STREAM INVENTORY

OWEN CREEK WATERSHED

1998

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Prepared by

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for

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SECTION 1 - REPORT

1.0 INTRODUCTION

An aquatic stream inventory was conducted in the Owen Creek Watershed from late June through to mid-August 1998. The watershed is located approximately 25 km southwest of Houston, BC (Figure 1). These studies were a continuation of an aquatic inventory program initiated in 1996 in the Thautil and Owen Operating Areas (Morice TSA 20). The results of the previous two years' studies are presented in Bustard (1997, 1998a and 1998b).

The specific objectives of the program were as follows:

- to identify the known watershed distributions of fish presence/absence based on existing information;
- to identify stream gradients and potential obstructions to fish passage within the study streams;
- to delineate stream reaches for all study streams;
- to delineate the distributions of fish and fish habitat throughout the study streams to allow for the identification and classification of fish-bearing streams under the Forest Practices Code (FPC) at a mapping scale of 1:20,000;
- to provide FPC riparian classification for stream reaches sampled during watershed inventory;
- to identify key habitat features/sites requiring special management attention during watershed inventory, including whether bull trout (*Salvelinus confluentus*) were present in the watershed;
- to provide baseline distributions of stream-dependent amphibian species and life-history stages.

The major focus of the study was to provide a broad-based aquatic inventory at an operational and landscape level to facilitate planning for forest development that minimizes impacts on the aquatic resources of the watershed. Emphasis was placed on accurately describing the distribution of fish within the study streams and establishing a riparian classification for all stream sections.

In the preliminary planning for the Owen Watershed aquatic inventory, larger scale mapping showed Peter Aleck Creek flowing into the Nadina drainage. As a result, this large tributary was not included in the Owen inventory. Subsequent field observations

indicate that Peter Aleck Creek does flow into Owen Lake. For this reason, this study includes all of the Owen drainage except for Peter Aleck Creek[1].

The sampling in the mainstem of Owen Creek included two "index sites" to compare fish abundance to past fisheries surveys, and to serve as reference points for future sampling.

The report is separated into three sections:

SECTION 1 presents an overview of the key results of the fish and habitat sampling including fish distribution, relative abundance, and a comparison to historical data available for the Owen Watershed. Recommendations concerning habitat restoration (mainly stream crossing concerns) are included in this section. A 1:50,000 map showing the location of the study streams, fish distribution and the main barriers is included at the back of the report.

SECTION 2 presents the detailed results for fish sampling. A summary of all fish sampled and the stream survey card information for each tributary are presented in this section. These summaries are intended for use with the 1:20,000 maps accompanying this report.

SECTION 3 summarizes the photodocumentation information.

1.1 ACKNOWLEDGMENTS

The studies were funded by the Operational Inventory Program of Forest Renewal BC with Houston Forest Products as the project proponent. The overall inventory program was coordinated by Melissa Todd of HFP. The field surveys were conducted by Rob Dams, Kate Portman, Dean Allen, and Dave Bustard. Rob Dams and Kate Portman were responsible for data compilation and draft map preparation. Western Geographic Information Systems Inc. was responsible for GIS digital mapping.

1.2 PROVINCIAL DISCLAIMER

The Province has not accepted the contents of this product for the purposes of Forest Practices Code, and reserves the right to dispute the validity of the summarized results. The Province does not necessarily agree with the classification assigned to any individual stream reach, for use in logging plans, silviculture prescriptions or any other application.

Insert Figure 1 - Key location map

[1] Two sample sites were located in the lower 3 km of Peter Aleck Creek.

2.0 STUDY AREA

The 210 km^2 study area is located on the south side of the Morice River approximately 25 km south of Houston.

The western portion of the Owen Watershed is located in the Sub-boreal spruce biogeoclimatic zone. This portion of the watershed is dominated by 2050 m high Nadina Mountain and to a lesser extent Tsalit Mountain. The streams drain moderately steep forested hillsides interspersed with several small lakes (including Tsalitpn and Upper and Lower Klate lakes). Creeks draining the western side of the study area are influenced by the larger mountains and their associated snowfields. Late summer high elevation snowmelt and groundwater inflows help to keep water temperatures cool and stabilize late summer and winter flows.

The southeastern portion of the watershed is dominated by deciduous aspen slopes mixed with pine ridges. Much of the terrain is moderate and south-facing with the highest elevations on Tekaiziyis Ridge reaching 1500 m. Snowmelt occurs quickly and many of the streams on this side either dewater in the late summer and winter or flows are reduced to a trickle. The area is characterized by many small ponds and lakes. This area provides significant wildlife overwintering areas and is utilized by grazing livestock.

The northeastern section of the study area is characterized by a large gentle bench area in the Sub-boreal spruce zone. Tributaries tend to rise steeply from Owen Creek onto the main bench area. The major creek in this section (OW2) is low gradient and has extensive wetlands associated with beaver dams and several small lakes. Much of this section of the watershed has been logged or burned and is in second growth forest.

Owen Lake is a central feature of the watershed. The lake has an area of approximately 300 ha and has a maximum depth of 38 m. Two major inlet tributaries to Owen Lake, Riddeck and Peter Aleck creeks, enter at the southern end of the lake.

Owen Creek drops approximately 100 m over the 12 kms from Owen Lake to the Morice River. The stream is characterized by a valley flat with thick willow growth and extensive beaver activity. Logging roads are present on both sides of Owen Creek, including the mainline forestry road accessing the Nadina/Tahtsa region to the south located on the east side of the creek and Owen Lake.

Inlet streams to the mainstem of Owen Creek drain directly into critical fisheries sections of Owen Creek. The low gradient of the mainstem creek, combined with the moderating presence of Owen Lake in the headwaters, results in a system with a low capability to transport coarse sediment materials.

A concrete culvert structure built at the time of road development into the Morice in 1960 has impacted the passage of juvenile fish moving upstream from the Morice River until it was replaced by a bridge in the early 1990’s.

The lower portion of Owen Creek was diverted during road construction so that it entered the Morice River more directly below the road crossing (Hancock et al. 1983). The Department of Fisheries and Oceans (DFO) has recently excavated and re-established fish access into the original channel as part of the Watershed Restoration Program. Several age classes of juvenile coho are presently utilizing this new channel[2].

Some water temperature and discharge information was collected in lower Owen Creek from May through November 1979 as part of the Kemano Completion Studies (Envirocon 1984). These studies indicated that water temperatures in Owen Creek first exceeded 5°C by May 20th and stayed above 10°C from June 15th through until mid-October. The maximum water temperatures in Owen Creek were 18°C during several periods in August. Temperatures dropped below 5°C by late October and the creek was iced over in mid-November.

Discharge peaked in late May and early June and remained above 1.0 m^3/sec through until the middle of July. Base flows in Owen Creek remained between 0.2 and 0.4 m^3/sec from mid-August until freeze-up in November. We suspect lowest flows occur during late February and March under the ice.

2.1 BACKGROUND FISHERIES INFORMATION

A review of existing fisheries and habitat information in the Owen Watershed is presented in Hagen (1996). Since this review indicates nearly all past studies have focused on fish and habitat work on the mainstem of Owen Creek, little additional habitat information was collected during this study to add to the habitat information already available for the mainstem creek. Data sources for habitat information describing the mainstem of Owen Creek include Pinsent (1969) and Tredger (1983). Some of the key background information is summarized in the following section.

2.1.1 Lake Information

Lake surveys have been completed on Owen and Tsalitpn lakes. The Owen Lake surveys[3] indicate rainbow trout (*Oncorhynchus mykiss*), Dolly Varden (*Salvelinus malma*), burbot (*Lota lota*), mountain whitefish (*Prosopium williamsoni*), pygmy whitefish (*Prosopium coulteri*), largescale suckers (*Catostomus macrocheilus*), longnose suckers (*Catostomus catostomus*), redside shiners (*Richardsonius balteatus*), northern squawfish (*Ptychocheilus oregonensis*), prickly sculpin (*Cottus asper*), and peamouth chub (*Mylocheilus caurinus*) are present in the lake.

[2] Brenda Donas, DFO, Smithers (pers. comm.).

[3] Two lake surveys have been conducted in Owen Lake - 1961 and 1974 (data on file, MOELP Smithers). As well, fish collections were conducted by the Provincial Museum in 1974.

Anecdotal evidence suggests adult coho salmon (*Oncorhynchus kisutch*) and steelhead trout have been observed in Owen Lake up until the early 1970's (Morris and Eccles 1975). A single coho juvenile was captured during the BC Provincial Museum fish collection studies at Owen Lake in 1974.

Longnose suckers were the only fish species captured in the Tsalitpn Lake survey[4].

2.1.2 Stream Information

Owen Creek has been identified as a significant spawning and rearing tributary for steelhead trout. The first steelhead studies were undertaken by Pinsent (1969) when he looked at the potential for establishing a steelhead spawning channel in Owen Creek. Further work was conducted in Owen Creek during the 1970's by Shepard and Algard (1977), Shepherd (1979), and Envirocon Ltd. (1984). The Envirocon work included a radio telemetry study of adult steelhead spawners that confirmed steelhead spawning in Owen Creek to within 2 km of Owen Lake in 1979. Four of 16 radio-tagged steelhead from the Morice River that were followed to their spawning locations spawned in Owen Creek, highlighting the importance of this tributary to the overall Morice steelhead population.

The Fish Habitat Improvement Section of MOELP conducted juvenile sampling in Owen Creek as part of a steelhead stock assessment program in the Morice drainage (Tredger 1981 to 1987). Juvenile steelhead studies in Owen were also conducted in 1991 and 1992 (Bustard 1992 and 1993). These seven years of background data provide an excellent basis for comparison to results obtained in the 1998 studies.

All of the above studies tended to focus on the mainstem of Owen Creek, with a minor amount of sampling in the lower reach of Puport and Klate creeks. The studies indicate that Owen Creek is an important steelhead spawning system and provides some of the highest densities of steelhead fry and parr rearing in the Morice Watershed. Resident rainbow trout associated with Owen Lake are also suspected to utilize the upper portion of Owen Creek and the lower reach of Klate Creek.

Coho surveys have been conducted in Owen Creek since the early 1950's (Hancock et al. 1983; Stream Information Summaries, data on file, MOELP, Smithers). The data indicates scattered coho salmon spawning throughout the upper reaches of Owen Creek to Owen Lake until the mid-1970's. Estimates typically ranged from 100-400 fish. However, visibility in Owen Creek, especially in the area of beaver dams, is poor, and accurate estimates are difficult to conduct. Comments on the older files indicate that beaver dam removal was ongoing. Coho adult estimates have been very low since 1975. The exception to this trend was 1980, when a large coho escapement (600 fish) was reported in Owen Creek. These past studies indicate that Owen Creek has a high

[4] Lake survey conducted by Degisi et al. (1997). As well, fish collections were undertaken by the BC Provincial Museum 1974 (data on file, MOELP Smithers).

potential for coho spawning and rearing, but that present use has dropped to very low levels, and that spawners are restricted to the lower stream sections by beaver dams.

Pink salmon (*Oncorhynchus gorbuscha*) spawners were reported in some years below the road culvert (Hancock et al. 1983). Since the recent culvert replacement with a bridge, pink salmon spawning has been observed up to the first beaver dam if streamflow conditions are high during September[5]. Dolly Varden, mountain whitefish, longnose dace (*Rhinichthys cataractae*) and Pacific lamprey (*Lamperta tridenta*) are also present throughout the creek, and chinook salmon (*Oncorhynchus tshawytscha*) fry have been sampled in the lower end of Owen Creek[6].

A review of the historical fish information indicates that while there is good fish information for the mainstem creek and Owen Lake, the overall distribution and abundance of fish in the rest of the watershed is poorly understood. Given the importance of this watershed to steelhead and coho, the recreational opportunities on the lake itself, and the interest in the area from forestry, wildlife and grazing activities, a thorough fisheries inventory of all of the streams in the watershed is essential for sound land management decisions.

3.0 METHODS

3.1 TIMING

A review of existing fisheries information and adding watershed code information to the 1:20,000 maps was conducted at the beginning of the overall project during the summer of 1996. Mapping and air photo studies to identify preliminary reach breaks and to assist with sample site locations was conducted during June 1998.

Most of the field studies were initiated during the last week of June and completed at the end of July. The index site sampling was conducted in mid-August to correspond to the timing that this sampling has been undertaken in the past. The late spring and summer of 1998 was hot and dry and streamflows in Owen Creek were conducive to effective sampling.

3.2 LOGISTICS

The field studies were conducted by a field crew of two or three persons. Road and ATV access was good in much of the watershed due to the extensive past logging, especially on the eastern sections of the study area. Helicopter access from Houston was utilized to access sites and conduct stream assessments not accessible by road. Approximately 5 hours of helicopter time was used during this project.

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[5] Based on observations by D. Bustard - September 1996.

[6] Shepard and Algard. 1976. Memo on file, MOELP, Smithers. Also observed by D. Bustard and Tom Pendray (DFO) while seining below the lower mainline road culvert during May in the late 1980's.

3.3 STREAM IDENTIFIERS

Watershed code and interim stream identifier information for the Owen was mapped in the summer of 1996, based on the available information at that time. This is the same format as the earlier phases of this project. The interim location point identifier consisted of a mix of letters (first letter of tributary) and number (n^{th} tributary upstream from the mouth of the main tributary). Each stream in the Owen has a unique designation. Only some have watershed codes as digitized by MOELP.

3.4 HABITAT AND SAMPLING

Resources Inventory Committee (RIC) Standard Reconnaissance Level Stream Inventory (MOELP, Draft 1995) and Forest Practices Code guidebooks provided the framework for conducting the fish and habitat surveys. The details of the sampling procedure are laid out in the *Schedule A Streams* accompanying reconnaissance level stream survey contracts conducted in 1996. These surveys were a continuation of this contract.

Several modifications were made to methodologies in consultation with the project monitor to allow for a more realistic achievement of program objectives. These are outlined below:

- The stream surveys emphasized distribution information. Considerable effort was directed at establishing the upstream barriers to fish distribution. In areas with poor access, or where tributaries continued for a considerable distance at slopes less than 20%, an estimate of the upper extent of fish access was made based on map contours and aerial reconnaissance observations. These sites have been delineated as suspected fish habitat on the accompanying aquatic maps (dashed red lines).

- Fish sampling was conducted above and below potential barriers. If extensive areas of potential fish habitat were identified as barren due to downstream barriers, a minimum of two sites were established to confirm barren designation. Dolly Varden and resident trout species are present in tributaries year-round, making it unnecessary to repeat sampling in these creeks during a different season to confirm that they are barren. The lower ends of small tributaries that may have been dry at the time of field examination, but that are accessible during higher flow conditions from the mainstem creek, have been classified as suspected fish habitat, assuming some use during high flow conditions.

Electrofishing was the main method of fish sampling in the study area. Lower stopnets were used on the larger, faster-flowing streams if access to the sites was good. A single pass was made up and back down to the net. Stopnets were not used where access was poor and a long hike was required or in small low velocity sites. Minow traps baited with

roe and set overnight were used in the deep slow-flowing streams and in the ponds and small lake habitats. As well, angling was conducted at some of the small lake habitats.

Index sites were established at two locations in the mid and upper sections of Owen Creek. These sites were located at the same sites as index sampling conducted during the early 1990's. The sites were enclosed with stopnets and two-pass removal electrofishing was conducted to establish estimates of fish production on a m^2 basis. Information from these mainstem sites on Owen Creek is useful for comparison to past surveys conducted as part of the steelhead stock assessment program in Morice River tributaries.

All fish captured were separated by species and a sample of fork lengths measured. Voucher specimens (2-3 fish) were retained for most species encountered in the watershed. Weights were recorded for all fish captured at the two index sites for biomass estimates. Scales for aging were retained from a range of sizes of 26 rainbow (steelhead) at the two index sites. Branchiostegal ray counts and head shape were key field indicators used to verify whether bull trout were present in the watershed. Genetic samples were retained from 10 char samples.

3.5 AMPHIBIAN DISTRIBUTION

Amphibian presence/absence information was recorded during the reconnaissance inventory. Electrofishing and minnow trapping, particularly in pond and small headwater lake areas provided special opportunities for amphibian observations. Care was taken to look for tailed frogs (*Ascaphus truei*) in steeper tributaries.

4.0 RESULTS AND DISCUSSIONS

4.1 OVERVIEW OF FISH DISTRIBUTION AND ABUNDANCE

Table 1 summarizes the number of sites sampled in the Owen Watershed and the fish species that were present in them. A total of 95 sites were examined during the Owen surveys. Fish were present at 28 of these locations. Ten smaller channels (mainly on the eastern side of Owen) were dry at the time of inspection. As well, ten of the sites examined were pond or wetland areas.

The Owen Watershed has been separated into two sections - those tributaries entering directly into the mainstem Owen Creek and those flowing into Owen Lake. Rainbow trout juveniles sampled in the Owen Lake inlet streams are suspected to be resident rainbow trout, while the Owen Creek tributaries appear to be utilized mainly by steelhead trout[7].

Dolly Varden were the most widespread fish species in the Owen Watershed and were found at 21 of the 95 sites examined. Steelhead juveniles were present at nine locations including the mainstem of Owen Creek and five tributaries. Rainbow trout were present at locations in four tributaries. Cutthroat trout and mountain whitefish were found at two sites. Other species such as longnose dace, longnose suckers, prickly sculpins and redside shiners were present in a total of seven of the 95 sites examined. Bull trout and coho salmon were not present in any of the sample sites. A more detailed breakdown by major study stream is presented in Appendix 1 Table 1.

Table 2 summarizes the total number of fish captured during the surveys by general area. Juvenile rainbow and steelhead trout comprised 59% of the total 661 fish captured during all surveys. This was followed by Dolly Varden (16%), longnose dace (13%), prickly sculpins (5%), longnose suckers (3%) and a small number of cutthroat trout, mountain whitefish, redside shiners, and lake chub together comprising 4% of the overall catch. Pacific lamprey ammocoetes were present at the two mainstem Owen Creek sites and in the lower reach of OW14.

Table 1. Summary of Number of Sites Sampled and Breakdown by Species Present

[7]Resident rainbow and juvenile steelhead are visually very similar and difficult to distinguish in the field. Rainbow and steelhead do show some difference in fry size at emergence. Sampling during July indicated that rainbow trout fry in lower Owen Creek were 29 mm or larger. Observations elsewhere in the Morice drainage indicates newly-emerged steelhead are generally 28 mm fork length and larger. Steelhead spawning has been confirmed in Owen Creek based on radio telemetry. Many of the rainbow fry sampled in the lake inlet tributaries were 24-28 mm. We assume the smaller fry size reflects a smaller egg size, suggesting resident trout.

at Sample Sites in the Owen Watershed.

Stream Section	Sites Examined	Fish Present	RBT	CT	DV	MW	Other Species
Lower Owen Mainstem	2	2	2	0	2	1	2
Lower Owen Tributaries	48	18	7	2	15	1	2
Owen Lake Tributaries	45	8	6	0	4	0	3
TOTAL	95	28	15	2	21	2	7

Table 2. Percentage Composition by Species of Fish Sampled at All Sites in the Owen Watershed in 1998.

Stream Section	RBT	CT	DV	MW	LN Dace	LN Sucker	Lake Chub	RS Shiner	P Sculpin
Lower Owen Mainstem	186	0	30	6	85	0	0	0	0
Lower Owen Tributaries	149	10	61	2	1	5	0	0	0
Owen Lake Tributaries	56	0	13	0	0	13	2	10	32
TOTAL	391	10	104	8	86	18	2	10	32
%	59.2	1.5	15.7	1.2	13.0	2.7	0.3	1.5	4.8

Historical data is available for fish species composition at sites in the mainstem of Owen Creek dating back to 1969 (Table 3). In this early sample, conducted using rotenone to poison a 16 m section of Owen Creek in the vicinity of Puport Creek, juvenile coho dominated the catch, comprising over 90% of the fish sampled. Steelhead fry and parr combined accounted for less than 5% of the catch.

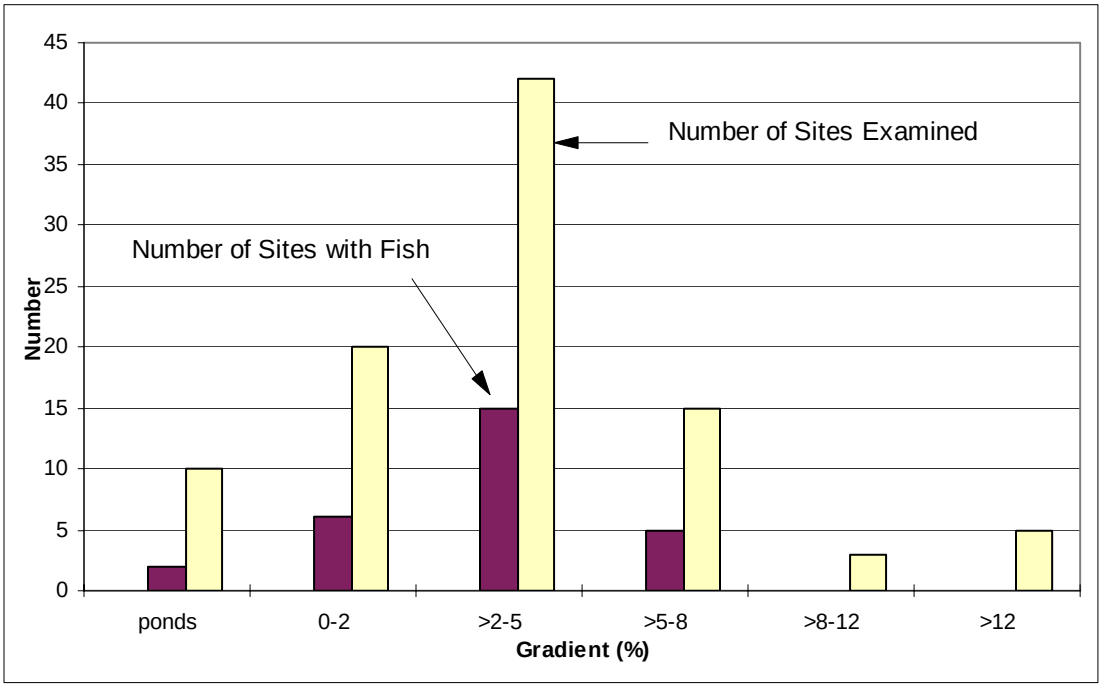
Electrofishing at mainstem sites in Owen Creek has been conducted during eight years since 1980 (Table 3). The results indicate that steelhead fry and parr have dominated the catches during this period, and on average have accounted for 80% of the overall catch. Coho juveniles were present during the early 1980's, but have not been sampled at any index sites since 1983.

Insert Table 3 - Mainstem Species Composition 1980 to 1998.

The 1998 catch composition indicates a smaller proportion of steelhead fry and an increase in the abundance of steelhead parr and longnose dace compared to the average of sampling conducted since 1980. Longnose dace were not recorded at index sites in the mainstem of Owen Creek prior to 1983. However, Morris and Eccles (1975) indicated longnose dace were present in Owen Creek during their surveys[8].

A summary of stream gradient versus fish presence is shown in Figure 2. The results indicate that no fish were present at most ponds in the watershed. The pond sites sampled were mainly located on the eastern slopes above Owen Creek upstream from barriers restricting fish access from Owen Lake and Owen Creek. All fish were found in stream locations with gradients of 8% or less.

Figure 2. Summary of Fish Sample Sites by Gradient.



4.2 FISH DISTRIBUTION AND ABUNDANCE BY SPECIES

[8] Their sampling was for presence/absence data and did not report effort or amount of area sampled.

This section provides an overview of fish distribution and abundance by species presented in the context of historical data where available. This section includes species life history information and critical habitats. The detailed distribution and habitat information is presented on the accompanying maps and in the reach, site and fish summary cards.

4.2.1 Steelhead

4.2.1.1 Distribution and Key Habitats in the Owen Watershed

Steelhead are the dominant fish species present in Owen Creek and the lower sections of five tributary streams: OW2; OW3; OW9; Puport Creek; and OW14.

Steelhead are distributed throughout Owen Creek, and spawning has been documented to within 2 km of Owen Lake during a radio telemetry study (Envirocon Ltd. 1984). Anecdotal observations indicate steelhead have been observed at the Owen Lake outlet[9].

A large number (>100) fry and parr assumed to be steelhead were captured in the lower reach of OW2 suggesting that the lower 1 km of this creek is used by spawning steelhead. An 8 m falls restricts fish access above this point. The road culvert was judged to be impassable to juveniles moving upstream from Owen Creek, but it assumed that adult steelhead are able to move up into this creek to spawn based on the presence of steelhead fry and parr upstream from the culvert.

Steelhead parr were present in the lower 200 m of OW3. The road culvert is judged to be impassable and no fish were present above this culvert. Fry were not captured in the sample, and we assume the parr moved up out of Owen Creek into the lower end of OW3. Sampling was conducted early in the season at this site, and steelhead emergence may not have occurred by the sample date.

We suspect some steelhead spawning occurs in the lower 300 m of OW9 based on the presence of newly-emerged fry and the good potential spawning habitat in this section. The upper extent of potential fish access is located at a chute 850 m upstream.

The lower 3 km of Puport Creek is utilized by steelhead based on the presence of parr during the 1998 sampling. Newly-emerged steelhead fry were captured in lower Puport Creek during surveys in 1979 (Envirocon Ltd. 1984), suggesting steelhead spawning in this tributary. A series of chutes at 3 km restricts steelhead use in upstream areas of Puport Creek.

[9] This was reported by Jack Southern, former lodge owner on Owen Lake, in Shepard and Algard (1977).

OW14, located approximately 1 km below the outlet of Owen Lake, has some good potential spawning sections for steelhead. The presence of newly-emerged fry at the lower sample site, and parr above the road culvert, suggests steelhead do access this area. No juveniles were found above beaver dams located 1.2 km upstream.

Based on the above information, we conclude that the 12 kms of mainstem Owen Creek provides the most critical spawning and rearing areas for steelhead in the watershed. However, the lower ends of at least four tributaries (OW2; OW9; Puport; and OW14) also are used by steelhead for spawning and rearing and together constitute an additional 5 km of stream channel. Steelhead use of a fifth tributary (OW3) is restricted to the lower 200 m.

A key to Owen Creek's excellent steelhead capability may be the relatively high late summer streamflows and moderate water temperatures that are a result of inflows from tributaries, particularly those on the west side of the creek.

4.2.1.2 Steelhead Life History Information

Information collected during radio telemetry studies conducted during the winter and spring of 1979 (Envirocon Ltd 1984) provides timing information for adult steelhead that spawn in Owen Creek. Two of the four steelhead that eventually spawned in Owen Creek overwintered in the Morice River upstream from Lamprey Creek including one fish overwintering upstream from Gosnell Creek. The other two steelhead overwintered in the Morice River between Owen Creek and Houston Tommy Creek. This section of the river provides important overwintering areas for Morice steelhead (Lough 1995).

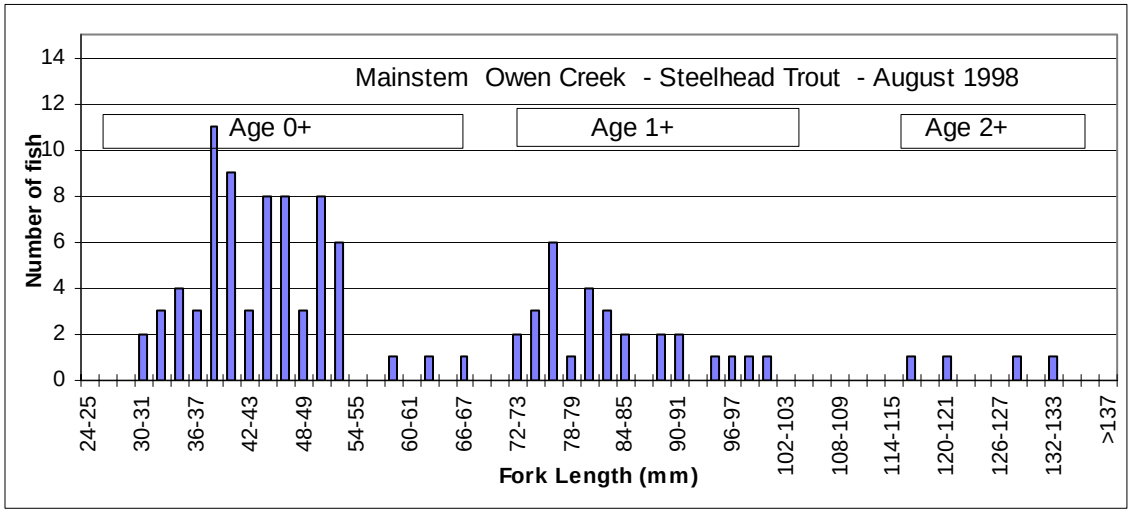
During the 1979 studies, all four steelhead moved into Owen Creek during high flow conditions in mid-May, and were present at spawning locations in late May and early June. Two of the fish were recorded moving downstream (assumed kelts) during the period June 7 to 10th. Three of the four fish spawned in the mid and upper reaches of Owen Creek and a single fish spawned in lower Owen Creek. The telemetry studies were not detailed enough to determine whether these fish spawned in the mainstem of Owen Creek or the lower end of one of the tributaries.

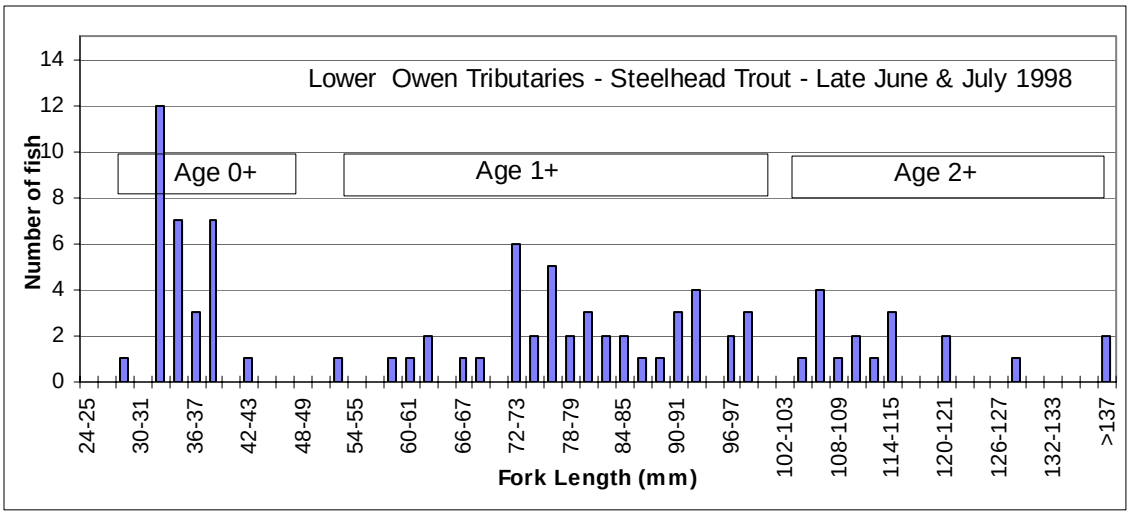
Steelhead fry emergence in the Owen Watershed occurs from late June through July. During the 1998 studies, newly-emerged steelhead fry were sampled in OW2 on June 30th. Owen Creek and its tributary streams appear to have a short incubation period compared to other locations in the Morice Watershed, where emergence may not occur until late August (Envirocon Ltd. 1984)[10]. The shorter incubation in the Owen presumably reflects the influence of warm headwater lakes leading to higher water temperatures during June compared to other sites.

[10] Appendix E of Steelhead trout spawning and fry emergence studies in the Morice River during 1982. In: Fish Resource of the Morice River System: Baseline Information.

Steelhead fry captured in Owen Creek tributaries during late June through July ranged from 28-42 mm fork length (Figure 3). By the middle of August, steelhead fry in the mainstem ranged from 30 to 67 mm in length.

Figure 3. Fork Lengths of Juvenile Steelhead in Owen Creek Mainstem and Tributaries in 1998.





Whately et al. (1978) determined that most Morice River steelhead spend 3 or 4 years in freshwater prior to leaving as smolts. Typically steelhead move downstream into larger systems as they grow. Length data collected in Owen Creek suggests that many of the steelhead parr sampled in Owen Creek were age 1+ (Figure 3). These results suggest that steelhead parr are dropping downstream out of Owen Creek, typically after spending two summers rearing in this creek. Sampling in Owen Creek during November 1979 (Envirocon Ltd 1984) suggests that the steelhead parr are spending a second winter in the creek, and presumably drop downstream into the Morice and Bulkley rivers during their

third summer. Shepard and Algard (1977) reported that age 3+ steelhead were common in Owen Creek during sampling in the summer of 1976.

A higher proportion of older parr were present in the lower sections of the Owen tributaries (Figure 3). The heavier spotting on some of the larger juveniles (e.g., in OW2)
suggests that there may be a mix of steelhead and stream resident rainbow at some of these locations.

The results of the aging analysis for the 26 fish that had scales taken is presented in Appendix 2 Table 1.

4.2.1.3 Comparison of Steelhead Rearing Densities Between Years

Figure 4 summarizes steelhead fry and parr rearing densities measured in Owen Creek between 1980 and 1998. The data indicate that steelhead fry densities of 48 fry/100 m^2 of habitat fall into the lower end of the range obtained since 1980 (mean of 103 fry/100 m^2)[11]. However, these densities of steelhead fry are high compared to other steelhead tributaries[12]. Estimates conducted in nearby Buck Creek, which has a long term juvenile steelhead database, indicated that 1998 steelhead fry densities were also well below average (Bustard 1998c).

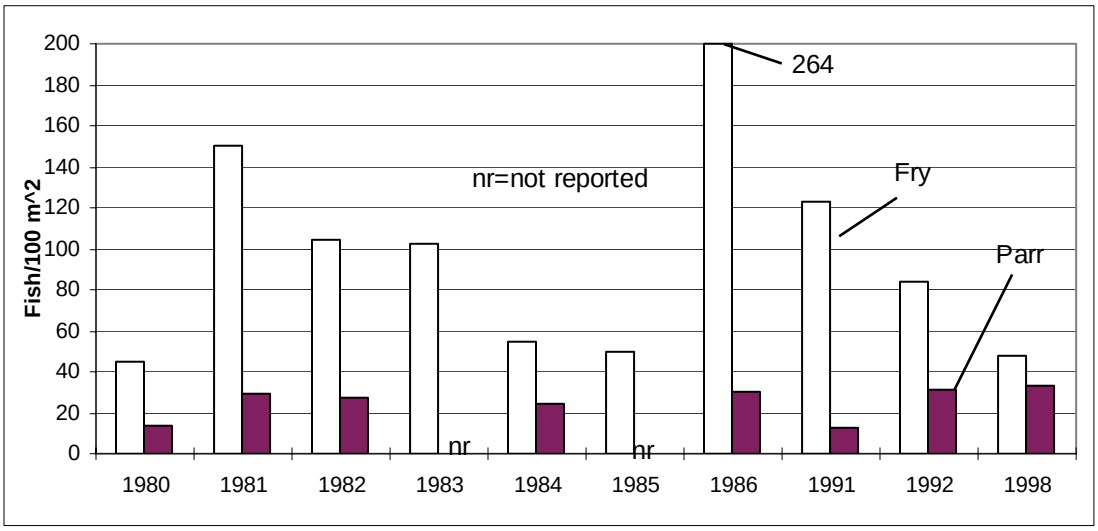
Estimates of 33 steelhead parr/100 m^2 are the highest obtained in Owen Creek to date. The average for those years reported is 25 steelhead parr/100 m^2. Parr estimates in Owen Creek tend to be fairly stable and have ranged from 13 to 33 parr/100 m^2 for those years reported. Parr estimates in Buck Creek were also very high in 1998 (Bustard 1998c). A more detailed summary of density estimates is presented in Appendix 3 Table3.

The parr densities of over 30 parr/100 m^2 measured in Owen Creek are among the highest densities achieved by steelhead parr in the best steelhead tributaries in the Morice on good recruitment years (Bustard 1993) and exceed the biostandard estimates of 10 parr/100 m^2 reported in Koning and Keeley (1997). We suspect these high estimates reflect adequate fry recruitment from the past two years in conjunction with conditions suitable for high survival in Owen Creek through to the parr stage.

Figure 4. Comparison of Steelhead Fry and Parr Densities in Owen Creek for Ten

[11] Mean for the two index sites - see Appendix 3 Table 3.
[12] See Bustard (1993) for a comparison to other Morice River tributaries.

Years Since 1980.



4.2.2 Rainbow Trout

4.2.2.1 Distribution and Key Habitats in the Owen Watershed

Resident rainbow trout appear to be mainly associated with Owen Lake and occur in the larger accessible inlet tributaries to the lake. Rainbow trout were present in lower Klate Creek, Riddeck Creek, Peter Aleck Creek and in a short section of Emil Creek near the lake. The upper reach of Owen Creek in the vicinity of Owen Lake may also be used by resident rainbow trout from Owen Lake for spawning and rearing. Tredger (1983) reported suspected resident rainbow trout redds in the upper reach of Owen Creek.

Rainbow trout juveniles were present in Riddeck Creek to a 6 m falls located 3.5 km upstream. No fry were captured at the two sample sites within this section. Rainbow trout parr were also present in lower Emil Creek, but probably cannot access this creek past a road culvert at 250 m upstream.

Rainbow trout juveniles were present at the two sites sampled in lower Peter Aleck Creek. We suspect that Peter Aleck Creek is the main spawning creek for Owen Lake rainbow trout. Reach 3 of Peter Aleck Creek had good potential spawning habitat, and newly-emerged trout fry were abundant at the two sites sampled. The upper reaches of Peter Aleck Creek were not part of the study area and the upper extent of rainbow trout use in this system is unknown.

The only other rainbow trout fry captured in the lake inlet streams was in lower Klate Creek, where a single newly-emerged fry was captured at the lower sample site. Tredger (1981) captured eight rainbow trout fry in a nine meter section of lower Klate Creek in September 1980. Juvenile rainbow trout were common in the lower Klate Creek sample site in 1998.

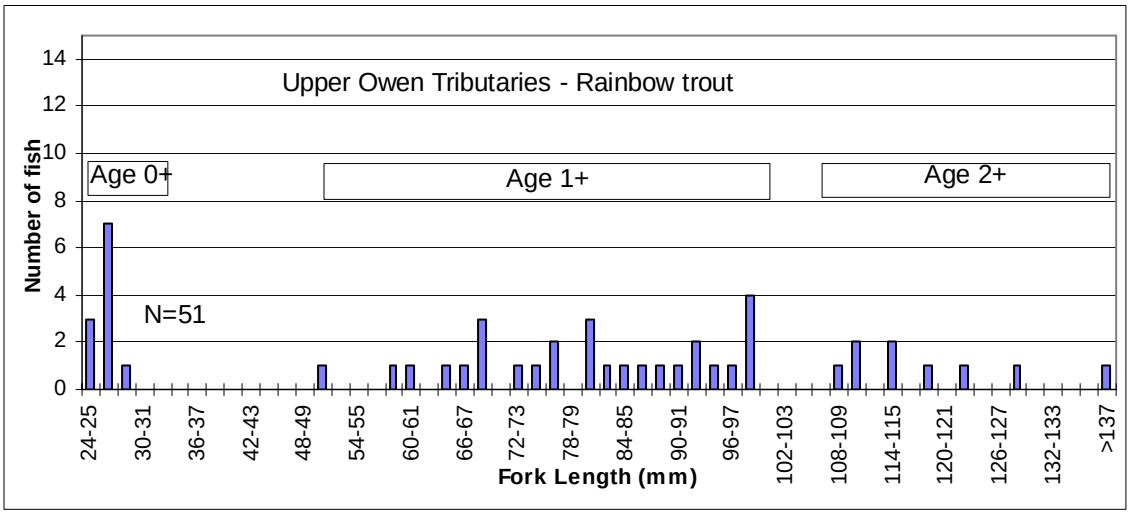
4.2.2.2 Rainbow Trout Life History Information

Life history information describing the rainbow trout population in the Owen Watershed is not available. Based on studies in the adjacent Francois Lake drainage (Bustard 1990), we assume that spawners move upstream from Owen Lake into inlet streams during late April and early May with a peak of spawning during the first half of May. Newly-emerged trout fry were captured in Peter Aleck Creek on July 5th, indicating a short incubation period.

The Francois Lake studies (Bustard 1990) suggest that juvenile rainbow rear in the inlet stream until age 1+ and age 2+ and then drop down into the lake. While juvenile rainbow were present in the Owen Lake inlet streams (Figure 4), no fish larger than 138 mm fork length were present, suggesting a similar life history strategy for rainbow trout in Owen Lake.

A single larger rainbow trout (182 mm) was captured in OW2. The heavy spotting on this fish compared to others captured in lower Owen tributaries suggests it may have been a stream resident fish.

Figure 5. Fork Lengths of Juvenile Rainbow Trout in Owen Lake Inlet Tributaries.



4.2.3 Cutthroat Trout

Cutthroat trout were only present in the upper two reaches of OW14 and its headwater lake (Upper Klate Lake). Based on this limited presence, we suspect that this population of cutthroat was planted in the headwater lake, and that juveniles sampled in the reaches downstream from the lake are associated with the lake population of fish.

Two fish angled in Upper Klate Lake were 25-30 cm fork length. Juveniles ranged from 82-103 mm fork length. No cutthroat fry were sampled in the inlet stream to Upper Klate Lake, so we suspect that cutthroat from the lake spawn in the outlet stream and spend some time rearing in the upper reaches of OW14 prior to lake entry.

Upper Klate Lake provides a sport fishery for locals, and a trail from a lodge on Owen Lake has been developed to this small lake.

4.2.4 Coho Salmon

No coho salmon juveniles or adults were noted during the 1998 surveys, so distribution information is based on past records. Historical data suggests coho spawning occurred largely in the middle and upper reaches of Owen Creek during late September through until early November (Hancock et al. 1983). Extensive beaver dams located in the middle and lower sections of Owen Creek, combined with poor returns of spawning adults[13], have presumably led to the decline of coho in Owen Creek since the early 1980's. A single coho redd was observed 1.5 km upstream on Owen Creek in the fall of 1997[14]. Similarly, a single coho redd was noted in lower Owen Creek in 1998, despite extensive ground examination of this system throughout the spawning period[15].

Juvenile sampling conducted in Owen Creek by Envirocon Ltd. (1984) during three time periods in 1979 provides some background information describing coho juvenile use in this system during years when fish are present. The data indicates that two age classes of coho are present in Owen Creek during the late summer and fall period. Scale analyses from returning adults indicate that Morice River coho remain in freshwater for one (75%) or two (25%) winters prior to smolting (Shepherd 1979).

No coho fry were present in Owen Creek during the late May sampling (Table 4). By late June and early July, newly-emerged coho fry were present at the sample sites and averaged 34 mm fork length. By early September, the age 0+ coho averaged 61 mm fork length. Some of the age 1+ coho captured during the late May sampling were pre-smolts

Table 4. Summary of Juvenile Coho Fork Lengths During Three Different Sample Periods in 1979[16].

[13] See "Coho Backgrounder" - Status of Skeena River Coho Salmon 1997. Prepared by Coho Response Team - Department of Fisheries and Oceans.
[14] Gord Wadley, fisheries contractor, personal communication.
[15] Brenda Donas, DFO, Smithers, personal communication.
[16] Data source - Envirocon Ltd. (1984).

Sample period[17]	Juvenile coho fork lengths (mm)	
	Age 0+	Age 1+
May 20-29	not emerged	83.3 (n= 20)
June 29-July 3	34.3 (n=28)	na[18]
Sept 3-6	61.6 n=28	85.0 n=17

that presumably leave Owen Creek during late May and June, similar to elsewhere in the Morice system (Envirocon Ltd. 1984).

Habitat assessments indicates that the mainstem of Owen Creek provides excellent rearing habitat for coho. The beaver dams that restrict adult upstream access, especially during falls when high flows do not occur during the migration period, provide the pond habitat that is favored by coho fry and yearlings. The key to coho use in this system is getting adult spawners sufficiently far upstream into the best spawning areas, so that the resulting fry recruitment can fully utilize the excellent rearing opportunities present in Owen Creek and the lower sections of accessible tributaries.

Habitat assessments conducted during the 1998 studies suggest that the lower reaches of OW14 also provide excellent spawning and rearing potential for coho salmon.

4.2.5 Dolly Varden

4.2.5.1 Distribution and Key Habitats in the Owen Watershed

Dolly Varden were the most widespread fish species found during the Owen surveys. Dolly Varden were present at 21 of the 95 sites examined (Table 1) and comprised 16% of the overall catch in mainstem Owen Creek and tributary streams. The smallest channel utilized was 0.8 m wide (headwaters of Trib PU1) and the steepest channel was 8% (Trib PU2).

Dolly Varden in the Owen Watershed tended to be present farther upstream in tributaries than other species. However, headwater populations were not present above obvious barriers to fish passage from Owen Creek or Owen Lake. Isolated resident populations of Dolly Varden have been found above barriers in other tributaries in the Morice such as in the Thautil Watershed (Bustard 1997).

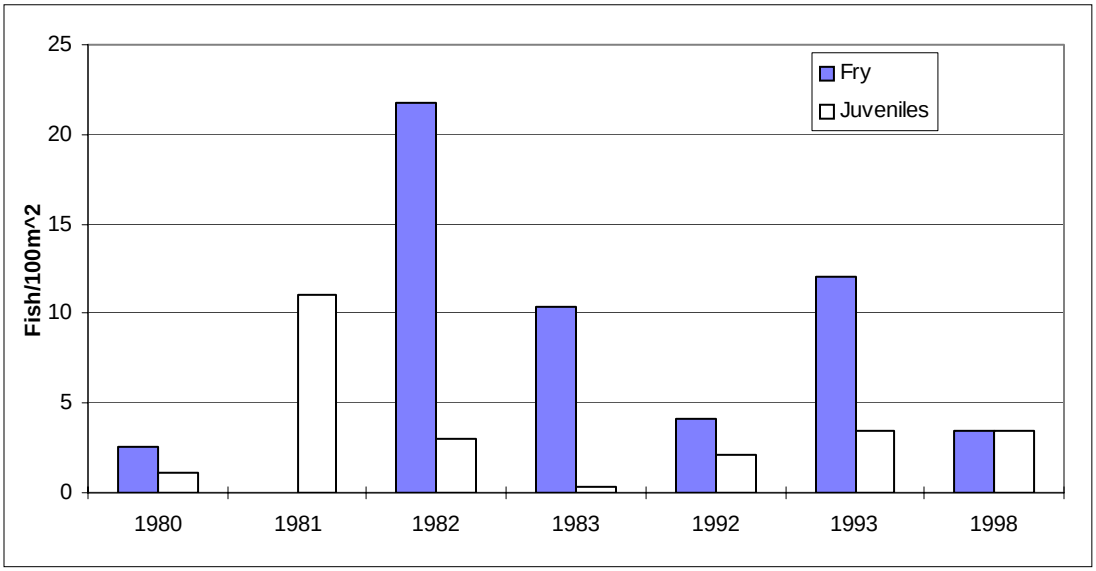
[17] A combination of minnow trapping and electrofishing was used during each sample period.
[18] Information not available.

Eight sites were identified as Dolly Varden spawning locations based on the presence of newly-emerged fry and suitable potential spawning habitat in the vicinity of the observations. We assume that more locations are present throughout the watershed, presumably in most of the tributaries where Dolly Varden are found. Since surveys were not conducted during the fall spawning period, spawners and redd observations were not a part of the surveys.

Dolly Varden fry were captured at the two Owen Creek index sites, and we assume Dolly Varden spawn at a range of sites in the mainstem of Owen Creek. Maturing adults were captured at Site In1. Dolly Varden fry were captured in the lower reach of OW9, and in OW10 at Sites 25 and 26. Newly-emerged Dolly Varden fry were also captured in a small unmapped inlet creek to Upper Klate Lake (Site 43), and in upper Klate Creek in the vicinity of groundwater inflows. Dolly Varden fry in the vicinity of good potential spawning areas were also noted at Site 92 in Peter Aleck Creek.

The index site sampling in Owen Creek provides some information describing rearing densities of Dolly Varden for seven years since 1980 (Figure 5). The data indicates that

Figure 6. Densities of Dolly Varden Fry and Juveniles in the Mainstem of Owen Creek for Seven Years Since 1980.



Dolly Varden juveniles rear at low densities (typically less than 5 juveniles/100 m^2 of habitat). Fry estimates tend to be more variable than juvenile densities between years, with estimates exceeding 20 fry/100 m^2 in 1982. Sampling at a range of sites in the Thautil Watershed in 1996 indicated that Dolly Varden densities in that Morice tributary typically ranged from 2 to 7 juveniles/100 m^2.

We suspect that Dolly Varden achieve higher densities than shown in Figure 5 in some of the smaller tributaries. Sampling in the small tributaries typically used single pass electroshocking, often without stopnets, so density estimates were not determined for these sites in this study.

4.2.5.2 Dolly Varden Life History Information

Figure 6 summarizes the fork lengths of Dolly Varden sampled throughout the Owen Watershed in 1998. Only four fish exceeded 150 mm fork length. The largest individual was 160 mm fork length and was captured below the road culvert at OW3. These sizes are similar to other tributaries in the Morice with resident Dolly Varden populations (Envircon Ltd. 1984; Bustard 1997).

Many of the Dolly Varden exceeding 120 mm fork length were sexually maturing fish. Based on observations during the fall in other Morice tributaries, we assume that Dolly Varden spawning peaks during late September and early October (Bustard 1997).

Timing of emergence for Dolly Varden fry is not well documented in the Owen or Morice watersheds. Recently emerged fry were sampled in early July, and we suspect that most emergence occurs during late May and June based on the size of char fry sampled in July.

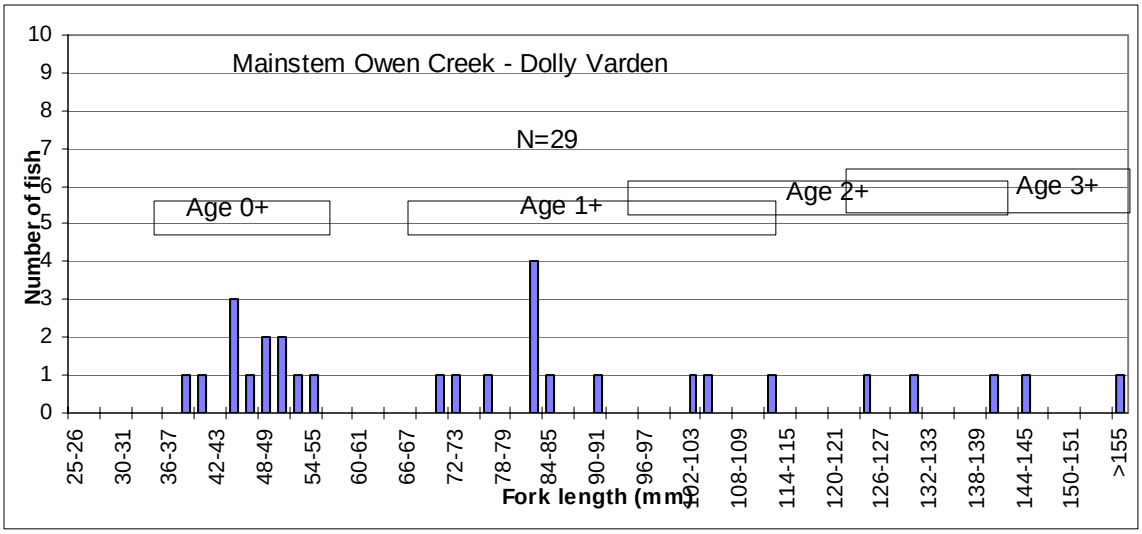
The small size of the resident populations sampled in Owen suggests that these fish are primarily residents to Owen Creek, and that they remain in Owen Creek and its tributaries rather than move into the Morice River. Char populations in the Morice River tend to be comprised of larger fish (Envirocon Ltd. 1984) that we suspect are mainly sub-adult and adult bull trout.

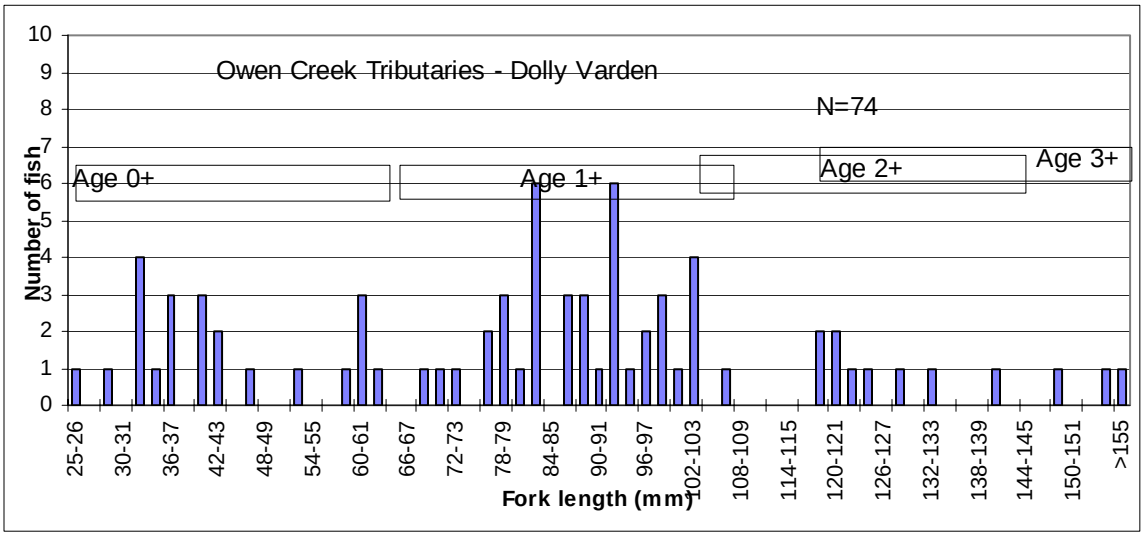
4.2.6 Other Species

4.2.6.1 Pink Salmon

Several hundred pink salmon spawners were observed in the lower section of Owen Creek in August 1996. This was a high flow year, and following the replacement of the road culvert with a bridge, pinks were able to gain access as far upstream in Owen Creek as the lowest beaver dam. In 1998, the low flows restricted pink salmon to spawning sites in the Morice River at the mouth of Owen Creek.

Figure 7. Fork Lengths of Dolly Varden in Owen Creek Mainstem and Tributaries in 1998.





Pink salmon spawn during late August with a peak in early September (Envirocon Ltd. 1984). Pink fry emergence occurs mainly from May 1 to 15th.

4.2.6.2 Mountain Whitefish

Mountain whitefish were infrequent in the fish sample sites in Owen Creek. In total one fry and five yearling whitefish were captured in the two mainstem Owen sample sites (Appendix 3 Tables 1 and 2). Sampling in other years indicates that whitefish numbers have always been low and this species has never comprised more than 4% of the total number of fish sampled in Owen Creek (Table 3).

The only other mountain whitefish sampled in the watershed in 1998 were two yearlings captured in the lower reach of OW 14.

4.2.6.3 Longnose Dace

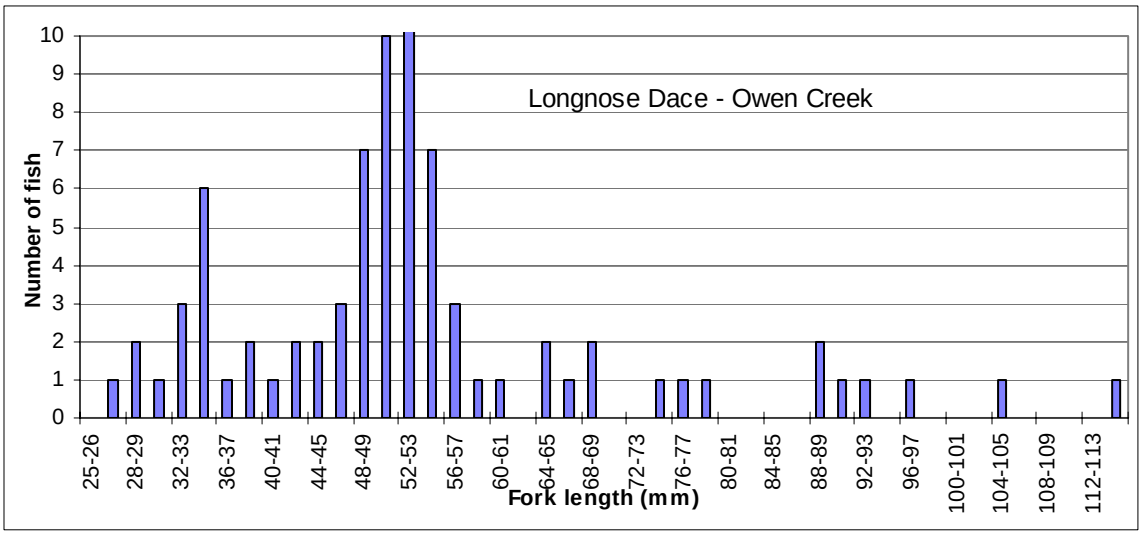
Longnose dace comprised over 30% of the sample collected in the mainstem index sites in 1998 (Table 3). This was well above the average of 7% for all years of sampling, and the next highest catch of 13% collected in 1983.

Most of the longnose dace sampled in this study were captured at Site In2 in the mainstem of Owen Creek approximately 3.5 km downstream from Owen Lake. The density of longnose dace at this site (89 fish/100 m^2) was very high, and this species comprised over 40% of the total site biomass (Appendix 3 Table 2). Longnose dace were far less numerous at In1 in the mid-reach of Owen Creek (3 fish/100 m^2). The only other longnose dace captured in this study was a single fish captured in the lower reach of OW14 at Site 38.

Longnose dace occupy fast-flowing riffle sites, often similar to those locations utilized by juvenile steelhead. They are most commonly found in stream sections where water temperatures are near the upper end of the range used by trout, characteristic of the mainstem of upper Owen Creek during the late summer. Water temperatures at the two Owen Creek index sites were 18.5°C during the mid-August sample period in 1998.

The longnose dace sampled in this study ranged in size from 27 to 114 mm in fork length (Figure 7).

Figure 8. Fork Lengths of Longnose Dace in Owen Creek in 1998.



4.2.6.4 Longnose Suckers

Longnose suckers were present at three tributary locations in the Owen Watershed - all closely associated with lake habitats. Longnose suckers were present at OW23 and in the

lower end of Riddeck Creek. Both of these locations were within 1 km of Owen Lake. Tredger (1981 to 1987) also reported small numbers of longnose suckers in the mainstem of Owen Creek during some years.

Longnose suckers were the only fish species present in Tsalitpn Lake and upper Puport Creek. In addition to five longnose suckers sampled at the outlet, a school of up to 500 fish was observed along the lake shoreline, and 12 juveniles were electrofished along the lakeshore. Their presence was also confirmed in this lake in 1974[19] and in 1996 (Degisi et al. 1997).

The presence of longnose suckers in this headwater lake upstream from barriers on lower Puport Creek that restrict char and trout populations is an anomaly for fish distribution in the Owen Watershed. A possible explanation for their presence may be that originally this lake was accessible to other species from Owen Creek, and longnose suckers were the only species able to tolerate the low dissolved oxygen levels in the lake during the winter (Degisi et al. 1997). Alternatively, the longnose suckers present in Tsalitpn Lake may have been introduced into this lake. We suggest that it is unlikely that the longnose sucker population in Tsalitpn Lake is the result of some unique zoogeographical event that would qualify it for regionally significant status under the Forest Practices Code.

Longnose suckers captured during this study ranged in size from 58 to 128 mm fork length for all of the sites combined. Gillnet surveys in Tsalitpn Lake in 1996 indicated that the lake population had a mean fork length of 184 mm and that some of the fish achieved a size of 440 mm. This was based on a sample size of 100 fish.

4.2.6.5 Prickly Sculpins, Redside Shiners and Lake Chub

The above three fish species together comprised 6.6% of the overall catch of fish in the Owen Watershed. These species were all present in the lower end of OW23 near Owen Lake. Prickly sculpins were also present in lower Klate Creek. Prickly sculpins and redside shiners have been present in samples in upper Owen Creek near the outlet of Owen Lake in past years (Tredger 1981 to 1987)

4.3 AMPHIBIAN OBSERVATIONS

Observations of amphibians during the surveys are summarized in Table 5. The data indicates that amphibians were encountered fairly infrequently in the study streams. Most amphibians were captured in minnow trap sets in ponds and wetland sites.

[19] BC Provincial Museum lake survey.

Long-toed salamanders (*Ambystoma macrodactylum*) were the most widely distributed of the amphibians encountered and were identified at six locations. The larval stage of the long-toed salmander were most often encountered in tributaries on the east side of Owen Creek, including OW2, OW9, OW16, and RI2. They were also present in the outlet of Klate Lake. Fish were not present at any of the sites where long-toed salamanders were sampled.

Western spotted frogs (*Bufo boreas*) were observed at sites in OW9 and OW13, also on the east side of Owen Creek.

No tailed frogs were observed during the surveys.

Insert Table 5 - Amphibians

4.4 STREAM CROSSINGS - POTENTIAL RESTORATION SITES

Potential fish passage difficulties related to poor culvert installations were identified at eight locations in the watershed. Additional assessments are needed at OW13 and OW16 to determine whether the culverts should be removed or replaced with structures that will allow juvenile and adult access. The following sites were identified:

OW2 - This culvert restricts fry and juvenile upstream movements. The 1.6 m diameter 26 m long culvert is installed at a 2% slope. We assume adult steelhead are able to pass upstream at this culvert due to the presence of age 0+ fry upstream. *Recommendation - this structure should eventually be replaced with a bridge. It is a point of difficult passage - but steelhead do get past it at present.*

OW3 - Two 1 m diameter culverts with a 1 m drop at the outlet are present at this location. The two culverts located at the mainline road crossing pose a barrier to fish movement upstream. Dolly Varden and steelhead juveniles were present below the culvert but not above it. There is potentially 400 m of fish habitat above the culvert. *High priority for replacement*.

PU1 - This 1 m diameter 18 m long culvert has a 20 cm drop at the outlet. We suspect this culvert is not passable to juveniles. However, impassable beaver dams are located just upstream and a resident fish population is present above the crossing. *Recommendation - remove culvert as road is not being used.*

OW13 - There is a 0.5 m drop at the culvert outlet. The habitat upstream from this crossing was not assessed during the 1998 surveys. *Recommendation - there is need to determine how much potential habitat exists upstream prior to recommending culvert replacement.*

OW14 - This culvert has a 1 m diameter and is 19 m long with no drop at the outlet and a 4 m high road fill. We suspect that this culvert restricts juvenile upstream movements in this high value fish stream. Suspected steelhead fry were captured upstream from the culvert, indicating adult passage does occur. There is extensive fish habitat upstream from this culvert. *Recommendation - this culvert should be replaced with a bridge due to the extensive and important fish habitat upstream.*

OW16 - The culvert on Emil Creek is impassable to fish. Potential habitat upstream is probably quite limited but has not been adequately assessed. *Recommendation - potential of upstream area needs to be assessed before any action taken at this crossing.*

Riddeck Creek - The culvert on the mainline road is 1.2 m diameter by 26 m long. It may be a problem for juvenile fish upstream passage due to its steep slope. Rainbow trout are present upstream from the culvert. As well, the two 0.6 m culverts at the upstream crossing at Site 79 also may restrict juvenile movements.

Recommendation - long-term plan should include replacing this crossing with a structure that allows for fish passage.

4.5 SITES WITH PAST LOGGING AND CATTLE IMPACTS

The following sites were identified during the field studies as areas that have been impacted by poor logging practices:

OW2 - Collapsed bridge structure at Site 5. No fish are present in this section.

OW8 - The old logged setting extends to the left bank of this Dolly Varden creek. There are debris problems associated with this logging.

PU1 - Logging to the edge of this creek occurred along several cutblocks including in the vicinity of Site 21 and Site 22. Dolly Varden and rainbow trout are present in this creek.

PU1.1 - This small unmapped tributary is located in the middle of an old cutblock and has been logged across. Dolly Varden spawn in this creek.

OW22 - Wrinch Creek - Sediment inputs directly into creek from mainline road after heavy rains.

The following sites were identified during the field studies as areas that have been impacted by cattle grazing. In all cases, the impacts were bank erosion problems associated with cattle in streams:

OW7 - Site 15; **Riddeck Creek** - Site 79; **Riddeck Creek** - Site 88.

4.6 RECOMMENDED ADDITIONAL SAMPLING

The new road crossing locations on **OW20** and **OW21** should be sampled as access improves to these locations to confirm that fish are not present in the vicinity of proposed cutblocks 364-2 and 365-1. Access to these streams was poor and streamflows were low during the summer of 1998. A chute at 560 m upstream on OW21 was not confirmed as a barrier, since sampling was not conducted upstream. These creeks have been classified as suspected S6 in their upper sections, but additional sampling should confirm this classification.

Several sites were classified as suspected fish habitat, despite not catching fish during sampling. These sites were judged to be accessible from Owen Creek and to have suitable habitat to support fish. Additional sampling would be required to downgrade the stream classifications for **OW6** (Site 12); **OW14.1** (Reach 2); and **OW 14.1.1** (Reach 1). Similarly **Klate Lake** has been classified as suspected fish habitat despite no fish

captured on two occasions. At present, a 2 m beaver dam restricts fish from accessing this lake from areas immediately downstream.

5.0 CONCLUSIONS

The 95 fish and habitat sample sites conducted in the Owen Watershed during the summer of 1998, in conjunction with ground observations and information from past studies, provides an excellent database for delineating fish distribution and developing riparian classifications for the watershed[20]. Some of the key conclusions from the studies include the following:

- Fish were present at 28 of the 95 sites examined. Most of the tributaries on the east side of Owen Lake were not used by fish due to barriers in their lower reaches. Several of the tributaries on the west side of Owen Creek provide important fish habitat for a mix of fish species. Steelhead, resident rainbow trout and Dolly Varden were the main fish species encountered during the studies. No bull trout were encountered at any of the study sites.

- Steelhead were present throughout Owen Creek and the lower sections of five tributaries: OW2; OW3; OW9; Puport Creek and OW14. Rainbow trout were present in four Owen Lake inlet tributaries including Klate, Riddeck, Emil and Peter Aleck creeks. Dolly Varden were widely dispersed throughout the watershed and were present at 21 sample sites. Owen Creek is one of the most significant steelhead tributaries to the Morice River. The 12 km of mainstem habitat in Owen Creek provides the most critical spawning and rearing areas for steelhead in the watershed. As well, the presence of newly-emerged steelhead fry and juveniles in the lower ends of five tributary streams indicates that these tributaries together constitute an additional 5 km of steelhead habitat. Sampling at mainstem Owen index sites indicates that this creek continues to produce high densities of steelhead fry and parr. The parr estimates derived in 1998 were higher than estimates from seven previous years.

- Resident rainbow trout in the Owen Watershed appear to be mainly associated with lake inlet tributaries. The lower reaches of Peter Aleck Creek appear to be important spawning areas for rainbow trout based on abundant newly-emerged fry at the two sample sites established in this system. Other potential spawning sites include the outlet of Owen Lake and the lower reach of Klate Creek. We suspect that most rainbow trout spend several years rearing in the lake inlet streams and then enter Owen Lake. Resident adult rainbow were not captured in the inlet streams.

- Dolly Varden were present throughout the mainstem of Owen Creek and in many of the larger tributaries on the west side of the Owen Watershed flowing from Nadina

[20] Excluding the mid and upper reaches of Peter Aleck Creek.

Mountain. Dolly Varden in the Owen Watershed are mainly stream residents that do not achieve sizes much larger than 15 cm fork length. Eight potential spawning sites were identified in this study, including several very small headwater seepage tributaries. Dolly Varden juvenile densities in the mainstem of Owen Creek were comparable to those measured at index sites since 1980.

- Juvenile coho salmon were not captured in the Owen Watershed during the 1998 field studies, and have not been present at juvenile index sites since 1983. The decline in coho numbers is emphasized by sample information collected in the mid-reaches of Owen Creek in 1969, when coho juveniles comprised over 90% of the juvenile catch. Owen Creek used to be an important spawning tributary for coho, but surveys indicate coho spawner numbers have been very low since 1975, with the exception of 1980. In addition to excellent habitat in the mainstem of Owen Creek, Tributary OW14 was identified as an area offering good potential coho spawning and rearing habitat.

- Cutthroat trout were associated with the upper reaches of OW14 and Upper Klate Lake. We suspect that cutthroat were introduced into the lake.

6.0 RECOMMENDATIONS

The Owen Watershed comprises important fish habitat, particularly for Morice River steelhead trout. Historical data indicates that it also has high potential for coho production, and the mainstem and tributary habitat should be managed to maintain production potential for these two species.

Changes to water temperature and sediment related to forestry and agricultural activities are two habitat aspects of particular concern in Owen Creek. Summer water temperatures in the mainstem creek are at the upper limits for productive trout rearing, and small increases in water temperatures in this system could make it less attractive for trout and salmon rearing and more suited for species such as longnose dace. Careful attention to good riparian management in this watershed is essential to maintain cool water temperatures.

The moderating influence of Owen Lake on the flow regime of Owen Creek also means this system has a low potential to deal with sediment inputs. The watershed has a history of sediment problems related to road construction on both sides of the mainstem creek. Sediment from poor management practices will tend to concentrate in key spawning locations in the lower sections of tributaries and in the low gradient, low-energy mainstem creek. Potential sediment impacts are a lesser concern on the east side tributaries upstream from lakes and pond habitats.

A number of specific stream impacts resulting from poor crossing structures, faulty cutblock layout, and cattle grazing were identified during this study. These concerns,

particularly culvert crossings on the lower end of Owen Creek tributaries, should be addressed.

Peter Aleck Creek may be the most important rainbow trout and Dolly Varden spawning tributary to Owen Lake based on sampling results from two sites in the lower reaches. This tributary should be inventoried, and logging operations designed to ensure fisheries values in this creek are protected.

Proposed logging operations on the west side of Owen Lake should take into account the recreational opportunities associated with angling for cutthroat trout in Upper Klate Lake. This lake is presently accessed by trail from a lodge on Owen Lake.

Further sampling should be conducted on two tributary streams (OW20 and OW21) to ensure that these creeks have been properly classified at the proposed stream crossings. Access to the crossing sites was poor during the 1998 field season.

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SECTION 2 - FISH SUMMARIES AND STREAM SURVEY FORMS

Owen Creek Fish Collection Data Form - 1998

Stream Name	Watershed Code	Date	Reach #	Site #	Area (m*m)	Water Temp (^{0}C)	Cond. (μ mhos)	Capture Method	Pass/ Trap #	Spp.	Maturity	FL (mm)	Activity	Comments
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	DV	F	45	R	+ Several Pacific lamprey
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	DV	F	47	R	ammocoetes.
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	DV	F	52	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	DV	F	53	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	DV	F	54	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	DV	J	70	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	DV	J	82	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	DV	J	90	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	DV	J	103	R	DNA sample taken.
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	DV	J	112	R	DNA sample taken.
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	DV	A	124	R	DNA sample taken.
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	DV	A	130	R	Maturing, DNA sample taken
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	DV	A	140	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	DV	A	145	R	DNA sample taken.
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	F	37	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	F	38	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	F	38	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	F	42	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	F	42	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	F	43	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	F	44	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	F	44	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	F	48	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	F	48	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	F	48	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	F	49	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	F	51	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	F	52	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	F	56	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	J	69	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	J	75	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	J	75	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	J	76	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	J	79	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	J	79	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	J	83	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	J	83	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	J	84	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	J	88	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	J	90	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	J	90	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	J	97	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	J	100	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	J	101	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	J	101	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	J	109	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	J	111	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	J	112	R	

Owen Creek Fish Collection Data Form - 1998

Stream Name	Watershed Code	Date	Reach #	Site #	Area (m*m)	Water Temp (^{0}C)	Cond. (μ mhos)	Capture Method	Pass/ Trap #	Spp.	Maturity	FL (mm)	Activity	Comments
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	J	118	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	RB	J	119	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	LND	F	35	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	LND	F	38	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	1	LND	J	55	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	2	DV	J	76	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	2	DV	J	82	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	2	DV	J	82	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	2	DV	J	83	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	2	DV	A	145	R	Maturing.
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	2	DV	A	157	R	Maturing.
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	2	RB	F	40	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	2	RB	F	42	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	2	RB	F	44	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	2	RB	F	50	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	2	RB	F	51	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	2	RB	F	51	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	2	RB	F	52	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	2	RB	F	52	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	2	RB	J	75	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	2	RB	J	78	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	2	RB	J	79	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	2	RB	J	80	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	2	RB	J	81	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	2	RB	J	84	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	2	RB	J	85	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	2	RB	J	87	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	2	RB	J	90	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	2	RB	J	95	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	2	RB	J	97	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	4	IN1	159	18.5	80	EL	2	LND	F	27	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	DV	F	38	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	DV	F	44	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	DV	F	48	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	DV	F	49	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	DV	F	50	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	DV	F	51	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	DV	J	73	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	DV	J	84	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	MW	F	75	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	MW	J	114	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	MW	J	120	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	MW	J	126	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	MW	J	128	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	MW	J	129	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	30	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	30	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	30	R	

Owen Creek Fish Collection Data Form - 1998

Stream Name	Watershed Code	Date	Reach #	Site #	Area (m*m)	Water Temp (^0C)	Cond. (u mhos)	Capture Method	Pass/ Trap #	Spp.	Maturity	FL (mm)	Activity	Comments
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	31	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	31	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	33	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	33	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	33	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	34	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	34	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	35	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	35	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	36	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	36	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	37	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	38	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	38	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	38	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	38	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	38	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	38	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	38	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	38	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	38	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	39	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	39	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	40	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	41	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	41	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	41	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	41	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	41	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	41	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	41	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	41	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	42	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	43	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	43	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	44	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	44	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	44	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	45	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	45	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	45	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	45	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	45	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	46	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	46	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	46	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	46	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	46	R	

Stream Name	Watershed Code	Date	Reach #	Site #	Area (m*m)	Water Temp (^{0}C)	Cond. (u mhos)	Capture Method	Pass/ Trap #	Spp.	Maturity	FL (mm)	Activity	Comments
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	47	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	47	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	47	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	48	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	48	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	48	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	50	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	50	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	50	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	50	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	51	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	51	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	51	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	51	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	52	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	52	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	52	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	53	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	53	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	53	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	F	58	R	+ 13 RB fry nm.
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	J	67	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	J	73	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	J	74	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	J	75	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	J	76	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	J	77	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	J	77	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	J	78	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	J	81	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	J	81	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	J	81	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	J	83	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	J	85	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	J	85	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	J	88	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	J	90	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	J	95	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	J	96	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	J	98	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	J	100	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	J	117	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	J	121	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	J	128	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	RB	J	132	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	F	29	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	F	31	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	F	33	R	

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Stream Name	Watershed Code	Date	Reach #	Site #	Area (m*m)	Water Temp (^{0}C)	Cond. (u mhos)	Capture Method	Pass/ Trap #	Spp.	Maturity	FL (mm)	Activity	Comments
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	F	33	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	F	34	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	F	34	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	F	34	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	F	35	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	F	35	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	F	38	R	+ 5 LND fry nm.
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	J	43	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	J	43	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	J	44	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	J	46	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	J	47	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	J	48	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	J	48	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	J	48	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	J	48	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	J	50	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	J	51	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	J	51	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	J	52	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	J	52	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	J	52	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	J	52	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	J	53	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	J	53	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	J	53	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	J	53	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	J	53	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	J	57	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	J	57	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	J	69	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	J	88	R	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	1	LND	J	97	R	+ 39 LND juv. nm.
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	2	RB	J	62	62	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	2	RB	J	72	72	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	2	RB	J	75	82	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	2	RB	J	76	76	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	2	RB	J	77	81	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	2	RB	J	77	75	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	2	RB	J	81	77	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	2	RB	J	82	90	
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	2	RB	J	83	83	+ 24 RB fry nm on P2.
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	2	RB	J	89	89	+ 8 LND fry nm on P2.
Owen Creek	460-6006-239-000-000-000-000	13/08/1998	5	IN2	155.5	18.5	70	EL	2	RB	J	90	77	+ 25 LND juv. nm on P2.
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	F	32	R	Supect these RB
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	F	32	R	are mainly SST.
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	F	32	R	+80 RB fry nm.
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	F	32	R	

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Stream Name	Watershed Code	Date	Reach #	Site #	Area (m*m)	Water Temp (^{0}C)	Cond. (*u* mhos)	Capture Method	Pass/ Trap #	Spp.	Maturity	FL (mm)	Activity	Comments
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	F	33	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	F	33	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	F	33	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	F	33	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	F	33	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	F	34	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	F	34	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	F	34	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	F	35	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	F	35	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	F	36	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	F	37	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	F	38	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	F	38	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	F	38	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	F	39	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	F	39	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	F	39	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	F	39	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	F	42	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	J	58	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	J	68	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	J	72	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	J	72	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	J	72	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	J	73	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	J	73	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	J	75	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	J	77	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	J	77	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	J	78	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	J	80	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	J	82	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	J	83	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	J	84	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	J	90	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	J	93	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	J	106	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	J	107	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	J	120	R	Fish above the road
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	J	128	R	are not included.
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	J	143	R	
Owen Creek Trib.	460-6006-239-130-000-000-000	30/06/1998	1	2	84	14	160	EL	1	RB	J	182	R	Suspected RB due to spots.
Owen Creek Trib.	460-6006-239-172-000-000-000	30/06/1998	1	8	56	10	nm	EL	1	RB	J	73	R	Supect these RB are
Owen Creek Trib.	460-6006-239-172-000-000-000	30/06/1998	1	8	56	10	nm	EL	1	DV	J	81	R	mainly SST.
Owen Creek Trib.	460-6006-239-172-000-000-000	30/06/1998	1	8	56	10	nm	EL	1	DV	J	83	R	+ 10 (RB/DV) escaped.
Owen Creek Trib.	460-6006-239-172-000-000-000	30/06/1998	1	8	56	10	nm	EL	1	RB	J	86	R	
Owen Creek Trib.	460-6006-239-172-000-000-000	30/06/1998	1	8	56	10	nm	EL	1	RB	J	96	R	

Owen Creek Fish Collection Data Form - 1998

Stream Name	Watershed Code	Date	Reach #	Site #	Area (m*m)	Water Temp (^{0}C)	Cond. (μmhos)	Capture Method	Pass/ Trap #	Spp.	Maturity	FL (mm)	Activity	Comments
Owen Creek Trib.	460-6006-239-172-000-000-000	30/06/1998	1	8	56	10	nm	EL	1	RB	J	107	R	
Owen Creek Trib.	460-6006-239-172-000-000-000	30/06/1998	1	8	56	10	nm	EL	1	DV	J	133	R	
Owen Creek Trib.	460-6006-239-172-000-000-000	30/06/1998	1	8	56	10	nm	EL	1	DV	J	148	R	
Owen Creek Trib.	460-6006-239-172-000-000-000	30/06/1998	1	8	56	10	nm	EL	1	DV	J	160	R	
Owen Creek Trib.	460-6006-239-OW8-000-000-000	01/07/1998	1	16	100.8	11	210	EL	1	DV	J	123	R	Suspected stream resident.
Owen Creek Trib.	460-6006-239-393-000-000-000	23/07/1998	1	18	105	8	140	EL	1	DV	F	33	R	
Owen Creek Trib.	460-6006-239-393-000-000-000	23/07/1998	1	18	105	8	140	EL	1	DV	F	35	R	
Owen Creek Trib.	460-6006-239-393-000-000-000	23/07/1998	1	18	105	8	140	EL	1	DV	F	36	R	
Owen Creek Trib.	460-6006-239-393-000-000-000	23/07/1998	1	18	105	8	140	EL	1	DV	F	37	R	
Owen Creek Trib.	460-6006-239-393-000-000-000	23/07/1998	1	18	105	8	140	EL	1	DV	F	41	R	
Owen Creek Trib.	460-6006-239-393-000-000-000	23/07/1998	1	18	105	8	140	EL	1	DV	F	53	R	
Owen Creek Trib.	460-6006-239-393-000-000-000	23/07/1998	1	18	105	8	140	EL	1	DV	J	86	R	
Owen Creek Trib.	460-6006-239-393-000-000-000	23/07/1998	1	18	105	8	140	EL	1	RB	F	32	R	
Owen Creek Trib.	460-6006-239-393-000-000-000	23/07/1998	1	18	105	8	140	EL	1	RB	F	34	R	
Owen Creek Trib.	460-6006-239-393-000-000-000	23/07/1998	1	18	105	8	140	EL	1	RB	F	35	R	
Owen Creek Trib.	460-6006-239-393-000-000-000	23/07/1998	1	18	105	8	140	EL	1	RB	F	36	R	
Owen Creek Trib.	460-6006-239-393-000-000-000	23/07/1998	1	18	105	8	140	EL	1	RB	F	36	R	
Owen Creek Trib.	460-6006-239-393-000-000-000	23/07/1998	1	18	105	8	140	EL	1	RB	J	75	R	
Puport C. Trib.	460-6006-239-433-225-000-000	02/07/1998	1	21	88.2	15	30	EL	1	DV	F	41	R	
Puport C. Trib.	460-6006-239-433-225-000-000	02/07/1998	1	21	88.2	15	30	EL	1	DV	J	96	R	
Puport C. Trib.	460-6006-239-433-225-000-000	02/07/1998	1	21	88.2	15	30	EL	1	DV	J	123	R	
Puport C. Trib.	460-6006-239-433-225-000-000	02/07/1998	2	22	63	17	30	EL	1	RB	J	66	R	
Puport C. Trib.	460-6006-239-433-225-000-000	02/07/1998	2	22	63	17	30	EL	1	RB	J	77	R	
Puport C. Trib.	460-6006-239-433-225-000-000	02/07/1998	2	22	63	17	30	EL	1	DV	J	82	R	
Puport C. Trib.	460-6006-239-433-225-000-000	02/07/1998	3	23		21	50	TRAP	1to8	DV	J	77	R	
Puport C. Trib.	460-6006-239-433-225-000-000	02/07/1998	3	23		21	50	TRAP	1to8	DV	J	78	R	
Puport C. Trib.	460-6006-239-433-225-000-000	02/07/1998	3	23		21	50	TRAP	1to8	DV	J	98	R	
Puport C. Trib.	460-6006-239-433- PU-1.1-000	02/07/1998	1	25	21	15	10	EL	1	DV	J	68	R	+ 3 DV fry & 4 juveniles.
Puport C. Trib.	460-6006-239-433- PU-1.1-000	02/07/1998	1	25	21	15	10	EL	1	DV	F	25	R	Fry was newly emerged.
Puport Creek	460-6006-239-433-000-000-000	03/07/1998	2	26	144	11	30	EL	1	RB	J	53	R	
Puport Creek	460-6006-239-433-000-000-000	03/07/1998	2	26	144	11	30	EL	1	RB	J	61	R	
Puport Creek	460-6006-239-433-000-000-000	03/07/1998	2	26	144	11	30	EL	1	RB	J	63	R	
Puport Creek	460-6006-239-433-000-000-000	03/07/1998	2	26	144	11	30	EL	1	RB	J	63	R	
Puport Creek	460-6006-239-433-000-000-000	03/07/1998	2	26	144	11	30	EL	1	RB	J	91	R	
Puport Creek	460-6006-239-433-000-000-000	03/07/1998	2	26	144	11	30	EL	1	RB	J	92	R	
Puport Creek	460-6006-239-433-000-000-000	03/07/1998	2	26	144	11	30	EL	1	RB	J	104	R	
Puport Creek	460-6006-239-433-000-000-000	03/07/1998	2	26	144	11	30	EL	1	RB	J	108	R	
Puport Creek	460-6006-239-433-000-000-000	03/07/1998	2	26	144	11	30	EL	1	RB	J	114	R	
Puport Creek	460-6006-239-433-000-000-000	03/07/1998	2	26	144	11	30	EL	1	RB	J	114	R	
Puport Creek	460-6006-239-433-000-000-000	03/07/1998	2	26	144	11	30	EL	1	RB	J	114	R	
Puport Creek	460-6006-239-433-000-000-000	03/07/1998	2	26	144	11	30	EL	1	DV	F	33	R	
Puport Creek	460-6006-239-433-000-000-000	03/07/1998	2	26	144	11	30	EL	1	DV	J	78	R	
Puport Creek	460-6006-239-433-000-000-000	03/07/1998	2	26	144	11	30	EL	1	DV	J	83	R	
Puport Creek	460-6006-239-433-000-000-000	03/07/1998	2	26	144	11	30	EL	1	DV	J	87	R	
Puport Creek	460-6006-239-433-000-000-000	03/07/1998	2	26	144	11	30	EL	1	DV	J	92	R	
Puport Creek	460-6006-239-433-000-000-000	03/07/1998	2	26	144	11	30	EL	1	DV	J	98	R	
Puport Creek	460-6006-239-433-000-000-000	03/07/1998	2	26	144	11	30	EL	1	DV	J	100	R	
Puport Creek	460-6006-239-433-000-000-000	06/07/1998	5	28	209	20.5	100	EL	1	LSU	J	97	R	+ 12 juvenile LSU caught

Owen Creek Fish Collection Data Form - 1998

Stream Name	Watershed Code	Date	Reach #	Site #	Area (m*m)	Water Temp (^{0}C)	Cond. (μ mhos)	Capture Method	Pass/ Trap #	Spp.	Maturity	FL (mm)	Activity	Comments
Puport Creek	460-6006-239-433-000-000-000	06/07/1998	5	28	209	20.5	100	EL	1	LSU	J	102	R	upstream along lake shore.
Puport Creek	460-6006-239-433-000-000-000	06/07/1998	5	28	209	20.5	100	EL	1	LSU	J	110	R	
Puport Creek	460-6006-239-433-000-000-000	06/07/1998	5	28	209	20.5	100	EL	1	LSU	J	125	R	
Puport Creek	460-6006-239-433-000-000-000	06/07/1998	5	28	209	20.5	100	EL	1	LSU	J	127	R	
Puport C. Trib.	460-6006-239-433-PU2-000-000	02/07/1998	1	29	95	13	30	EL	1	DV	F	59	R	
Puport C. Trib.	460-6006-239-433-PU2-000-000	02/07/1998	1	29	95	13	30	EL	1	DV	F	61	R	
Puport C. Trib.	460-6006-239-433-PU2-000-000	02/07/1998	1	29	95	13	30	EL	1	DV	F	63	R	
Puport C. Trib.	460-6006-239-433-PU2-000-000	02/07/1998	1	29	95	13	30	EL	1	DV	J	68	R	
Puport C. Trib.	460-6006-239-433-PU2-000-000	02/07/1998	1	29	95	13	30	EL	1	DV	J	82	R	
Puport C. Trib.	460-6006-239-433-PU2-000-000	02/07/1998	1	29	95	13	30	EL	1	DV	J	85	R	
Puport C. Trib.	460-6006-239-433-PU2-000-000	02/07/1998	1	29	95	13	30	EL	1	DV	J	91	R	
Puport C. Trib.	460-6006-239-433-PU2-000-000	02/07/1998	1	29	95	13	30	EL	1	DV	J	93	R	
Puport C. Trib.	460-6006-239-433-PU2-000-000	02/07/1998	1	29	95	13	30	EL	1	DV	J	102	R	
Puport C. Trib.	460-6006-239-433-PU2-000-000	02/07/1998	1	29	95	13	30	EL	1	DV	J	129	R	+ 3 DV that escaped.
Puport C. Trib.	460-6006-239-433-PU2-000-000	03/07/1998	1	30	108	11	20	EL	1	DV	F	60	R	+ 1 DV that escaped.
Owen Creek Trib.	460-6006-239-594-000-000-000	01/07/1998	1	38	126	17	50	EL	1	RB	F	28	R	+ Several Pacific lamprey
Owen Creek Trib.	460-6006-239-594-000-000-000	01/07/1998	1	38	126	17	50	EL	1	RB	F	32	R	ammocoetes.
Owen Creek Trib.	460-6006-239-594-000-000-000	01/07/1998	1	38	126	17	50	EL	1	RB	J	78	R	
Owen Creek Trib.	460-6006-239-594-000-000-000	01/07/1998	1	38	126	17	50	EL	1	RB	J	81	R	
Owen Creek Trib.	460-6006-239-594-000-000-000	01/07/1998	1	38	126	17	50	EL	1	RB	J	92	R	
Owen Creek Trib.	460-6006-239-594-000-000-000	01/07/1998	1	38	126	17	50	EL	1	RB	J	98	R	
Owen Creek Trib.	460-6006-239-594-000-000-000	01/07/1998	1	38	126	17	50	EL	1	RB	J	110	R	
Owen Creek Trib.	460-6006-239-594-000-000-000	01/07/1998	1	38	126	17	50	EL	1	RB	J	113	R	
Owen Creek Trib.	460-6006-239-594-000-000-000	01/07/1998	1	38	126	17	50	EL	1	RB	J	120	R	
Owen Creek Trib.	460-6006-239-594-000-000-000	01/07/1998	1	38	126	17	50	EL	1	DV	J	120	R	
Owen Creek Trib.	460-6006-239-594-000-000-000	01/07/1998	1	38	126	17	50	EL	1	DV	J	155	R	
Owen Creek Trib.	460-6006-239-594-000-000-000	01/07/1998	1	38	126	17	50	EL	1	MW	J	90	R	
Owen Creek Trib.	460-6006-239-594-000-000-000	01/07/1998	1	38	126	17	50	EL	1	MW	J	92	R	
Owen Creek Trib.	460-6006-239-594-000-000-000	01/07/1998	1	38	126	17	50	EL	1	LND	J	114	R	
Owen Creek Trib.	460-6006-239-594-000-000-000	07/07/1998	5	41	65.7	13	60	EL	1	CT	J	82	R	
Owen Creek Trib.	460-6006-239-594-000-000-000	07/07/1998	5	41	65.7	13	60	EL	1	CT	J	86	R	
Owen Creek Trib.	460-6006-239-594-000-000-000	07/07/1998	5	41	65.7	13	60	EL	1	DV	J	89	R	
Owen Creek Trib.	460-6006-239-594-000-000-000	27/07/1998	6	42	56	21	60	EL	1	CT	J	85	R	Also angled 2 (25-35 cm)
Owen Creek Trib.	460-6006-239-594-000-000-000	27/07/1998	6	42	56	21	60	EL	1	CT	J	88	R	CT upstream in lake.
Owen Creek Trib.	460-6006-239-594-000-000-000	27/07/1998	6	42	56	21	60	EL	1	CT	J	91	R	
Owen Creek Trib.	460-6006-239-594-000-000-000	27/07/1998	6	42	56	21	60	EL	1	CT	J	97	R	
Owen Creek Trib.	460-6006-239-594-000-000-000	27/07/1998	6	42	56	21	60	EL	1	CT	J	97	R	
Owen Creek Trib.	460-6006-239-594-000-000-000	27/07/1998	6	42	56	21	60	EL	1	CT	J	103	R	
Owen Creek Trib.	460-6006-239-594-000-000-000	27/07/1998	6	42	56	21	60	EL	1	DV	J	107	R	
Owen Creek Trib.	460-6006-239-594-000-000-000	27/07/1998	8	43	65	7	50	EL	1	DV	F	29	R	
Owen Creek Trib.	460-6006-239-594-000-000-000	27/07/1998	8	43	65	7	50	EL	1	DV	F	33	R	
Owen Creek Trib.	460-6006-239-594-000-000-000	27/07/1998	8	43	65	7	50	EL	1	DV	F	33	R	
Owen Creek Trib.	460-6006-239-594-000-000-000	27/07/1998	8	43	65	7	50	EL	1	DV	F	61	R	
Owen Creek Trib.	460-6006-239-594-000-000-000	27/07/1998	8	43	65	7	50	EL	1	DV	J	71	R	
Owen Creek Trib.	460-6006-239-594-000-000-000	27/07/1998	8	43	65	7	50	EL	1	DV	J	72	R	
Owen Creek Trib.	460-6006-239-594-000-000-000	27/07/1998	8	43	65	7	50	EL	1	DV	J	102	R	DNA sample taken.
Owen Creek Trib.	460-6006-239-594-000-000-000	27/07/1998	8	43	65	7	50	EL	1	DV	J	103	R	DNA sample taken.
Owen Creek Trib.	460-6006-239-594-000-000-000	27/07/1998	8	43	65	7	50	EL	1	DV	J	119	R	DNA sample taken.

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Stream Name	Watershed Code	Date	Reach #	Site #	Area (m*m)	Water Temp (^{0}C)	Cond. (μ mhos)	Capture Method	Pass/ Trap #	Spp.	Maturity	FL (mm)	Activity	Comments
Owen Creek Trib.	460-6006-239-594-000-000-000	27/07/1998	8	43	65	7	50	EL	1	DV	J	119	R	DNA sample taken.
Owen Creek Trib.	460-6006-239-594-000-000-000	27/07/1998	8	43	65	7	50	EL	1	DV	J	121	R	DNA sample taken.
Owen Creek Trib.	460-6006-239-594- OW-14.-1	02/07/1998	1	44		18	30	TRAP	1to9	RB	J	77	R	
Owen Creek Trib.	460-6006-239-594- OW-14.-1	02/07/1998	1	44		18	30	TRAP	1to9	RB	J	77	R	
Owen Creek Trib.	460-6006-239-594- OW-14.-1	02/07/1998	1	44		18	30	TRAP	1to9	RB	J	80	R	
Owen Creek Trib.	460-6006-239-594- OW-14.-1	02/07/1998	1	44		18	30	TRAP	1to9	RB	J	84	R	
Owen Creek Trib.	460-6006-239-594- OW-14.-1	02/07/1998	1	44		18	30	TRAP	1to9	RB	J	88	R	
Owen Creek Trib.	460-6006-239-594- OW-14.-1	02/07/1998	1	44		18	30	TRAP	1to9	RB	J	91	R	
Owen Creek Trib.	460-6006-239-594- OW-14.-1	02/07/1998	1	44		18	30	TRAP	1to9	RB	J	92	R	
Owen Creek Trib.	460-6006-239-594- OW-14.-1	02/07/1998	1	44		18	30	TRAP	1to9	RB	J	97	R	
Owen Creek Trib.	460-6006-239-594- OW-14.-1	02/07/1998	1	44		18	30	TRAP	1to9	RB	J	98	R	
Owen Creek Trib.	460-6006-239-594- OW-14.-1	02/07/1998	1	44		18	30	TRAP	1to9	RB	J	99	R	
Owen Creek Trib.	460-6006-239-594- OW-14.-1	02/07/1998	1	44		18	30	TRAP	1to9	RB	J	107	R	
Owen Creek Trib.	460-6006-239-594- OW-14.-1	02/07/1998	1	44		18	30	TRAP	1to9	RB	J	111	R	
Owen Creek Trib.	460-6006-239-594- OW-14.-1	02/07/1998	1	44		18	30	TRAP	1to9	DV	J	82	R	
Owen Creek Trib.	460-6006-239-594- OW-14.-1	02/07/1998	1	44		18	30	TRAP	1to9	DV	J	89	R	
Owen Creek Trib.	460-6006-239-594- OW-14.-1	02/07/1998	1	44		18	30	TRAP	1to9	DV	J	92	R	
Owen Creek Trib.	460-6006-239-594- OW-14.-1	02/07/1998	1	44		18	30	TRAP	1to9	DV	J	92	R	
Owen Creek Trib.	460-6006-239-594- OW-14.-1	02/07/1998	1	44		18	30	TRAP	1to9	DV	J	93	R	
Owen Creek Trib.	460-6006-239-594- OW-14.-1	02/07/1998	1	44		18	30	TRAP	1to9	DV	J	98	R	
Owen Creek Trib.	460-6006-239-594- OW-14.-1	02/07/1998	1	44		18	30	TRAP	1to9	DV	J	103	R	
Emil Creek	460-6006-239-699-000-000-000	24/07/1998	1	50	38.5	12	110	EL	1	DV	J	95	R	
Emil Creek	460-6006-239-699-000-000-000	24/07/1998	1	50	38.5	12	110	EL	1	DV	J	97	R	
Emil Creek	460-6006-239-699-000-000-000	24/07/1998	1	50	38.5	12	110	EL	1	RB	J	84	R	
Emil Creek	460-6006-239-699-000-000-000	24/07/1998	1	50	38.5	12	110	EL	1	RB	J	88	R	
Emil Creek	460-6006-239-699-000-000-000	24/07/1998	1	50	38.5	12	110	EL	1	RB	J	90	R	
Emil Creek	460-6006-239-699-000-000-000	24/07/1998	1	50	38.5	12	110	EL	1	RB	J	99	R	
Klate Creek	460-6006-239-712-000-000-000	04/07/1998	1	54	95.7	14	90	EL	1	RB	F	24	R	Newly emerged fry.
Klate Creek	460-6006-239-712-000-000-000	04/07/1998	1	54	95.7	14	90	EL	1	RB	F	60	R	
Klate Creek	460-6006-239-712-000-000-000	04/07/1998	1	54	95.7	14	90	EL	1	RB	F	66	R	
Klate Creek	460-6006-239-712-000-000-000	04/07/1998	1	54	95.7	14	90	EL	1	RB	J	68	R	+ Several RB juv's escaped.
Klate Creek	460-6006-239-712-000-000-000	04/07/1998	1	54	95.7	14	90	EL	1	RB	J	68	R	
Klate Creek	460-6006-239-712-000-000-000	04/07/1998	1	54	95.7	14	90	EL	1	RB	J	72	R	
Klate Creek	460-6006-239-712-000-000-000	04/07/1998	1	54	95.7	14	90	EL	1	RB	J	77	R	
Klate Creek	460-6006-239-712-000-000-000	04/07/1998	1	54	95.7	14	90	EL	1	RB	J	83	R	
Klate Creek	460-6006-239-712-000-000-000	04/07/1998	1	54	95.7	14	90	EL	1	RB	J	87	R	
Klate Creek	460-6006-239-712-000-000-000	04/07/1998	1	54	95.7	14	90	EL	1	RB	J	92	R	
Klate Creek	460-6006-239-712-000-000-000	04/07/1998	1	54	95.7	14	90	EL	1	RB	J	93	R	
Klate Creek	460-6006-239-712-000-000-000	04/07/1998	1	54	95.7	14	90	EL	1	RB	J	95	R	
Klate Creek	460-6006-239-712-000-000-000	04/07/1998	1	54	95.7	14	90	EL	1	RB	J	97	R	
Klate Creek	460-6006-239-712-000-000-000	04/07/1998	1	54	95.7	14	90	EL	1	RB	J	98	R	
Klate Creek	460-6006-239-712-000-000-000	04/07/1998	1	54	95.7	14	90	EL	1	RB	J	99	R	
Klate Creek	460-6006-239-712-000-000-000	04/07/1998	1	54	95.7	14	90	EL	1	CAS	J	91	R	
Klate Creek	460-6006-239-712-000-000-000	04/07/1998	1	54	95.7	14	90	EL	1	CAS	J	97	R	
Klate Creek	460-6006-239-712-000-000-000	04/07/1998	1	54	95.7	14	90	EL	1	CAS	J	100	R	
Klate Creek	460-6006-239-712-000-000-000	04/07/1998	1	54	95.7	14	90	EL	1	CAS	J	113	R	
Klate Creek	460-6006-239-712-000-000-000	07/07/1998	3	55	127.3	8	90	EL	1	DV	F	42	R	+ 1 DV juv that escaped.
Klate Creek	460-6006-239-712-000-000-000	07/07/1998	3	55	127.3	8	90	EL	1	DV	J	77	R	

Owen Creek Fish Collection Data Form - 1998

Stream Name	Watershed Code	Date	Reach #	Site #	Area (m*m)	Water Temp (^{0}C)	Cond. (μmhos)	Capture Method	Pass/ Trap #	Spp.	Maturity	FL (mm)	Activity	Comments
Klate Creek	460-6006-239-712-000-000-000	07/07/1998	3	55	127.3	8	90	EL	1	DV	J	88	R	
Klate Creek	460-6006-239-712-000-000-000	07/07/1998	3	55	127.3	8	90	EL	1	DV	J	141	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	LKC	J	94	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	LKC	J	129	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	RSC	J	66	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	RSC	J	72	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	RSC	J	72	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	RSC	J	75	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	RSC	J	77	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	RSC	J	77	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	RSC	J	78	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	RSC	J	79	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	RSC	J	80	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	RSC	J	81	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	LSU	J	63	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	LSU	J	63	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	LSU	J	64	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	LSU	J	71	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	LSU	J	75	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	LSU	J	78	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	LSU	J	79	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	LSU	J	100	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	LSU	J	119	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	LSU	J	128	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	F	59	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	J	71	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	J	71	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	J	73	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	J	74	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	J	74	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	J	78	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	J	78	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	J	78	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	J	79	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	J	80	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	J	80	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	J	81	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	J	84	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	J	86	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	J	88	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	J	90	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	J	91	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	J	91	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	J	92	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	J	94	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	J	94	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	J	95	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	J	96	R	

Owen Creek Fish Collection Data Form - 1998

Stream Name	Watershed Code	Date	Reach #	Site #	Area (m*m)	Water Temp (^{0}C)	Cond. (μmhos)	Capture Method	Pass/ Trap #	Spp.	Maturity	FL (mm)	Activity	Comments
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	J	97	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	J	98	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	J	99	R	
Owen Creek Trib.	460-6006-239-594- OW-23 -000	13/07/1998	1	65		15	120	TRAP	1to10	CAS	J	101	R	
Riddeck Creek	460-6006-239- OW-26.-1 -000	08/07/1998	1	78	144	10.5	70	EL	1	RB	J	138	R	+ 3 other fish that escaped.
Riddeck Creek	460-6006-239- OW-26.-1 -000	08/07/1998	1	78	144	10.5	70	EL	1	LSU	J	92	R	
Riddeck Creek	460-6006-239- OW-26.-1 -000	08/07/1998	1	78		10.5	70	TRAP	1	LSU	J	109	R	
Riddeck Creek	460-6006-239- OW-26.-1 -000	08/07/1998	1	78		10.5	70	TRAP	1	LSU	J	110	R	
Riddeck Creek	460-6006-239- OW-26.-1 -000	16/07/1998	2	79	127.4	13	90	EL	1	RB	J	109	R	+ 2 RB escaped.
Riddeck Creek	460-6006-239- OW-26.-1 -000	16/07/1998	2	79	127.4	13	90	EL	1	RB	J	111	R	
Riddeck Creek	460-6006-239- OW-26.-1 -000	16/07/1998	2	79	127.4	13	90	EL	1	RB	J	114	R	
Riddeck Creek	460-6006-239- OW-26.-1 -000	16/07/1998	2	79	127.4	13	90	EL	1	RB	J	123	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	07/07/1998	3	92	266	15	50	EL	1	RB	F	22	R	+ Numerous RB fry nm.
Peter Aleck Ck.	460-6006-239-956-000-000-000	07/07/1998	3	92	266	15	50	EL	1	RB	F	22	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	07/07/1998	3	92	266	15	50	EL	1	RB	F	24	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	07/07/1998	3	92	266	15	50	EL	1	RB	F	25	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	07/07/1998	3	92	266	15	50	EL	1	RB	F	26	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	07/07/1998	3	92	266	15	50	EL	1	RB	F	26	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	07/07/1998	3	92	266	15	50	EL	1	RB	F	50	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	07/07/1998	3	92	266	15	50	EL	1	RB	F	64	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	07/07/1998	3	92	266	15	50	EL	1	RB	J	69	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	07/07/1998	3	92	266	15	50	EL	1	RB	J	74	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	07/07/1998	3	92	266	15	50	EL	1	RB	J	77	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	07/07/1998	3	92	266	15	50	EL	1	RB	J	98	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	07/07/1998	3	92	266	15	50	EL	1	DV	F	37	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	07/07/1998	3	92	266	15	50	EL	1	DV	F	41	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	07/07/1998	3	92	266	15	50	EL	1	DV	F	43	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	07/07/1998	3	92	266	15	50	EL	1	DV	F	46	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	07/07/1998	3	92	266	15	50	EL	1	DV	J	93	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	05/07/1998	3	93	205.2	16.5	60	EL	1	RB	F	26	R	+ Numerous RB fry nm.
Peter Aleck Ck.	460-6006-239-956-000-000-000	05/07/1998	3	93	205.2	16.5	60	EL	1	RB	F	26	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	05/07/1998	3	93	205.2	16.5	60	EL	1	RB	F	26	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	05/07/1998	3	93	205.2	16.5	60	EL	1	RB	F	27	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	05/07/1998	3	93	205.2	16.5	60	EL	1	RB	F	27	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	05/07/1998	3	93	205.2	16.5	60	EL	1	RB	F	29	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	05/07/1998	3	93	205.2	16.5	60	EL	1	RB	J	58	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	05/07/1998	3	93	205.2	16.5	60	EL	1	RB	J	80	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	05/07/1998	3	93	205.2	16.5	60	EL	1	RB	J	80	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	05/07/1998	3	93	205.2	16.5	60	EL	1	RB	J	81	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	05/07/1998	3	93	205.2	16.5	60	EL	1	RB	J	90	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	05/07/1998	3	93	205.2	16.5	60	EL	1	RB	J	111	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	05/07/1998	3	93	205.2	16.5	60	EL	1	RB	J	114	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	05/07/1998	3	93	205.2	16.5	60	EL	1	RB	J	119	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	05/07/1998	3	93	205.2	16.5	60	EL	1	RB	J	128	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	05/07/1998	3	93	205.2	16.5	60	EL	1	DV	J	79	R	
Peter Aleck Ck.	460-6006-239-956-000-000-000	05/07/1998	3	93	205.2	16.5	60	EL	1	DV	J	83	R	

Owen Creek Fish Collection Data Form - 1998

Stream Name	Watershed Code	Date	Reach #	Site #	Area (m*m)	Water Temp (^{0}C)	Cond. (μmhos)	Capture Method	Pass/ Trap #	Spp.	Maturity	FL (mm)	Activity	Comments

Notes: - Sampling was conducted by Dave Bustard and Associates (C87).
- nm = not measured
- Area sampled was not available for the minnow trapping sites.
- All DNA specimens were sent to, Susan Pollard, BC Fisheries Fish Geneticist, Victoria.

Crew Summary:
Dave Bustard
Rob Dams
Catherine Portman
Dean Allen

SECTION 3 - PHOTODOCUMENTATION

PHOTO SURVEY FORM 1 - Equipment Details

Survey start date (yyyy/mm/dd)**:** 29/06/1998 **Agency:** C087
Survey end date: 27/07/1998 **Crew:** DB/RD/CP/DA

CAMERA EX:

Make & model: kodak disposible	**Lens:** 35 mm
Format: 35 mm film	(focal length, mm)
Resolution (for digital and video cameras): n/a	
Output file type (for digital and video cameras): n/a	

CAMERA B:

Make and model: Pentax Zoom 90-WR Multi-AF	**Lens:** 38-90 mm zoom
Format: 35 mm film	(focal length, mm)
Resolution (for digital and video cameras): n/a	
Output file type (for digital and video cameras): n/a	

ROLL DETAILS:

Roll #'s	Camera #	Output Medium	For film cameras:	
			Film Type	ISO
EX	EX	negative	color	200
B1 - B10	B	negative	color	200