. Results were summarized by sample site, date and pass for each of the 13 off-channel electrofishing surveys. Also presented are the beach seine catch and mark recapture data for all species captured in the mainstem sample site. Length, weight and biomass per square metre were also calculated for all species. Juvenile chinook population numbers and rearing densities were estimated for each of the survey sites.

Table 5. Dome Creek fish sampling summary (June 1997 to March 1998).

Date 1997-1998	Sample Location[7]	Area (m^2)	Capture Method[8]	Species[9]	1st Pass	No. Marked and Released	2nd Pass	No. Recap-tured	Estimated catch efficiency	Pop-ulation Estimate	Standard Deviation on Population	Length (cm) X	Length (cm) SD	Weight (g) X	Weight (g) SD	Density (No. fish/m^2)	Catch Biomass (g/m^2)
June 10	Site 1 (SC)	110	EF	CH 0+	118		71			296	52	3.6	-[10]	0.4	-[11]	2.69	0.7
				CC	1		1					3.8		0.6			0.0
June 10	Site 2 (SC)	14	EF	CH 0+	10		2			13	1	3.9	0.5	0.7	0.2	0.89	0.6
				CH 1+	2		0			2	0	7.1	0.1	4.1	0.3		0.6
				BT	1		0					2.4		0.2			0.0
June 10	Site 3 (SC)	161	EF	CH 0+	45		9			55	2	3.6	0.3	0.4	0.2	0.34	0.1
				CH 1+	8		1			9	0	7.3	0.5	5.5	1.3		0.3
				BT	1		0					8.9		8.0			0.0
July 23-25	Site 1 (SC)	110	EF	CH 0+	58		21			91	8	4.3	0.5	0.9	0.4	0.83	0.7
				BT	1		2					7.7		16.0			0.4
				CC	2		0					5.7		3.1			0.1
July 23-25	Site 2 (SC)	17	EF	CH 0+	9		15		0.6	40		4.5	0.9	1.1	0.8	2.35	1.6
				CH 1+	1		2		0.6	5		6.9	0.2	4.3	0.2		0.8
July 23-25	Site 3 (SC)	161	EF	CH 0+	99		24			131	5	4.5	0.6	1.0	0.4	0.81	0.8
				CH 1+	3		0			3	0	8.3	0.4	6.8	1.9		0.1
				BT	0		1					3.1		0.3			0.0
July 23-25	Site 4 (MS)	220	SN	CH 0+	1	1	0	0		1	0	4.4	-	0.9	-	0.00	0.0
				WSU	1	1	0	0				53		1200			5.5
				MW	32	31	24	5				12.3		34.5			8.0
				CC	1	0	1	0				4.5		1.0			0.0

[7] SC = Side channel habitat; MS – Mainstem habitat.
[8] EF – electrofishing; SN – seining.
[9] CH 0+ - young-of-the-year chinook salmon fry; CH 1+ - yearling chinook salmon juvenile; CC – sculpin species; BT – bull trout; WSU – white sucker; MW – mountain whitefish; RB – rainbow trout. See Appendix Table 1 for complete species list.
[10] All newly-emerged fry, consistent size.
[11] Bulk weight sample.

Table 5. Continued.

Date 1997-1998	Sample Location[12]	Area (m^2)	Capture Method[13]	Species[14]	1st Pass	No. Marked and Released	2nd Pass	No. Recap-tured	Estimated catch efficiency	Pop-ulation Estimate	Standard Deviation on Population	Length (cm) X	Length (cm) SD	Weight (g) X	Weight (g) SD	Density (No. fish/m^2)	Catch Biomass (g/m^2)
Sept 9-11	Site 1 (SC)	66	EF	CH 0+	28		8			39	3	5.8	0.6	2.3	1.0	0.59	1.2
				CH 1+	1		0			1	0	8.2		7.9			0.1
				RB	1		0					11.4		18.7			0.3
				CC	2		3					6.6		4.7			0.4
Sept 9-11	Site 2 (SC)	12	EF	CH 0+	3		0			3	0	5.7	0.2	2.2	0.4	0.25	0.6
Sept 9-11	Site 3 (SC)	144	EF	CH 0+	66		18			91	5	6.0	0.7	2.8	0.9	0.63	1.6
				RB	3		0					7.5		5.1			0.1
				BT	4		1					8.4		6.7			0.2
Sept 9-11	Site 4 (MS)	130	SN	CH 0+	9	9	6	1		34	15	6.3	0.7	2.9	0.9	0.26	0.3
				MW	3	3	2	1				5.8		1.7			
				CC	0	0	1	0				7.4		4.2			
Oct 17-19	Site 1 (SC)	100	EF	CH 0+	33		6			40	2	6.0	0.8	3.1	1.3	0.40	1.2
				BT	2		0					9.2		12.0			0.2
Oct 17-19	Site 2 (SC)	34	EF	CH 0+	4		6		0.6	17		7.0	0.7	4.9	1.1	0.49	1.5
Oct 17-19	Site 3 (SC)	158	EF	CH 0+	61		14			79	3	6.3	0.6	3.4	1.1	0.50	1.6
				BT	1		0					9.2		8.6			0.1
March 9	Site 1 (SC)	61	EF	CH 1+	2		1			4	3	6.5	0.4	4.2	1.1	0.07	0.2
				BT	1		0					6.2		2.5			0.0
				CC	2		2					5.2		3.8			0.3

[12] SC – Side channel habitat; MS – Mainstem habitat.
[13] EF – Electrofishing; SN – seining.
[14] CH 0+ - young-of-the-year chinook salmon fry; CH 1+ - yearling chinook salmon juvenile; CC-sculpin species; BT-bull trout; WSU- white sucker; MW-mountain whitefish RB-rainbow trout. See Appendix Table 1 for complete species list.

The results indicate that the species mix and biomass changed in both mainstem and side channel habitats as the growing season progressed. Relative abundance of all species in the catch is reported as catch biomass per unit area sampled (g/m^2) for each of the 15 surveys conducted on Dome Creek. For each survey period, species abundance is summarized for the mainstem and the pooled off-channel sites in Table 6, and expressed graphically in Figure 6.

Table 6. Catch composition of Dome Creek side channel and mainstem sites, expressed in biomass (g/m^2).

Date 1997-1998	Habitat Type	Chinook Fry	Chinook Yearling	Rainbow Trout	Bull Trout	Mtn. White-fish	White Sucker	Cottid species
June 10	Side channel	0.5	0.3	0	0	0	0	0
July 23–25	Side channel	1.0	0.3	0	0.1	0	0	0
July 23–25	Mainstem	0	0	0	0	8.0	5.5	0
Sept 9–11	Side channel	0.7	0	0.1	0.1	0	0	0.1
Sept 9–11	Mainstem	0.3	0	0	0	0.1	0	0
Oct 17–19	Side channel	1.4	0	0	0.1	0	0	0
March 9	Side channel	0.2	0	0	0	0	0	0.3

In the June survey, chinook made up virtually 100% of the biomass in the side channel catches, consisting of 62% fry and 37% yearlings. The remaining 1% consisted of four other fish: two juvenile bull trout and two sculpin. The mainstem site was not sampled in June due to spring freshet conditions.

In the July survey, the predominance of chinook in the side channel catch continued, although the proportion of yearlings decreased. Chinook fry comprised 71% of the biomass and yearlings 22%, with bull trout making up most of the remaining 7%. At this time, chinook were virtually absent from the mainstem catch, which consisted mostly of mountain whitefish (59%) and white sucker (40%). It should be noted that the biomass figure for white sucker reflects only one individual weighing 1.2 kg. The remaining 1% of the mainstem catch consisted of one chinook fry and one sculpin.

In the September survey, chinook were still the dominant species in the side channel catches, although they were almost exclusively fry. Only one yearling chinook was captured and none were found in any of the subsequent surveys. Juvenile rainbow trout appeared in the side channel catches for the first time. Chinook fry comprised 70% of the catch biomass, while bull trout, rainbow trout and sculpin each made up approximately

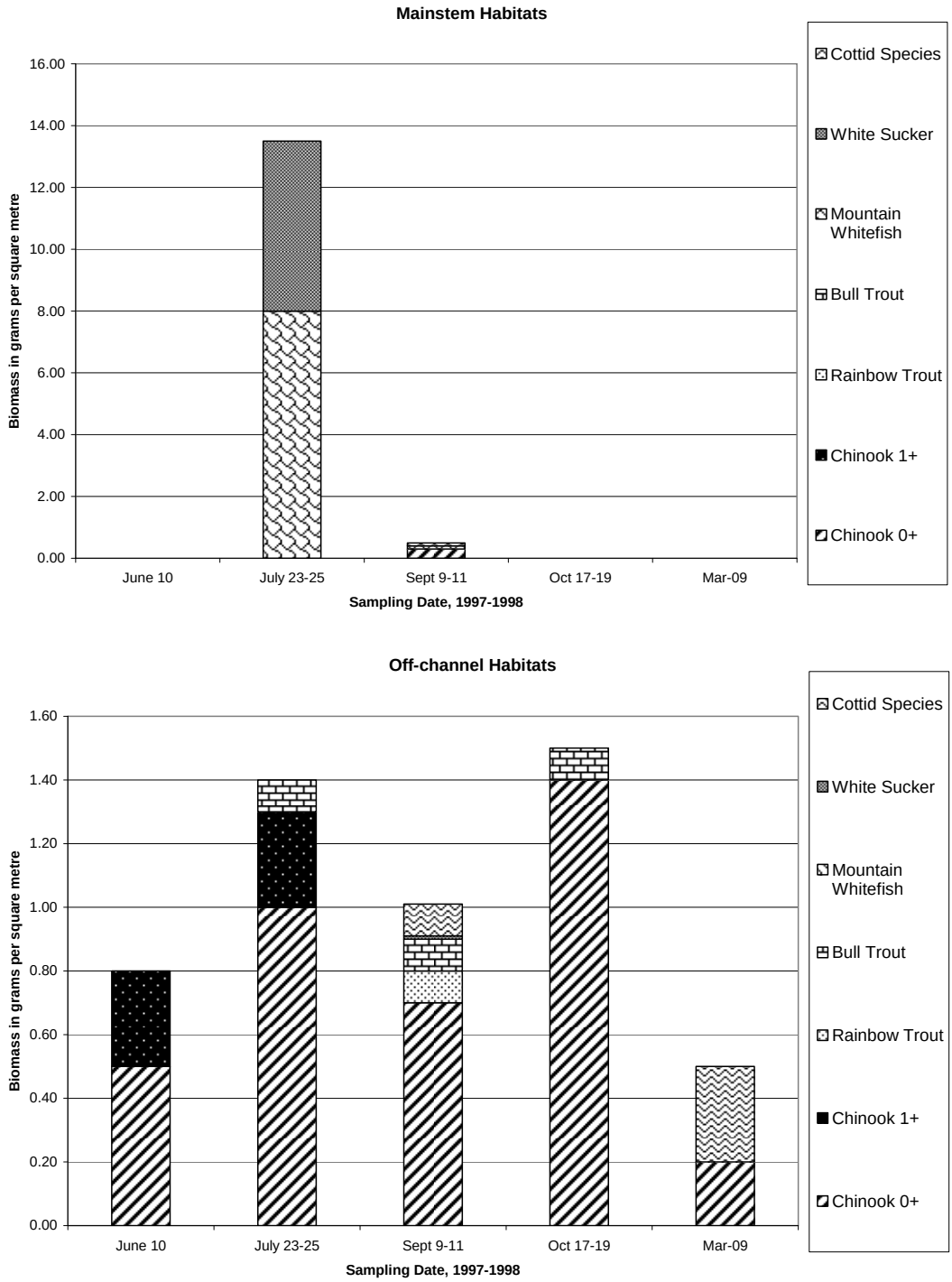

Figure 6. Catch composition of Dome Creek mainstem and off-channel sample sites, expressed in biomass.

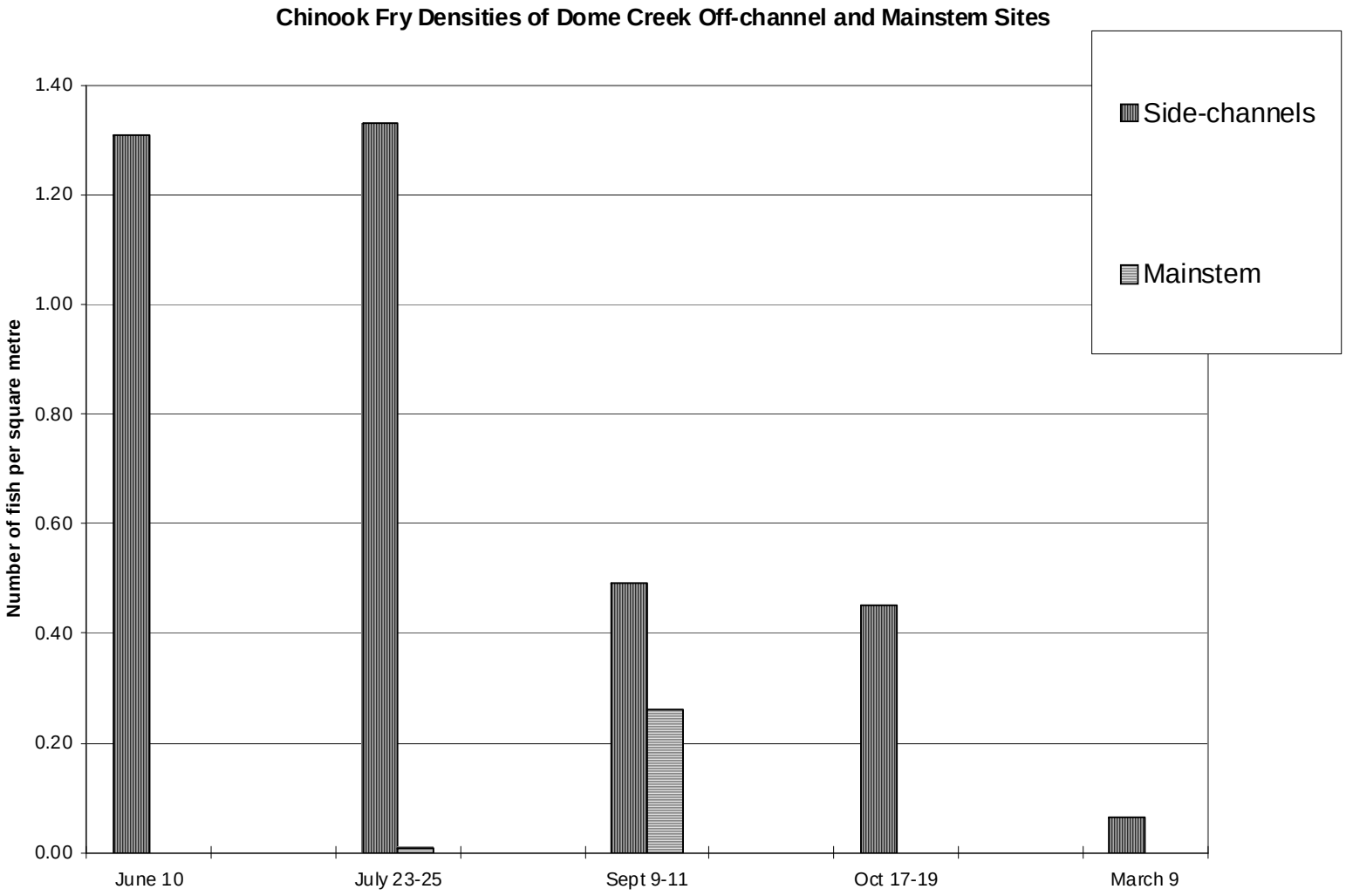

Figure 7. Density of chinook fry in Dome Creek off-channel and mainstem habitats, 1997-1998.

10% of the catch biomass in the off-channel sites. In the mainstem, significant numbers of chinook fry began to appear for the first time and dominated the catch. Chinook, mountain whitefish and sculpin comprised 78%, 15% and 7% of the mainstem catch biomass, respectively.

In the October survey, chinook remained the dominant species in the side channel site catches (93% of the biomass), followed by bull trout (7%). The mainstem was not sampled in October due to flood conditions caused by a major rain-on-snow event.

In March 1998, only the groundwater-fed side channel was surveyed, as it remained free of ice all winter. At this time, four sculpin, three chinook and one bull trout were captured. It was apparent that most of the chinook found during the four previous surveys of this off-channel site had disappeared.

4.1.4. Chinook Rearing Density

Chinook fry population numbers and rearing densities were estimated for each of the 13 off-channel electrofishing and two mainstem beach seining surveys conducted in Dome Creek (Table 7 and Figure 7). The data has been standardized to exclude yearling chinook catches, which resulted in a slight decrease of the June and July rearing density estimates.

The data show that densities of rearing chinook salmon fry were consistently higher in the off-channel sites than in the mainstem, for the entire survey period.

Chinook rearing densities in the off-channel sites remained relatively constant through the June and July survey dates and then decreased for the remainder of the survey. The highest density (2.69 fry/m^2) was recorded at off-channel site 1 (the groundwater-fed side channel) during the June survey and the lowest (0.07 fry/m^2) was recorded at the same site the following March. Chinook rearing densities in the mainstem showed an opposite, increasing trend over the survey, although the mainstem site was only sampled in July and September.

4.1.5. Juvenile Chinook Size

Weights of chinook fry were estimated for each of the survey sites, and the data are summarized in Table 7 and Figure 8. Average weights in the off-channel sites increased over the survey period, ranging from a low of 0.4g in off-channel Sites 1 and 3 in June to 4.9g in Site 2 in October, the warmest site.

Growth of chinook fry captured in the mainstem showed a similar trend, although the mainstem site was only surveyed in July and September. Average weight of the chinook captured at the mainstem site was 0.9g in July and 2.9g in September.

Table 7. Density and size of chinook fry in Dome Creek side channel and mainstem sites, expressed in numbers of fish per square metre (No./m^2), mean weight (g), length (cm) and condition factor (K) of individuals.

		Density (No./m^2)		Length (cm)		Weight (g)		Condition Factor (K)	
	Date 1997-1998	Mean	N	Mean	SD	Mean	SD	Mean	SD
Off-channel Sites[15]	June 10	1.31	175	3.62	0.19	0.43	0.12	0.90	0.15
	July 23–25	1.33	122	4.41	0.60	1.01	0.50	1.10	0.16
	Sept 9-11	0.49	61	5.87	0.67	2.50	0.94	1.20	0.20
	Oct 17-19	0.46	76	6.30	0.76	3.47	1.33	1.33	0.15
Mainstem Sites	June 10	NA[16]	0	NA	NA	NA	NA	NA	NA
	July 23–25	0	1	4.40	NA	.90	NA	1.06	NA
	Sept 9-11	0.26	14	6.31	0.65	2.92	0.93	1.13	0.09
	Oct 17-19	NA	0	NA	NA	NA	NA	NA	NA

[15] Sites 1, 2 and 3 combined.
[16] Not applicable.

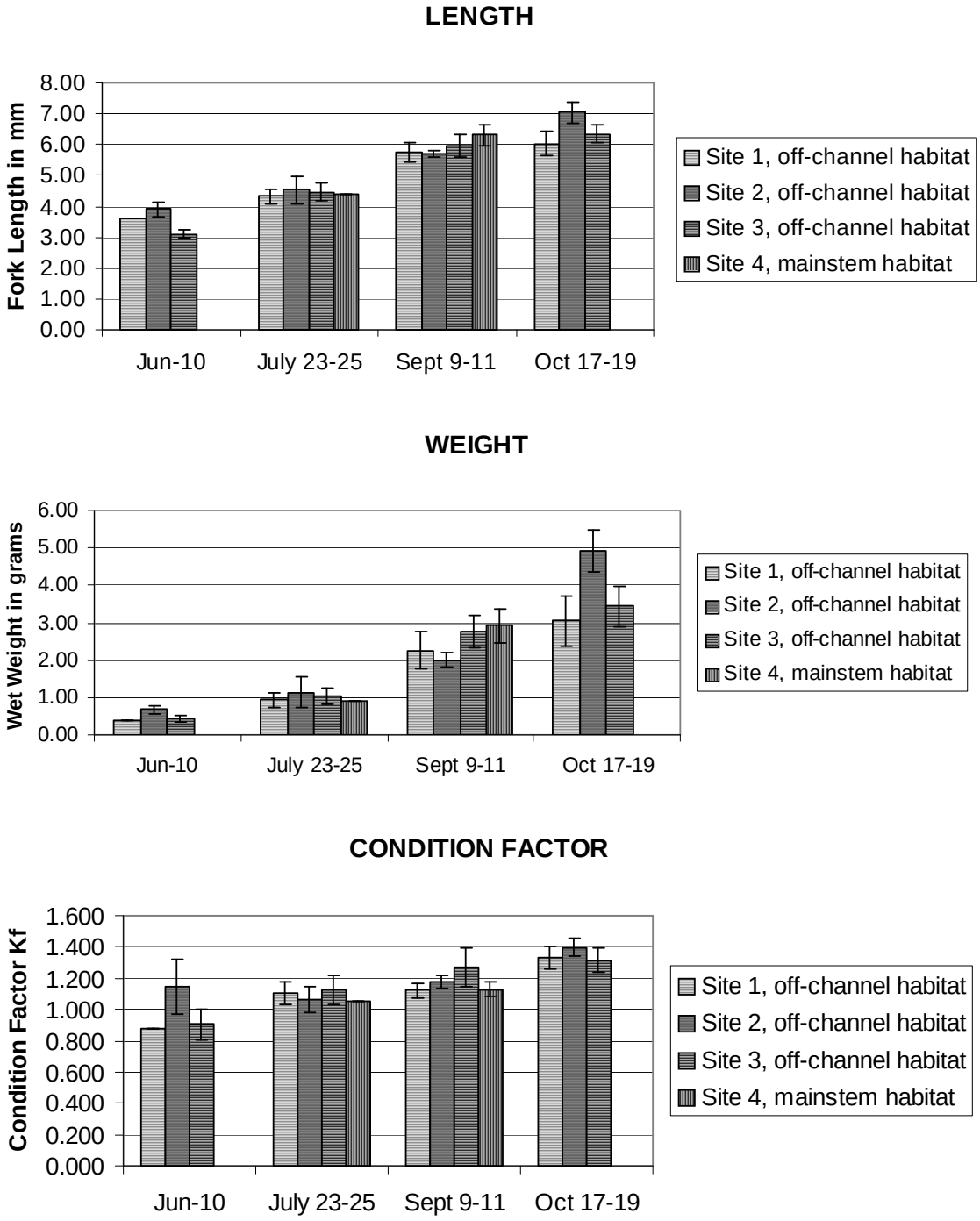

Figure 8. Sizes of chinook salmon juveniles found in Dome Creek at each sampling site in 1997.

Average fry fork length in off-channel sites increased from 3.6 cm in June to 6.3 cm in October. In the mainstem, average fry length was 4.4 cm during the July survey and 6.3 cm in September. The condition of the chinook fry sampled was generally very good in both the off-channel and mainstem sites throughout the survey period. K values below 1.0 were only found in June at Sites 1 and 3. These sites had the coldest water temperatures and smallest fry during the June survey.

4.2 BAKER CREEK

4.2.1. Catch Summaries

During the period of the study, 9 electrofishing surveys were conducted at the 3 off-channel sampling stations and 3 beach seining surveys were conducted at the mainstem sampling station. Table 8 describes the species captured, which includes chinook salmon, rainbow trout, mountain whitefish, white sucker, leopard dace (*Rhinichthys falcatus*), longnose dace (*Rhinichthys cataractae*), redside shiner (*Richardsonius balteatus*), northern pikeminnow (*Ptychocheilus oregonensis*), and chiselmouth (*Acrocheilus alutaceus*).

Table 8. Catch summary for off-channel and mainstem sites in Baker Creek.

Species and Stage	Number captured in Off-channel sites	Number captured in Mainstem site
Chinook salmon fry	265	95
Chinook salmon yearling	0	0
Rainbow trout	18	4
Bull trout	0	0
Mountain whitefish	0	4
White sucker	43	13
Sculpin species	0	0
Leopard dace	8	0
Longnose dace	63	1
Redside shiner	3	11
Northern pikeminnow	17	13
Chiselmouth	0	1
TOTAL	417	142

4.2.2. Wetted area, temperature and dissolved oxygen

A channel cross-section station was established at all of the sample sites and on each survey date wetted channel cross-section dimensions, water temperature and dissolved oxygen levels were recorded (Table 9). During the survey period, side channel Sites 2 and 3 continued to have adequate flows through the November survey date. Side channel site 1 dried up between the July and September survey dates. Flows in both the off-channel and mainstem sites decreased over the summer months reaching their lowest levels in September. With the onset of fall rains, water levels increased to early summer levels by the November survey date. The side channel sites froze and dried up by December, while the mainstem site iced over but continued to flow through the winter.

Unlike Dome Creek, the water temperatures at the Baker Creek mainstem site were very similar, and on some occasions, slightly warmer than the off-channel sites. The temperature of the off-channel sites ranged from a high of 18.1^{o}C in July to a low of 3.7^{o}C in November, during the June to November survey period. The temperature of the mainstem site over the same period ranged from a high of 18.3^{o}C in July to a low of 4.3^{o}C in November.

Dissolved oxygen levels were near saturation during the survey period for all sites. Mainstem and off-channel sites had similar dissolved oxygen levels, ranging from a low of 8.5 mg/l in July to a high of 11.8 mg/l in November.

Table 9. Channel cross-section dimensions, water temperature and dissolved oxygen levels at Baker Creek sample sites.

Date 1997-1998	Site Number	Description	Wetted Width (m)	Maximum Depth (m)	Temperature (^{o}C)	Dissolved Oxygen (mg/l)
June 12	1	Stream fed side channel	4.7	.38	16.4	9.0
June 12	2	Stream fed side channel	2.5	.21	17.3	9.2
June 12	3	Stream fed side channel	In flood	In flood	In flood	In flood
June 12	4	Mainstem pool-riffle	In flood	In flood	17.3	9.2
July 15 – 18	1	Stream fed side channel	3.0	.18	14.3	8.5
July 15 – 18	2	Stream fed side channel	2.7	.20	18.1	8.9
July 15 – 18	3	Stream fed side channel	3.7	.29	16.5	9.3
July 15 – 18	4	Mainstem pool-riffle	10.0	Too deep	18.3	9.2
September 16-17	1	Stream fed side channel	Dry	Dry	Dry	Dry
September 16-17	2	Stream fed side channel	1.9	.21	9.8	10.6
September 16-17	3	Stream fed side channel	3.1	.13	10.7	9.9
September 16-17	4	Mainstem pool-riffle	6.5	Too deep	9.8	10.6
November 3-4	1	Stream fed side channel	Dry	Dry	Dry	Dry
November 3 - 4	2	Stream fed side channel	2.6	.17	4.3	11.8
November 3 – 4	3	Stream fed side channel	3.6	.22	3.7	11.8
November 3 - 4	4	Mainstem pool-riffle	10.0	Too deep	4.3	11.8

4.2.3. Species composition and relative abundance

Table 10 summarizes the area sampled, effort, catch, and biomass of all species captured in the Baker Creek system. Results are summarized by sample site, data and pass for each of the nine off-channel electrofishing surveys. Also presented are the beach seine catch and mark recapture data for all species captured in the mainstem sample site. Length, weight and biomass per square metre are also calculated for all species. Juvenile chinook population numbers and rearing densities were estimated for each of the survey sites.

Similar to Dome Creek, the results indicate that the species mix and biomass changed in both mainstem and side channel habitats as the growing season progressed. Relative abundance of all species in the catch is reported as catch biomass per unit area sampled (g/m^2) for each of the 12 surveys conducted on Baker Creek. For each survey date, species abundance is summarized for the mainstem and the pooled off-channel sites in Table 10, and expressed graphically in Figure 9.

In contrast to Dome Creek, chinook were not the dominant species in the off-channel site catches in the June surveys. Also unlike Dome Creek, no age 1+ chinook were captured during the entire survey period in any of the sample sites. A number of species were found to be utilizing the off-channel habitats during the June spring freshet conditions, including white sucker (42% of biomass), rainbow trout (33%), chinook fry (13%), northern pikeminnow (8%), longnose dace (2%), leopard dace (2%) and redside shiner (<.5%). The mainstem site was not sampled in June due to spring freshet high water conditions.

Table 10. Baker Creek fish sampling summary (June 1997 to November 1997).

Date 1997-1998	Sample Location[17]	Area (m^2)	Capture Method[18]	Species[19]	1st Pass	No. Marked and Released	2nd Pass	No. Recap-tured	Estimated catch efficiency	Pop-ulation Estimate	Standard Deviation on Population	Length (cm) X	Length (cm) SD	Weight (g) X	Weight (g) SD	Density (No. fish/m^2)	Catch Biomass (g/m^2)
June 12	Site 1 (SC)	169	EF	CH 0+	2		5		0.5	14		4.5	0.4	1.1	0.3	0.08	0.05
				RSC	3		0					5.5		1.6			0.03
				WSU	3		4					4.7		2.0			0.08
				LDC	1		7					5.2		1.6			0.08
				LNC	13		7					4.2		0.7			0.08
				NSC	5		10					6.2		3.1			0.28
June 12	Site 2 (SC)	83	EF	CH 0+	25		28		0.5	106		4.3	0.3	0.8	0.2	1.28	0.54
				RB	3		1					12.2		31.2			1.50
				WSU	16		6					7.3		6.9			1.83
				LNC	4		1					3.6		0.5			0.03
				NSC	1		0					8.2		6.9			0.08
July 15-18	Site 1 (SC)	108	EF	LNC	6		1					3.3		0.4			0.02
				NSC	0		1					3.3		0.3			0.00
July 15-18	Site 2 (SC)	89	EF	CH 0+	52		28			113	23	5.6	0.6	2.1	0.7	1.27	1.85
				RB	3		2					13.3		37.8			2.12
				WSU	9		4					5.7		4.8			0.70
				LNC	5		3					4.1		0.9			0.08
July 15-18	Site 3 (SC)	70	EF	CH 0+	9		4			16	5	6.3	0.4	2.9	0.6	0.23	0.54
				RB	0		1					2.5		0.2			0.00
				LNC	10		8					7.1		4.3			1.10
				WSU	1		0					7.1		4.2			0.06

[17] SC – Side channel habitat; MS – Mainstem habitat.

[18] EF – Electrofishing; SN – Seining.

[19] CH – chinook salmon; RSC – redside shiner; WSU – white sucker; LDC – leopard dace; LNC – longnose dace; NSC – northern pikeminnow; RB – rainbow trout; MW – mountain whitefish; CMC – chiselmouth. See Appendix Table 1 for complete species list.

Table 10. Continued.

Date 1997-1998	Sample Location[20]	Area (m^2)	Capture Method[21]	Species[22]	1st Pass	No. Marked and Released	2nd Pass	No. Recap-tured	Estimated catch efficiency	Pop-ulation Estimate	Standard Deviation on Population	Length (cm) X	Length (cm) SD	Weight (g) X	Weight (g) SD	Density (No. fish/m^2)	Catch Biomass (g/m^2)
July 15-18	Site 4 (MS)	310	SN	CH 0+	27	27	11	6		47	9	6.5	0.5	3.2	0.8	0.15	0.33
				RB	2	2	1	0				14.6		35.5			0.34
				MW	1	1	2	0				14.5		40.9			0.40
				WSU	0	0	10	0				15.6		60.8			1.96
				RSC	1	1	9	0				9.7		11.5			0.37
				CMC	0	0	1	0				9.5		11.5			0.04
				NSC	0	0	4	0				14.8		8.2			0.11
Sept 16-17	Site 2 (SC)	63	EF	CH 0+	53		7			61	1	7.6	0.9	4.7	1.8	0.97	4.51
Sept 16-17	Site 3 (SC)	70	EF	CH 0+	7		0			7	0	7.6	0.2	5.2	0.4	0.10	0.52
				RB	3		1					6.4		3.0			0.17
				LNC	1		3					3.2		0.4			0.02
Sept 16-17	Site 4 (MS)	156	SN	CH 0+	17	17	17	4		64	19	8.3	0.6	6.7	1.7	0.41	1.29
				LNC	1	1	0	0				8.0		5.5			0.04
				NSC	9	9	0	0				9.6		9.9			0.57
				RSC	1	1	0	0				6.6		2.8			0.02
				WSU	2	2	1	0				17.4		171.4			3.30
Nov 3-4	Site 2 (SC)	86	EF	CH 0+	40		2			42	0	7.4	0.8	4.6	1.2	0.49	2.26
Nov 3-4	Site 3 (SC)	68	EF	CH 0+	3		0			3	0	7.3	0.5	4.2	0.9	0.04	0.19
				RB	4		0					6.3		3.0			0.18
				LNC	1		0					2.2		0.2			0.00
Nov 3-4	Site 4 (MS)	290	SN	CH 0+	16	16	7	3		33	9	9.0	0.6	8.0	1.7	0.11	0.55
				RB	1	1	0	0				20.0		85.1			0.29
				MW	1	1	0	0				12.0		15.1			0.05

[20] SC – Side channel habitat; MS – Mainstem habitat.

[21] EF – electrofishing; SN – seining.

[22] CH=chinook salmon; RSC=redside shiner; WSU=white sucker; LDC=leopard dace; LNC=longnose dace; NSC=northern pikeminnow; RB=rainbow trout; MW=mountain whitefish; CMC=chiselmouth. See Appendix Table 1 for complete species list.

Table 11. Catch composition of Baker Creek side channel and mainstem sites, expressed in biomass (g/m^2).

Date	Habitat Type	Chinook Fry	Rainbow Trout	Mountain Whitefish	White Sucker	Leopard Dace	Longnose Dace	Redside Shiner	Northern Pikeminnow	Chiselmouth
June 12	Side channel	0.29	0.75	0	0.95	0.04	0.06	0.01	0.18	0
July 15 – 18	Side channel	0.80	0.71	0	0.25	0	0.40	0	0	0
July 15 – 18	Mainstem	0.33	0.34	0.4	1.96	0	0	0.37	0.11	0.04
September 16 – 17	Side channel	2.51	0.09	0	0	0	0.01	0	0	0
September 16 – 17	Mainstem	1.29	0	0	3.3	0	0.04	0.02	0.57	0
November 3 – 4	Side channel	1.22	0.09	0	0	0	0	0	0	0
November 3 – 4	Mainstem	0.55	0.29	0.05	0	0	0	0	0	0

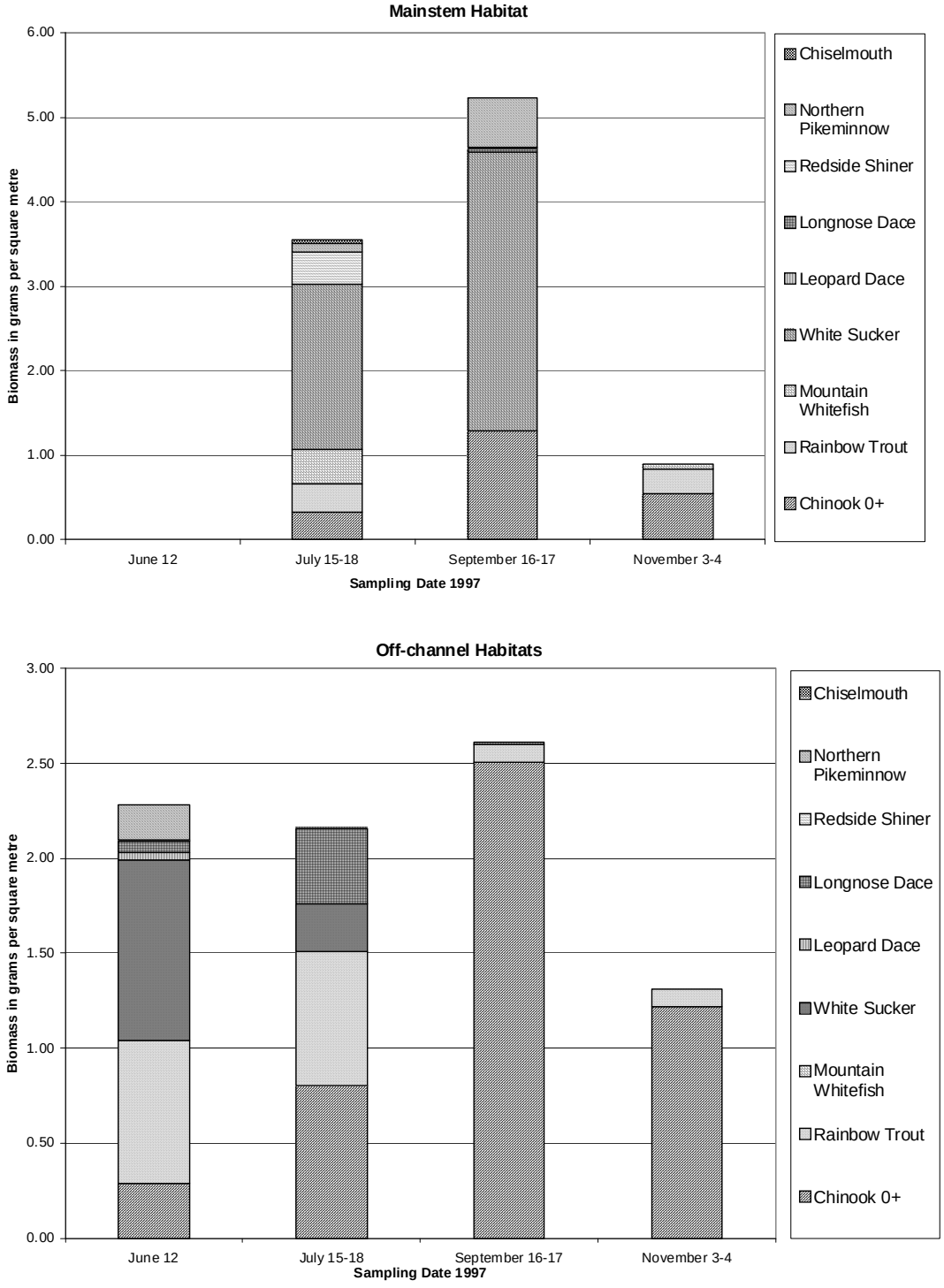

Figure 9. Catch composition of Baker Creek mainstem and off-channel sites, expressed in biomass.

By the July surveys, chinook had become the dominant species in the off-channel site catches. While chinook abundance in the off-channel sites did not increase much from the June survey date, the abundance of other species in these habitats had decreased. Species biomass proportions in the side-channel catches during July were mostly chinook juveniles and rainbow trout (37% and 33%, respectively), followed by longnose dace (19%) and white sucker (11%). Only one northern pikeminnow was captured in the off-channel sites at this time. The composition of the mainstem site catch during the July survey was substantially different from that of the off-channel sites. White suckers were dominant (56% of the biomass) with chinook comprising only a minor proportion of the catch (9%). Many of the species that appeared to become less abundant in the off-channel sites in July were present in the mainstem. Biomass proportions of other species in the mainstem catch included mountain whitefish (11%), redside shiner (10%), rainbow trout (10%), northern pikeminnow (3%) and chiselmouth (1%).

Chinook dominance in the off-channel site catches continued into September, with the proportion of chinook in the catch increasing from 37% in July to 97% in September, followed by rainbow trout and longnose dace (3% and <.0.5% of the off-channel catch biomass, respectively). In the mainstem, the proportion of chinook in the catch also increased from the July survey date, although white sucker remained the dominant species in that habitat. Species biomass proportions in the September mainstem catch reflected greater biodiversity: white sucker (63%), chinook (25%) and northern pikeminnow (11%), as well as 1% attributed to one redside shiner and one longnose dace.

During the November survey chinook remained the dominant species in the off-channel site catches, comprising 94% of the catch biomass, followed by rainbow trout, and one longnose dace. Chinook were also the dominant species in the mainstem site catch for the first time during the survey period. Only chinook, rainbow trout and mountain whitefish were captured at the mainstem site, comprising 62%, 32% and 6% of the catch biomass, respectively.

4.2.4. Chinook Rearing Density

Chinook fry population numbers and rearing densities were estimated for each of the nine off-channel electrofishing and three mainstem beach seining surveys conducted in Baker Creek (Table 12 and Figure 10). The data show that during the entire survey period, densities were consistently higher in the off-channel sites than in the mainstem site, as was the case for Dome Creek.

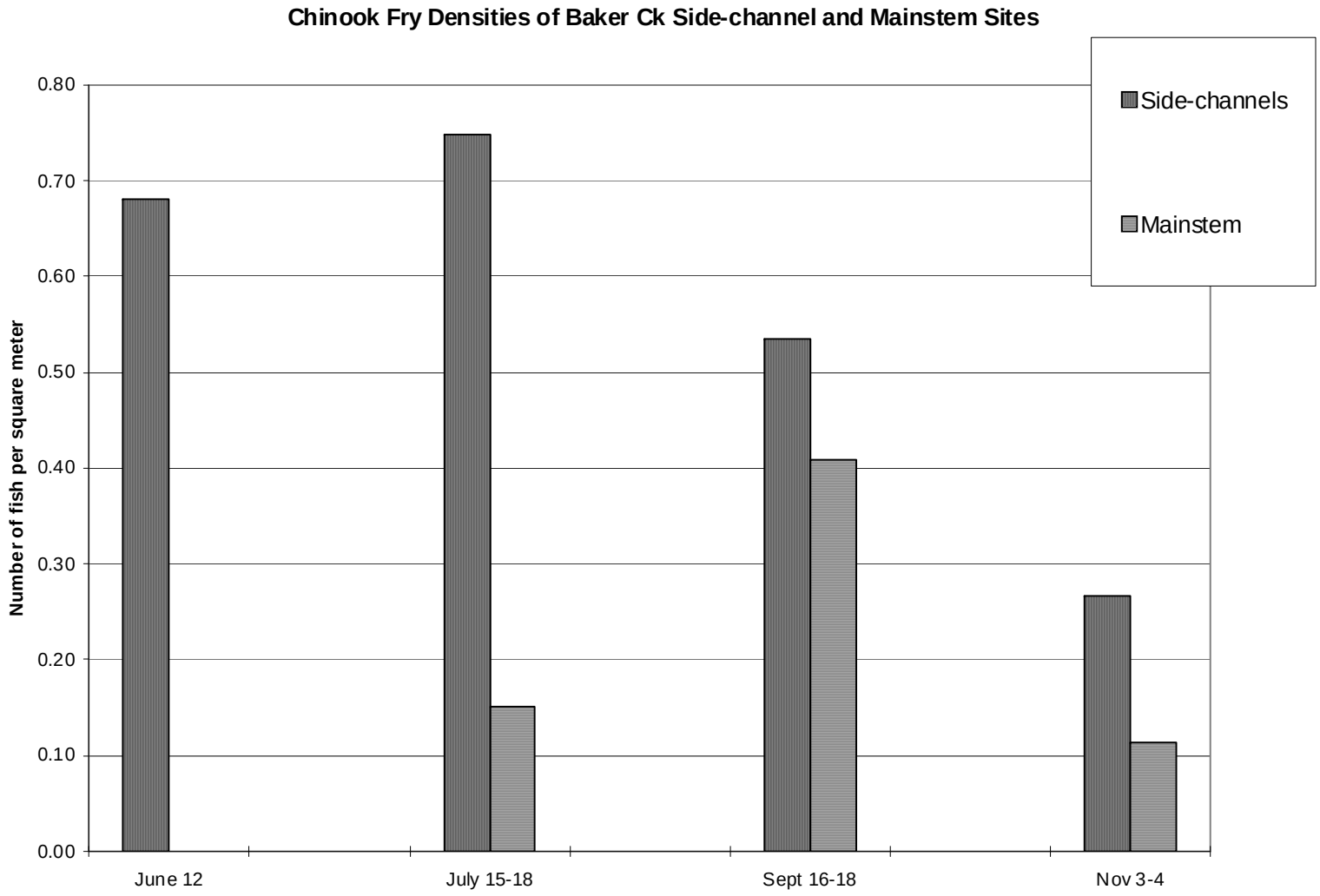

Figure 10. Density of chinook fry in Baker Creek mainstem and off-channel habitats.

Chinook rearing densities in the off-channel sites remained relatively constant through the June and July survey dates and then decreased over the remaining period of the survey. The highest value of 1.28 fry/m^2 was recorded at off-channel Site 2 during the June survey and the lowest value (0.04 fry/m^2) was recorded at off-channel Site 3 in November. Consistent with the Dome Creek findings, chinook rearing densities in the mainstem site showed the opposite trend through the summer, with densities increasing from July to September, and then decreasing in November.

4.2.5. Juvenile Chinook Size

Weights of chinook fry were estimated for each of the survey sites, and the data are summarized in Table 12 and Figure 11. Average chinook fry weight in the off-channel sites increased over the June to September period and then decreased in November, possibly due to the emigration of larger fry from off-channel to mainstem habitats. Average weight over the period of the survey ranged from a low of 0.8g at Site 2 in June to a high of 5.2g at Site 3 in September.

Average chinook fry weight in the mainstem site increased over the July to November survey period. Average weight of the chinook captured at the mainstem site was 3.3g in July, 6.7g in September and 8.0g in November.

Average fry fork length in off-channel sites increased from 4.3 cm in June to 7.6 cm in September and then decreased slightly in November. In the mainstem, average fry length increased from 6.5 cm in July to 9.8 cm in November. The condition of the chinook fry sampled was consistently very good at all sample sites throughout the survey period. K values for the off-channel and mainstem sites varied from a low of 1.04 at Site 2 in June to a high of 1.20 at Site 3 in September.

As was observed in Dome Creek, at the start of the mainstem survey in July, average fry size was similar to that of the off-channel sites. However, the difference between the two habitat types increased through the summer, with the average size of mainstem fry becoming larger. This corresponded with decreasing chinook rearing densities in the side channel sites, and increasing densities in the mainstem, suggesting some degree of fry emigration into the mainstem.

Table 12. Density and size of chinook fry in Baker Creek side channel and mainstem sites, expressed in numbers of fish per square metre (No./m^2), mean weight (g), length (cm) and condition factor (K) of individuals.

		Density		Length (cm)		Weight (g)		Condition Factor (K)	
	Date 1997	Mean	N	Mean	SD	Mean	SD	Mean	SD
Off-channel Sites[23]	June 12	0.68	60	4.3	0.3	0.9	0.2	1.05	0.14
	July 15-18	0.75	45	5.8	0.6	2.3	0.8	1.14	0.10
	Sept 16-18	0.53	37	7.6	0.8	4.8	1.6	1.10	0.30
	Nov 3-4	0.27	32	7.4	0.7	4.6	1.2	1.13	0.10
Mainstem Sites	June 12	NA[24]	0	NA	NA	NA	NA	NA	NA
	July 15-18	0.15	32	6.5	0.5	3.2	0.9	1.17	0.11
	Sept 16-18	0.41	30	8.3	0.6	6.7	1.7	1.14	0.07
	Nov 3-4	0.11	20	9.8	0.6	8.0	1.7	1.10	0.08

[23] Sites 1, 2 and 3 combined.
[24] Not applicable.

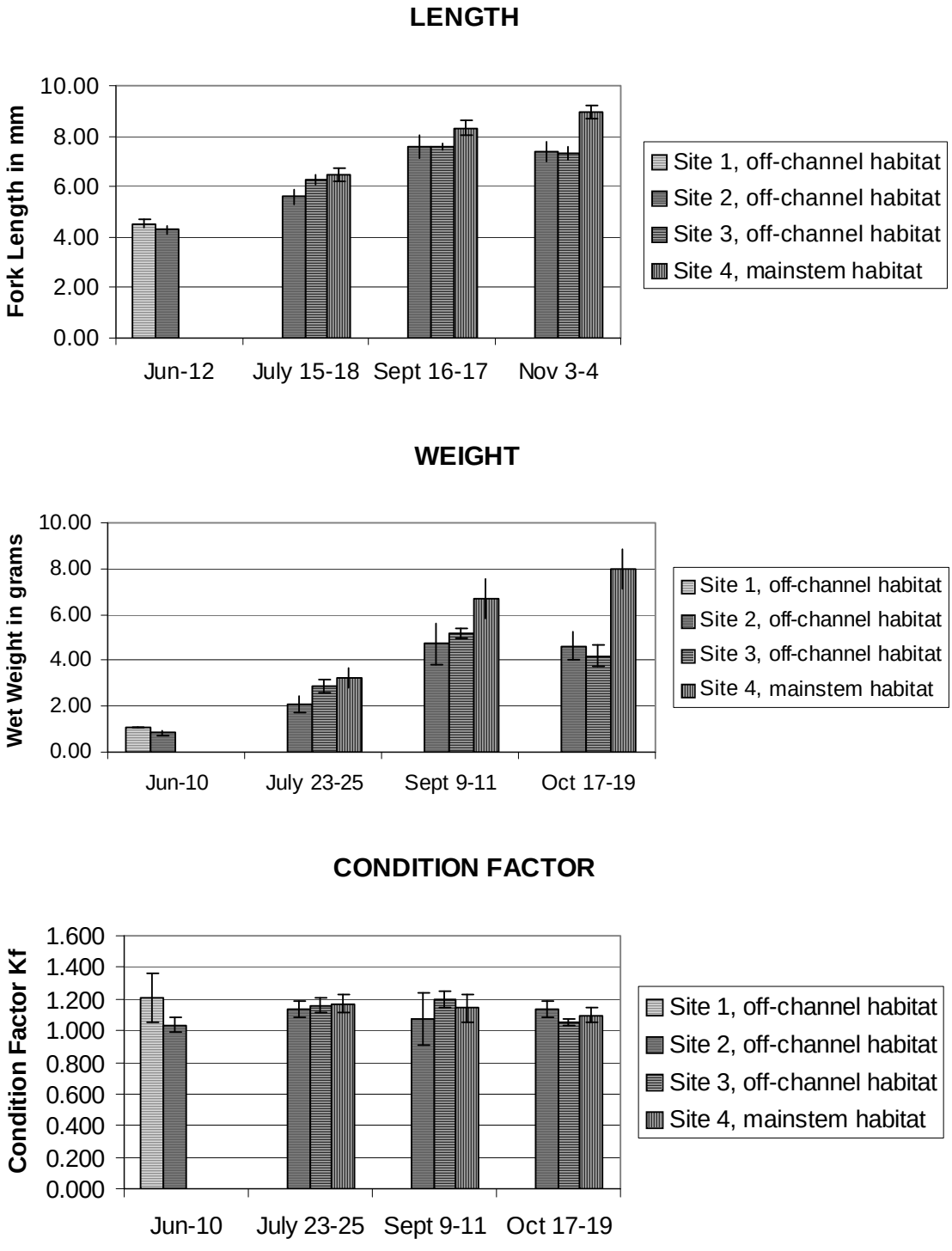

Figure 11. Sizes of chinook salmon juveniles found in Baker Creek at each sampling site in 1997.

5.0. DISCUSSION

Use of off-channel and mainstem habitats:
In his summary of chinook salmon life history patterns, Healy (1991) points out that there is evidence of four dispersal periods: immediately downstream after emergence, a second dispersal later in the spring that redistributes them to suitable summer rearing sites, a third dispersal to suitable overwintering habitats (from tributaries into the mainstem); and finally a migration to the ocean in the spring. While there may be some variation in timing, during late spring to early summer the populations tend to shift into deeper water and move seaward.

This study indicates that during the first and second dispersal periods there may be significant juvenile chinook migration into off-channel habitats in upper Fraser River populations. We observed that chinook salmon fry actively move upstream into non-natal, off-channel habitats during the late spring to early summer period, some of whom reside there well into the fall. This was evident in the two groundwater-fed side channels that had only an outlet connection to the mainstem. The observed decline of chinook densities in off-channel habitats and a corresponding increase in mainstem habitats in late summer and fall is consistent with Healy. Levings and Lauzier (1991) also reported that overwintering habitats were found in the deeper, mainstem channels of the larger rivers.

A somewhat unexpected result of this survey was the length of time chinook fry reared in the off-channel sites and the size they achieved while occupying these habitats. Early in the survey, the off-channel sites in both watersheds appeared to be the preferred habitat of chinook juveniles, as rearing densities were much higher at those sample sites than the mainstem sites. As the summer progressed, chinook rearing densities decreased in the off-channel sites and increased in the mainstem sites, suggesting fry emigration from off-channel to mainstem habitats. However, chinook fry were still relatively abundant at many off-channel sites during the final fall survey, with densities approaching 0.5 fry/m^2.

While no sampling was conducted during the December onset of winter freeze-up, chinook fry likely continued to emigrate from their off-channel rearing areas to the mainstem as flows diminished and freezing began. This appeared to be the case in the Dome Creek groundwater-fed channel which was the only off-channel site that continued to flow through the winter months and the only site sampled on the March survey date. Chinook fry density was 0.40 fry/m^2 at this site during the final fall survey in late October, but by the March survey date, had decreased to 0.07 fry/m^2.

A number of species were captured during the survey in both watersheds, however, species diversity was higher in the Baker Creek catches. Six species of fish (chinook salmon, rainbow trout, bull trout, mountain whitefish, white sucker and sculpin spp.) were captured at the Dome Creek sample stations compared to nine species of fish (chinook salmon, rainbow trout, mountain whitefish, white sucker, leopard dace, longnose dace, redside shiner, northern pikeminnow, chiselmouth) at the Baker Creek sample sites.

There were notable temporal and spatial differences in species mix and relative abundances of these species in mainstem versus off-channel sites in both watersheds. For example, mountain whitefish were relatively abundant in the mainstem but were not found at any of the off-channel sites through the survey period. Chinook were generally the predominant species in the off-channel site catches of both watersheds and this persisted throughout the survey period. In contrast, other species dominated the mainstem catches of both watersheds during the early summer period of the survey. However, as the survey progressed through the summer and into the fall, chinook comprised an increasing proportion of the mainstem catches and became the predominant species by the end of the survey.

Seasonal growth of chinook fry:
In this study, the average weight of rearing chinook salmon increased in both off-channel and mainstem habitats. However, it is unlikely that we measured a static population of fish. Scrivener et al (1994) found that emigrating chinook salmon took up short-term residency at the confluence of the mainstem Fraser River and lower Hawks Creek. In the latter study, while fish were present in the off-channel habitat throughout the growing season, the average holding time for individual fish was only about nine days. In the current study, individual fish were not tracked – analyses were based on measurements of the population present at the time of the field surveys.

Chinook fry achieved more than 70% of their yearling smolt size during their first spring and summer rearing months and condition coefficients generally exceeded a value of 1.0. The mean weight of Dome Creek chinook fry sampled in the off-channel sites in October was 3.8g (mainstem not sampled in October) compared to the 5.3g mean weight of 21 yearling smolts sampled in Dome Creek. Baker Creek chinook mean fry weights in the off-channel and mainstem sites during September were 4.9 and 6.7g, respectively.

During the later summer months, when chinook abundance decreased at the off-channel sites and increased at the mainstem sites, the size difference between mainstem and off-channel fry increased, with the mainstem chinook fry being the largest. From September to November, the average weight of chinook fry in the Baker Creek off-channel sites actually decreased from 4.9g to 4.4g, while at the mainstem site it increased from 6.7g to 8.0g over the same period. The increasing size divergence between off-channel and mainstem sites later in the survey period may be a result of larger fry emigrating from off-channel habitats into mainstem habitats, while smaller fry remained in off-channel refugia well into the fall. The late season size divergence observed between the two habitat types does not appear to be the result of deteriorating habitat quality in the off-channel habitats. The condition factor of chinook juveniles at all the off-channel sample sites remained relatively constant or increased through the late summer and fall period.

Examination of the fish density data also suggests that as the summer progressed, fry emigrated from off-channel to mainstem habitats, as indicated by chinook densities that decreased in the side channel sites and increased in the mainstem sites during this period.

Abiotic and Biotic Influences on Habitat Preferences of Juvenile Chinook:
On a large scale, climate and hydrologic regime probably had some effect on fish distribution (Table 13). For instance, Dome Creek is a colder, high elevation watershed with flows fed primarily by snow-melt through the summer and fall months. The ambient air temperature is generally warmer during this period than the mainstem water temperature. Water temperatures in the lower flow off-channel sites warm to a greater degree in response to the warmer ambient air temperatures during this period. Conversely, Baker Creek is a warmer lower elevation lake-fed stream and water temperatures in both the mainstem and off-channel sites more closely resembled ambient air temperatures during the survey period. During the period of the study, both watersheds experienced similar discharge patterns. Peak spring freshet flows were observed in May and June, decreased through the summer to a low in September and then increased again through October and November with the onset of fall rains. Flows again began to decrease in December with freezing temperatures and were at their lowest during the March survey.

During the survey period, spring freshet flood flows were observed in Baker Creek in May and Dome Creek in May-June. Both watersheds experienced flood flows again in the fall during rain-on-snow events. While these mainstem flood events were occurring, the off-channel sites experienced relatively benign flow conditions and offered stable refuge habitats for rearing juvenile chinook and other species.

Baker Creek water temperatures were consistently warmer than those in Dome Creek over the survey period. During the critical spring and summer growth period for chinook juveniles, the Dome Creek off-channel sites appeared to offer more optimal water temperatures for growth than the mainstem. During this period, maximum water temperatures recorded at the Dome Creek mainstem sites was 12^{o}C compared to 16^{o}C in the off-channel sites. The warmer off-channel habitats appear to offer a growth advantage over the colder snow-melt fed mainstem. In Baker Creek, off-channel and mainstem habitats experienced similar water temperatures during the survey period.

Table 13. Comparative list of watershed characteristics of Dome and Baker Creeks.

Parameter	Dome Creek	Baker Creek
Order	Fourth	Fifth
Drainage area	273 km^2	1,573 km^2
Elevation at Fraser River confluence	660 m	480 m
Elevation at headwaters	1,900 m	1,300 m
Biogeoclimatic zones represented	Sub Boreal Spruce; Interior Cedar-Hemlock; Engelman Spruce Sub Alpine Fir; Arctic Tundra	Sub Boreal Spruce
Length of mainstem accessible to anadromous fish	32 km	59 km
Number of fish species captured in this study	6	9

Fish capture data indicates that the fish community occupying off-channel habitats was somewhat different from the fish community in adjacent mainstem habitats. Certain species and life history stages preferred one habitat type to the other. In Dome Creek, mountain whitefish were captured in the mainstem sites but were not observed in any of the off-channel sites. During July and August of the survey period, the Penny Salmonid Enhancement Society operated a counting fence in the lower Dome Creek mainstem to enumerate chinook spawners. We observed the capture of adult rainbow trout, bull trout and northern pikeminnow in the counting fence trap. While juveniles of some of these species were observed in the off-channel sample sites, the distribution of larger individuals of these species appeared to be limited to mainstem habitats.

Similar differences were noted in the fish communities occupying mainstem and off-channel habitats in Baker Creek. As was the case in Dome Creek, mountain whitefish were only captured at the mainstem sites and were not observed in any of the off-channel sites. Redside shiners were also more prevalent in the mainstem catches and were only observed in one of the nine off-channel site surveys. Northern pikeminnow and white sucker were observed in both the mainstem and off-channel sites, however, only juveniles of these species were observed in the off-channel habitats, while larger individuals appeared to be limited to the mainstem habitats.

In both watersheds, off-channel habitats were heavily utilized by chinook fry during the survey period. For much of the study, off-channel habitats experienced more optimal rearing temperatures and flow conditions than mainstem habitats. The observed species and life history stage habitat partitioning between off-channel and mainstem habitats may

have also been a factor influencing the distribution of newly emergent chinook fry. The apparent chinook fry preference for off-channel habitats in these watersheds during early rearing is likely a strategy to take advantage of more favourable growing conditions, and reduced competition with, or predation by, other species which were more prevalent in the mainstem habitats.

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8.0. APPENDICES

APPENDIX TABLE 1. LIST OF FISH SPECIES CAPTURED.

Mnemonic	Common Name	Scientific Name
BT	Bull trout	*Salvelinus confluentus*
CC	Sculpin (general)	*Cottidae family*
CH 0+	Chinook salmon fry	*Oncorhynchus tshawytscha*
CH 1+	Chinook salmon yearling	*Oncorhynchus tshawytscha*
CMC	Chiselmouth	*Acrocheilus alutaceus*
LDC	Leopard dace	*Rhinichthys falcatus*
LNC	Longnose dace	*Rhinichthys cataractae*
MW	Mountain whitefish	*Prosopium williamsoni*
NSC	Northern pikeminnow	*Ptychocheilus oregonensis*
RB	Rainbow trout	*Oncorhynchus mykiss*
RSC	Redside shiner	*Richardsonius balteatus*
WSU	White sucker	*Catostomus commersoni*

APPENDIX TABLE 2. LIST OF ALL FISH CAPTURED AT DOME CREEK SAMPLE SITES.

Fish ID	Site	Date	Species	Length	Weight	Pass
689	1	6/10/1997	Chinook			2
678	1	6/10/1997	Chinook			2
679	1	6/10/1997	Chinook			2
680	1	6/10/1997	Chinook			2
681	1	6/10/1997	Chinook			2
682	1	6/10/1997	Chinook			2
683	1	6/10/1997	Chinook			2
684	1	6/10/1997	Chinook			2
685	1	6/10/1997	Chinook			2
686	1	6/10/1997	Chinook			2
699	1	6/10/1997	Chinook			2
688	1	6/10/1997	Chinook			2
675	1	6/10/1997	Chinook			2
690	1	6/10/1997	Chinook			2
691	1	6/10/1997	Chinook			2
692	1	6/10/1997	Chinook			2
693	1	6/10/1997	Chinook			2
694	1	6/10/1997	Chinook			2
695	1	6/10/1997	Chinook			2
696	1	6/10/1997	Chinook			2
697	1	6/10/1997	Chinook			2
651	1	6/10/1997	Chinook	3.6	0.4	1
687	1	6/10/1997	Chinook			2
663	1	6/10/1997	Chinook	3.6	0.4	1
652	1	6/10/1997	Chinook	3.6	0.4	1
653	1	6/10/1997	Chinook	3.6	0.4	1
654	1	6/10/1997	Chinook	3.6	0.4	1
655	1	6/10/1997	Chinook	3.6	0.4	1
656	1	6/10/1997	Chinook	3.6	0.4	1
657	1	6/10/1997	Chinook	3.6	0.4	1
658	1	6/10/1997	Chinook	3.6	0.4	1
659	1	6/10/1997	Chinook	3.6	0.4	1
660	1	6/10/1997	Chinook	3.6	0.4	1
677	1	6/10/1997	Chinook			2
662	1	6/10/1997	Chinook	3.6	0.4	1
676	1	6/10/1997	Chinook			2
664	1	6/10/1997	Chinook	3.6	0.4	1
665	1	6/10/1997	Chinook	3.6	0.4	1
666	1	6/10/1997	Chinook	3.6	0.4	1
667	1	6/10/1997	Chinook	3.6	0.4	1
668	1	6/10/1997	Chinook	3.6	0.4	1
669	1	6/10/1997	Chinook	3.6	0.4	1

Fish ID	Site	Date	Species	Length	Weight	Pass
670	1	6/10/1997	Chinook	3.6	0.4	1
672	1	6/10/1997	Chinook	3.6	0.4	1
674	1	6/10/1997	Chinook			2
700	1	6/10/1997	Chinook			2
661	1	6/10/1997	Chinook	3.6	0.4	1
736	1	6/10/1997	Chinook			2
725	1	6/10/1997	Chinook			2
726	1	6/10/1997	Chinook			2
727	1	6/10/1997	Chinook			2
728	1	6/10/1997	Chinook			2
729	1	6/10/1997	Chinook			2
730	1	6/10/1997	Chinook			2
731	1	6/10/1997	Chinook			2
732	1	6/10/1997	Chinook			2
733	1	6/10/1997	Chinook			2
698	1	6/10/1997	Chinook			2
735	1	6/10/1997	Chinook			2
722	1	6/10/1997	Chinook			2
737	1	6/10/1997	Chinook			2
738	1	6/10/1997	Chinook			2
739	1	6/10/1997	Chinook			2
740	1	6/10/1997	Chinook			2
741	1	6/10/1997	Chinook			2
742	1	6/10/1997	Chinook			2
743	1	6/10/1997	Chinook			2
744	1	6/10/1997	Chinook			2
556	1	6/10/1997	Chinook	3.6	0.4	1
734	1	6/10/1997	Chinook			2
712	1	6/10/1997	Chinook			2
701	1	6/10/1997	Chinook			2
702	1	6/10/1997	Chinook			2
703	1	6/10/1997	Chinook			2
704	1	6/10/1997	Chinook			2
705	1	6/10/1997	Chinook			2
706	1	6/10/1997	Chinook			2
707	1	6/10/1997	Chinook			2
708	1	6/10/1997	Chinook			2
709	1	6/10/1997	Chinook			2
724	1	6/10/1997	Chinook			2
711	1	6/10/1997	Chinook			2
723	1	6/10/1997	Chinook			2
713	1	6/10/1997	Chinook			2
714	1	6/10/1997	Chinook			2
715	1	6/10/1997	Chinook			2
716	1	6/10/1997	Chinook			2

Fish ID	Site	Date	Species	Length	Weight	Pass
717	1	6/10/1997	Chinook			2
718	1	6/10/1997	Chinook			2
719	1	6/10/1997	Chinook			2
720	1	6/10/1997	Chinook			2
721	1	6/10/1997	Chinook			2
671	1	6/10/1997	Chinook	3.6	0.4	1
710	1	6/10/1997	Chinook			2
592	1	6/10/1997	Chinook	3.6	0.4	1
603	1	6/10/1997	Chinook	3.6	0.4	1
673	1	6/10/1997	Chinook	3.6	0.4	1
583	1	6/10/1997	Chinook	3.6	0.4	1
650	1	6/10/1997	Chinook	3.6	0.4	1
585	1	6/10/1997	Chinook	3.6	0.4	1
586	1	6/10/1997	Chinook	3.6	0.4	1
587	1	6/10/1997	Chinook	3.6	0.4	1
588	1	6/10/1997	Chinook	3.6	0.4	1
589	1	6/10/1997	Chinook	3.6	0.4	1
580	1	6/10/1997	Chinook	3.6	0.4	1
591	1	6/10/1997	Chinook	3.6	0.4	1
579	1	6/10/1997	Chinook	3.6	0.4	1
593	1	6/10/1997	Chinook	3.6	0.4	1
594	1	6/10/1997	Chinook	3.6	0.4	1
595	1	6/10/1997	Chinook	3.6	0.4	1
596	1	6/10/1997	Chinook	3.6	0.4	1
597	1	6/10/1997	Chinook	3.6	0.4	1
598	1	6/10/1997	Chinook	3.6	0.4	1
599	1	6/10/1997	Chinook	3.6	0.4	1
600	1	6/10/1997	Chinook	3.6	0.4	1
601	1	6/10/1997	Chinook	3.6	0.4	1
602	1	6/10/1997	Chinook	3.6	0.4	1
590	1	6/10/1997	Chinook	3.6	0.4	1
568	1	6/10/1997	Chinook	3.6	0.4	1
557	1	6/10/1997	Chinook	3.6	0.4	1
558	1	6/10/1997	Chinook	3.6	0.4	1
559	1	6/10/1997	Chinook	3.6	0.4	1
560	1	6/10/1997	Chinook	3.6	0.4	1
561	1	6/10/1997	Chinook	3.6	0.4	1
562	1	6/10/1997	Chinook	3.6	0.4	1
563	1	6/10/1997	Chinook	3.6	0.4	1
564	1	6/10/1997	Chinook	3.6	0.4	1
565	1	6/10/1997	Chinook	3.6	0.4	1
581	1	6/10/1997	Chinook	3.6	0.4	1
567	1	6/10/1997	Chinook	3.6	0.4	1
584	1	6/10/1997	Chinook	3.6	0.4	1
569	1	6/10/1997	Chinook	3.6	0.4	1

Fish ID	Site	Date	Species	Length	Weight	Pass
570	1	6/10/1997	Chinook	3.6	0.4	1
571	1	6/10/1997	Chinook	3.6	0.4	1
572	1	6/10/1997	Chinook	3.6	0.4	1
573	1	6/10/1997	Chinook	3.6	0.4	1
574	1	6/10/1997	Chinook	3.6	0.4	1
575	1	6/10/1997	Chinook	3.6	0.4	1
576	1	6/10/1997	Chinook	3.6	0.4	1
577	1	6/10/1997	Chinook	3.6	0.4	1
578	1	6/10/1997	Chinook	3.6	0.4	1
566	1	6/10/1997	Chinook	3.6	0.4	1
640	1	6/10/1997	Chinook	3.6	0.4	1
629	1	6/10/1997	Chinook	3.6	0.4	1
630	1	6/10/1997	Chinook	3.6	0.4	1
631	1	6/10/1997	Chinook	3.6	0.4	1
632	1	6/10/1997	Chinook	3.6	0.4	1
633	1	6/10/1997	Chinook	3.6	0.4	1
634	1	6/10/1997	Chinook	3.6	0.4	1
635	1	6/10/1997	Chinook	3.6	0.4	1
636	1	6/10/1997	Chinook	3.6	0.4	1
637	1	6/10/1997	Chinook	3.6	0.4	1
628	1	6/10/1997	Chinook	3.6	0.4	1
639	1	6/10/1997	Chinook	3.6	0.4	1
646	1	6/10/1997	Chinook	3.6	0.4	1
641	1	6/10/1997	Chinook	3.6	0.4	1
642	1	6/10/1997	Chinook	3.6	0.4	1
643	1	6/10/1997	Chinook	3.6	0.4	1
644	1	6/10/1997	Chinook	3.6	0.4	1
645	1	6/10/1997	Chinook	3.6	0.4	1
604	1	6/10/1997	Chinook	3.6	0.4	1
647	1	6/10/1997	Chinook	3.6	0.4	1
582	1	6/10/1997	Chinook	3.6	0.4	1
649	1	6/10/1997	Chinook	3.6	0.4	1
638	1	6/10/1997	Chinook	3.6	0.4	1
607	1	6/10/1997	Chinook	3.6	0.4	1
648	1	6/10/1997	Chinook	3.6	0.4	1
627	1	6/10/1997	Chinook	3.6	0.4	1
605	1	6/10/1997	Chinook	3.6	0.4	1
606	1	6/10/1997	Chinook	3.6	0.4	1
608	1	6/10/1997	Chinook	3.6	0.4	1
609	1	6/10/1997	Chinook	3.6	0.4	1
610	1	6/10/1997	Chinook	3.6	0.4	1
611	1	6/10/1997	Chinook	3.6	0.4	1
612	1	6/10/1997	Chinook	3.6	0.4	1
613	1	6/10/1997	Chinook	3.6	0.4	1
614	1	6/10/1997	Chinook	3.6	0.4	1

Fish ID	Site	Date	Species	Length	Weight	Pass
615	1	6/10/1997	Chinook	3.6	0.4	1
625	1	6/10/1997	Chinook	3.6	0.4	1
617	1	6/10/1997	Chinook	3.6	0.4	1
618	1	6/10/1997	Chinook	3.6	0.4	1
619	1	6/10/1997	Chinook	3.6	0.4	1
620	1	6/10/1997	Chinook	3.6	0.4	1
621	1	6/10/1997	Chinook	3.6	0.4	1
622	1	6/10/1997	Chinook	3.6	0.4	1
623	1	6/10/1997	Chinook	3.6	0.4	1
624	1	6/10/1997	Chinook	3.6	0.4	1
626	1	6/10/1997	Chinook	3.6	0.4	1
616	1	6/10/1997	Chinook	3.6	0.4	1
745	1	6/10/1997	Sculpin	4.3	0.7	2
746	1	6/10/1997	Sculpin	3.2	0.4	1
830	1	7/23/1997	Bull trout	3.3	0.4	2
829	1	7/23/1997	Bull trout	3.5	0.3	2
805	1	7/23/1997	Bull trout	16.2	47.2	1
799	1	7/23/1997	Chinook	4.0	0.8	1
792	1	7/23/1997	Chinook	5.0	1.2	1
803	1	7/23/1997	Chinook	4.3	0.9	1
802	1	7/23/1997	Chinook	4.5	1.0	1
801	1	7/23/1997	Chinook	5.0	1.3	1
808	1	7/23/1997	Chinook			2
800	1	7/23/1997	Chinook	4.9	1.3	1
804	1	7/23/1997	Chinook	4.1	0.7	1
798	1	7/23/1997	Chinook	4.4	1.0	1
797	1	7/23/1997	Chinook	4.1	0.8	1
796	1	7/23/1997	Chinook	4.0	0.5	1
795	1	7/23/1997	Chinook	4.1	0.9	1
790	1	7/23/1997	Chinook	4.2	0.9	1
793	1	7/23/1997	Chinook	4.9	1.2	1
809	1	7/23/1997	Chinook			2
791	1	7/23/1997	Chinook	4.0	0.6	1
825	1	7/23/1997	Chinook			2
794	1	7/23/1997	Chinook	4.6	1.1	1
819	1	7/23/1997	Chinook			2
789	1	7/23/1997	Chinook	3.9	0.5	1
769	1	7/23/1997	Chinook	4.2	0.9	1
828	1	7/23/1997	Chinook			2
827	1	7/23/1997	Chinook			2
826	1	7/23/1997	Chinook			2
824	1	7/23/1997	Chinook			2
822	1	7/23/1997	Chinook			2
823	1	7/23/1997	Chinook			2
820	1	7/23/1997	Chinook			2

Fish ID	Site	Date	Species	Length	Weight	Pass
810	1	7/23/1997	Chinook			2
818	1	7/23/1997	Chinook			2
817	1	7/23/1997	Chinook			2
816	1	7/23/1997	Chinook			2
815	1	7/23/1997	Chinook			2
814	1	7/23/1997	Chinook			2
813	1	7/23/1997	Chinook			2
812	1	7/23/1997	Chinook			2
811	1	7/23/1997	Chinook			2
821	1	7/23/1997	Chinook			2
755	1	7/23/1997	Chinook	4.0	0.7	1
767	1	7/23/1997	Chinook	5.1	1.4	1
766	1	7/23/1997	Chinook	4.7	1.4	1
765	1	7/23/1997	Chinook	3.7	0.4	1
764	1	7/23/1997	Chinook	4.4	0.9	1
763	1	7/23/1997	Chinook	3.7	0.5	1
762	1	7/23/1997	Chinook	3.5	0.5	1
761	1	7/23/1997	Chinook	4.5	1.0	1
759	1	7/23/1997	Chinook	5.7	2.2	1
768	1	7/23/1997	Chinook	3.4	0.4	1
756	1	7/23/1997	Chinook	4.3	0.8	1
760	1	7/23/1997	Chinook	4.4	1.0	1
754	1	7/23/1997	Chinook	4.2	0.8	1
753	1	7/23/1997	Chinook	4.4	1.0	1
752	1	7/23/1997	Chinook	3.9	0.6	1
751	1	7/23/1997	Chinook	3.6	0.4	1
750	1	7/23/1997	Chinook	4.7	1.6	1
749	1	7/23/1997	Chinook	4.2	0.7	1
748	1	7/23/1997	Chinook	4.2	0.9	1
788	1	7/23/1997	Chinook	4.7	1.1	1
757	1	7/23/1997	Chinook	4.3	0.9	1
784	1	7/23/1997	Chinook	4.8	1.4	1
787	1	7/23/1997	Chinook	4.3	0.8	1
758	1	7/23/1997	Chinook	4.2	0.9	1
785	1	7/23/1997	Chinook	4.4	0.9	1
771	1	7/23/1997	Chinook	4.0	0.8	1
783	1	7/23/1997	Chinook	5.0	1.3	1
782	1	7/23/1997	Chinook	4.5	0.9	1
781	1	7/23/1997	Chinook	4.5	1.1	1
780	1	7/23/1997	Chinook	4.0	0.8	1
779	1	7/23/1997	Chinook	4.0	0.7	1
778	1	7/23/1997	Chinook	4.1	0.6	1
777	1	7/23/1997	Chinook	5.4	2.1	1
770	1	7/23/1997	Chinook	4.0	0.9	1
776	1	7/23/1997	Chinook	4.0	0.7	1

Fish ID	Site	Date	Species	Length	Weight	Pass
786	1	7/23/1997	Chinook	4.3	0.9	1
775	1	7/23/1997	Chinook	4.3	0.7	1
774	1	7/23/1997	Chinook	4.8	1.3	1
773	1	7/23/1997	Chinook	4.0	0.7	1
772	1	7/23/1997	Chinook	3.7	0.6	1
747	1	7/23/1997	Chinook	5.2	1.6	1
806	1	7/23/1997	Sculpin	7.9	5.5	1
807	1	7/23/1997	Sculpin	3.5	0.7	1
868	1	9/9/1997	Chinook			2
858	1	9/9/1997	Chinook	5.1	1.4	1
852	1	9/9/1997	Chinook	5.5	1.8	1
853	1	9/9/1997	Chinook	5.2	1.5	1
854	1	9/9/1997	Chinook	5.9	2.2	1
855	1	9/9/1997	Chinook	5.4	1.7	1
851	1	9/9/1997	Chinook	5.8	2.3	1
856	1	9/9/1997	Chinook	6.1	2.5	1
857	1	9/9/1997	Chinook	5.3	1.6	1
859	1	9/9/1997	Chinook	5.5	1.8	1
863	1	9/9/1997	Chinook			2
864	1	9/9/1997	Chinook			2
865	1	9/9/1997	Chinook			2
867	1	9/9/1997	Chinook			2
850	1	9/9/1997	Chinook	5.4	1.6	1
869	1	9/9/1997	Chinook			2
870	1	9/9/1997	Chinook			2
840	1	9/9/1997	Chinook	5.6	1.9	1
866	1	9/9/1997	Chinook			2
841	1	9/9/1997	Chinook	5.6	1.6	1
836	1	9/9/1997	Chinook	5.9	2.4	1
837	1	9/9/1997	Chinook	6.3	3.0	1
838	1	9/9/1997	Chinook	6.1	2.5	1
839	1	9/9/1997	Chinook	5.6	1.9	1
849	1	9/9/1997	Chinook	7.6	5.4	1
832	1	9/9/1997	Chinook	5.8	2.5	1
835	1	9/9/1997	Chinook	5.8	2.2	1
834	1	9/9/1997	Chinook	5.8	2.4	1
842	1	9/9/1997	Chinook	5.2	1.5	1
831	1	9/9/1997	Chinook	7.2	4.4	1
843	1	9/9/1997	Chinook	5.3	2.1	1
844	1	9/9/1997	Chinook	7.2	4.4	1
845	1	9/9/1997	Chinook	5.8	2.0	1
846	1	9/9/1997	Chinook	5.2	1.6	1
847	1	9/9/1997	Chinook	5.1	1.5	1
848	1	9/9/1997	Chinook	5.3	1.6	1
833	1	9/9/1997	Chinook 1+	8.2	7.9	1

Fish ID	Site	Date	Species	Length	Weight	Pass
860	1	9/9/1997	Rainbow trout	11.4	18.7	1
871	1	9/9/1997	Sculpin	7.1	4.7	2
872	1	9/9/1997	Sculpin	9.5	11.0	2
861	1	9/9/1997	Sculpin	7.5	5.7	1
862	1	9/9/1997	Sculpin	4.4	0.9	1
873	1	9/9/1997	Sculpin	4.3	1.3	2
908	1	10/18/1997	Bull trout	5.5	1.5	1
907	1	10/18/1997	Bull trout	12.8	22.5	1
905	1	10/18/1997	Chinook	4.9	1.4	1
896	1	10/18/1997	Chinook	5.5	2.2	1
897	1	10/18/1997	Chinook	6.1	3.0	1
898	1	10/18/1997	Chinook	6.9	3.7	1
899	1	10/18/1997	Chinook	6.1	2.8	1
900	1	10/18/1997	Chinook	5.8	2.5	1
901	1	10/18/1997	Chinook	6.6	3.4	1
914	1	10/18/1997	Chinook			2
902	1	10/18/1997	Chinook	5.8	2.1	1
895	1	10/18/1997	Chinook	6.1	3.2	1
904	1	10/18/1997	Chinook	4.8	1.3	1
906	1	10/18/1997	Chinook	5.7	2.1	1
909	1	10/18/1997	Chinook			2
910	1	10/18/1997	Chinook			2
911	1	10/18/1997	Chinook			2
912	1	10/18/1997	Chinook			2
913	1	10/18/1997	Chinook			2
885	1	10/18/1997	Chinook	7.0	5.2	1
903	1	10/18/1997	Chinook	6.0	2.6	1
882	1	10/18/1997	Chinook	5.9	2.8	1
894	1	10/18/1997	Chinook	5.6	2.5	1
874	1	10/18/1997	Chinook	5.4	2.2	1
875	1	10/18/1997	Chinook	4.7	1.5	1
876	1	10/18/1997	Chinook	6.2	3.6	1
877	1	10/18/1997	Chinook	5.5	2.5	1
878	1	10/18/1997	Chinook	5.2	2.0	1
879	1	10/18/1997	Chinook	5.2	2.0	1
881	1	10/18/1997	Chinook	5.9	3.0	1
887	1	10/18/1997	Chinook	7.5	5.8	1
883	1	10/18/1997	Chinook	6.3	3.9	1
884	1	10/18/1997	Chinook	8.6	7.6	1
886	1	10/18/1997	Chinook	5.5	2.4	1
888	1	10/18/1997	Chinook	7.0	5.3	1
889	1	10/18/1997	Chinook	6.1	3.1	1
890	1	10/18/1997	Chinook	7.1	4.2	1
891	1	10/18/1997	Chinook	6.3	3.1	1
892	1	10/18/1997	Chinook	6.2	2.7	1

Fish ID	Site	Date	Species	Length	Weight	Pass
893	1	10/18/1997	Chinook	6.0	2.5	1
880	1	10/18/1997	Chinook	5.4	2.5	1
917	1	3/9/1998	Bull trout	6.2	2.5	1
920	1	3/9/1998	Chinook 1+	6.9	5.2	2
915	1	3/9/1998	Chinook 1+	6.5	4.5	1
916	1	3/9/1998	Chinook 1+	6.1	3.0	1
918	1	3/9/1998	Sculpin	2.0	0.2	1
919	1	3/9/1998	Sculpin	9.0	11.1	1
921	1	3/9/1998	Sculpin	4.6	1.9	2
922	1	3/9/1998	Sculpin	5.0	2.1	2
935	2	6/10/1997	Bull trout	2.4	0.2	1
925	2	6/10/1997	Chinook	3.9	0.5	1
934	2	6/10/1997	Chinook	4.1	1.0	1
933	2	6/10/1997	Chinook	3.3	0.6	1
932	2	6/10/1997	Chinook	3.6	0.6	1
931	2	6/10/1997	Chinook	3.9	0.6	1
930	2	6/10/1997	Chinook	4.8	1.1	1
929	2	6/10/1997	Chinook	3.7	0.5	1
928	2	6/10/1997	Chinook	3.8	0.4	1
926	2	6/10/1997	Chinook	3.8	0.5	1
936	2	6/10/1997	Chinook	4.5	1.0	2
937	2	6/10/1997	Chinook	3.2	0.6	2
927	2	6/10/1997	Chinook	4.2	0.7	1
923	2	6/10/1997	Chinook 1+	7.1	4.3	1
924	2	6/10/1997	Chinook 1+	7.0	3.9	1
951	2	7/23/1997	Chinook	4.0	0.6	2
963	2	7/23/1997	Chinook	4.4	1.0	2
939	2	7/23/1997	Chinook	4.2	0.8	1
962	2	7/23/1997	Chinook	3.7	0.6	2
964	2	7/23/1997	Chinook	3.4	0.4	2
961	2	7/23/1997	Chinook	6.5	2.9	2
960	2	7/23/1997	Chinook	5.3	1.8	2
959	2	7/23/1997	Chinook	5.6	1.8	2
958	2	7/23/1997	Chinook	4.2	0.4	2
957	2	7/23/1997	Chinook	5.3	1.6	2
955	2	7/23/1997	Chinook	6.1	2.7	2
953	2	7/23/1997	Chinook	6.0	2.8	2
952	2	7/23/1997	Chinook	3.7	0.6	2
945	2	7/23/1997	Chinook	4.1	0.7	1
938	2	7/23/1997	Chinook	5.0	1.2	1
941	2	7/23/1997	Chinook	4.2	0.7	1
942	2	7/23/1997	Chinook	4.1	0.8	1
950	2	7/23/1997	Chinook	3.6	0.4	2
944	2	7/23/1997	Chinook	4.0	0.8	1
946	2	7/23/1997	Chinook	3.5	0.4	1

Fish ID	Site	Date	Species	Length	Weight	Pass
947	2	7/23/1997	Chinook	4.0	0.7	1
948	2	7/23/1997	Chinook	4.5	1.0	2
949	2	7/23/1997	Chinook	5.5	2.0	2
943	2	7/23/1997	Chinook	3.9	0.6	1
956	2	7/23/1997	Chinook 1+	7.0	4.5	2
954	2	7/23/1997	Chinook 1+	7.1	4.3	2
940	2	7/23/1997	Chinook 1+	6.7	4.1	1
966	2	9/9/1997	Chinook	5.5	1.8	1
967	2	9/9/1997	Chinook	5.7	2.3	1
965	2	9/9/1997	Chinook	5.9	2.5	1
974	2	10/17/1997	Chinook	6.8	4.8	2
977	2	10/17/1997	Chinook	5.9	2.7	2
968	2	10/17/1997	Chinook	7.5	5.3	1
975	2	10/17/1997	Chinook	7.8	6.3	2
973	2	10/17/1997	Chinook	7.3	5.5	2
972	2	10/17/1997	Chinook	6.6	4.4	2
971	2	10/17/1997	Chinook	7.8	6.3	1
970	2	10/17/1997	Chinook	7.6	5.7	1
969	2	10/17/1997	Chinook	6.4	4.0	1
976	2	10/17/1997	Chinook	6.7	4.4	2
1031	3	6/10/1997	Bull trout	8.9	8.0	1
987	3	6/10/1997	Chinook	3.5	0.4	1
982	3	6/10/1997	Chinook	3.5	0.4	1
983	3	6/10/1997	Chinook	3.4	0.3	1
984	3	6/10/1997	Chinook	3.2	0.2	1
988	3	6/10/1997	Chinook	3.4	0.4	1
986	3	6/10/1997	Chinook	4.4	0.9	1
1028	3	6/10/1997	Chinook	3.7	0.5	1
1014	3	6/10/1997	Chinook	3.8	0.5	1
1015	3	6/10/1997	Chinook	3.5	0.3	1
1016	3	6/10/1997	Chinook	3.6	0.4	1
1017	3	6/10/1997	Chinook	4.3	0.6	1
1018	3	6/10/1997	Chinook	3.9	0.4	1
1019	3	6/10/1997	Chinook	3.8	0.5	1
1020	3	6/10/1997	Chinook	3.6	0.4	1
1021	3	6/10/1997	Chinook	3.6	0.4	1
1022	3	6/10/1997	Chinook	4.3	1.0	1
1023	3	6/10/1997	Chinook	3.6	0.4	1
1024	3	6/10/1997	Chinook	3.6	0.2	1
1013	3	6/10/1997	Chinook	3.7	0.4	1
1026	3	6/10/1997	Chinook	3.6	0.4	1
1027	3	6/10/1997	Chinook	3.6	0.2	1
1030	3	6/10/1997	Chinook	3.4	0.4	1
1033	3	6/10/1997	Chinook			2
1034	3	6/10/1997	Chinook			2

Fish ID	Site	Date	Species	Length	Weight	Pass
1035	3	6/10/1997	Chinook			2
1036	3	6/10/1997	Chinook			2
1037	3	6/10/1997	Chinook			2
1038	3	6/10/1997	Chinook			2
1039	3	6/10/1997	Chinook			2
1040	3	6/10/1997	Chinook			2
1041	3	6/10/1997	Chinook			2
989	3	6/10/1997	Chinook	3.3	0.4	1
1025	3	6/10/1997	Chinook	3.9	0.6	1
998	3	6/10/1997	Chinook	3.4	0.4	1
990	3	6/10/1997	Chinook	3.2	0.2	1
994	3	6/10/1997	Chinook	3.5	0.4	1
995	3	6/10/1997	Chinook	3.7	0.5	1
996	3	6/10/1997	Chinook	3.2	0.4	1
1011	3	6/10/1997	Chinook	3.4	0.3	1
997	3	6/10/1997	Chinook	3.6	0.5	1
985	3	6/10/1997	Chinook	3.7	0.4	1
999	3	6/10/1997	Chinook	3.7	0.4	1
1000	3	6/10/1997	Chinook	3.8	0.6	1
1001	3	6/10/1997	Chinook	3.4	0.4	1
1003	3	6/10/1997	Chinook	3.6	0.6	1
1004	3	6/10/1997	Chinook	3.5	0.3	1
1005	3	6/10/1997	Chinook	3.6	0.5	1
1006	3	6/10/1997	Chinook	3.7	0.5	1
1007	3	6/10/1997	Chinook	3.6	0.4	1
1008	3	6/10/1997	Chinook	3.6	0.5	1
1009	3	6/10/1997	Chinook	3.5	0.5	1
1002	3	6/10/1997	Chinook	3.5	0.4	1
1029	3	6/10/1997	Chinook	3.4	0.4	1
1010	3	6/10/1997	Chinook	3.4	0.3	1
1032	3	6/10/1997	Chinook 1+	7.5	5.5	2
1012	3	6/10/1997	Chinook 1+	6.8	4.6	1
991	3	6/10/1997	Chinook 1+	8.2	8.1	1
992	3	6/10/1997	Chinook 1+	7.2	5.5	1
993	3	6/10/1997	Chinook 1+	7.5	6.2	1
981	3	6/10/1997	Chinook 1+	7.0	3.6	1
980	3	6/10/1997	Chinook 1+	6.9	4.9	1
978	3	6/10/1997	Chinook 1+	6.6	4.7	1
979	3	6/10/1997	Chinook 1+	8.0	6.6	1
1168	3	7/24/1997	Bull trout	3.1	0.3	2
1120	3	7/24/1997	Chinook			1
1135	3	7/24/1997	Chinook			1
1134	3	7/24/1997	Chinook			1
1133	3	7/24/1997	Chinook			1
1132	3	7/24/1997	Chinook			1

Fish ID	Site	Date	Species	Length	Weight	Pass
1131	3	7/24/1997	Chinook			1
1130	3	7/24/1997	Chinook			1
1129	3	7/24/1997	Chinook			1
1128	3	7/24/1997	Chinook			1
1127	3	7/24/1997	Chinook			1
1126	3	7/24/1997	Chinook			1
1125	3	7/24/1997	Chinook			1
1124	3	7/24/1997	Chinook			1
1123	3	7/24/1997	Chinook			1
1107	3	7/24/1997	Chinook			1
1114	3	7/24/1997	Chinook			1
1167	3	7/24/1997	Chinook			2
1108	3	7/24/1997	Chinook			1
1109	3	7/24/1997	Chinook			1
1110	3	7/24/1997	Chinook			1
1111	3	7/24/1997	Chinook			1
1122	3	7/24/1997	Chinook			1
1113	3	7/24/1997	Chinook			1
1121	3	7/24/1997	Chinook			1
1115	3	7/24/1997	Chinook			1
1116	3	7/24/1997	Chinook			1
1117	3	7/24/1997	Chinook			1
1118	3	7/24/1997	Chinook			1
1119	3	7/24/1997	Chinook			1
1136	3	7/24/1997	Chinook			1
1112	3	7/24/1997	Chinook			1
1161	3	7/24/1997	Chinook			2
1165	3	7/24/1997	Chinook			2
1155	3	7/24/1997	Chinook			2
1156	3	7/24/1997	Chinook			2
1157	3	7/24/1997	Chinook			2
1158	3	7/24/1997	Chinook			2
1153	3	7/24/1997	Chinook			2
1160	3	7/24/1997	Chinook			2
1152	3	7/24/1997	Chinook	4.4	0.9	2
1162	3	7/24/1997	Chinook			2
1163	3	7/24/1997	Chinook			2
1164	3	7/24/1997	Chinook			2
1106	3	7/24/1997	Chinook			1
1166	3	7/24/1997	Chinook			2
1098	3	7/24/1997	Chinook			1
1159	3	7/24/1997	Chinook			2
1145	3	7/24/1997	Chinook	5.5	1.7	2
1138	3	7/24/1997	Chinook			1
1139	3	7/24/1997	Chinook			1

Fish ID	Site	Date	Species	Length	Weight	Pass
1140	3	7/24/1997	Chinook			1
1141	3	7/24/1997	Chinook			1
1142	3	7/24/1997	Chinook			1
1154	3	7/24/1997	Chinook			2
1144	3	7/24/1997	Chinook	3.3	0.4	2
1137	3	7/24/1997	Chinook			1
1146	3	7/24/1997	Chinook	4.3	0.8	2
1147	3	7/24/1997	Chinook	4.3	0.9	2
1148	3	7/24/1997	Chinook	5.1	1.5	2
1149	3	7/24/1997	Chinook	4.1	0.6	2
1150	3	7/24/1997	Chinook	5.0	1.2	2
1151	3	7/24/1997	Chinook	5.1	1.5	2
1143	3	7/24/1997	Chinook			1
1065	3	7/24/1997	Chinook	4.2	1.2	1
1072	3	7/24/1997	Chinook	4.0	0.7	1
1059	3	7/24/1997	Chinook	3.8	0.5	1
1060	3	7/24/1997	Chinook	4.3	1.2	1
1061	3	7/24/1997	Chinook	4.7	1.5	1
1062	3	7/24/1997	Chinook	4.4	1.3	1
1057	3	7/24/1997	Chinook	4.4	0.9	1
1064	3	7/24/1997	Chinook	5.2	1.7	1
1056	3	7/24/1997	Chinook	4.3	0.9	1
1066	3	7/24/1997	Chinook	4.1	0.8	1
1067	3	7/24/1997	Chinook	4.2	0.8	1
1068	3	7/24/1997	Chinook	4.0	0.7	1
1069	3	7/24/1997	Chinook	4.5	1.2	1
1070	3	7/24/1997	Chinook	3.7	0.5	1
1071	3	7/24/1997	Chinook	3.6	0.7	1
1063	3	7/24/1997	Chinook	5.4	1.9	1
1049	3	7/24/1997	Chinook	5.1	1.6	1
1042	3	7/24/1997	Chinook	4.8	1.2	1
1043	3	7/24/1997	Chinook	5.0	1.3	1
1044	3	7/24/1997	Chinook	4.3	0.7	1
1045	3	7/24/1997	Chinook	3.9	0.5	1
1046	3	7/24/1997	Chinook	5.9	2.1	1
1058	3	7/24/1997	Chinook	4.0	0.8	1
1048	3	7/24/1997	Chinook	4.5	0.9	1
1052	3	7/24/1997	Chinook	5.2	1.6	1
1100	3	7/24/1997	Chinook			1
1051	3	7/24/1997	Chinook	4.5	0.9	1
1105	3	7/24/1997	Chinook			1
1053	3	7/24/1997	Chinook	4.5	1.0	1
1054	3	7/24/1997	Chinook	4.6	1.2	1
1055	3	7/24/1997	Chinook	4.2	0.8	1
1047	3	7/24/1997	Chinook	3.9	0.5	1

Fish ID	Site	Date	Species	Length	Weight	Pass
1099	3	7/24/1997	Chinook			1
1104	3	7/24/1997	Chinook			1
1050	3	7/24/1997	Chinook	4.2	0.7	1
1103	3	7/24/1997	Chinook			1
1102	3	7/24/1997	Chinook			1
1101	3	7/24/1997	Chinook			1
1097	3	7/24/1997	Chinook			1
1096	3	7/24/1997	Chinook			1
1095	3	7/24/1997	Chinook			1
1094	3	7/24/1997	Chinook			1
1093	3	7/24/1997	Chinook			1
1092	3	7/24/1997	Chinook			1
1091	3	7/24/1997	Chinook			1
1090	3	7/24/1997	Chinook			1
1089	3	7/24/1997	Chinook			1
1077	3	7/24/1997	Chinook			1
1088	3	7/24/1997	Chinook			1
1076	3	7/24/1997	Chinook			1
1078	3	7/24/1997	Chinook			1
1079	3	7/24/1997	Chinook			1
1080	3	7/24/1997	Chinook			1
1081	3	7/24/1997	Chinook			1
1083	3	7/24/1997	Chinook			1
1084	3	7/24/1997	Chinook			1
1085	3	7/24/1997	Chinook			1
1086	3	7/24/1997	Chinook			1
1082	3	7/24/1997	Chinook			1
1087	3	7/24/1997	Chinook			1
1075	3	7/24/1997	Chinook 1+	8.0	6.6	1
1073	3	7/24/1997	Chinook 1+	8.1	5.0	1
1074	3	7/24/1997	Chinook 1+	8.8	8.7	1
1240	3	9/9/1997	Bull trout	5.8	1.9	1
1260	3	9/9/1997	Bull trout	10.9	12.2	2
1239	3	9/9/1997	Bull trout	9.0	7.9	1
1241	3	9/9/1997	Bull trout	6.0	1.9	1
1238	3	9/9/1997	Bull trout	10.2	9.4	1
1229	3	9/9/1997	Chinook			1
1228	3	9/9/1997	Chinook			1
1220	3	9/9/1997	Chinook			1
1227	3	9/9/1997	Chinook			1
1226	3	9/9/1997	Chinook			1
1231	3	9/9/1997	Chinook			1
1230	3	9/9/1997	Chinook			1
1225	3	9/9/1997	Chinook			1
1224	3	9/9/1997	Chinook			1

Fish ID	Site	Date	Species	Length	Weight	Pass
1223	3	9/9/1997	Chinook			1
1216	3	9/9/1997	Chinook			1
1221	3	9/9/1997	Chinook			1
1219	3	9/9/1997	Chinook			1
1218	3	9/9/1997	Chinook			1
1217	3	9/9/1997	Chinook			1
1232	3	9/9/1997	Chinook			1
1253	3	9/9/1997	Chinook			2
1215	3	9/9/1997	Chinook			1
1222	3	9/9/1997	Chinook			1
1249	3	9/9/1997	Chinook			2
1200	3	9/9/1997	Chinook			1
1214	3	9/9/1997	Chinook			1
1259	3	9/9/1997	Chinook			2
1258	3	9/9/1997	Chinook			2
1257	3	9/9/1997	Chinook			2
1256	3	9/9/1997	Chinook			2
1255	3	9/9/1997	Chinook			2
1254	3	9/9/1997	Chinook			2
1251	3	9/9/1997	Chinook			2
1250	3	9/9/1997	Chinook			2
1233	3	9/9/1997	Chinook			1
1248	3	9/9/1997	Chinook			2
1247	3	9/9/1997	Chinook			2
1246	3	9/9/1997	Chinook			2
1245	3	9/9/1997	Chinook			2
1244	3	9/9/1997	Chinook			2
1243	3	9/9/1997	Chinook			2
1242	3	9/9/1997	Chinook			2
1234	3	9/9/1997	Chinook			1
1252	3	9/9/1997	Chinook			2
1178	3	9/9/1997	Chinook	5.8	2.7	1
1189	3	9/9/1997	Chinook	6.4	3.1	1
1188	3	9/9/1997	Chinook	7.0	3.8	1
1187	3	9/9/1997	Chinook	6.0	2.6	1
1186	3	9/9/1997	Chinook	5.6	2.7	1
1185	3	9/9/1997	Chinook	5.5	2.4	1
1184	3	9/9/1997	Chinook	5.2	2.2	1
1183	3	9/9/1997	Chinook	5.5	1.8	1
1182	3	9/9/1997	Chinook	5.8	2.9	1
1181	3	9/9/1997	Chinook	4.5	0.8	1
1190	3	9/9/1997	Chinook	6.0	2.8	1
1179	3	9/9/1997	Chinook	5.4	2.3	1
1173	3	9/9/1997	Chinook	6.3	2.9	1
1177	3	9/9/1997	Chinook	5.0	2.1	1

Fish ID	Site	Date	Species	Length	Weight	Pass
1176	3	9/9/1997	Chinook	6.0	2.5	1
1175	3	9/9/1997	Chinook	4.8	2.4	1
1174	3	9/9/1997	Chinook	6.1	2.9	1
1172	3	9/9/1997	Chinook	6.2	2.9	1
1170	3	9/9/1997	Chinook	6.2	2.9	1
1169	3	9/9/1997	Chinook	7.6	4.7	1
1202	3	9/9/1997	Chinook			1
1213	3	9/9/1997	Chinook			1
1180	3	9/9/1997	Chinook	5.5	1.7	1
1209	3	9/9/1997	Chinook			1
1212	3	9/9/1997	Chinook			1
1171	3	9/9/1997	Chinook	6.5	3.1	1
1211	3	9/9/1997	Chinook			1
1210	3	9/9/1997	Chinook			1
1208	3	9/9/1997	Chinook			1
1207	3	9/9/1997	Chinook			1
1206	3	9/9/1997	Chinook			1
1205	3	9/9/1997	Chinook			1
1204	3	9/9/1997	Chinook			1
1203	3	9/9/1997	Chinook			1
1201	3	9/9/1997	Chinook			1
1192	3	9/9/1997	Chinook	6.2	2.9	1
1199	3	9/9/1997	Chinook			1
1191	3	9/9/1997	Chinook	5.5	1.7	1
1193	3	9/9/1997	Chinook	6.4	3.0	1
1194	3	9/9/1997	Chinook	5.7	2.2	1
1195	3	9/9/1997	Chinook	7.6	5.3	1
1196	3	9/9/1997	Chinook	7.0	4.3	1
1197	3	9/9/1997	Chinook	6.4	3.2	1
1198	3	9/9/1997	Chinook	5.8	2.1	1
1236	3	9/9/1997	Rainbow trout	6.7	4.1	1
1235	3	9/9/1997	Rainbow trout	7.8	5.9	1
1237	3	9/9/1997	Rainbow trout	7.9	5.3	1
1322	3	10/19/1997	Bull trout	9.2	8.6	1
1316	3	10/19/1997	Chinook			1
1305	3	10/19/1997	Chinook			1
1313	3	10/19/1997	Chinook			1
1312	3	10/19/1997	Chinook			1
1311	3	10/19/1997	Chinook			1
1310	3	10/19/1997	Chinook			1
1314	3	10/19/1997	Chinook			1
1309	3	10/19/1997	Chinook			1
1308	3	10/19/1997	Chinook			1
1301	3	10/19/1997	Chinook			1
1306	3	10/19/1997	Chinook			1

Fish ID	Site	Date	Species	Length	Weight	Pass
1304	3	10/19/1997	Chinook			1
1303	3	10/19/1997	Chinook			1
1302	3	10/19/1997	Chinook			1
1330	3	10/19/1997	Chinook			2
1300	3	10/19/1997	Chinook			1
1307	3	10/19/1997	Chinook			1
1327	3	10/19/1997	Chinook			2
1315	3	10/19/1997	Chinook			1
1299	3	10/19/1997	Chinook			1
1336	3	10/19/1997	Chinook			2
1335	3	10/19/1997	Chinook			2
1334	3	10/19/1997	Chinook			2
1333	3	10/19/1997	Chinook			2
1332	3	10/19/1997	Chinook			2
1328	3	10/19/1997	Chinook			2
1329	3	10/19/1997	Chinook			2
1318	3	10/19/1997	Chinook			1
1326	3	10/19/1997	Chinook			2
1325	3	10/19/1997	Chinook			2
1324	3	10/19/1997	Chinook			2
1323	3	10/19/1997	Chinook			2
1321	3	10/19/1997	Chinook			1
1320	3	10/19/1997	Chinook			1
1319	3	10/19/1997	Chinook			1
1331	3	10/19/1997	Chinook			2
1266	3	10/19/1997	Chinook	6.3	2.5	1
1277	3	10/19/1997	Chinook	7.1	4.7	1
1276	3	10/19/1997	Chinook	7.0	3.6	1
1275	3	10/19/1997	Chinook	5.9	2.9	1
1274	3	10/19/1997	Chinook	6.0	2.8	1
1273	3	10/19/1997	Chinook	6.4	3.8	1
1272	3	10/19/1997	Chinook	7.0	5.2	1
1270	3	10/19/1997	Chinook	5.1	1.8	1
1278	3	10/19/1997	Chinook	5.9	2.4	1
1267	3	10/19/1997	Chinook	6.2	3.1	1
1271	3	10/19/1997	Chinook	7.4	6.0	1
1265	3	10/19/1997	Chinook	6.8	4.6	1
1264	3	10/19/1997	Chinook	6.1	3.1	1
1263	3	10/19/1997	Chinook	5.9	2.6	1
1262	3	10/19/1997	Chinook	6.1	3.4	1
1261	3	10/19/1997	Chinook	7.3	5.9	1
1317	3	10/19/1997	Chinook			1
1298	3	10/19/1997	Chinook			1
1268	3	10/19/1997	Chinook	6.3	3.8	1
1294	3	10/19/1997	Chinook			1

Fish ID	Site	Date	Species	Length	Weight	Pass
1297	3	10/19/1997	Chinook			1
1296	3	10/19/1997	Chinook			1
1269	3	10/19/1997	Chinook	6.0	2.9	1
1295	3	10/19/1997	Chinook			1
1279	3	10/19/1997	Chinook	6.2	3.7	1
1293	3	10/19/1997	Chinook	6.2	2.8	1
1292	3	10/19/1997	Chinook	5.6	2.0	1
1291	3	10/19/1997	Chinook	6.5	3.3	1
1290	3	10/19/1997	Chinook	7.1	3.6	1
1289	3	10/19/1997	Chinook	6.0	2.9	1
1283	3	10/19/1997	Chinook	6.5	3.8	1
1281	3	10/19/1997	Chinook	6.2	2.6	1
1288	3	10/19/1997	Chinook	6.4	3.0	1
1280	3	10/19/1997	Chinook	7.2	5.0	1
1282	3	10/19/1997	Chinook	6.1	3.2	1
1284	3	10/19/1997	Chinook	7.1	5.1	1
1285	3	10/19/1997	Chinook	5.6	2.2	1
1286	3	10/19/1997	Chinook	5.9	2.5	1
1287	3	10/19/1997	Chinook	5.8	2.6	1
1337	4	7/24/1997	Chinook	4.4	0.9	1
1367	4	7/24/1997	Mountain whitefish	8.7	6.0	1
1362	4	7/24/1997	Mountain whitefish	11.1	12.8	1
1356	4	7/24/1997	Mountain whitefish	7.6	4.3	1
1358	4	7/24/1997	Mountain whitefish	7.7	4.4	1
1355	4	7/24/1997	Mountain whitefish	7.2	4.3	1
1360	4	7/24/1997	Mountain whitefish	11.5	14.1	1
1361	4	7/24/1997	Mountain whitefish	11.0	12.2	1
1363	4	7/24/1997	Mountain whitefish	12.0	15.7	1
1364	4	7/24/1997	Mountain whitefish	12.7	18.4	1
1370	4	7/24/1997	Mountain whitefish	20.7	94.0	1
1366	4	7/24/1997	Mountain whitefish	9.2	7.4	1
1368	4	7/24/1997	Mountain whitefish	7.7	3.6	1
1369	4	7/24/1997	Mountain whitefish	11.9	16.7	1
1357	4	7/24/1997	Mountain whitefish	8.1	4.5	1
1354	4	7/24/1997	Mountain whitefish	23.6	146.0	1
1365	4	7/24/1997	Mountain whitefish	7.6	3.7	1
1340	4	7/24/1997	Mountain whitefish	17.3	56.8	1
1353	4	7/24/1997	Mountain whitefish	11.6	13.7	1
1359	4	7/24/1997	Mountain whitefish	7.2	3.2	1
1339	4	7/24/1997	Mountain whitefish	24.2	169.0	1
1341	4	7/24/1997	Mountain whitefish	10.0	9.5	1
1342	4	7/24/1997	Mountain whitefish	8.0	5.0	1
1343	4	7/24/1997	Mountain whitefish	23.9	157.8	1
1344	4	7/24/1997	Mountain whitefish	8.7	5.5	1
1346	4	7/24/1997	Mountain whitefish	8.0	4.6	1

Fish ID	Site	Date	Species	Length	Weight	Pass
1347	4	7/24/1997	Mountain whitefish	11.0	14.4	1
1348	4	7/24/1997	Mountain whitefish	12.3	16.9	1
1349	4	7/24/1997	Mountain whitefish	12.6	18.4	1
1352	4	7/24/1997	Mountain whitefish	7.1	3.1	1
1350	4	7/24/1997	Mountain whitefish	11.6	14.7	1
1351	4	7/24/1997	Mountain whitefish	12.3	17.0	1
1345	4	7/24/1997	Mountain whitefish	6.6	2.8	1
1371	4	7/24/1997	Sculpin	4.3	0.9	1
1338	4	7/24/1997	White sucker	53.0	1200.0	1
1386	4	7/25/1997	Mountain whitefish	11.6	15.6	2
1388	4	7/25/1997	Mountain whitefish	13.3	21.7	2
1389	4	7/25/1997	Mountain whitefish	30.0	291.8	2
1390	4	7/25/1997	Mountain whitefish	28.6	275.3	2
1391	4	7/25/1997	Mountain whitefish			2
1392	4	7/25/1997	Mountain whitefish			2
1394	4	7/25/1997	Mountain whitefish			2
1395	4	7/25/1997	Mountain whitefish			2
1384	4	7/25/1997	Mountain whitefish	18.3	81.3	2
1385	4	7/25/1997	Mountain whitefish	8.6	5.5	2
1393	4	7/25/1997	Mountain whitefish			2
1374	4	7/25/1997	Mountain whitefish	11.9	17.0	2
1387	4	7/25/1997	Mountain whitefish	12.5	17.5	2
1383	4	7/25/1997	Mountain whitefish	8.2	4.5	2
1373	4	7/25/1997	Mountain whitefish	17.8	59.3	2
1375	4	7/25/1997	Mountain whitefish	18.2	4.7	2
1376	4	7/25/1997	Mountain whitefish	7.5	4.2	2
1377	4	7/25/1997	Mountain whitefish	13.9	26.3	2
1378	4	7/25/1997	Mountain whitefish	7.9	4.5	2
1379	4	7/25/1997	Mountain whitefish	8.6	5.8	2
1380	4	7/25/1997	Mountain whitefish	7.9	4.2	2
1381	4	7/25/1997	Mountain whitefish	10.7	11.8	2
1382	4	7/25/1997	Mountain whitefish	12.0	16.6	2
1372	4	7/25/1997	Mountain whitefish	10.3	9.8	2
1428	4	7/25/1997	Sculpin	4.7	1.0	1
1399	4	9/10/1997	Chinook	6.4	3.2	1
1408	4	9/10/1997	Chinook	6.9	3.7	2
1413	4	9/10/1997	Chinook			2
1412	4	9/10/1997	Chinook	7.1	4.2	2
1411	4	9/10/1997	Chinook	5.3	1.6	2
1410	4	9/10/1997	Chinook	6.9	3.6	2
1409	4	9/10/1997	Chinook	7.0	3.8	2
1404	4	9/10/1997	Chinook	5.4	2.0	1
1403	4	9/10/1997	Chinook	5.5	2.0	1
1402	4	9/10/1997	Chinook	5.8	2.0	1
1400	4	9/10/1997	Chinook	6.5	3.0	1

Fish ID	Site	Date	Species	Length	Weight	Pass
1398	4	9/10/1997	Chinook	6.0	2.2	1
1397	4	9/10/1997	Chinook	7.2	4.5	1
1396	4	9/10/1997	Chinook	6.2	2.3	1
1401	4	9/10/1997	Chinook	6.1	2.8	1
1405	4	9/10/1997	Mountain whitefish	5.9	2.0	1
1406	4	9/10/1997	Mountain whitefish	5.8	1.5	1
1407	4	9/10/1997	Mountain whitefish	5.0	1.0	1
1414	4	9/10/1997	Mountain whitefish	6.5	2.3	2
1415	4	9/10/1997	Mountain whitefish			2
1416	4	9/10/1997	Sculpin	7.4	4.2	2

Note that a maximum of 30 individuals of each species were length-weight sampled at each sampling period and site. Those fish that were captured but not measured are indicated by blank values in those fields.

APPENDIX TABLE 3. LIST OF ALL FISH CAPTURED AT BAKER CREEK SAMPLE SITES.

Fish ID	Site	Date	Species	Length	Weight	Pass
2	1	6/12/1997	Chinook	4.1	1.2	1
1	1	6/12/1997	Chinook	4.7	0.8	1
28	1	6/12/1997	Chinook	4.9	1.2	2
29	1	6/12/1997	Chinook	5.1	1.5	2
30	1	6/12/1997	Chinook	4.1	0.9	2
31	1	6/12/1997	Chinook	4.5	1.3	2
32	1	6/12/1997	Chinook	4.4	0.9	2
50	1	6/12/1997	Leopard dace	5.6	2.3	2
56	1	6/12/1997	Leopard dace	4.2	0.8	2
55	1	6/12/1997	Leopard dace	5.0	1.5	2
54	1	6/12/1997	Leopard dace	4.0	0.6	2
53	1	6/12/1997	Leopard dace	6.0	2.0	2
52	1	6/12/1997	Leopard dace	5.7	2.2	2
51	1	6/12/1997	Leopard dace	6.4	2.7	2
24	1	6/12/1997	Leopard dace	4.8	0.8	1
43	1	6/12/1997	Longnose dace	4.5	0.9	2
44	1	6/12/1997	Longnose dace	4.5	0.9	2
45	1	6/12/1997	Longnose dace	3.8	0.7	2
48	1	6/12/1997	Longnose dace	4.2	0.7	2
47	1	6/12/1997	Longnose dace	4.5	1.0	2
46	1	6/12/1997	Longnose dace	4.9	1.4	2
18	1	6/12/1997	Longnose dace	4.5	0.6	1
15	1	6/12/1997	Longnose dace	4.8	1.0	1
14	1	6/12/1997	Longnose dace	3.8	0.6	1
13	1	6/12/1997	Longnose dace	4.1	0.6	1
12	1	6/12/1997	Longnose dace	4.6	0.8	1
11	1	6/12/1997	Longnose dace	4.6	0.9	1
10	1	6/12/1997	Longnose dace	4.5	0.8	1
9	1	6/12/1997	Longnose dace	3.7	0.3	1
17	1	6/12/1997	Longnose dace	4.7	0.8	1
19	1	6/12/1997	Longnose dace	4.0	0.6	1
20	1	6/12/1997	Longnose dace	3.8	0.6	1
8	1	6/12/1997	Longnose dace	2.9	0.2	1
49	1	6/12/1997	Longnose dace	2.6	0.2	2
16	1	6/12/1997	Longnose dace	4.2	0.7	1
38	1	6/12/1997	Northern Pikeminnow	6.2	2.7	2
42	1	6/12/1997	Northern Pikeminnow	6.3	3.0	2
7	1	6/12/1997	Northern Pikeminnow	4.2	0.6	1
6	1	6/12/1997	Northern Pikeminnow	5.1	1.6	1
5	1	6/12/1997	Northern Pikeminnow	3.8	0.7	1
35	1	6/12/1997	Northern Pikeminnow	6.1	2.7	2

Fish ID	Site	Date	Species	Length	Weight	Pass
3	1	6/12/1997	Northern Pikeminnow	6.3	2.7	1
33	1	6/12/1997	Northern Pikeminnow	8.8	8.2	2
40	1	6/12/1997	Northern Pikeminnow	5.8	2.3	2
34	1	6/12/1997	Northern Pikeminnow	7.9	5.2	2
41	1	6/12/1997	Northern Pikeminnow	5.7	2.3	2
36	1	6/12/1997	Northern Pikeminnow	6.0	2.9	2
37	1	6/12/1997	Northern Pikeminnow	6.5	2.8	2
39	1	6/12/1997	Northern Pikeminnow	8.9	7.4	2
4	1	6/12/1997	Northern Pikeminnow	6.0	2.1	1
22	1	6/12/1997	Redside shiner	5.4	1.5	1
21	1	6/12/1997	Redside shiner	5.7	1.8	1
23	1	6/12/1997	Redside shiner	5.4	1.5	1
58	1	6/12/1997	White sucker	5.5	1.9	2
59	1	6/12/1997	White sucker	3.8	0.5	2
57	1	6/12/1997	White sucker	9.7	8.8	2
60	1	6/12/1997	White sucker	3.6	0.8	2
27	1	6/12/1997	White sucker	2.9	0.7	1
26	1	6/12/1997	White sucker	3.5	0.6	1
25	1	6/12/1997	White sucker	3.7	0.4	1
64	1	7/18/1997	Longnose dace	3.0	0.3	1
67	1	7/18/1997	Longnose dace	2.6	0.2	1
65	1	7/18/1997	Longnose dace	3.1	0.3	1
63	1	7/18/1997	Longnose dace	4.4	0.7	1
62	1	7/18/1997	Longnose dace	3.2	0.2	1
61	1	7/18/1997	Longnose dace	3.8	0.5	1
66	1	7/18/1997	Longnose dace	3.3	0.4	1
68	1	7/18/1997	Northern Pikeminnow	3.3	0.3	1
128	2	6/12/1997	Chinook	4.1	0.7	2
127	2	6/12/1997	Chinook	3.7	0.5	2
129	2	6/12/1997	Chinook	4.0	0.6	2
126	2	6/12/1997	Chinook	4.7	1.1	2
125	2	6/12/1997	Chinook	3.9	0.6	2
124	2	6/12/1997	Chinook	4.0	0.8	2
123	2	6/12/1997	Chinook	4.4	0.9	2
122	2	6/12/1997	Chinook	4.5	1.0	2
130	2	6/12/1997	Chinook	4.3	1.0	2
120	2	6/12/1997	Chinook	3.6	0.5	2
138	2	6/12/1997	Chinook	4.0	0.6	2
119	2	6/12/1997	Chinook	4.8	1.1	2
121	2	6/12/1997	Chinook	4.4	0.9	2
131	2	6/12/1997	Chinook	4.3	0.9	2
132	2	6/12/1997	Chinook	4.3	0.7	2
133	2	6/12/1997	Chinook	4.0	0.6	2
134	2	6/12/1997	Chinook	4.8	1.2	2

Fish ID	Site	Date	Species	Length	Weight	Pass
135	2	6/12/1997	Chinook	4.7	1.1	2
137	2	6/12/1997	Chinook	5.1	1.6	2
118	2	6/12/1997	Chinook	4.3	0.8	2
140	2	6/12/1997	Chinook	4.6	1.1	2
142	2	6/12/1997	Chinook	4.4	0.8	2
143	2	6/12/1997	Chinook	4.0	0.7	2
144	2	6/12/1997	Chinook	4.0	0.6	2
145	2	6/12/1997	Chinook	4.0	0.6	2
139	2	6/12/1997	Chinook	4.5	0.9	2
136	2	6/12/1997	Chinook	4.5	0.9	2
79	2	6/12/1997	Chinook	4.8	1.2	1
91	2	6/12/1997	Chinook	4.6	1.0	1
90	2	6/12/1997	Chinook	4.0	0.6	1
89	2	6/12/1997	Chinook	4.1	0.8	1
88	2	6/12/1997	Chinook	4.0	0.7	1
87	2	6/12/1997	Chinook	4.2	0.8	1
86	2	6/12/1997	Chinook	3.9	0.6	1
85	2	6/12/1997	Chinook	4.1	0.8	1
84	2	6/12/1997	Chinook	4.6	1.0	1
83	2	6/12/1997	Chinook	4.7	1.1	1
82	2	6/12/1997	Chinook	4.2	0.8	1
92	2	6/12/1997	Chinook	4.1	0.7	1
80	2	6/12/1997	Chinook	4.5	0.9	1
70	2	6/12/1997	Chinook	4.1	0.6	1
78	2	6/12/1997	Chinook	4.7	1.0	1
77	2	6/12/1997	Chinook	4.2	0.7	1
76	2	6/12/1997	Chinook	4.2	0.8	1
75	2	6/12/1997	Chinook	4.6	1.0	1
74	2	6/12/1997	Chinook	4.7	1.2	1
73	2	6/12/1997	Chinook	4.2	0.7	1
72	2	6/12/1997	Chinook	4.1	0.6	1
71	2	6/12/1997	Chinook	4.5	1.0	1
69	2	6/12/1997	Chinook	4.0	0.6	1
141	2	6/12/1997	Chinook	4.2	0.7	2
81	2	6/12/1997	Chinook	4.3	0.9	1
93	2	6/12/1997	Chinook	4.5	1.0	1
146	2	6/12/1997	Longnose dace	4.2	0.7	2
117	2	6/12/1997	Longnose dace	5.0	1.3	1
116	2	6/12/1997	Longnose dace	3.1	0.3	1
115	2	6/12/1997	Longnose dace	2.6	0.2	1
114	2	6/12/1997	Longnose dace	3.1	0.2	1
97	2	6/12/1997	Northern Pikeminnow	8.2	6.9	1
95	2	6/12/1997	Rainbow trout	8.7	6.8	1
96	2	6/12/1997	Rainbow trout	13.3	32.1	1

Fish ID	Site	Date	Species	Length	Weight	Pass
94	2	6/12/1997	Rainbow trout	18.8	81.0	1
153	2	6/12/1997	Rainbow trout	8.1	4.7	2
147	2	6/12/1997	White sucker	6.5	3.3	2
100	2	6/12/1997	White sucker	10.2	12.3	1
152	2	6/12/1997	White sucker	4.0	0.8	2
151	2	6/12/1997	White sucker	10.7	13.3	2
150	2	6/12/1997	White sucker	4.7	1.2	2
149	2	6/12/1997	White sucker	5.8	2.2	2
148	2	6/12/1997	White sucker	4.8	1.5	2
98	2	6/12/1997	White sucker	11.4	19.4	1
99	2	6/12/1997	White sucker	12.8	23.5	1
111	2	6/12/1997	White sucker	3.6	0.5	1
112	2	6/12/1997	White sucker	4.0	0.7	1
101	2	6/12/1997	White sucker	13.0	22.0	1
110	2	6/12/1997	White sucker	5.2	1.4	1
109	2	6/12/1997	White sucker	7.4	4.8	1
108	2	6/12/1997	White sucker	6.9	3.9	1
107	2	6/12/1997	White sucker	8.8	8.1	1
106	2	6/12/1997	White sucker	4.0	0.6	1
104	2	6/12/1997	White sucker	7.0	4.6	1
103	2	6/12/1997	White sucker	11.6	15.0	1
102	2	6/12/1997	White sucker	10.5	11.7	1
105	2	6/12/1997	White sucker	3.9	0.5	1
113	2	6/12/1997	White sucker	3.6	0.5	1
201	2	7/15/1997	Chinook			1
229	2	7/15/1997	Chinook			2
228	2	7/15/1997	Chinook			2
227	2	7/15/1997	Chinook			2
226	2	7/15/1997	Chinook			2
225	2	7/15/1997	Chinook			2
224	2	7/15/1997	Chinook			2
223	2	7/15/1997	Chinook			2
205	2	7/15/1997	Chinook			1
204	2	7/15/1997	Chinook			1
202	2	7/15/1997	Chinook			1
200	2	7/15/1997	Chinook			1
198	2	7/15/1997	Chinook			1
196	2	7/15/1997	Chinook			1
199	2	7/15/1997	Chinook			1
197	2	7/15/1997	Chinook			1
247	2	7/15/1997	Chinook			2
230	2	7/15/1997	Chinook			2
203	2	7/15/1997	Chinook			1
240	2	7/15/1997	Chinook			2

Fish ID	Site	Date	Species	Length	Weight	Pass
250	2	7/15/1997	Chinook			2
187	2	7/15/1997	Chinook			1
195	2	7/15/1997	Chinook			1
249	2	7/15/1997	Chinook			2
248	2	7/15/1997	Chinook			2
246	2	7/15/1997	Chinook			2
244	2	7/15/1997	Chinook			2
243	2	7/15/1997	Chinook			2
245	2	7/15/1997	Chinook			2
241	2	7/15/1997	Chinook			2
231	2	7/15/1997	Chinook			2
239	2	7/15/1997	Chinook			2
238	2	7/15/1997	Chinook			2
237	2	7/15/1997	Chinook			2
236	2	7/15/1997	Chinook			2
235	2	7/15/1997	Chinook			2
234	2	7/15/1997	Chinook			2
233	2	7/15/1997	Chinook			2
232	2	7/15/1997	Chinook			2
242	2	7/15/1997	Chinook			2
166	2	7/15/1997	Chinook	5.1	1.5	1
179	2	7/15/1997	Chinook	6.0	2.5	1
178	2	7/15/1997	Chinook	6.2	2.7	1
177	2	7/15/1997	Chinook	7.1	3.8	1
176	2	7/15/1997	Chinook	6.0	2.3	1
175	2	7/15/1997	Chinook	5.4	1.7	1
174	2	7/15/1997	Chinook	5.4	1.7	1
173	2	7/15/1997	Chinook	4.9	1.5	1
172	2	7/15/1997	Chinook	5.0	1.4	1
171	2	7/15/1997	Chinook	5.6	1.9	1
170	2	7/15/1997	Chinook	5.1	1.5	1
169	2	7/15/1997	Chinook	5.9	2.1	1
180	2	7/15/1997	Chinook	5.4	1.9	1
194	2	7/15/1997	Chinook			1
167	2	7/15/1997	Chinook	5.0	1.4	1
189	2	7/15/1997	Chinook			1
164	2	7/15/1997	Chinook	5.0	1.3	1
163	2	7/15/1997	Chinook	6.0	2.2	1
162	2	7/15/1997	Chinook	5.7	1.9	1
161	2	7/15/1997	Chinook	6.3	3.1	1
160	2	7/15/1997	Chinook	5.5	1.9	1
159	2	7/15/1997	Chinook	7.0	4.4	1
158	2	7/15/1997	Chinook	6.4	2.9	1
157	2	7/15/1997	Chinook	5.8	2.3	1

Fish ID	Site	Date	Species	Length	Weight	Pass
156	2	7/15/1997	Chinook	5.6	2.0	1
155	2	7/15/1997	Chinook	5.5	2.5	1
154	2	7/15/1997	Chinook	4.8	1.3	1
168	2	7/15/1997	Chinook	4.9	1.3	1
193	2	7/15/1997	Chinook			1
184	2	7/15/1997	Chinook	5.2	1.5	1
183	2	7/15/1997	Chinook	5.9	2.0	1
182	2	7/15/1997	Chinook	5.5	1.9	1
181	2	7/15/1997	Chinook	5.9	2.4	1
186	2	7/15/1997	Chinook			1
188	2	7/15/1997	Chinook			1
190	2	7/15/1997	Chinook			1
191	2	7/15/1997	Chinook			1
185	2	7/15/1997	Chinook	5.0	1.3	1
192	2	7/15/1997	Chinook			1
165	2	7/15/1997	Chinook	5.3	1.8	1
257	2	7/15/1997	Longnose dace	3.7	0.6	2
258	2	7/15/1997	Longnose dace	7.5	3.7	2
259	2	7/15/1997	Longnose dace	3.7	0.6	2
218	2	7/15/1997	Longnose dace	3.6	0.5	1
219	2	7/15/1997	Longnose dace	3.4	0.4	1
220	2	7/15/1997	Longnose dace	3.3	0.4	1
221	2	7/15/1997	Longnose dace	4.0	0.7	1
222	2	7/15/1997	Longnose dace	3.9	0.5	1
251	2	7/15/1997	Rainbow trout	13.8	30.5	2
252	2	7/15/1997	Rainbow trout	8.6	6.3	2
207	2	7/15/1997	Rainbow trout	17.6	65.5	1
208	2	7/15/1997	Rainbow trout	19.3	82.8	1
206	2	7/15/1997	Rainbow trout	7.0	3.8	1
256	2	7/15/1997	White sucker	4.4	0.9	2
217	2	7/15/1997	White sucker	5.1	1.7	1
215	2	7/15/1997	White sucker	5.3	2.0	1
255	2	7/15/1997	White sucker	4.6	1.1	2
254	2	7/15/1997	White sucker	16.4	45.1	2
253	2	7/15/1997	White sucker	4.5	1.1	2
209	2	7/15/1997	White sucker	5.9	2.6	1
213	2	7/15/1997	White sucker	4.0	0.8	1
212	2	7/15/1997	White sucker	4.5	1.0	1
211	2	7/15/1997	White sucker	4.9	1.5	1
210	2	7/15/1997	White sucker	5.4	2.0	1
214	2	7/15/1997	White sucker	5.3	2.0	1
216	2	7/15/1997	White sucker	4.1	0.7	1
271	2	9/16/1997	Chinook	7.5	4.2	1
272	2	9/16/1997	Chinook	6.8	5.3	1

Fish ID	Site	Date	Species	Length	Weight	Pass
273	2	9/16/1997	Chinook	6.8	3.0	1
274	2	9/16/1997	Chinook	7.8	3.5	1
275	2	9/16/1997	Chinook	6.7	7.1	1
276	2	9/16/1997	Chinook	6.5	2.5	1
278	2	9/16/1997	Chinook	7.6	3.9	1
270	2	9/16/1997	Chinook	9.0	7.2	1
261	2	9/16/1997	Chinook	8.0	4.0	1
277	2	9/16/1997	Chinook	6.4	2.9	1
269	2	9/16/1997	Chinook	7.8	4.7	1
268	2	9/16/1997	Chinook	7.5	2.6	1
267	2	9/16/1997	Chinook	7.5	5.7	1
266	2	9/16/1997	Chinook	8.2	5.7	1
265	2	9/16/1997	Chinook	10.0	9.1	1
264	2	9/16/1997	Chinook	8.5	8.7	1
281	2	9/16/1997	Chinook	8.3	6.9	1
262	2	9/16/1997	Chinook	8.5	5.7	1
260	2	9/16/1997	Chinook	9.5	6.5	1
263	2	9/16/1997	Chinook	7.5	3.7	1
312	2	9/16/1997	Chinook			1
301	2	9/16/1997	Chinook			1
302	2	9/16/1997	Chinook			1
303	2	9/16/1997	Chinook			1
304	2	9/16/1997	Chinook			1
305	2	9/16/1997	Chinook			1
306	2	9/16/1997	Chinook			1
307	2	9/16/1997	Chinook			1
300	2	9/16/1997	Chinook			1
310	2	9/16/1997	Chinook			1
309	2	9/16/1997	Chinook			1
313	2	9/16/1997	Chinook			2
314	2	9/16/1997	Chinook			2
315	2	9/16/1997	Chinook			2
316	2	9/16/1997	Chinook			2
317	2	9/16/1997	Chinook			2
318	2	9/16/1997	Chinook			2
319	2	9/16/1997	Chinook			2
280	2	9/16/1997	Chinook	7.2	5.1	1
308	2	9/16/1997	Chinook			1
282	2	9/16/1997	Chinook	7.0	3.7	1
311	2	9/16/1997	Chinook			1
279	2	9/16/1997	Chinook	6.4	2.4	1
299	2	9/16/1997	Chinook			1
283	2	9/16/1997	Chinook	7.8	4.7	1
284	2	9/16/1997	Chinook	6.3	2.3	1

Fish ID	Site	Date	Species	Length	Weight	Pass
285	2	9/16/1997	Chinook	7.4	4.0	1
286	2	9/16/1997	Chinook	7.3	4.8	1
287	2	9/16/1997	Chinook	6.3	2.6	1
288	2	9/16/1997	Chinook	7.8	4.4	1
289	2	9/16/1997	Chinook	7.5	5.1	1
296	2	9/16/1997	Chinook			1
297	2	9/16/1997	Chinook			1
295	2	9/16/1997	Chinook			1
294	2	9/16/1997	Chinook			1
293	2	9/16/1997	Chinook			1
292	2	9/16/1997	Chinook			1
291	2	9/16/1997	Chinook			1
290	2	9/16/1997	Chinook			1
298	2	9/16/1997	Chinook			1
342	2	11/3/1997	Chinook	7.1	3.9	1
358	2	11/3/1997	Chinook			1
350	2	11/3/1997	Chinook			1
343	2	11/3/1997	Chinook	8.0	5.3	1
344	2	11/3/1997	Chinook	7.8	5.3	1
345	2	11/3/1997	Chinook	6.1	3.2	1
346	2	11/3/1997	Chinook	6.6	3.1	1
347	2	11/3/1997	Chinook	6.9	3.7	1
348	2	11/3/1997	Chinook	7.9	4.9	1
349	2	11/3/1997	Chinook			1
351	2	11/3/1997	Chinook			1
352	2	11/3/1997	Chinook			1
353	2	11/3/1997	Chinook			1
361	2	11/3/1997	Chinook			2
357	2	11/3/1997	Chinook			1
341	2	11/3/1997	Chinook	7.4	4.7	1
359	2	11/3/1997	Chinook			1
360	2	11/3/1997	Chinook			2
354	2	11/3/1997	Chinook			1
355	2	11/3/1997	Chinook			1
322	2	11/3/1997	Chinook	8.7	7.2	1
340	2	11/3/1997	Chinook	8.5	6.2	1
356	2	11/3/1997	Chinook			1
321	2	11/3/1997	Chinook	7.4	4.5	1
323	2	11/3/1997	Chinook	7.5	4.7	1
324	2	11/3/1997	Chinook	7.6	4.7	1
325	2	11/3/1997	Chinook	6.8	3.7	1
320	2	11/3/1997	Chinook	8.4	7.2	1
326	2	11/3/1997	Chinook	7.9	6.2	1
327	2	11/3/1997	Chinook	8.2	5.6	1

Fish ID	Site	Date	Species	Length	Weight	Pass
328	2	11/3/1997	Chinook	6.1	2.5	1
335	2	11/3/1997	Chinook	7.9	5.1	1
329	2	11/3/1997	Chinook	7.3	4.7	1
337	2	11/3/1997	Chinook	6.6	3.3	1
336	2	11/3/1997	Chinook	6.2	3.0	1
334	2	11/3/1997	Chinook	7.8	5.9	1
333	2	11/3/1997	Chinook	7.9	5.1	1
332	2	11/3/1997	Chinook	6.9	3.7	1
339	2	11/3/1997	Chinook	6.4	3.4	1
331	2	11/3/1997	Chinook	6.3	3.1	1
330	2	11/3/1997	Chinook	7.5	4.7	1
338	2	11/3/1997	Chinook	8.1	5.7	1
365	3	7/16/1997	Chinook	6.2	2.8	1
369	3	7/16/1997	Chinook	5.5	2.1	1
1425	3	7/16/1997	Chinook	6.4	3.3	2
1424	3	7/16/1997	Chinook	6.4	3.0	2
1423	3	7/16/1997	Chinook	6.6	3.4	2
370	3	7/16/1997	Chinook	6.0	2.2	1
368	3	7/16/1997	Chinook	5.9	2.2	1
362	3	7/16/1997	Chinook	6.8	3.7	1
366	3	7/16/1997	Chinook	6.4	2.9	1
364	3	7/16/1997	Chinook	6.8	3.9	1
363	3	7/16/1997	Chinook	6.1	2.8	1
1426	3	7/16/1997	Chinook	6.4	3.2	2
367	3	7/16/1997	Chinook	5.9	2.0	1
382	3	7/16/1997	Longnose dace	7.8	5.4	2
389	3	7/16/1997	Longnose dace	7.6	4.8	2
388	3	7/16/1997	Longnose dace	6.7	3.8	2
387	3	7/16/1997	Longnose dace	6.3	2.7	2
384	3	7/16/1997	Longnose dace	8.9	6.9	2
385	3	7/16/1997	Longnose dace	7.8	5.2	2
383	3	7/16/1997	Longnose dace	8.0	5.7	2
380	3	7/16/1997	Longnose dace	6.5	3.0	1
379	3	7/16/1997	Longnose dace	6.5	3.0	1
378	3	7/16/1997	Longnose dace	7.0	4.2	1
377	3	7/16/1997	Longnose dace	8.2	6.1	1
376	3	7/16/1997	Longnose dace	6.3	3.0	1
375	3	7/16/1997	Longnose dace	5.4	1.8	1
374	3	7/16/1997	Longnose dace	9.5	9.7	1
372	3	7/16/1997	Longnose dace	6.2	2.8	1
386	3	7/16/1997	Longnose dace	6.1	2.3	2
371	3	7/16/1997	Longnose dace	6.8	3.2	1
373	3	7/16/1997	Longnose dace	6.5	3.5	1
390	3	7/16/1997	Rainbow trout	2.5	0.2	2

Fish ID	Site	Date	Species	Length	Weight	Pass
381	3	7/16/1997	White sucker	7.1	4.2	1
395	3	9/16/1997	Chinook	7.5	4.6	1
396	3	9/16/1997	Chinook	7.5	5.8	1
394	3	9/16/1997	Chinook	7.4	5.1	1
393	3	9/16/1997	Chinook	7.8	5.3	1
392	3	9/16/1997	Chinook	7.9	5.4	1
391	3	9/16/1997	Chinook	7.6	5.2	1
397	3	9/16/1997	Chinook	7.2	4.7	1
398	3	9/16/1997	Longnose dace	3.3	0.4	1
402	3	9/16/1997	Longnose dace	3.5	0.6	2
403	3	9/16/1997	Longnose dace	3.1	0.2	2
404	3	9/16/1997	Longnose dace	2.9	0.2	2
405	3	9/16/1997	Rainbow trout	6.8	3.6	2
399	3	9/16/1997	Rainbow trout	6.8	3.4	1
400	3	9/16/1997	Rainbow trout	6.3	2.9	1
401	3	9/16/1997	Rainbow trout	5.6	2.0	1
408	3	11/3/1997	Chinook	6.8	3.2	1
406	3	11/3/1997	Chinook	7.8	5.0	1
407	3	11/3/1997	Chinook	7.4	4.4	1
413	3	11/3/1997	Longnose dace	2.2	0.2	1
411	3	11/3/1997	Rainbow trout	7.0	3.7	1
412	3	11/3/1997	Rainbow trout	6.2	3.1	1
409	3	11/3/1997	Rainbow trout	5.5	2.2	1
410	3	11/3/1997	Rainbow trout	6.4	3.1	1
430	4	7/17/1997	Chinook	5.6	2.1	1
431	4	7/17/1997	Chinook	6.2	2.8	1
432	4	7/17/1997	Chinook	7.0	3.8	1
433	4	7/17/1997	Chinook	6.6	2.8	1
434	4	7/17/1997	Chinook	5.9	2.4	1
435	4	7/17/1997	Chinook	5.8	2.2	1
436	4	7/17/1997	Chinook	6.5	3.1	1
437	4	7/17/1997	Chinook	6.5	3.3	1
438	4	7/17/1997	Chinook	6.2	2.8	1
439	4	7/17/1997	Chinook	6.4	3.0	1
440	4	7/17/1997	Chinook	6.4	2.8	1
419	4	7/17/1997	Chinook	5.5	1.9	1
422	4	7/17/1997	Chinook	6.4	3.0	1
415	4	7/17/1997	Chinook	6.3	4.1	1
416	4	7/17/1997	Chinook	7.6	5.6	1
421	4	7/17/1997	Chinook	6.7	4.0	1
429	4	7/17/1997	Chinook	6.4	3.1	1
414	4	7/17/1997	Chinook	7.1	4.0	1
420	4	7/17/1997	Chinook	6.0	2.5	1
417	4	7/17/1997	Chinook	6.7	3.7	1

Fish ID	Site	Date	Species	Length	Weight	Pass
423	4	7/17/1997	Chinook	7.5	5.0	1
424	4	7/17/1997	Chinook	6.6	3.0	1
425	4	7/17/1997	Chinook	6.4	2.8	1
426	4	7/17/1997	Chinook	6.1	2.7	1
427	4	7/17/1997	Chinook	6.5	3.0	1
428	4	7/17/1997	Chinook	6.7	3.4	1
418	4	7/17/1997	Chinook	6.4	3.2	1
443	4	7/17/1997	Mountain whitefish	18.0	55.8	1
441	4	7/17/1997	Rainbow trout	12.6	20.9	1
442	4	7/17/1997	Rainbow trout	17.2	55.0	1
444	4	7/17/1997	Redside shiner	9.4	11.1	1
453	4	7/18/1997	Chinook			2
446	4	7/18/1997	Chinook	7.1	4.3	2
455	4	7/18/1997	Chinook			2
454	4	7/18/1997	Chinook			2
452	4	7/18/1997	Chinook			2
451	4	7/18/1997	Chinook			2
450	4	7/18/1997	Chinook			2
449	4	7/18/1997	Chinook	7.2	4.4	2
447	4	7/18/1997	Chinook	6.2	2.6	2
445	4	7/18/1997	Chinook	6.8	3.8	2
448	4	7/18/1997	Chinook	5.9	2.3	2
473	4	7/18/1997	Chiselmouth	9.5	11.5	2
457	4	7/18/1997	Mountain whitefish	6.0	1.8	2
458	4	7/18/1997	Mountain whitefish	19.5	65.2	2
460	4	7/18/1997	Northern Pikeminnow	16.9	51.3	2
459	4	7/18/1997	Northern Pikeminnow	12.5	19.8	2
461	4	7/18/1997	Northern Pikeminnow	14.7	37.0	2
462	4	7/18/1997	Northern Pikeminnow	15.0	36.7	2
456	4	7/18/1997	Rainbow trout	14.0	30.7	2
477	4	7/18/1997	Redside shiner	8.5	7.9	2
482	4	7/18/1997	Redside shiner	10.0	13.1	2
481	4	7/18/1997	Redside shiner	11.6	19.1	2
480	4	7/18/1997	Redside shiner	10.2	11.2	2
478	4	7/18/1997	Redside shiner	9.2	9.7	2
476	4	7/18/1997	Redside shiner	9.6	10.5	2
475	4	7/18/1997	Redside shiner	8.4	7.7	2
474	4	7/18/1997	Redside shiner	10.8	15.9	2
479	4	7/18/1997	Redside shiner	9.3	9.1	2
467	4	7/18/1997	White sucker	13.2	26.0	2
463	4	7/18/1997	White sucker	24.2	154.0	2
464	4	7/18/1997	White sucker	23.0	122.8	2
472	4	7/18/1997	White sucker	9.0	7.2	2
471	4	7/18/1997	White sucker	9.3	8.5	2

Fish ID	Site	Date	Species	Length	Weight	Pass
470	4	7/18/1997	White sucker	8.5	7.1	2
469	4	7/18/1997	White sucker	11.1	15.7	2
468	4	7/18/1997	White sucker	13.5	26.7	2
465	4	7/18/1997	White sucker	24.6	152.8	2
466	4	7/18/1997	White sucker	19.7	87.6	2
495	4	9/16/1997	Chinook	8.0	5.9	1
497	4	9/16/1997	Chinook	8.5	6.6	1
498	4	9/16/1997	Chinook	8.5	7.3	1
499	4	9/16/1997	Chinook	7.7	5.2	1
493	4	9/16/1997	Chinook	8.2	6.8	1
494	4	9/16/1997	Chinook	8.0	6.1	1
491	4	9/16/1997	Chinook	8.9	7.9	1
490	4	9/16/1997	Chinook	9.0	7.9	1
489	4	9/16/1997	Chinook	8.0	6.2	1
488	4	9/16/1997	Chinook	7.5	4.6	1
487	4	9/16/1997	Chinook	8.7	6.7	1
486	4	9/16/1997	Chinook	7.9	4.9	1
492	4	9/16/1997	Chinook	7.9	5.9	1
496	4	9/16/1997	Chinook	9.5	9.5	1
485	4	9/16/1997	Chinook	7.8	5.4	1
484	4	9/16/1997	Chinook	8.7	6.9	1
483	4	9/16/1997	Chinook	8.9	7.2	1
500	4	9/16/1997	Longnose dace	8.0	5.5	1
507	4	9/16/1997	Northern Pikeminnow	11.9	17.2	1
508	4	9/16/1997	Northern Pikeminnow	8.1	6.5	1
504	4	9/16/1997	Northern Pikeminnow	11.4	14.0	1
501	4	9/16/1997	Northern Pikeminnow	7.5	4.2	1
502	4	9/16/1997	Northern Pikeminnow	9.0	7.5	1
509	4	9/16/1997	Northern Pikeminnow	7.5	4.5	1
503	4	9/16/1997	Northern Pikeminnow	9.8	9.2	1
505	4	9/16/1997	Northern Pikeminnow	10.6	12.7	1
506	4	9/16/1997	Northern Pikeminnow	10.6	13.7	1
510	4	9/16/1997	Redside shiner	6.6	2.8	1
512	4	9/16/1997	White sucker	8.2	8.1	1
511	4	9/16/1997	White sucker	36.0	500.0	1
525	4	9/17/1997	Chinook	9.9	12.6	2
528	4	9/17/1997	Chinook			2
523	4	9/17/1997	Chinook	7.9	5.8	2
526	4	9/17/1997	Chinook			2
524	4	9/17/1997	Chinook	8.2	6.3	2
529	4	9/17/1997	Chinook			2
515	4	9/17/1997	Chinook	9.2	9.2	2
521	4	9/17/1997	Chinook	8.7	8.0	2
520	4	9/17/1997	Chinook	8.5	7.0	2

Fish ID	Site	Date	Species	Length	Weight	Pass
519	4	9/17/1997	Chinook	8.4	6.8	2
518	4	9/17/1997	Chinook	7.8	5.4	2
517	4	9/17/1997	Chinook	7.5	4.6	2
516	4	9/17/1997	Chinook	8.5	7.6	2
513	4	9/17/1997	Chinook	8.0	5.4	2
514	4	9/17/1997	Chinook	8.1	6.2	2
527	4	9/17/1997	Chinook			2
522	4	9/17/1997	Chinook	7.2	4.7	2
530	4	9/17/1997	White sucker	7.9	6.0	2
546	4	11/3/1997	Chinook	8.7	6.4	1
549	4	11/3/1997	Chinook	8.4	6.3	2
550	4	11/3/1997	Chinook	8.4	6.6	2
551	4	11/3/1997	Chinook	10.2	11.3	2
552	4	11/3/1997	Chinook	8.9	7.3	2
553	4	11/3/1997	Chinook			
545	4	11/3/1997	Chinook	8.9	7.7	1
555	4	11/3/1997	Chinook			
540	4	11/3/1997	Chinook	8.5	7.8	1
554	4	11/3/1997	Chinook			
544	4	11/3/1997	Chinook	8.4	6.6	1
543	4	11/3/1997	Chinook	9.4	8.6	1
541	4	11/3/1997	Chinook	9.4	10.1	1
539	4	11/3/1997	Chinook	8.3	6.0	1
538	4	11/3/1997	Chinook	8.2	5.8	1
537	4	11/3/1997	Chinook	9.8	11.1	1
536	4	11/3/1997	Chinook	9.4	10.0	1
535	4	11/3/1997	Chinook	9.4	8.5	1
534	4	11/3/1997	Chinook	9.7	9.3	1
533	4	11/3/1997	Chinook	9.1	9.3	1
532	4	11/3/1997	Chinook	8.9	8.2	1
531	4	11/3/1997	Chinook	8.6	6.3	1
542	4	11/3/1997	Chinook	8.6	6.9	1
548	4	11/3/1997	Mountain whitefish	12.0	15.1	1
547	4	11/3/1997	Rainbow trout	20.0	85.1	1

Note that a maximum of 30 individuals of each species were length-weight sampled at each sampling period and site. Those fish that were captured but not measured are indicated by blank values in those fields.