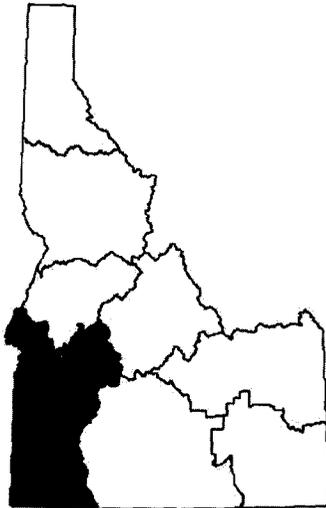


FISHERY MANAGEMENT INVESTIGATIONS



**IDAHO DEPARTMENT OF FISH AND GAME
FISHERY MANAGEMENT ANNUAL REPORT**

Cal Groen, Director



SOUTHWEST REGION - NAMPA

2002

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2002 SOUTHWEST REGION – NAMPA FISHERY MANAGEMENT REPORT

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2002 SOUTHWEST REGION - NAMPA FISHERY MANAGEMENT REPORT

State of: Idaho

Program: Fisheries Management F-71-R-27

Project I: Surveys and Inventories

Subproject I-D: Southwest Region

Job No.: a

Title: Mountain Lakes Investigation

Period Covered: July 1, 2002 to June 30, 2003

ABSTRACT

No mountain lake sampling was conducted in the Southwest Region in 2002.

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2002 SOUTHWEST REGION - NAMPA FISHERY MANAGEMENT REPORT

State of: Idaho

Program: Fisheries Management F-71-R-27

Project I: Surveys and Inventories

Subproject I-D: Southwest Region

Job No.: b

Title: Lowland Lakes Investigations

Contract Period: July 1, 2002 to June 30, 2003

ABSTRACT

Brownlee Reservoir was surveyed in June 2002 using standardized lowland lakes sampling gear. Game fish captured included white crappie *Pomoxis annularis*, black crappie *P. nigromaculatus*, brown bullhead *Ameiurus nebulosus*, channel catfish *Ictalurus punctatus*, smallmouth bass *Micropterus dolomieu*, yellow perch *Perca flavescens*, rainbow trout *Oncorhynchus mykiss*, bluegill *Lepomis macrochirus*, and pumpkinseed *L. gibbosus*. Non-game fish captured included common carp *Cyprinus carpio*, bridgelip sucker *Catostomus columbianus*, largescale sucker *C. macrocheilus* and chiselmouth chub *Acrocheilus alutaceus*. Electrofishing catch per unit effort (CPUE) for all warm water game-fish, except white crappie, was lower in 2002 than in past lowland lake samples.

Paddock Valley Reservoir was sampled in May 2002 with experimental gill nets, trap nets, and electrofishing. Game fish captured included bluegill, largemouth bass *M. salmoides*, black crappie, brown bullhead, and rainbow trout. No non-game fish were sampled. Twelve percent of the largemouth bass in the electrofishing sample were ≥ 300 mm, and 5% were ≥ 360 mm. In 1999, 25% were ≥ 300 mm and 14% were ≥ 360 mm.

Riddle area lakes sampled in June 2002 included Shoofly, Bybee, Grasmere, Payne Creek, and Little Blue Creek reservoirs. Lake sampling included experimental gill nets, trap nets, and angling. Game fish captured included Lahontan cutthroat trout *O. clarkii henshawi*, and bluegill; non-game fish captured included bridgelip sucker, and redbreast shiner *Richardsonius balteatus*. The total catch at Shoofly, Bybee, and Grasmere reservoirs had a higher percentage of Lahontan cutthroat trout than in 1999.

Claytonia Pond was sampled with experimental gill nets in April to monitor the abundance of common carp. Non-game fish sampled included common carp, and largescale suckers. One carp and two largescale suckers were collected in three hours of gillnetting. One largemouth bass and one bluegill were also collected. Carp abundance in Claytonia Pond remains very low.

Redtop Pond was sampled by electrofishing on May 15, primarily to collect and transport warm water fish to a new urban pond in Boise. A total of 152 fish were sampled, including largemouth bass, bluegill, pumpkinseed, brown bullhead, and black crappie. Largemouth bass

comprised 10% of the catch with a size range of 130 to 455 mm. A total of 70 bluegill and 25 brown bullheads were transported to Redwood Park Pond in Boise.

West Veterans Pond and the surrounding property, formerly owned by Consolidated Concrete, were acquired by the city of Boise in 2002 as an addition to the city parks system. The pond was surveyed by electrofishing on July 16, 2002. A total of 117 fish were sampled, including largemouth bass, bluegill, black crappie, yellow perch, and common carp. Once public access is provided, this pond will provide additional warm water fishing opportunity in Boise.

Boat electrofishing was used in June to conduct a Peterson mark recapture population estimate of largemouth bass in Crane Falls Lake. The population estimate of largemouth bass >150 mm was 5,284 (95% CI: 4,301 < N < 6,266). Our observed largemouth bass CPUE was the highest recorded since 1992. Estimates of fish density and standing stock were approximately three times the estimates made in 1991.

Zooplankton samples were taken from Lucky Peak, Arrowrock, C.J. Strike, and Deadwood reservoirs in 2002. A slight increase in the zooplankton quality index (ZQI - a measure that includes zooplankton abundance and size) was observed in Lucky Peak, Arrowrock, and Deadwood reservoirs from 2001 to 2002. The C.J. Strike Reservoir ZQI results were substantially lower at all sample sites than in 2001.

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OBJECTIVES

1. Use standardized sampling methods to describe fish population trends in regional lakes and reservoirs.
2. Assess the current largemouth bass population in Crane Falls Lake, including abundance, standing stock, and size structure.
3. Use standardized methods to assess zooplankton size structure trends in C.J. Strike, Lucky Peak, Arrowrock, and Deadwood reservoirs.

METHODS

Standardized Lowland Lake Surveys

Gill netting was done using floating and sinking experimental nets. Experimental gill nets were 45.7 m long by 1.8 m deep, and were composed of 6 - 7.6 m panels of 1.9, 2.5, 3.2, 3.8, 5.2, and 6.4 cm bar mesh. Nets were set in late afternoon and pulled the following morning. Nets were set by tying or anchoring one end of the net near or on shore in water less than 0.5 m deep and extending the net perpendicular to shore. When more than one floating or one sinking net was used per water, nets were set to alternate large and small mesh ends next to the shore. One unit of gill net effort was defined as one floating and one sinking experimental gill net fished overnight. Catch per unit effort (CPUE) was expressed as the combined catch, by number and weight, for one pair of nets. (Hereafter, gill net catch refers to combined catch from one floating and one sinking experimental gill net.)

Short term gill net sets consist of one pair of floating, and sinking gill nets set for one to several hours. In this case CPUE was expressed as the combined catch, by number and weight, for one pair of experimental nets, per hour.

Trap netting was conducted using standard trap nets composed of two light steel frames measuring 1.8 m x 0.9 m, covered with 19 mm square black mesh, with five 76 cm steel round hoops with crow foot throats on the first and third hoops, and with 23 m long lead lines 0.9 to 1.3 m in height. Trap nets were set on shallow sloping areas with the top of the steel frame within 0.3 m of the water surface and the lead lines tied to shore. Trap nets were set late in the afternoon and pulled the following morning. One unit of trap net effort was defined as one trap net fished overnight. Trap net CPUE was expressed as the catch of one trap net, by number and weight, per night.

Electrofishing was conducted from a boom-mounted electrofishing boat. Netting of immobilized fish was conducted with one or two netters. Electrofishing was conducted along shorelines. Attempts were made to collect all immobilized fish. Unless otherwise noted, electrofishing was conducted at night. Electrofishing CPUE was expressed as catch, by number and weight, per hour of activated electrode time.

Brownlee Reservoir

A lowland lake survey was conducted June 3-5 using 2 h of electrofishing, three trap nets, and five pairs of floating and sinking gill nets. All sampling in Brownlee Reservoir was conducted between Dennett Creek and Brownlee Creek. Sampling sites were chosen in the general area of previous fish collections. Netting locations included; near Swedes Landing, near Sturgill Creek, near the Powder River arm, and in the Brownlee Creek arm. Electrofishing was conducted on the north and south banks near Swedes Landing, the Idaho side near the Powder River arm, the first island near Brownlee Creek on the Oregon side, and the Brownlee Creek arm.

Paddock Reservoir

A lowland lake survey was conducted May 28 using one h of electrofishing, four trap nets, and three pairs of floating and sinking gill nets. Sampling occurred throughout the reservoir.

Riddle Lakes

Shoofly, Bybee, Grasmere, Payne Creek, and Little Blue Creek Reservoirs were sampled with gill nets and trap nets on June 12-13 to monitor hatchery Lahontan cutthroat trout and nongame fish populations. One pair of floating and sinking gill nets and one trap net were set overnight in each reservoir.

Angling was conducted on Bybee, Grasmere, Little Blue Creek, and Shoofly Reservoirs using flies and lures. One hour of angling was equal to one unit of effort.

Claytonia Pond

Claytonia Pond was sampled to monitor abundance of common carp with three pairs of floating and sinking gill nets on April 25 for three hours. The gill nets were set along the north, south, and west shorelines.

Redtop Pond

Redtop Pond was sampled on May 15 by boat electrofishing for a total of 45 minutes of energized field time to collect and stock warm water game fish in a new Boise urban pond (Redwood Pond).

West Veterans Pond

West Veterans Pond was acquired by the City of Boise in 2002. No previous data had been collected on this pond. On July 16 it was sampled for fifteen minutes of energized field time by boat electrofishing to document fish species composition.

Crane Falls Lake Population Estimate

Considerable effort has been invested in monitoring the largemouth bass population in Crane Falls Lake. The largemouth bass fishery has been managed with a trophy regulation (2 per day, none under 508 mm) since 1990. Increasing concern about the quantity and quality of the fishery prompted closer examination in 2002. Because several population estimates have been conducted in Crane Falls over the last 25 years, we chose to reevaluate the fishery and follow the methods used in 1991 by Dillon (1992). The resulting data were compared to population estimates or size structure indices completed in 1977 (Mallet and Reid 1978), 1991 (Dillon 1992), 1992 (Allen et al. 1995), 1994 (Allen et al. 2000a), 1997 (Allen et al. 2000b), 1998 (Allen et al. 2001), and 2001 (Flatter et al. in press).

Boat electrofishing was used to conduct a Peterson mark recapture population estimate. Mark and recapture runs were conducted one week apart, June 20 and June 27, respectively. Water surface temperature and conductivity was 23°C and 1340 mS, respectively, at 2000 h on June 20. Two boats were used; an electrofishing boat with two netters and a boat containing a three-man fish marking crew. The entire shoreline was sampled using approximately ten 20-minute collection periods during mark and recapture events.

During the marking runs, all fish species were collected for the first 71.5 min of shocking, after which only largemouth bass were collected. All fish during the marking runs were weighed and measured to the nearest g and mm (total length), respectively. Only lengths of largemouth bass were recorded during the recapture runs. Largemouth bass were marked in the caudal fin with a standard paper hole punch. Although all healthy bass collected during the marking period were marked, the population estimate was limited to bass >150 mm based on size selectivity and recapture ratios reported by Dillon (1992). Because of the trophy regulation, we assumed that largemouth bass harvest between the mark and recapture runs was negligible.

Standardized Zooplankton Surveys

Zooplankton samples were collected from Lucky Peak (3 sites), Arrowrock (3 sites), and C.J. Strike Reservoir (5 sites) on August 6-8, and Deadwood Reservoir (3 sites) on September 12, 2002. Samples were collected and processed following the standardized methods developed by Teuscher (1999). Samples were collected with vertical tows using three plankton nets with different mesh sizes (153 μ , 500 μ , and 750 μ). Samples from C.J. Strike, Lucky Peak, and Arrowrock Reservoirs were weighed on August 20, and samples from Deadwood were weighed on October 3. Zooplankton weights in each sample were used to derive an index of zooplankton size structure (zooplankton ratio; ZPR) and an index of both size structure and abundance (zooplankton quality index; ZQI) for each sampling location.

RESULTS AND DISCUSSION

Standardized Lowland Lake Surveys

A summary of sampling effort by gear type for each water is provided in Appendix A. Catch data by location, gear type, and species are provided in Appendix B. Length frequencies and relative weights of sampled fish are provided in Appendix C.

Brownlee Reservoir

Brownlee Reservoir was within 3 m of full pool during the sampling effort, and the water temperature was 21° C at 2200 h. The weather during fish collection efforts was predominantly clear skies, with light winds.

A total of 1,427 fish were sampled by electrofishing, gill netting, and trap netting combined (Appendix B). Captured game fish included smallmouth bass, bluegill, pumpkinseed, black crappie, white crappie, yellow perch, hatchery rainbow trout, wild rainbow trout, brown bullhead, and channel catfish. Non-game species collected included bridgelip sucker, largescale sucker, chiselmouth, and common carp.

Electrofishing, gill netting, and trap netting accounted for 53% (754 fish), 46% (659 fish), and 1% (14 fish) of the total catch, respectively. Catch composition for the last three lowland lake surveys (1996, 1999, and 2002) suggests that relative abundance can vary widely over time in Brownlee Reservoir (Figure 1), and there are few obvious trends over this time period. An exception is white crappie, which increased from 2% of the catch in 1996 to 5% in 1999 and 12% in 2002. During this same time frame, bluegill and pumpkinseeds declined from 34% of the catch in 1996 to 11% in 1999 and 8% in 2002.

Electrofishing CPUE for all warm water game-fish, except white crappie, was lower in 2002 than in past lowland lake samples (Table 1; Appendix B). White crappie had a higher CPUE in 2002 than in the 1999 sample, but still substantially lower than either 1995, or 1996. Smallmouth bass CPUE was similar to the 1995 sample, but much lower than 1996, and half the 1999 sample.

Smallmouth bass were the predominant game-fish sampled, comprising 52% of the total fish caught, an increase from 1996 (43%), and 1999 (33%). Electrofishing, gill netting, and trap netting accounted for 563, 178, and one smallmouth bass, respectively (Appendix B). Lengths of smallmouth bass ranged from 65 - 665 mm, with a mean of 230 mm. Weights of smallmouth bass ranged from 10-1390 g, with a mean of 174 g. Proportional stock density for 2002 was 9.72 similar to 1996 when PSD was 8.89 (Allen et. al. 1999), but lower than 1999 when PSD was 17.06 (Flatter and Allen 2001).

White crappie made up 12% of the total catch (Appendix B), higher than in 1996 (2%), and 1999 (5%). A total of 171 white crappie were sampled with electrofishing and gill netting combined. Lengths ranged from 110 - 345 mm, with a mean of 254 mm. A total of 90 white crappie were captured in 1999 with a mean length of 181 mm (Flatter and Allen, 2001). Mean relative weight (W_r), and PSD were higher in 2002 than in 1999 (Table 2).

A total of 78 black crappie were collected, 6% of the total catch (Appendix B). Lengths ranged from 85 - 270 mm, with a mean of 163 mm. Mean relative weight was 115, down from both 1996, and 1999 samples. Proportional stock density was higher than previous years at 82 (Table 2).

Bluegill electrofishing CPUE decreased from 1999 (50%), and 1996 (92%) (Table 1, Appendix B). Lengths ranged from 50 to 230 mm, with a mean of 163 mm. Mean relative weight was comparable to previous samples, but PSD was much greater at 98 (Table 2).

Channel catfish comprised 8% of the total catch by number (Appendix B), which was similar to 1999, and greater than in 1996. Lengths ranged from 250 - 660 mm, with a mean length of 471 mm. Weights ranged from 170 – 3,200 g with a mean of 1,284 g. Mean W_r was higher than previous samples at 111, while PSD was lower than both 1996 and 1999 (Table 2).

Rainbow trout comprised 1% of the total catch (Appendix B). Lengths ranged from 195 - 545 mm, with a mean of 316 mm. Weights ranged from 140 – 1,400 g, with a mean of 533 g.

Paddock Valley Reservoir

Paddock Reservoir was less than half-full as a result of continued drought conditions, and water temperature was 21°C at 2145 h. The weather during collection efforts was clear with light winds.

Game fish sampled (n=471) included largemouth bass, bluegill, brown bullhead, black crappie, pumpkinseed, and rainbow trout (Appendix B). There were no non-game fish sampled. Electrofishing, gill netting, and trap netting accounted for 72% (337 fish), 25% (117 fish), and 3% (17 fish) of the total catch, respectively.

Largemouth bass electrofishing CPUE by number was 161 (Appendix B), down from 652 in 1999, and comparable to 1998 when electrofishing CPUE was 136 (Flatter and Allen, 2001). Largemouth bass comprised 46% (217 fish) of the total catch. Lengths for largemouth bass sampled by electrofishing and gill netting ranged from 85 - 450 mm, and PSD was 15.6. The 2002 PSD was 25% of the 1999 value, but greater than the 1996 value (Table 3).

Bluegill electrofishing CPUE by number was 158 (Appendix B), down from 1,924 in 1999, and the same as in 1998. Bluegill made up 40% (191 fish) of the total catch. Lengths for all bluegill sampled ranged from 30 - 260 mm, with a mean of 205 mm. Lengths from 1999 ranged from 30 - 240 mm, with a mean of 61 mm (Flatter and Allen, 2001). Very few bluegill less than 100 mm were collected or observed.

Brown bullhead made up 6% of the total catch (Appendix B). Lengths ranged from 215-360 mm, with a mean of 320 mm. The mean weight for brown bullhead sampled by electrofishing was 930 g, compared to 707 g in 1999 (Flatter and Allen 2001).

Black crappie, pumpkinseed, and rainbow trout made up the remainder of the total catch at 4.6%, 1.7%, and 1%, respectively (Appendix B).

In response to information from irrigators that Paddock Valley Reservoir was to be drained by the end of September, a salvage order was enacted September 21. With consecutive years of drought conditions, irrigators expected the reservoir to be drained by the end of the month. The maximum depth on September 27 was 4.3 m, and the reservoir was divided into two pools separated by a bedrock shelf. The upper pool was very shallow and could not be accessed by boats larger than canoes. Because of the low water, boat ramps were un-usable and access was limited to the shoreline or by hand launching boats or canoes. The reservoir was not completely drained in 2002, however, and an evaluation of fish survival and abundance should be done in spring 2003.

Riddle Lakes

Shoofly, Bybee, and Grasmere reservoirs were sampled on June 12 and Payne Creek and Little Blue Creek reservoirs were sampled on June 13, 2002. Only Shoofly Reservoir was near full, all others were drawn down as a result of drought and irrigation demand. Water temperatures at the time of sampling were 16°C at 1100 h in Grasmere Reservoir, and 14°C at 1000 h in Payne Creek Reservoir.

In Shoofly Reservoir, a total of two bluegill and 24 Lahontan cutthroat trout were sampled (Appendices B, C). Bluegill represented 8%, and Lahontan cutthroat made up 92% of the total catch. In 1999, bluegill represented 52%, and Lahontan cutthroat 48% of the total catch by number (Flatter and Allen, 2001). Lahontan cutthroat trout ranged in length from 205-505 mm with a mean length of 377 mm. Mean length in 1999 was 385 mm. Lahontan cutthroat trout gill net CPUE by number was 24.0 (Appendix B), twice the 1999 CPUE by number (Flatter and Allen, 2001).

Shoofly Reservoir was angled on June 11 for a total of six hours. No fish were caught.

In Bybee Reservoir a total of 64 fish were captured (Appendices B, C). Lahontan cutthroat trout comprised 50% of the total catch. Bridgelip sucker made up the remainder of the total catch. Lengths for Lahontan cutthroat ranged from 260-750 mm, with a mean of 460 mm. Mean length was similar to 1999 (473 mm), and greater than 1995 (337 mm). The gill net CPUE was 19, similar to the 1999 rate, and approximately one-half the 1995 rate. Lengths for bridgelip sucker ranged from 165 - 355 mm, with a mean of 292 mm. Lengths in 1999 ranged from 150-330 mm, with mean of 242 mm. Trap netting, and gillnetting CPUE by number for bridgelip sucker in 1999 was 3 and 50, respectively (Flatter and Allen, 2001), while trap netting and gillnetting CPUE by number in 2002 was 3 and 20, respectively (Appendix A).

A total of 19 Lahontan cutthroat trout were caught in 31 hours of angling in Bybee Reservoir on June 13, and June 20. The June 13 angling effort resulted in 11 fish caught in 17 hours for a catch rate of 0.65 fish/h. Angling on June 20 resulted in 8 fish caught in 14 hours for a catch rate of 0.57 fish/h. Mean lengths for Lahontan cutthroat trout sampled by gill nets, and trap nets was 485 mm, and the mean length for those sampled by angling was 488 mm, suggesting there was not a substantial difference in size selectivity among sampling methods.

Grasmere Reservoir was very turbid at the time of sampling, and water level was approximately 1.8 m from full pool. The water surface temperature was 16°C at 1100 h. A total of 51 fish were captured, including Lahontan cutthroat trout, bridgelip sucker, and redbreast shiner (Appendices B, C). Lahontan cutthroat trout comprised 69% of the total catch by number, a significant increase from the 10% measured in 1999 (Flatter and Allen, 2001). Lengths ranged from 160 - 500 mm, with a mean of 331 mm. In 1999, the observed length range was 245 - 445 mm, but the mean was similar at 335 mm. The 2002 CPUE by number for trap net, and gill net was 9 and 13, respectively. In 1999, the trap net and gill net CPUE by number was 4 and 26, respectively (Flatter and Allen, 2001). Bridgelip suckers represented 31% of the total catch by number, a significant decrease from 90% in 1999. Bridgelip sucker lengths ranged from 170 - 320 mm, with a mean of 242 mm, very similar to 1999 results.

Six hours of angling effort was expended on Grasmere Reservoir June 10, 2002. No Lahontan cutthroat trout were caught.

In Payne Creek Reservoir only 2 fish were sampled, a 400 mm Lahontan cutthroat trout, and a 290 mm bridgelip sucker. Payne Creek Reservoir was extremely low due to continued drought conditions. Sampling occurred in the upper end of the reservoir and at mid-reservoir.

In Little Blue Creek Reservoir a total of 30 fish were sampled (Appendices B, C). Two species were collected, Lahontan cutthroat trout, and Bridgelip sucker. Lahontan cutthroat trout were sampled only in gill nets; none were captured in trap nets. Lahontan cutthroat comprised 30% of the total catch. In 1999, a total of 132 fish were sampled, of which 68% were bridgelip sucker, and 32% Lahontan cutthroat trout (Flatter and Allen, 2001). Lahontan cutthroat trout lengths ranged from 175 - 535 mm with a mean of 406 mm. In 1999 lengths ranged from 170-700 mm with a mean of 300 mm. The CPUE by number for gillnetting on Lahontan cutthroat trout was 9, down from 40 in 1999 (Flatter and Allen, 2001).

Little Blue Creek Reservoir was angled on June 12 and 13, for a total of 15 hours of effort. No fish were caught.

Claytonia Pond

Claytonia Pond was refilling on April 25, and was approximately 2 m from full. Secchi depth was 0.25 m and water temperature was 18°C. Only five fish were captured by gillnetting, including one common carp, one largemouth bass, one bluegill, and two largescale sucker (Appendices B, C). The carp was 325 mm and 600 g. No other carp were observed. There was no indication of carp recruitment, or invasion from the irrigation canal at this time.

Redtop Pond

A total of 152 fish were captured (Appendices B, C). Bluegill were the predominant fish sampled comprising 45% of the total catch, followed by pumpkinseed (24%), brown bullhead (17%), largemouth bass (10%), and black crappie (4%). Bluegill lengths ranged from 60 to 185 mm with an average of 139 mm, and the mean weight was 52 g. Bluegill CPUE by number was 92 fish. Brown bullhead lengths ranged from 150 to 330 mm with an average of 284 mm. Mean weight for brown bullhead was 413 g. Largemouth bass ranged in length from 130 mm to 455 mm with an average of 218 mm. Mean weight for largemouth bass was 259 g. Black crappie lengths ranged from 140 to 230 mm with a mean of 178 mm.

All bluegill (n = 69) and 25 of the brown bullhead collected were transported and released into Redwood Park Pond in Boise.

West Veterans Pond

West Veterans Pond is a small pond approximately 1 ha in size located along the Boise River in Boise. It is a gravel pit formerly used by Consolidated Concrete. In 2002 the City of Boise acquired this pond. This was the initial inventory of fish populations in this pond.

A total of 117 fish were sampled on July 16 using 15 minutes of electrofishing time (Appendices B, C). Largemouth bass comprised 46% of the total catch. Common carp, yellow perch, and black crappie comprised 37%, 12%, and 3% of the total catch, respectively.

Largemouth bass lengths ranged from 40 to 530 mm with a mean of 110 mm. Mean weight for largemouth bass in this pond was 562 g.

Bluegill ranged in length from 50 to 230 mm with a mean of 108 mm. Mean weight for bluegill was 31 g.

Sampling effort, CPUE by gear type, length frequency, and relative weight information appears in Appendices B, C, and D, respectively.

Crane Falls Lake Population Estimate

A total of 716 largemouth bass were marked in 2.9 h of activated electrofishing effort, of which 689 were >150 mm. Six fish were collected but not marked because they appeared to have been injured by electrofishing or handling. In 3.6 h of recapture effort, 582 largemouth bass were collected, of which, 566 were >150 mm, and 83 were recaptures >150 mm. Only one marked fish \leq 150 mm was recaptured. The mean total largemouth bass length was 240 mm. The length frequency for all unmarked fish captured can be found in Figure 3.

The electrofishing total CPUE by number was 241 and 155 largemouth bass/h during the mark and recapture periods, respectively. Our observed CPUE was the highest recorded since 1992 (Table 4).

The population estimate of largemouth bass >150 mm was 5,284 (95% CI: 4,301 < N < 6,266), which was approximately three times the number Dillon (1992) estimated in 1991 and twice what Mallet and Reid (1978) estimated in 1977 (Table 5). As a result, estimates of fish density and standing stock increased approximately threefold.

Nearly all length groups collected had mean relative weights which exceeded 100 (Figure 2).

Comparisons of largemouth bass length frequencies over time in Crane Falls Lake indicate numerous missing year-classes, which strongly suggest widely variable recruitment (Figure 3). More age-classes were represented in our 2002 catch than in the previous five lake surveys. Missing year-classes have also contributed to wide year-to-year variability in PSD (Table 6). Overall, our estimates of abundance, size structure, and condition suggest that the current largemouth bass population in Crane Falls is more robust than at any time in the last decade.

Standardized Zooplankton Surveys

An overall decrease in the zooplankton quality index (ZQI) was observed in C.J. Strike Reservoir between 2001 and 2002 (Table 7). A small increase in ZQI was observed at upper and lower sample sites for Lucky Peak Reservoir. In Arrowrock Reservoir, ZQI was higher at all sample sites than in 2001. Deadwood Reservoir ZQI results were higher in 2002 than in 1999.

The decrease in ZQI for C.J. Strike Reservoir between 2001 and 2002 may be partially explained by abundant phytoplankton collected in zooplankton tows in 2001. It was difficult to fully digest and remove all the phytoplankton from 2001 samples, which may have positively

biased sample weights for that year. Compared with the 2000 sample, however, ZQI values for 2002 were higher in four of five sites (Table 7).

We will continue to collect annual standardized zooplankton samples for at least these four waters. As the available data increase, we will examine relationships between zooplankton abundance and size structure and hydrologic conditions (drought, turnover). In Deadwood Reservoir, zooplankton monitoring will be important as management efforts to increase kokanee salmon continue.

MANAGEMENT RECOMMENDATIONS

Brownlee Reservoir

1. Repeat lowland lake survey in 2005 to monitor abundance and size structure of fish populations.

Paddock Reservoir

1. Conduct lowland lake survey in 2003 to assess impacts of drought.
2. Collect spot creel information in 2003, 2004 to assess impacts of drought periods of 2001, and 2002.

Claytonia Pond

1. Monitor common carp abundance in April and July of 2003.

Riddle Lakes

1. Re-survey Riddle Reservoirs in 2005 and continue to monitor bridgelip sucker abundance.
2. Inform anglers of opportunities in the Riddle area reservoirs.
3. Discontinue stocking Payne Creek Reservoir. This reservoir is frequently drawn down excessively, access is difficult, and there is poor survival of stocked fish.

Table 1. Electrofishing catch per unit effort (CPUE) for gamefish collected in Brownlee Reservoir, 1995-2002.

Species	CPUE			
	1995	1996	1999	2002
Black crappie	43.0	251.5	28.8	12.0
Bluegill	17.6	664.2	109.5	51.5
Channel catfish	1.4	1.0	2.1	0.5
Hatchery rainbow trout	0.7	0.0	1.4	2.0
Largemouth bass	0.7	2.0	0.7	0.0
Pumpkinseed	0.0	2.0	4.8	1.5
Smallmouth bass	225.4	773.5	348.4	281.5
White crappie	52.1	64.6	0.7	5.0
Wild redband trout	0.7	0.0	1.4	0.0
Yellow perch	2.1	26.8	10.3	7.0

Table 2. Proportional stock density (PSD), and mean relative weight (W_r) for gamefish sampled at Brownlee Reservoir 1996, 1999, and 2002.

Species	Year	PSD (%)	Mean W_r
Smallmouth bass	1996	9	97.5
	1999	17	85.1
	2002	10	104.4
Black crappie	1996	2	167.0
	1999	24	123.4
	2002	82	115.0
White crappie	1996	61	114.0
	1999	79	101.0
	2002	97	119.0
Channel catfish	1996	100	105.2
	1999	75	86.5
	2002	72	111.4
Bluegill	1996	14	163.0
	1999	12	134.0
	2002	98	144.0

Table 3. Proportional stock density (PSD), and mean relative weight (Wr) for Paddock Reservoir largemouth bass 1996, 1999, and 2002.

Date Sampled	Mean Length	Mean Weight	PSD %	Wr
May 23, 1996	264	299	3	123.4
May 18, 1999	206	377	61	118.9
May 28, 2002	271	314	16	108.1

Table 4. Mean and maximum lengths, mean weights, and total catch-per-unit-effort (CPUE) for largemouth bass collected while electrofishing in Crane Falls Lake between 1992 and 2002.

Year	Sample date	Mean Length in mm (SE)	Maximum Length (mm)	Mean Weight in g (SE)	CPUE (fish/h)
1992 ^a	Sept. 14	285 (n/a)	480	n/a	108
1994 ^b	May 11	266 (12)	n/a	442 (45)	105
1997 ^c	May 27	315 (12)	440	631 (39)	91
1998 ^d	June 10	243 (12)	423	358 (42)	139
2001 ^e	May 14	270 (13)	470	380 (59)	61
2002	June 20	240 (2)	470	316 (20)	241

^aAllen et al. 1995

^bAllen et al. 2000a

^cAllen et al. 2000b

^dAllen et al. 2001

^eFlatter et al. in press

Table 5. Comparison of largemouth bass density and biomass estimates for Crane Falls Lake. Standard errors of population estimates and density are presented in parentheses, if known.

Year	Population	Density		
		Bass/ha	kg/ha	Bass/ shoreline km
1977 ^a	2,167	57	17.7	657
1991 ^b	1,579 (162)	42 (4.3)	14.9	478
2002	5,284 (14.5)	148 (4.1)	47.0	1,822

^a Mallet and Reid 1978

^b Dillon 1992

Table 6. Crane Falls Reservoir historical Proportional Stock Density (PSD) values for largemouth bass caught while electrofishing.

Sample Date	Electrofishing effort (h)	Number of largemouth bass		PSD (%) ^a
		≥300 mm	≥200 mm	
4/28/92 ^b	0.33	21	35	60
5/11/94 ^c	0.66	36	53	68
5/27/97 ^d	1.0	63	68	92
6/10/98 ^e	0.59	38	54	70
5/14/01 ^f	0.75	16	36	44
6/20 and 6/27/02	6.5	192	950	20

^a Gabelhouse 1984

^b Allen et al. 1995

^c Allen et al. 2000a

^d Allen et al. 2000b

^e Allen et al. 2001

^f Flatter et al. in press

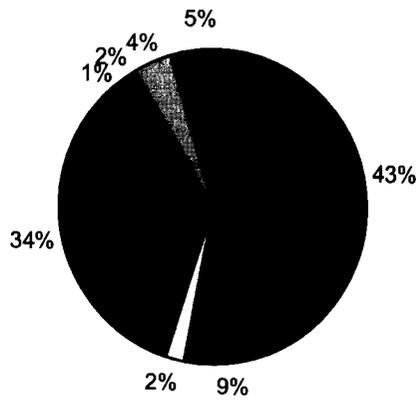
Table 7. Zooplankton tow values in grams per meter sampled, zooplankton ratio (ZPR), and zooplankton quantity index (ZQI) for reservoirs sampled in 1999, 2000, 2001, and 2002. Depth of all samples was 9.1 meters.

Water	Sample Location	Biomass (g/m)			ZPR 750 μ /500 μ	ZQI (500 μ +750 μ)ZPR
		153 μ	500 μ	750 μ		
C.J. Strike Res.	Snake Arm @ Crane Falls					
	1999	0.48	0.01	0.01	0	0
	2000	0.089	0.021	0.018	0.842	0.032
	2001	0.008	0.02	0.076	3.8	0.3648
	2002	0.033	0	0	0	0
	Snake Arm @ Powerline					
	1999	0.31	0.01	0.01	0	0
	2000	3.19	1.55	0.785	0.503	1.18
	2001	8.43	6.35	4.46	0.702	7.59
	2002	4.88	3.01	1.55	0.51	2.35
	Bruneau Arm					
	1999	2.51	0.63	0.33	0.53	0.5
	2000	2.21	0.671	0.322	0.479	0.476
	2001	4.22	2.78	2.94	1.06	6.06
	2002	0.97	0.53	0.61	1.17	1.33
	Bruneau Narrows					
	1999	2.89	0.98	0.51	0.52	0.78
	2000	1.422	0.679	0.430	0.633	0.701
	2001	4.47	2.19	1.07	0.48	1.58
	2002	1.28	0.94	0.57	0.60	0.92
	Near Dam					
	1999	1.29	0.46	0.24	0.52	0.36
	2000	0.91	0.18	0.14	0.784	0.25
	2001	3.02	1.08	0.5	0.46	0.72
2002	1.93	1	0.38	0.38	0.53	
Lucky Peak Res.	Upper					
	1999	1.2	0.65	0.25	0.39	0.35
	2000	0.926	0.936	0.582	0.622	0.944
	2001	0.14	0.07	0.03	0.4	0.04
	2002	1.11	0.83	0.63	0.75	1.10
	Middle					
	1999	0.9	0.42	0.28	0.66	0.46
	2000	0.323	0.232	0.223	0.962	0.44
	2001	0.81	0.63	0.58	0.93	1.12
	2002	0.52	0.27	0.25	0.92	0.48

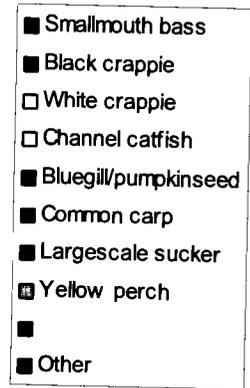
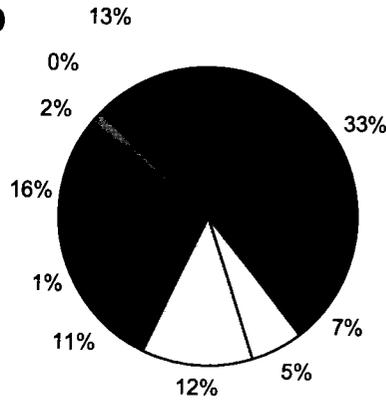
Table 7. continued

Water	Sample Location	Biomass (g/m)			ZPR	ZQI
		153μ/500μ/750μ			750μ/500μ	(500μ+750μ)ZPR
Lucky Peak Res.	Lower					
	1999	0.29	0.12	0.07	0.55	0.11
	2000	0.343	0.262	0.345	1.32	0.80
	2001	0.29	0.10	0.08	0.79	0.14
	2002	0.13	0.13	0.09	0.67	0.15
Arrowrock Res.	Upper					
	1999	0.45	0.43	0.25	0.59	0.4
	2000	0.54	0.30	0.195	0.65	0.32
	2001	0.36	0.24	0.17	0.72	0.30
	2002	0.37	0.22	0.22	1	0.44
	Middle					
	1999	0.59	0.46	0.36	0.79	0.65
	2000	0.148	0.166	0.124	0.75	0.22
	2001	0.52	0.28	0.18	0.65	0.30
	2002	0.63	0.32	0.21	0.65	0.35
	Lower					
	1999	1.12	0.87	0.7	0.81	1.27
2000	0.46	0.44	0.20	0.47	0.30	
2001	0.75	0.72	0.32	0.44	0.45	
2002	0.45	0.42	0.43	1.03	0.87	
Deadwood Res.	Upper					
	1999	0.59	0.5	0.14	0.37	0.25
	2002	0.56	0.46	0.24	0.51	0.36
	Middle					
	1999	0.74	0.68	0.25	0.37	0.35
	2002	0.26	0.19	0.28	1.5	0.71
	Dam					
	1999	0.67	0.54	0.26	0.49	0.39
	2002	0.27	0.32	0.30	0.92	0.57

1996



1999



2002

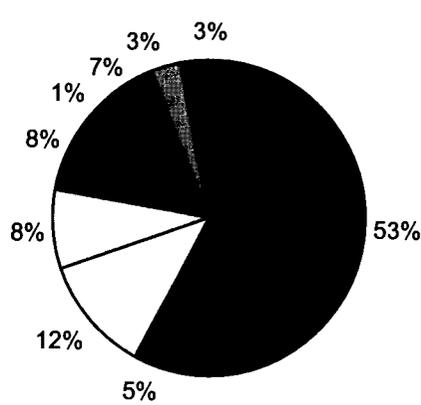


Figure 1. Catch composition by number for standardized lowland lake surveys in Brownlee Reservoir 1996, 1999, and 2002.

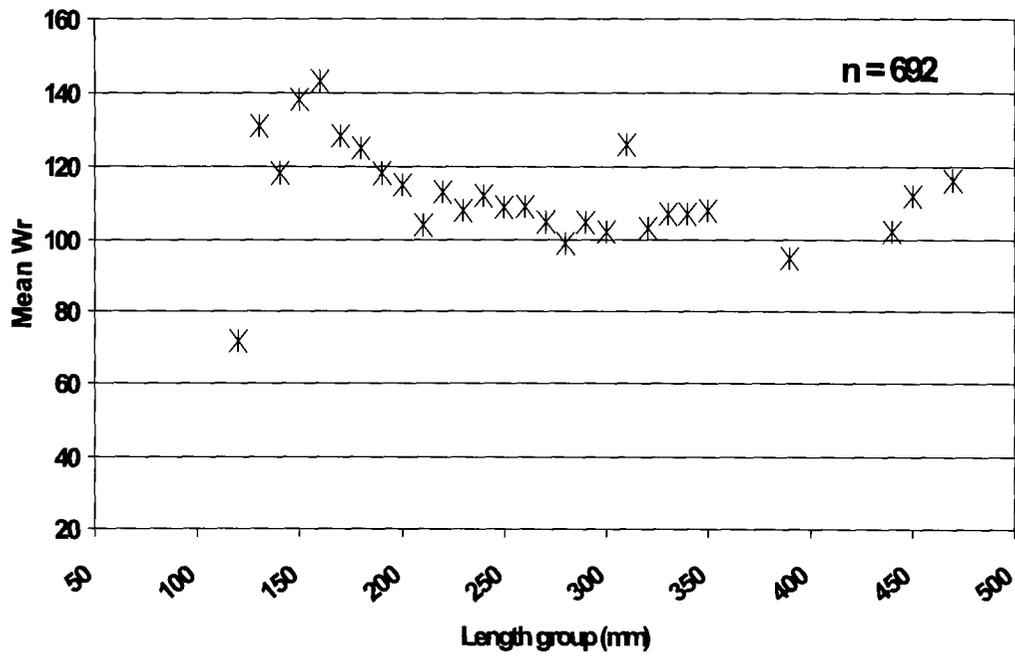


Figure 2. Mean relative weight (Wr) by length group for largemouth bass collected while electrofishing in Crane Falls Lake on June 20, 2002.

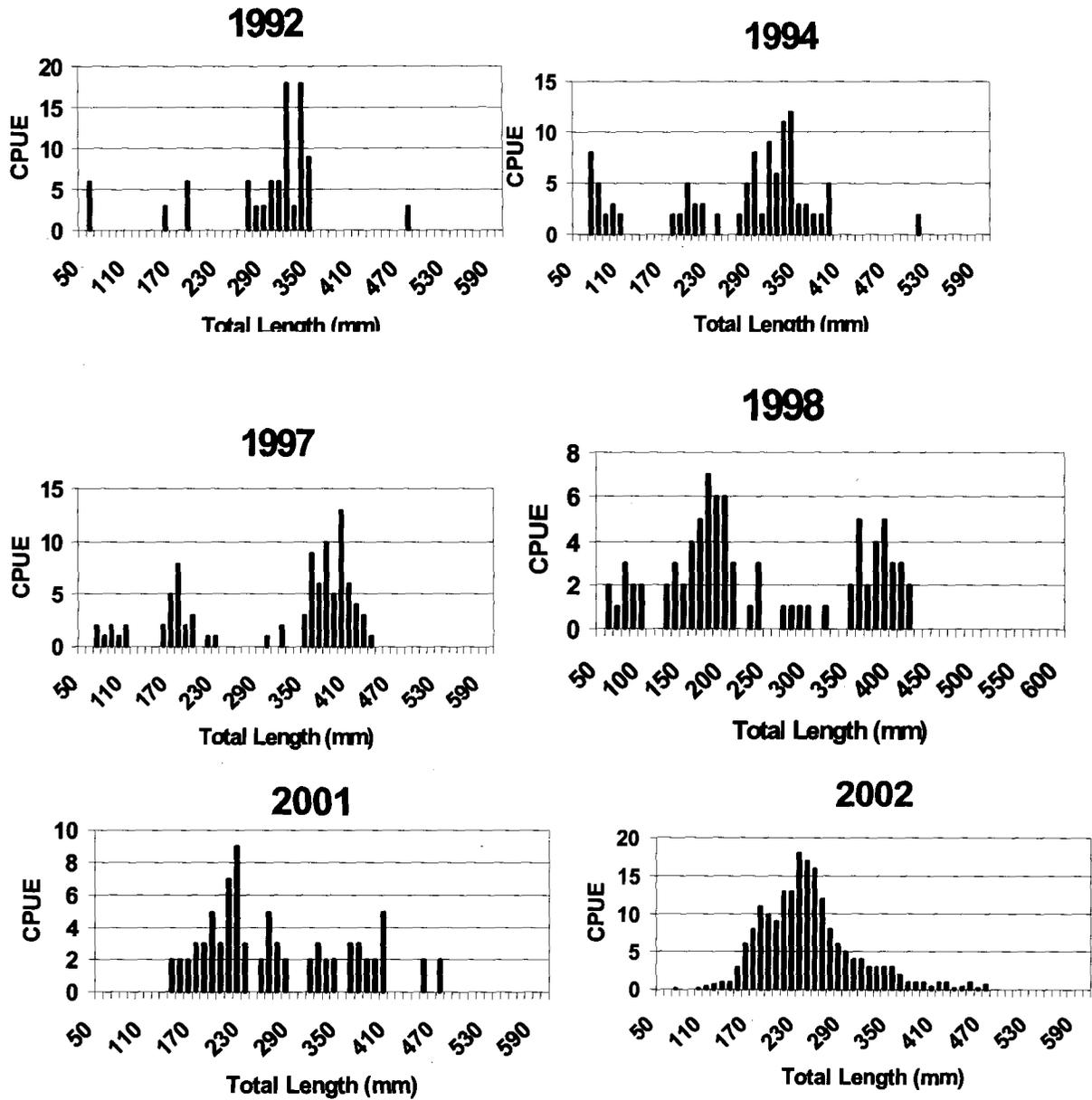


Figure 3. Largemouth bass catch-per-unit-effort (CPUE) by length group (mm) while electrofishing in Crane Falls Lake between 1992 and 2002.

2002 SOUTHWEST REGION – NAMPA FISHERY MANAGEMENT REPORT

State of: Idaho

Program: Fisheries Management F-71-R-27

Project I: Surveys and Inventories

Subproject I-D: Southwest Region

Job No.: c

Title: Rivers and Streams Investigations

Contract Period: July 1, 2002 to June 30, 2003

ABSTRACT

Backpack electrofishing was conducted in the Brownlee Creek drainage in July and August 2002 to conduct population estimates for redband trout *Oncorhynchus mykiss gairdneri*. One section was electrofished on Dukes Creek, Grade Creek, and the West Fork of Brownlee Creek. Two sections were electrofished in the East, and Middle Forks of Brownlee Creek. Densities of redband trout larger than 100 mm, were 20.8 and 40.0 fish/100 m² in the Middle Fork of Brownlee Creek, the East Fork of Brownlee Creek sites had densities of 11.5, and 15.2 fish/100 m². Redband trout densities in West Fork of Brownlee, Dukes, and Grade creeks were 23.5, 26.8, and 25.0 fish/100 m², respectively. Densities were lower in the East Fork of Brownlee Creek, higher in the Middle Fork of Brownlee Creek, and similar for Grade Creek compared to 1995 surveys.

Backpack electrofishing was conducted in June 2002 in Little Blue Creek, and an unnamed tributary to Little Blue Creek Reservoir to document Lahontan cutthroat trout presence, and possible interactions with redband trout. Lahontan cutthroat trout were found in the unnamed tributary, but not in Little Blue Creek. No redband trout were sampled in either stream.

A fish trap was operated in the Kirby Dam fish ladder during late July and August to document bull trout migration patterns. Flows in the ladder were poorly managed in 2002, and no fish were captured during the trapping period. Additional coordination with the hydropower operators will be required for the ladder and trap to be effective.

Deadwood River upstream of Deadwood Reservoir was surveyed for fall Chinook salmon *Oncorhynchus tshawytscha* redds in October. Two complete redds were counted, no live fish were observed. No carcasses were encountered. Fewer redds and live fish were observed in 2002 than in previous years.

Snorkel surveys were conducted in Elk and Sulphur Creek trend areas August 13-15, 2002. Densities of juvenile Chinook salmon ranged from 0.65 to 8.9 fish/100 m² in Elk Creek and from 10.8 to 21.9 fish/100 m² in Sulphur Creek. Densities in Sulphur Creek were higher than in 2000 and 2001.

Salmon spawning ground surveys were conducted in Bear Valley, Elk, and Sulphur Creek trend areas August 27-28. Salmon redds numbered 245, 377, and 103 in Bear Valley, Elk, and Sulphur Creek, respectively. Redd count numbers were considerably higher than in 2000 or 2001 for all trend areas counted.

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OBJECTIVES

1. Obtain current information for fishery management decisions on rivers and streams, including angler use, success, harvest and opinions, fish population characteristics, spawning success, habitat characteristics, return-to-the-creel for hatchery trout and develop appropriate management recommendations.
2. Establish permanent trend sites and standardized methods to monitor stream and river fish populations.
3. Monitor use of the Kirby Dam fish ladder in August by bull trout and other fish species in the Middle Fork Boise River.

METHODS

Standardized Stream Surveys

Stream survey transects were established in representative stream reaches. Top and bottom transect boundaries were selected at locations which would curtail fish escapement and allow the lengths of sample sections to reach 100 m when possible. Habitat measurements were taken at a minimum of three cross sections through each survey transect for width, depth, and substrate composition. Two pass depletion population estimates for trout larger than 100 mm, and confidence intervals were calculated by utilizing the MicroFiche 3.0 program developed by Van Deventer and Platts (1985). Fish densities were calculated by dividing the population estimate by the area sampled and reported as fish/100 m². Global Position System (GPS) coordinates were collected at the upstream endpoint of electrofishing sites using a Garmin model 12 handheld GPS receiver.

A Smith-Root model 15-B backpack electrofishing unit was used for conducting two-pass depletion estimates. Fish from each pass were kept separate and alive in holding pens. Each game fish was measured to the nearest millimeter and weighed to the nearest gram.

Whole fish samples were collected and preserved as voucher specimens (non-game fish only) for identification. All samples were delivered to Albertsons College of Idaho wildlife museum, and will be identified by Dr. Zaroban. Results will appear in the 2003 annual report.

Brownlee Creek Drainage

Seven sites were surveyed by electrofishing in July and August to monitor redband trout populations. Five of the seven sites were established in 1995 following the acquisition of Andrus Wildlife Management Area by the Idaho Department of Fish and Game. These sites were selected to document redband trout distribution through the drainage following changes in land management practices. Pre-established transects on Grade, East Fork, and Middle Fork of Brownlee Creek were sampled in 2002. All pre-established transects had been marked with steel fence posts ("T-post"). The fence posts were placed adjacent to the downstream end of

each transect. New transects on Dukes, and the West Fork Brownlee Creek were similarly marked in 2002.

Little Blue Creek Reservoir Tributaries

In June, one site was surveyed by electrofishing in Little Blue Creek approximately 5.6 km above the reservoir. Another site in an un-named tributary to the reservoir was sampled about 2.6 km above the mouth.

Chinook Salmon Parr Monitoring

Elk and Sulphur Creeks

Parr monitoring snorkel counts were conducted in mid-August with two snorkelers moving upstream through the trend sections identifying fish species and sizes while recording information on waterproof tablets. Snorkel sections were then measured (length and minimum of four widths) to calculate the area surveyed. Physical measurements included habitat type, substrate particle size, water depth, and temperature. Road and trail directions to each site and GPS coordinates for each site are provided in Appendix D.

Chinook Salmon Redd Counts

Bear Valley, Elk, and Sulphur Creeks

Salmon spawning ground surveys were conducted in Bear Valley, Elk, and Sulphur Creek trend areas on August 27-28. Redds were enumerated and GPS coordinates were taken according to criteria described in the draft Idaho Redd Counting Manual (IDFG). Live fish observed were visually identified to sex and approximate ocean age (jacks, II, or III) when possible.

Kirby Dam fish Ladder Monitoring

In April the fish ladder at Kirby Dam was opened to allow passage of fish into the upper Middle Fork Boise River. The operational plan and monitoring requirements for the fish ladder, and ladder trapping techniques, are described in Flatter et al. (in press). To monitor upstream movement through the ladder, a fish trap was installed on July 20, and remained until September 4, 2002. Trap tending duties were shared by regional fisheries staff, and Bureau of Reclamation and US Forest Service (USFS) field crews.

Deadwood River Fall Chinook Redd Counts

Fall Chinook salmon were stocked in Deadwood Reservoir from 1995 to 1998 to diversify the fishery and to help control the overabundant kokanee *O. nerka* population in the reservoir at that time. Stocking was halted as kokanee populations declined, but by fall of 1998 spawning fall Chinook salmon were observed in the Deadwood River above the reservoir.

Because natural recruitment is not desirable, it is important to monitor spawning escapement. Current management objectives for the reservoir include enhancing kokanee abundance. If fall Chinook salmon establish a self-supporting population, additional control measures may be necessary to reduce or eliminate them.

Fall Chinook salmon redds were counted on October 9, 2002 from Deer Creek downstream to Deadwood Reservoir, approximately four miles. A crew of two counters was used. One person was taken to Deer Creek and counted downstream, the second person drove downstream approximately half way between Deer Creek and the reservoir, and parked. The second person then continued counting downstream to Deadwood Reservoir. All redds were enumerated and GPS coordinates were taken according to criteria described in the draft Idaho Redd Counting Manual (IDFG).

RESULTS AND DISCUSSION

Standardized Stream Surveys

Whole fish voucher specimens were preserved from Little Blue Creek, the un-named tributary to Little Blue Creek Reservoir, and the Middle Fork of Brownlee Creek. Samples were delivered to Dr. Don Zaroban at Albertson's College of Idaho in Caldwell for identification. Fish specimens collected included shiners, sculpin, and dace species. Final results will be reported in the 2003 stream survey report.

Brownlee Creek Drainage

Population estimates, standard error, habitat information, and GPS coordinates for all Brownlee Creek electrofishing sites can be found in Appendix B.

Two pre-established sites were electrofished in East Fork of Brownlee Creek (EFBC). Densities for redband trout were 11 and 15 redband trout/100 m² for the Campground and USFS sign sites, respectively (Table 8). Densities in both sites were lower than reported in 1995 (Allen et al. 1995).

Two pre-established sites were electrofished in Middle Fork of Brownlee Creek (MFBC). Densities for redband trout were 21 and 40 redband trout/100 m² for the lower and upper sites, respectively (Table 8). Densities at both sites increased since 1995.

One new monitoring site was established in West Fork of Brownlee Creek (WFBC). The density of redband trout was 24 fish/100 m² (Table 8).

Another new monitoring site was established in Dukes Creek. Density of redband trout was 27 fish/100 m² (Table 8).

One pre-established site was electrofished in Grade Creek. Density of redband trout was 25 fish/100 m² which was a slight increase from 1995 (Table 8).

Densities for redband trout >100 mm increased for most of the Brownlee Creek drainage sites sampled with the exception of both EFBC sites. The lower densities in the EFBC may be a result of angling pressure given the proximity of the sites to the campground and USFS living quarters. The increase in density of larger trout may indicate reduced recruitment or production in this drainage as a result of continued drought conditions. All sites sampled in 2002 in the Brownlee Creek drainage should be used as permanent monitoring sites. All have habitat characteristics representative of the drainage (i.e. substrate, riparian cover, and gradient).

Little Blue Creek Reservoir Tributaries

In the Little Blue Creek site, only redband shiners and speckled dace *Rhinichthys osculus* were collected (Appendix E). No Lahontan cutthroat or redband trout were observed. In the unnamed tributary, four Lahontan cutthroat trout were captured, along with sculpin and speckled dace (Appendix E). No redband trout were observed.

Little Blue Creek Reservoir and other Riddle area reservoirs are located within the historic distribution of native redband trout. These tributary surveys suggest little interaction between redband trout and introduced Lahontan cutthroat trout in the Little Blue Creek drainage, but more extensive surveys in this and other nearby streams are warranted.

Chinook Salmon Parr Monitoring

Elk and Sulphur Creeks

Five snorkel transects were completed in Elk Creek and three transects were completed in Sulphur Creek (Figure 4). Chinook salmon juvenile densities ranged from 0.65 to 8.9 fish/100 m² in Elk Creek and from 10.8 to 21.9 fish/100 m² in Sulphur Creek (Table 9). Densities increased in all Sulphur Creek snorkel sites, and in three of five Elk Creek sites compared to 2001 surveys (Flatter et al. in press). Fish abundance and habitat data were forwarded to IDFG anadromous research staff for incorporation into the Idaho Salmon and Steelhead Investigations report (Idaho Salmon and Steelhead Investigations 2002, Idaho Department of Fish and Game, in press).

Chinook Salmon Redd Counts

Bear Valley, Elk, and Sulphur Creeks

Trend areas surveyed in 2002 were similar to areas surveyed in the past. An additional effort was made to survey Sulphur Creek upstream to the North Fork Sulphur Creek (Figure 4). The number of redds counted were 245, 377, and 103 for Bear Valley, Elk, and Sulphur Creeks, respectively (Table 11). The increased effort on Sulphur Creek yielded an additional 59 redds. Redds counted in 2002 were higher than those counted in 2000, or 2001 (Table 12).

Live fish observed in Bear Valley Creek totaled 22 two-ocean males, 3 three-ocean males, 30 two-ocean females, and 6 three-ocean females. In Elk Creek there were 14 two-ocean males, 2 three-ocean males, 18 two-ocean females, and 2 three-ocean females observed. Live fish observed in Sulphur Creek totaled one two-ocean male, 3 two-ocean

females, and one three-ocean female (Table 11). No one-ocean males (jacks) were observed in any trend area.

Kirby Dam Fish Ladder Monitoring

The trap was in operation for a total of 1,008 hours between July 20 and September 4. There were no fish captured during the trapping period.

Drought conditions were prevalent during 2002 and no significant rainfall occurred during the trapping period. River flows were below normal, and water management at the dam spillway and hydroelectric project did not provide sufficient attraction flows at the base of the ladder. The rubber collar on the spillway remained deflated through most of the trapping period, and an estimated 25-30cfs was flowing over the spillway. Flows in the ladder were estimated at 2-3 cfs during this time, and the penstock bypass pipe that provides attraction flow at the base of the ladder was not used. After several phone calls, the hydroelectric operator (Atlanta Power) agreed to partially inflate half of the rubber collar on Aug 25. Flows in the ladder increased slightly, but still no fish were trapped.

Trapping during August will continue at the Kirby Dam fish ladder through 2005. It is obvious that additional coordination efforts will be required between IDFG and Atlanta Power if the ladder is to effectively attract fish and provide passage in late summer. Even optimum flows for the fish ladder and penstock bypass system should not impact hydropower production. Spillway flows in 2002 clearly exceeded the combined capacity of the ladder and bypass system despite the lower than average river flows. We assume that the hydroelectric plant was operating at capacity throughout the time frame of ladder operation.

Deadwood River Fall Chinook Redd Counts

A total of two fall Chinook salmon redds were identified in the Deadwood River upstream of Deadwood Reservoir. No live salmon were observed, and no carcasses were recovered. Redds counted in 2002 in the same section were lower than those counted in 1998, and 2001 (Table 13). Redd counts above Deadwood Reservoir should be discontinued until there is evidence of increased fall Chinook spawning, or juvenile recruitment to the reservoir.

MANAGEMENT RECOMMENDATIONS

Standardized Stream Surveys

1. Continue to establish permanent stream monitoring sites in watersheds where none exist, or more are needed. Future sites should be created in tributaries to the lower Payette and Weiser Rivers.
2. Resurvey Brownlee Creek drainage in 2006. All electrofishing sites sampled in 2002 will be considered permanent monitoring sites.

3. Expand stream survey data collection in streams near the Riddle lakes to better describe interactions between redband trout and Lahontan cutthroat trout.

Kirby Dam Fish Ladder

1. Contact Atlanta Power in the spring of 2003 and re-visit management of water in excess of power production needs. Monitor flows through fish ladder closely in 2003.

Deadwood River Fall Chinook Redd Counts

1. Discontinue redd surveys above Deadwood Reservoir until evidence of spawning supports continued sampling.

Table 8. Densities of redband trout > 100 mm collected in the Brownlee Creek Drainage in 1995^a and 2002.

Location	Year	Section length (m)	Mean width (m)	Mean depth (m)	# Trout sampled > 100 mm	Density #/100 m ²
EF Brownlee Cr. @ USFS sign	1995	50.0	2.6	0.6	30	23.1
	2002	48.5	3.5	0.1	25	15.2
EF Brownlee Cr. Campground	1995	54.0	2.9	0.5	27	17.2
	2002	54.1	4.6	0.1	34	11.5
Upper MF Brownlee Creek	1995	51.0	3.1	0.4	47	29.7
	2002	54.4	2.6	0.1	57	40.0
Lower MF Brownlee Creek	1995	50.0	2.4	0.4	3	2.5
	2002	53.0	2.4	0.1	27	20.8
WF Brownlee Creek	2002	44.3	3.8	0.2	33	23.5
Grade Creek	1995	50.0	2.1	0.3	23	21.9
	2002	53.7	3.0	0.2	39	25.0
Dukes Creek	2002	50.3	2.1	0.1	28	26.8

^aAllen et al. 1999.

Table 9. Number of age-0 chinook salmon in general parr monitoring sections, August, 2002 in Elk and Sulphur Creeks.

Stream	Strata/Section	Number observed	Area sampled (m ²)	Density (fish/100m ²)
Elk Creek	1-A	148	1659.7	8.9
	1-B	31	1366.5	2.3
	2-A	24	1266.5	1.9
	2-B	12	1857.6	0.6
	2-C	50	1540.9	3.2
Sulphur Creek	2-3A	93	861.0	10.8
	2-4A	224	1021.5	21.9
	2-4B	187	1468.8	12.7

Table 10. Chinook salmon redds counted August 27-28, 2002 in Bear Valley, Elk, and Sulphur Creek trend areas.

Transect Date sampled	Transect description	# Redds	# Test digs	Live fish			
				Wild spring chinook salmon		Wild spring chinook salmon	
Bear Valley Creek trend area 8/27/02				2-Ocean fish Male	2-Ocean fish Female	3-Ocean fish Male	3-Ocean fish Female
WS-9a	Mine exclosure area	3	1		3	1	
WS-9b	Mine exclosure to Cub Creek	12	9				
WS-9c	Cub Creek to Sack Creek	42	18	4	2		
WS-9d	Sack Creek to Elk Creek	92		6	5		
WS-10a	Elk Creek to Poker Bridge	90	22	12	20	2	6
WS-10b	Poker Bridge to Fir Creek	6					
Total for Bear Valley Creek		245	50	22	30	3	6
Elk Creek Trend Area 8/27-28/02							
WS-11a	West Fork Elk Creek to Twin Bridges	267	25	2	6		2
WS-11b	Twin Bridges to Guard Station	95	17	2	2		
WS-11c	Guard Station to Bear Valley Creek	15	2	10	10	2	
Total for Elk Creek		377	44	14	18	2	2
Sulphur Creek trend area 8/28/02							
WS-12	Rockslide to Sulphur Cr. Ranch	44			2		1
OS-4	Sulphur Cr. Ranch to 1.5 miles upstream	49		1	1		
OS-4 to NF Sulphur Creek	1.5 miles upstream of Ranch to NF Sulphur Creek	10					
Total for Sulphur Creek		103		1	3		1

Table 11. Total chinook salmon redds counted in Bear Valley, Elk, and Sulphur creek trend areas, 2000-2002.

Year	Bear Valley Creek	Elk Creek	Sulphur Creek
2000	69	83	5
2001	172	219	38
2002	245	377	103 ^a

^a Includes area from Sulphur Creek Ranch upstream to the North Fork Sulphur Creek.

Table 12. Deadwood River fall chinook salmon redd counts from October 1998, 2001, and 2002 from Deadwood Reservoir upstream to Deer Creek.

Year counted	Redds counted	Live fish counted	Carcasses recovered
1998	12	10	2
2001	5	1	0
2002	2	0	0

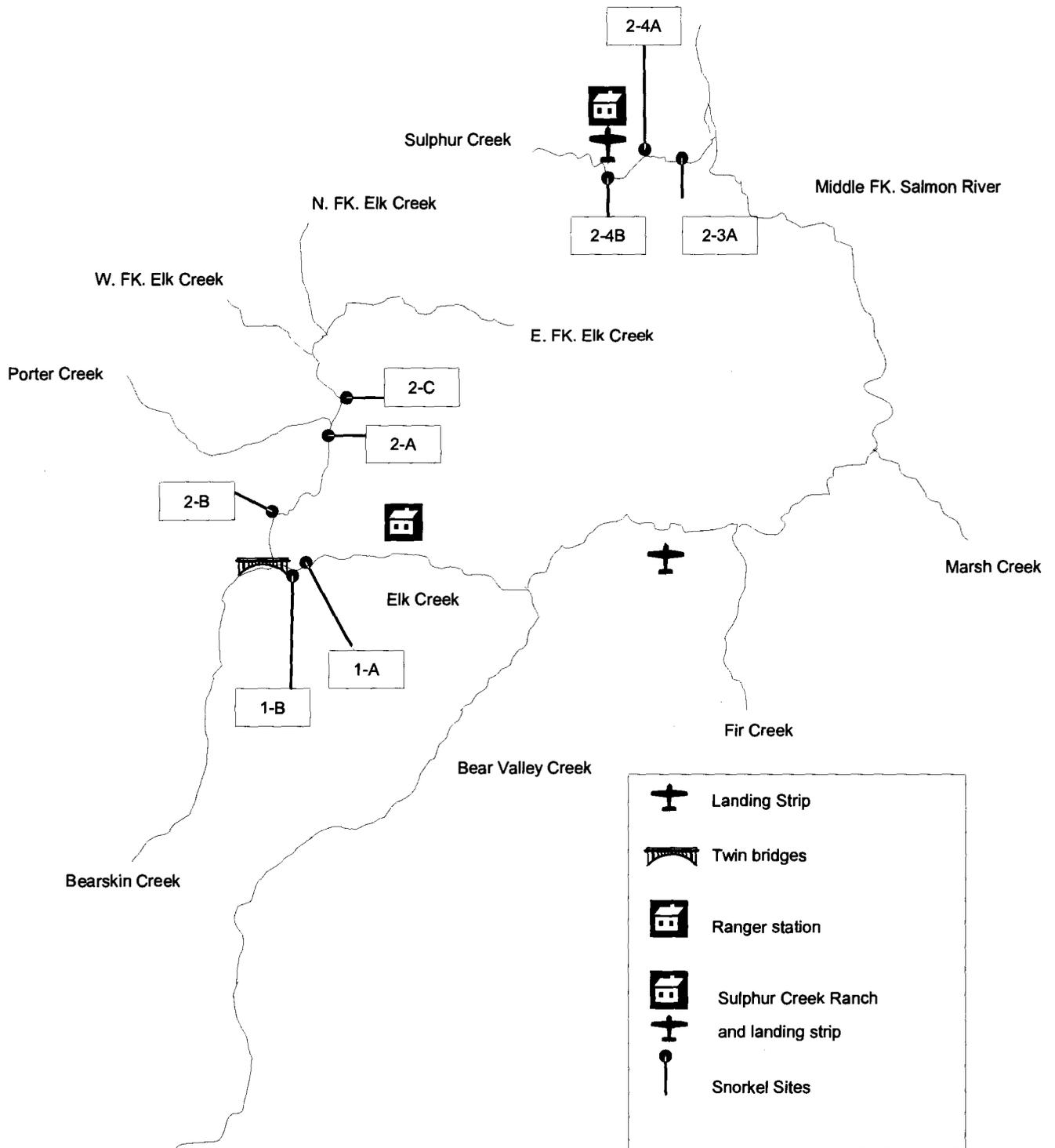


Figure 4. Chinook salmon parr monitoring snorkel sites in Elk and Sulphur creeks, 2002.

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APPENDICES

Appendix A. Units of sampling effort for lowland lake sampling, 2002.

Location	Date	Gear type	Effort ^a
Brownlee Res.	6/3/02	GN	8
Brownlee Res.	6/3/02	EF	2
Brownlee Res.	6/3/02	TN	3
Bybee Res.	6/12/02	TN	2
Bybee Res	6/12/02	GN	1
Bybee Res	6/13/02	AN	16.5
Bybee Res	6/20/02	AN	14
Claytonia Pond	4/25/02	GN	1
Crane Falls Lake	6/20/02	EF	3
Crane Falls Lake	6/27/02	EF	3.75
Grasmere Res.	6/12/02	GN	2
Grasmere Res	6/12/02	TN	1
Little Blue Creek Res.	6/13/02	TN	1
Little Blue Creek Res.	6/13/02	GN	1
Paddock Res.	5/28/02	TN	4
Paddock Res	5/28/02	GN	3
Paddock Res	5/28/02	EF	1
Payne Creek Res.	6/13/02	GN	1
Payne Creek Res.	6/13/02	TN	1
Redtop Pond	5/15/02	EF	0.75
Shoofly Res.	6/12/02	TN	1
Shoofly Res.	6/12/02	GN	1
Veterans Pond West	7/16/02	EF	0.25

^a Units of effort: EF = electrofishing, hours of activated electrode time; GN = pairs of floating and sinking experimental gill nets set overnight; TN = number of trap nets set overnight; AN = angling effort in hours.

Appendix B. Number of fish collected, minimum and maximum length, weight, condition factor, standard errors, catch-per-unit-effort (CPUE), and percent of total by number and weight for fish collected during lowland lake and reservoir sampling, 2002.

<i>Water</i>	<i>Species</i>	<i>Total Collected</i>	<i>Min Length (mm)</i>	<i>Max Length (mm)</i>	<i>Mean Length (mm)</i>	<i>SE Length</i>	<i>Mean Weight (g)</i>	<i>SE Weight</i>	<i>Mean CondFact</i>	<i>SE CondFact</i>	<i>CPUE (Number)</i>	<i>CPUE (Weight kg)</i>	<i>Percent (Number)</i>	<i>Percent (Weight)</i>
BROWNLEE RES														
6/3/02														
Electrofishing														
	Black crappie	24	85	235	136	10	68	19	1.63	0.09	12.00	0.70	3.17	1.05
	Bluegill	103	50	220	148	3	120	8	3.10	0.07	51.50	6.02	13.59	9.00
	Bridgelip sucker	9	180	375	279	20	299	63	1.20	0.03	4.50	1.26	1.19	1.89
	Channel catfish	1	590	590	590		2600		1.27		0.50	1.30	0.13	1.94
	Chiselmouth	4	170	285	231		170	65	1.12	0.11	2.00	0.34	0.53	0.51
	Common carp	3	200	740	537	170	3820	1984	1.32	0.29	1.50	5.73	0.40	8.57
	Hatchery rainbow	4	365	545	448	37	951	184	1.03	0.06	2.00	1.90	0.53	2.84
	Largescale sucker	16	260	575	412	25	991	170	1.22	0.04	8.00	8.06	2.11	12.06
	Pumpkinseed	3	150	165	155	5	108	13	2.89	0.21	1.50	0.16	0.40	0.24
	Smallmouth bass	563	65	665	207	5	141	3	1.57	0.05	281.50	39.14	74.27	58.51
	White crappie	10	195	255	243	6	258	16	1.80	0.06	5.00	1.25	1.32	1.86
	Yellow perch	14	105	280	184	14	120	22	1.84	0.27	7.00	0.81	1.85	1.21
	Total	754									377.00	66.67		
Gill Net														
	Black crappie	43	125	270	225	3	204	9	1.72	0.06	5.38	1.11	6.03	2.15
	Bluegill	9	200	230	213	3	261	38	2.68	0.36	1.13	0.30	1.26	0.58
	Bridgelip sucker	19	220	430	357	11	552	54	1.18	0.07	2.38	1.33	2.66	2.57
	Brown bullhead	1	230	230	230		250		2.05		0.13	0.03	0.14	0.06
	Channel catfish	114	250	660	471	11	1284	73	1.06	0.02	14.25	18.30	15.99	35.32
	Common carp	10	465	845	702	33	5556	766	1.57	0.05	1.25	6.25	1.40	12.06
	Hatchery rainbow	11	210	435	304	23	381	96	1.12	0.05	1.38	0.53	1.54	1.01
	Largescale sucker	82	48	600	400	9	892	57	3.46	2.19	10.25	9.11	11.50	17.58
	Smallmouth bass	178	140	460	262	4	269	15	1.34	0.02	22.25	6.04	24.96	11.66
	White crappie	161	110	345	264	2	306	6	1.61	0.02	20.13	6.17	22.58	11.92
	Wild rainbow/redband	1	195	195	195		50		0.67		0.13	0.01	0.14	0.01
	Yellow perch	30	200	325	260	6	273	19	1.48	0.04	3.75	1.03	4.21	1.99
	Total	659									82.41	50.20		

Appendix B. continued

<i>Water</i>	<i>Species</i>	<i>Total Collected</i>	<i>Min Length (mm)</i>	<i>Max Length (mm)</i>	<i>Mean Length (mm)</i>	<i>SE Length</i>	<i>Mean Weight (g)</i>	<i>SE Weight</i>	<i>Mean CondFact</i>	<i>SE CondFact</i>	<i>CPUE (Number)</i>	<i>CPUE (Weight kg)</i>	<i>Percent (Number)</i>	<i>Percent (Weight)</i>
BROWNEE RES														
Trap Net														
	Black crappie	11	105	190	128	7	100		1.46		3.67	0.11	78.57	48.81
	Bluegill	2	110	145	128	18	35		1.15		0.67	0.04	14.29	17.54
	Smallmouth bass	1	260	260	260		200		1.14		0.33	0.08	7.14	33.65
	Total	14									4.67	0.23		
BYBEE RES														
6/12/02														
Gill Net														
	Bridgelip sucker	20	165	355	292	12	336	29	1.29	0.04	20.00	6.66	50.00	19.74
	Lahontan cutthroat	19	260	750	460	25	1351	256	1.26	0.10	19.00	27.07	50.00	80.26
	Total	39									39.00	33.72		
Trap Net														
	Bridgelip sucker	3	255	280	272	8	207	7	1.04	0.09	3.00	0.68	60.00	20.23
	Lahontan cutthroat	2	500	520	510	10	1363	188	1.02	0.08	2.00	2.68	40.00	79.77
	Total	5									5.00	3.36		
6/13/02														
Angling														
	Lahontan cutthroat	11	406	539	500	12					0.66		100.00	
6/20/02														
Spot Creel Census														
	Lahontan cutthroat	8	406	610	476	23					0.57		100.00	
	Total													
CLAYTONIA P														
4/25/02														
Gill Net														
	Bluegill	1	120	120	120		30		1.74		1.00	0.03	20.00	0.94
	Common carp	1	325	325	325		600		1.75		1.00	0.60	20.00	18.75
	Largemouth bass	1	355	355	355		640		1.43		1.00	0.64	20.00	20.00
	Largescale sucker	2	405	420	413	8	965	15	1.38	0.10	2.00	1.93	40.00	60.31
	Total	5									5.00	3.20		

Appendix B. continued

<i>Water</i>	<i>Species</i>	<i>Total Collected</i>	<i>Min Length (mm)</i>	<i>Max Length (mm)</i>	<i>Mean Length (mm)</i>	<i>SE Length</i>	<i>Mean Weight (g)</i>	<i>SE Weight</i>	<i>Mean CondFact</i>	<i>SE CondFact</i>	<i>CPUE (Number)</i>	<i>CPUE (Weight kg)</i>	<i>Percent (Number)</i>	<i>Percent (Weight)</i>
CRANE FALLS RES 6/20/02														
Electrofishing														
	Black crappie	1	160	160	160						0.33		0.11	
	Bluegill	152	35	170	113	2					50.67		17.10	
	Brown bullhead	1	320	320	320						0.33		0.11	
	Hatchery rainbow	1	290	290	290						0.33		0.11	
	Largemouth bass	723	100	470	240	2	316	20	1.54	0.01	241.00	62.00	81.33	100.00
	Pumpkinseed	10	90	120	103	3					3.33		1.12	
	Yellow perch	1	180	180	180						0.33		0.11	
	Total	889									296.32	62.00		
CRANE FALLS RES 6/27/02														
Electrofishing														
	Largemouth bass	582	70	470	242	2					155.20		100.00	
GRASMERE RES 6/12/02														
Gill Net														
	Bridgelip sucker	14	170	320	242	13	126	16	0.87	0.06	7.00	0.88	33.33	17.29
	Lahontan cutthroat	26	160	500	309	17	322	50	0.86	0.04	13.00	4.20	61.90	82.42
	Redside shiner	2	130	140	135	5	30		1.09		1.00	0.02	4.76	0.29
	Total	42									21.00	5.09		
Trap Net														
	Lahontan cutthroat	9	310	435	354	12	406	33	0.91	0.03	9.00	3.62	100.00	100.00
	Total	9									9.00	3.62		
LITTLE BLUE CREEK RES 6/12/02														
Gill Net														
	Bridgelip sucker	15	160	385	253	21	192	54	0.65	0.13	15.00	2.94	62.50	29.63
	Lahontan cutthroat	9	175	535	406	36	775	144	0.99	0.02	9.00	6.98	37.50	70.37
	Total	24									24.00	9.92		

Appendix B. continued

<i>Water</i>	<i>Species</i>	<i>Total Collected</i>	<i>Min Length (mm)</i>	<i>Max Length (mm)</i>	<i>Mean Length (mm)</i>	<i>SE Length</i>	<i>Mean Weight (g)</i>	<i>SE Weight</i>	<i>Mean CondFact</i>	<i>SE CondFact</i>	<i>CPUE (Number)</i>	<i>CPUE (Weight kg)</i>	<i>Percent (Number)</i>	<i>Percent (Weight)</i>
LITTLE BLUE CREEK RES														
	Trap Net													
	Bridgelip sucker	6	170	375	296	39	383	104	1.31	0.14	6.00	2.23	100.00	100.00
	Total	6									6.00	2.23		
PADDOCK RES														
	5/28/02													
	Electrofishing													
	Black crappie	13	100	250	201	16	176	26	1.82	0.03	13.00	2.36	3.86	2.97
	Bluegill	158	30	235	166	4	163	8	2.67	0.07	158.00	25.72	46.88	32.31
	Brown bullhead	1	325	325	325		930		2.71		1.00	0.83	0.30	1.04
	Largemouth bass	161	85	450	271	4	314	14	1.45	0.01	161.00	50.56	47.77	63.51
	Pumpkinseed	4	70	130	105	13	29	12	1.72	0.59	4.00	0.13	1.19	0.16
	Total	337									337.00	79.60		
	Gill Net													
	Black crappie	4	220	250	234	7	250	24	1.94	0.03	1.33	0.32	3.42	2.01
	Bluegill	26	160	260	218	3	321	17	3.03	0.06	8.67	2.78	22.22	17.35
	Brown bullhead	27	215	360	316	7	767	40	2.36	0.05	9.00	6.94	23.08	43.37
	Largemouth bass	56	190	315	267	3	281	9	1.46	0.02	18.67	5.24	47.86	32.78
	Wild rainbow/redband	4	195	420	351	53	538	173	1.04	0.04	1.33	0.72	3.42	4.48
	Total	117									39.00	16.00		
	Trap Net													
	Black crappie	5	225	255	239	6	256	13	1.88	0.06	1.25	0.31	29.41	33.75
	Bluegill	7	75	230	170	25	200	56	2.19	0.57	1.75	0.35	41.18	38.55
	Pumpkinseed	4	110	200	140	21	108	45	3.49	0.22	1.00	0.10	23.53	11.33
	Wild rainbow/redband	1	410	410	410		600		0.87		0.25	0.15	5.88	16.38
	Total	17									4.25	0.91		
PAYNE CREEK RES														
	6/12/02													
	Gill Net													
	Bridgelip sucker	1	290	290	290		375		1.54		1.00	0.38	50.00	22.59
	Lahontan cutthroat	1	400	400	400		1285		2.01		1.00	1.29	50.00	77.41
	Total	2									2.00	1.67		
	Trap Net													
	Bridgelip sucker	2	140	160	150	10	75	25	2.13	0.31	2.00	0.15	100.00	100.00
	Total	2									2.00	0.15		

Appendix B. continued

<i>Water</i>	<i>Species</i>	<i>Total Collected</i>	<i>Min Length (mm)</i>	<i>Max Length (mm)</i>	<i>Mean Length (mm)</i>	<i>SE Length</i>	<i>Mean Weight (g)</i>	<i>SE Weight</i>	<i>Mean CondFact</i>	<i>SE CondFact</i>	<i>CPUE (Number)</i>	<i>CPUE (Weight kg)</i>	<i>Percent (Number)</i>	<i>Percent (Weight)</i>
REDTOP POND														
5/15/02														
Electrofishing														
	Black crappie	6	145	230	178	16	73	35	0.89	0.30	8.00	0.59	3.95	2.17
	Bluegill	69	60	185	139	3	52	5	1.35	0.11	92.00	4.82	45.39	17.85
	Brown bullhead	26	150	330	284	8	413	29	1.67	0.08	34.67	14.31	17.11	52.97
	Largemouth bass	15	130	455	218	28	259	131	0.76	0.16	20.00	5.19	9.87	19.21
	Pumpkinseed	36	100	160	132	3	44	6	1.68	0.23	48.00	2.11	23.68	7.80
	Total	152									202.67	27.02		
SHOOFLY RES														
6/12/02														
Gill Net														
	Lahontan cutthroat	24	205	505	377	16	601	54	1.06	0.03	24.00	14.42	100.00	100.00
	Total	24									24.00	14.42		
Trap Net														
	Bluegill	2	150	180	165	15	175	50	3.78	0.08	2.00	0.35	100.00	100.00
	Total	2									2.00	0.35		
VETERANS POND WEST														
7/16/02														
Electrofishing														
	Black crappie	3	100	150	123	15	27	7	1.45	0.28	12.00	0.32	2.56	0.22
	Bluegill	43	50	230	108	4	31	8	1.55	0.05	172.00	4.48	36.75	3.15
	Common carp	14	480	600	541	8	1931	84	1.21	0.02	56.00	108.12	11.97	76.01
	Largemouth bass	54	40	530	110	16	562	211	1.35	0.08	216.00	29.32	46.15	20.61
	Yellow perch	3	95	140	118	13					12.00		2.56	
	Total	117									468.00	142.24		

Appendix C. Length frequency and relative weight, by location and gear type, for fish collected during standardized lowland lake surveys, 2002.

Water	Date	Species	Length group (cm)	Number caught by angling	Number caught by electrofishing	Number Caught in Gill Nets	Number caught in trap nets	Total caught	Relative weight			
Brownlee Res.	6/3/02	Hatchery rainbow trout	21			1		1	99.95			
			24			1		1	117.79			
			25			2		2	96.57			
			27			2		2	89.23			
			28			1		1	102.48			
			31			1		1	89.72			
			36			1			1	90.15		
			40			1		1	2	111.70		
			43			1			1	95.28		
			44			1			1	96.12		
			54			1			1	72.90		
			Black crappie	8		1				1	145.91	
				9		1				1	145.91	
				10		2			1	3	78.34	
				11		10			2	12	129.55	
		12			1		1	3	5	40.16		
		13			4			4	8	123.29		
		19						1	1	118.78		
		20			1		1		2	167.84		
		21			1		4		5	114.06		
		22			1		15		16	111.52		
		23			2		12		14	112.62		
		24					6		6	113.48		
		25					1		1	138.34		
		26						1	1	86.67		
		27						1	1	94.72		
		Bluegill		5			1				1	
				8			1				1	
			9			2				2	143.73	
			10			3				3	122.90	
			11			5			1	6	140.87	
			12			6				6	127.38	
			13			16				16	148.56	
			14			28			1	29	150.52	
			15			8				8	149.81	
			16			7				7	173.67	
			17			7				7	163.83	
			18			10				10	156.32	
			19			3				3	157.71	
			20			4		2		6	156.21	
			21					5		5	93.98	
		22			2		1		3	147.51		
23					1		1	139.50				
Bridgelip sucker	18		1					1				
	22					1		1				
	23		1					1				
	26		3					3				
	27		1					1				
	29					1		1				
	30					1		1				
	31		1					1				
	33					2		2				
	34					1		1				
	35		1			3		4				
	36					1		1				

Appendix C. continued

Water	Date	Species	Length group (cm)	Number caught by angling	Number caught by electrofishing	Number Caught in Gill Nets	Number caught in trap nets	Total caught	Relative weight		
Brownlee Res.	6/3/02	Bridgelip sucker	39			1		1			
			41			3		3			
			43			1		1			
		Brown Bullhead	23			1		1			
			Channel catfish	25			1		1	208.76	
				26			1		1	111.61	
				27			1		1	116.78	
				28			2		2	105.83	
				29			9		9	116.18	
				30			2		2	89.98	
				31			6		6	115.05	
				32			5		5	124.67	
				33			2		2	118.17	
				35			2		2	119.87	
				36			1		1	118.00	
				39			1		1	98.71	
				40			1		1	103.92	
				43			1		1	187.51	
				45			1		1	119.75	
				46			2		2	93.52	
				47			1		1	135.78	
				48			1		1	82.58	
				49			8		8	102.26	
				50			2		2	61.00	
				51			5		5	114.52	
				52			7		7	98.03	
				53			13		13	99.71	
				54			7		7	98.89	
				55			10		10	95.74	
				56			6		6	111.77	
				57			3		3	119.72	
				58			3		3	101.22	
				59				1		1	119.70
				60					4	4	107.16
				61					3	3	95.90
				63					1	1	100.48
				64					1	1	92.83
				66					1	1	102.42
		Chiselmouth		17			1				1
			19			1				1	
		Common carp	28			2				2	
			20			1					
46						1					
64						1					
66						1					
67					1						
70						2					
71						1					
72						1					
74					1						
76						1					
80						1					
84						1					
Largescale sucker			4					1			

Appendix C. continued

Water	Date	Species	Length group (cm)	Number caught by angling	Number caught by electrofishing	Number Caught in Gill Nets	Number caught in trap nets	Total caught	Relative weight			
Brownlee Res.	6/3/02	Largescale sucker	26		2	1		3				
			28			2		2				
			30		1				1			
			31				1		1			
			32				1		1			
			35					5		5		
			36				2	4		6		
			37					4		4		
			38					4		4		
			39				1	4		5		
			40				2	8		10		
			41					6		6		
			42				1	5		6		
			43					5		5		
			44				1	7		8		
			45					1		1		
			46						2	2		
			47						1	1		
			48				1	1		2		
			49						1	1		
			50				1			1		
			52				1		2	3		
			53						1	1		
			54						2	2		
			55						1	1		
			56				1			1		
			57				1			1		
			60						2	2		
					Pumpkinseed	15	2					
						16	1					
					Smallmouth bass	6	1				1	
						7	2				2	1797.58
			8	3				3	61.32			
			9	3				3				
			10	5				5	92.10			
			11	6				6	158.07			
			12	3				3	89.32			
			13	2				2	268.58			
			14	14		1		15	125.72			
			15	21				21	124.35			
			16	64		1		65	124.60			
			17	68				68	117.05			
			18	52		2		54	117.54			
			19	50		4		54	113.21			
			20	22		13		35	110.70			
			21	22		9		31	102.53			
			22	29		5		34	104.20			
			23	50		3		53	101.27			
			24	53		29		82	99.11			
			25	35		29		64	93.84			
			26	17		24	1	42	93.44			
			27	20		23		43	94.50			
			28	7		5		12	95.87			
			29	5		7		12	92.86			
			30	1		1		2	72.99			
			31	3				3	86.44			
			32	2		5		7	77.79			

Appendix C. continued

Water	Date	Species	Length group (cm)	Number caught by angling	Number caught by electrofishing	Number Caught in Gill Nets	Number caught in trap nets	Total caught	Relative weight		
Brownlee Res.	6/3/02	Smallmouth bass	33		1	1		2	103.52		
			34			3		3	97.85		
			35		2	1		3	93.17		
			36			2		2	90.77		
			37				1		1	92.14	
			38				2		2	86.5	
			40					1		1	81.05
			41					1		1	94.20
			42					1		1	93.10
			44					1		1	101.44
		White crappie	11					2		2	
			12					1		1	180.78
			19			1		1		2	146.36
			22					2		2	146.21
			23			2		2		4	131.87
			24			1		5		6	119.27
			25			6		28		34	117.40
			26					49		49	113.27
			27					41		41	107.28
			28					17		17	110.88
			29					4		4	111.88
			30					3		3	96.04
		31					1		1	99.74	
		32					3		3	102.53	
		34					2		2	81.90	
		Wild rainbow trout	19					1		1	62.87
		Yellow perch	10			1				1	144.07
			11			2				2	268.48
			13			1				1	191.94
			16			1				1	100.39
			19			2				2	97.54
20				2		2		4	114.60		
21				3				3	113.29		
22						2		2	105.70		
23				1		3		4	84.89		
24						1		1	99.76		
25						4		4	109.29		
26						8		8	104.07		
27						2		2	97.94		
28					1	3		4	93.98		
29						2		2	104.21		
32					3		3	96.52			
Bridgelip sucker	16					1		1			
	17					1		1			
	23					1		1			
	25					1	1	2			
	27					1		1			
	28					1	2	3			
	29					2		2			
	30					3		3			
	31					2		2			
	32					2		2			
	33					2		2			
	34					2		2			
	35					1		1			

Appendix C. continued

Water	Date	Species	Length group (cm)	Number caught by angling	Number caught by electrofishing	Number Caught in Gill Nets	Number caught in trap nets	Total caught	Relative weight	
Bybee Res.	6/12/02	Lahontan cutthroat	26			1		1		
			27			1		1		
			39			3		3		
			40			1		1		
			41			1		1		
			42			5		5		
			50						1	1
			51					1		1
			52					1	1	2
			55					3		3
			56					1		1
			57					1		1
			75					1		1
Claytonia Pond	4/25/02	Bluegill	12		1			1	90.48	
		Common carp	32		1			1		
		Largemouth bass	35		1			1	97.04	
		Largescale sucker	42		1			1		
Crane Falls Lake	6/20/02	Black crappie	16		1			1		
			3		2			2		
			4		5			5		
			5		1			1		
			6		2			2		
			7		5			5		
			8		3			3		
			9		12			12		
			10		23			23		
			11		27			27		
			12		15			15		
			13		19			19		
			14		20			20		
			15		15			15		
			16		2			2		
			17		1			1		
			Brown bullhead	32		1		1		
		Hatchery rainbow trout		29		1		1		
				Largemouth bass	10		1		1	
			11		2		2			
			12		4		4		72.36	
			13		4		4		130.79	
			14		5		5		118.01	
			15		16		16		138.10	
			16		22		22		142.59	
			17		33		33		128.49	
			18		47		47		125.43	
			19		39		39		118.05	
			20		34		34		115.05	
			21		46		46		104.40	
			22		45		45		112.80	
			23		66		66		108.19	
			24		67		67		112.43	
			25		62		62		109.46	
	26		50		50		109.20			
	27		31		31		105.28			
	28		26		26		99.47			
	29		11		11		105.21			
	30		13		13		101.69			
	31		13		13		126.17			
	32		11		11		103.46			
	33		12		12		107.18			
	34		16		16		106.73			

Appendix C. continued

Water	Date	Species	Length group (cm)	Number caught by angling	Number caught by electrofishing	Number Caught in Gill Nets	Number caught in trap nets	Total caught	Relative weight	
Crane Falls Lake	6/20/02	Largemouth bass	35		6			6	107.88	
			39		4		4	95.11		
			44		3		3	101.94		
			45		4		4	111.90		
			47		2		2	115.84		
		Pumpkinseed	9		2		2			
			10		4		4			
			11		3		3			
			12		1		1			
			18		1		1			
		Yellow perch								
		6/27/02	Largemouth bass	7		1			1	
				11		1		1		
				12		2		2		
	13				4		4			
	14				2		2			
	15				6		6			
	16				17		17			
	17				21		21			
	18				25		25			
	19				32		32			
	20				26		26			
	21				48		48			
	22				49		49			
	23				57		57			
	24				53		53			
	25				58		58			
	26				33		33			
	27				22		22			
	28				20		20			
	29				17		17			
	30				11		11			
31				14		14				
32				9		9				
33				8		8				
34				7		7				
35				13		13				
36				6		6				
37		2		2						
38		3		3						
40		1		1						
41		3		3						
42		3		3						
43		2		2						
45		1		1						
46		2		2						
47		3		3						
Grasmere Res.	6/12/02	Bridgelip sucker	17			1		1		
			18			2		2		
			21			1		1		
			22			1		1		
			23			1		1		
			24			1		1		
			25			1		1		
			26			2		2		
			27			1		1		
			29			1		1		
			31			1		1		
32			1		1					
18			3		3					
21			2		2					

Appendix C. continued

Water	Date	Species	Length group (cm)	Number caught by angling	Number caught by electrofishing	Number Caught in Gill Nets	Number caught in trap nets	Total caught	Relative weight			
Grasmere Res.	6/12/02	Lahontan cutthroat trout	16			1		1				
			23			1		1				
			28			1		1				
			32			3	1	4				
			33			4		4				
			34			3	2	5				
			35			1	2	3				
			36			2	1	3				
			37				1	1				
			38			1		1				
			40			1		1				
			43				1	1				
			45				1	1				
			50				1	1				
		Redside shiner	13		1			1				
			14		1			1				
Little Blue Creek Res.	6/12/02	Bridgelip sucker	16		1			1				
			17		2	2	4					
			18		3		3					
			21		2		2					
			29		1		1					
			30		1		1					
			31		2		2					
			34			1	1					
			35		1	1	2					
			36		1	1	2					
			37			1	1					
			38		1		1					
					Lahontan cutthroat trout	17		1			1	
						34		2		2		
38		1					1					
43		1					1					
46		1					1					
48		1					1					
49		1					1					
53		1		1								
Paddock Res.	5/28/02	Black crappie	10		3			3	152.43			
			21		1			1	117.83			
			22		2	2	5	121.01				
			23		5	2	7	118.36				
		Bluegill	3		4		4					
			4		1		1					
			5		3		3					
			6		2		2					
			7		2	2	4	53.74				
			8		1		1					
			9		2		2	130.89				
			10		1		1	140.88				
			11		2		2	251.80				
			12		4		4	137.01				
			13		10		10	150.55				
			14		8		8	131.97				
15		14		14	124.76							
16		22	1	23	125.02							

Appendix C. continued

Water	Date	Species	Length group (cm)	Number caught by angling	Number caught by electrofishing	Number Caught in Gill Nets	Number caught in trap nets	Total caught	Relative weight			
Paddock Res.	5/28/02	Bluegill	17		14			14	129.30			
			18		4			4	132.72			
			19		12				12	136.53		
			20		18				18	133.35		
		24					2	4	24	133.35		
		24					1		1	148.39		
		25					1		1	137.54		
		26					1		1	121.93		
		Brown bullhead	21					1		1		
			24					1		1		
			25					1		1		
			29					2		2		
			30					3		3		
			31					2		2		
			32			1		3		4		
			33					8		8		
			34					3		3		
			35					1		1		
			36					2		2		
			Largemouth bass	8			1				1	217.39
				11			1				1	63.67
				13			2				2	103.63
				16			1				1	139.74
		17				1				1	111.16	
		19						1		1	111.37	
		21				2		1		3	136.52	
		22				4		1		5	106.54	
		23				10		2		12	109.70	
		24				12		4		16	105.85	
		25				19		7		26	103.72	
		26				26		8		34	104.02	
		27				28		14		42	102.51	
		28				18		9		27	100.56	
		29				9		4		13	101.21	
		30				9		4		13	102.21	
		31				3		1		4	104.16	
		33				3				3	101.93	
		34				1				1	93.01	
		36				2				2	106.22	
		37			2				2	95.67		
		39			3				3	91.53		
		40			1				1	92.62		
		45			1				1	90.73		
		Pumpkinseed	7			1				1		
			10			1				1		
11							2	2				
12				1				1				
13				1			1	2				
Wild rainbow trout	19					1		1	100.59			
	37					1		1	79.52			
	41						1	1	75.46			
	42					2		2	93.97			
Payne Creek Res.	6/12/02	Bridgelip sucker	14					1				
			16					1				
		Lahontan cutthroat	29				1					
			40				1					

Appendix C. continued

Water	Date	Species	Length group (cm)	Number caught by angling	Number caught by electrofishing	Number Caught in Gill Nets	Number caught in trap nets	Total caught	Relative weight		
Redtop Pond	5/15/02	Brown bullhead	15		1			1			
			23		2			2			
			24		1				1		
			25		1				1		
			26		2				2		
			27		5				5		
			28		1				1		
			33		3				3		
			14	Brown bullhead		1				1	
			15	Black crappie		2				2	83.90
		16			1				1		
		22			1				1	89.96	
		23			1				1	104.48	
		6	Bluegill		1				1		
		7			1				1		
		8			2				2		
		9			3				3		
		10			3				3		
		11			4				4		
		12			6				6		
		13			6				6		
		14			4				4		
		15			17				17		
		16		12				12			
		17		7				7			
		18		3				3			
		13	Largemouth bass		3				3	24.91	
		15			3				3		
		16			1				1	57.81	
		17			1				1	79.40	
		20			1				1	94.56	
		21			2				2	75.08	
		22			1				1	76.75	
		34			1				1	83.53	
		44			1				1	91.74	
		45			1				1	116.79	
		10	Pumpkinseed		2				2		
		11			5				5		
		12			3				3		
		13			10				10		
14		10					10				
15		4					4				
16		2					2				
15	Bluegill					1	1	179.88			
18						1	1	176.89			
Shoofly Res.	6/12/02	Lahontan cutthroat trout	20			1		1			
			23			1		1			
			27			1		1			
			30			1		1			
			31			1		1			
			32			1		1			
			33			2		2			
			35			2		2			
			38			1		1			
			40			3		3			
			41			1		1			
			42			1		1			
			43			4		4			
			45			2		2			
			48			1		1			
50			1		1						

Appendix C. continued

Water	Date	Species	Length group (cm)	Number caught by angling	Number caught by electrofishing	Number Caught in Gill Nets	Number caught in trap nets	Total caught	Relative weight		
Veterans Pond West	7/16/02	Black crappie	10		1			1	169.45		
			12		1			1	92.08		
			15		1				1	87.30	
		Bluegill	5		2				2		
			6		2				2		
			8		3				3	105.17	
			9		5				5	74.01	
			10		10				10	75.10	
			11		8				8	80.50	
			12		4				4	84.75	
			13		6				6	86.96	
			14		1				1	90.45	
			15		1				1	71.95	
			23		1				1	97.65	
			Common carp	48		1				1	
				50		1				1	
				51		1				1	
				52		1				1	
				53		1				1	
				54		4				4	
		55			1				1		
		56			1				1		
		57			1				1		
		58			1				1		
		Largemouth bass	60		1				1		
			4			5				5	
			5			19				19	
			6			9				9	
			7			7				7	
			10			1				1	86.30
			12			1				1	148.23
			13			2				2	74.74
			16			1				1	96.34
			29			2				2	97.11
			35			1				1	109.46
			39			2				2	81.60
			48			1				1	100.87
Yellow perch	53			1				1			
	9			1				1			
	12			1				1			
			14					1			

Appendix D. Chinook Parr monitoring snorkel site descriptions in Sulphur and Elk Creeks.

Sulphur Creek - Section: 2-3A

Vehicle Access - Turn off of Idaho 21 onto USFS 082 (this road turns into USFS 579), and stay on USFS 579 past the landing strip in Bruce Meadows. Turn north on USFS 568. Stay on USFS 568 until it reaches the first Boundary Creek parking lot. Park the vehicle near the restroom facilities. The trailhead begins at the parking lot.

Site Description - Stay on the pack trail approximately .75 miles, the trail splits, one fork goes towards lower Sulphur Creek on the right, the other fork goes up a short hill and will lead to upper Sulphur Creek. Take the left fork and follow it for another .75 miles through several small meadows, to a point where the trail crosses Sulphur Creek. The beginning of the site is downstream of the trail crossing on Sulphur Creek. The GPS coordinates at the start of the site are UTM 11T 0633110E, 4933267N. The site begins downstream of the trail crossing and continues upstream for 70 m ending at the upstream end of a large pool below a rock outcropping on the left bank (looking upstream). Alternate name for this site is "Footbridge."

Sulphur Creek - Section: 2-4A

Vehicle Access - Turn off of Idaho 21 onto USFS 082 (this road turns into USFS 579), and stay on USFS 579 past the landing strip in Bruce Meadows. Turn north on USFS 568. Stay on USFS 568 until it reaches the first Boundary Creek parking lot. Park the vehicle near the restroom facilities. The trailhead begins at the parking lot.

Site Description - Continue on the trail upstream past the 2-3A (a.k.a. "Footbridge") approximately 1 mile. At the large rockslide paralleling the trail, turn south off the trail and walk through the meadow towards Sulphur Creek. The GPS coordinates for the start of the site are UTM 11T 0631871E, 4933269N. The total length of the section is 107.5 m. Alternate name for this site is "Rockslide."

Sulphur Creek - Section: 2-4B

Vehicle Access - Turn off of Idaho 21 onto USFS 082 (this road turns into USFS 579), and stay on USFS 579 past the landing strip in Bruce Meadows. Turn north on USFS 568. Stay on USFS 568 until it reaches the first Boundary Creek parking lot. Park the vehicle near the restroom facilities. The trailhead begins at the parking lot.

Site Description - From the large rockslide mentioned near section 2-4A, continue on the trail 1.5 miles to the Sulphur Creek Wilderness Ranch (total of 5.5 miles from the parking lot). Directly past the ranch, walk south past the horse pastures towards Sulphur Creek. The GPS coordinates for the start of the site are UTM 11T 0629513E, 4932214N. The total length of the section is 136 m. Alternate name for this site is "Ranch."

Appendix D. continued

Elk Creek- Section: 1-A

Vehicle Access - From Lowman towards Stanley on Idaho 21, drive over Banner Summit and turn left onto USFS 082 (this road turns into USFS 579). Drive upstream along Elk Creek towards the intersection of USFS 563 and USFS 579, towards the Twin Bridges. The parking spot is located 0.6 miles downstream from the bridges. Park the vehicle in a pullout on the right side of the road.

Site Description - Walk across the road and down the embankment to the creek alongside the road. The GPS coordinates at the start of the site are UTM 11T 0622907E, 4919438N. The old tree that used to mark the lower boundary is now lying in the creek just below the riffle at the start of the section. The total length of the section is 119.4 m.

Elk Creek - Section: 1-B

Vehicle Access - From Lowman towards Stanley on Idaho 21, drive over Banner Summit and turn left onto USFS 082 (this road turns into USFS 579). Drive upstream along Elk Creek towards the intersection of USFS 563, and USFS 579, towards the Twin bridges. The parking spot is located 0.4 miles downstream from the bridges. Park the vehicle in a pullout on the right side of the road.

Site Description - Walk across the road and down the embankment through a small grove of trees into the meadow. Hike approximately 0.2 miles across the meadow in a slight southwest direction, to the creek. The GPS coordinates at the start of the site are UTM 11T 0622672E, 4919057N. The total length of the section is 78.9 m.

Appendix D. continued

Elk Creek - Section: 2-A



Vehicle Access - From the intersection of USFS 563 and USFS 579, drive east on USFS 579 over the Twin bridges over Elk Creek, and pull into the Elk Creek Trail road. Elk Creek Trail road is located off the north side of USFS 579. Park the vehicle by road-closed gate and walk to Elk Creek.

Site Description - From the road-closed gate, hike through a meadow, past a wilderness registration box, up over a hill, down into the Elk Creek drainage. The total hike is about 3.6 miles one-way. The GPS coordinates of the site are UTM 11T 0623264E, 4923611N. The total length of the section is 149 m. The upper end of this section is at the mouth of Porter Creek.

Appendix D. continued

Elk Creek - Section: 2-B

Vehicle Access - Take the Elk Creek access road off of USFS 579, 0.1 miles west of the Twin bridges, turn right onto an access road at the top of the hill. Drive to the end of this access road and park near the wilderness boundary sign.

Site Description - Hike from where you park the vehicle upstream approximately 0.5 miles. The GPS coordinates at the start of the site are UTM 11T 0621611E, 4920476N. The total length of the section is 216 m.

Elk Creek - Section: 2-C



Vehicle Access - From the intersection of USFS 563 and USFS 579, drive east on USFS 579 over the Twin bridges over Elk Creek, and pull into the Elk Creek Trail road (2.9 miles east of Twin Bridges). Elk Creek Trail road is located off the north side of USFS 579. Park the vehicle by the road-closed gate and walk to Elk Creek.

Site Description - Hike upstream, past site 2-A, on the trail past Porter Creek to a section where there is a small finger of trees that extends toward the creek. The section is located just off of this finger of trees. The GPS coordinates at the start of the site are UTM 11T 06223641E, 4924076N. The total length of the section is 206 m.

Appendix E. continued

STREAM: BROWNLEE CREEK-EAST SAMPLE DATE: 7/31/02
 SECTION: CAMPGROUND
 EPA REACH: 17050201 QUAD MAP: Advent Gulch
 RTS: R4W, T16N, S9 UTM: 49 53.943 ; 51 14710
 SECTION DESCRIPTION: Park at fee lot station near the entrance to Brownlee Creek campground. Section is upstream of culvert at the entrance of the campground.

Transect Information:
 Section Length (m): 54.1
 Elevation (m): 1317
 Gradient (%): 0.00%
 Population Est: 35.0 S.E(popest): 1.69
 Shade (%): 0.0
 Mean Width (m): 4.6
 Mean Depth (m): 0.1
 Fish Cover (%): 100

Habitat Type:
 Pool: 20.0 %
 Riffle: 46.7 %
 Run: 33.3 %
 Pocket: 0.0 %

Substrate
 Organic: 0 %
 Sand: 4 %
 Gravel: 34 %
 Rubble: 48 %
 Boulder: 14 %
 Bedrock: 0 %

Water Chemistry
 Time: 1515
 H2O Temp(C): 11.5
 Air Temp(C):
 pH: 7.8
 Alkalinity(mg/l CaCO₃):
 Hardness(mg/l CaCO₃):
 Conductivity (uS/cm³): 150
 Species Sampled

WRB Wild rainbow/redband

Length Frequency

Species	CM	Method	Number
Group			Measured
WRB	5	EF	1
WRB	6	EF	1
WRB	7	EF	6
WRB	8	EF	5
WRB	9	EF	3
WRB	10	EF	6
WRB	11	EF	7
WRB	12	EF	3
WRB	13	EF	3
WRB	14	EF	4
WRB	15	EF	3
WRB	16	EF	2
WRB	17	EF	3
WRB	18	EF	1
WRB	19	EF	2

Appendix E. continued

STREAM: BROWNLEE CREEK-EAST SAMPLE DATE: 7/31/02
 SECTION: USFS SIGN
 EPA REACH: 17050201 QUAD MAP:
 RTS: R4W, T16N, S7 UTM: 49 53.493 ; 51 828
 SECTION DESCRIPTION: 50 yds. DS of USFS sign at green post in ground on the north side of the creek, DS of mile marker 11 on Hwy 71.

Transect Information:
 Section Length (m): 48.5
 Elevation (m): 1024
 Gradient (%): 0.00%
 Population Est: 26.0 S.E(popest): 2.09
 Shade (%): 0.0
 Mean Width (m): 3.5
 Mean Depth (m): 0.1
 Fish Cover (%): 100

Habitat Type:
 Pool: 0.0 %
 Riffle: 80.0 %
 Run: 20.0 %
 Pocket: 0.0 %

Substrate
 Organic: 0 %
 Sand: 0 %
 Gravel: 35 %
 Rubble: 34 %
 Boulder: 31 %
 Bedrock: 0 %

Water Chemistry
 Time: 1731
 H2O Temp(C): 13
 Air Temp(C):
 pH: 7.8
 Alkalinity(mg/l CaCO₃):
 Hardness(mg/l CaCO₃):
 Conductivity(uS/cm³): 170
 Species Sampled

WRB Wild rainbow/redband

Length Frequency

Species	CM	Method	Number
Group			Measured
WRB	3	EF	1
WRB	5	EF	1
WRB	8	EF	5
WRB	9	EF	4
WRB	10	EF	4
WRB	11	EF	2
WRB	12	EF	7
WRB	13	EF	2
WRB	14	EF	5
WRB	15	EF	2
WRB	17	EF	2
WRB	21	EF	1

Appendix E. continued

STREAM: BROWNLEE CREEK-WEST SAMPLE DATE: 8/7/02
 SECTION: WFBRCR
 EPA REACH: 17050201 QUAD MAP: Neil Gulch
 RTS: R5W, T16N, S14 UTM: 49 50.327 ; 50 6719
 SECTION DESCRIPTION: Drive 2.7 miles upstream of WF gate off of Hwy. 71, site begins US from 1st major tributary from the west.

Transect Information:
 Section Length (m): 44.3
 Elevation (m): 927
 Gradient (%): 0.00%
 Population Est: 40.0 S.E.(popest): 8.75
 Shade (%): 0.0
 Mean Width (m): 3.8
 Mean Depth (m): 0.2
 Fish Cover (%): 54

Habitat Type:
 Pool: 6.7 %
 Riffle: 66.7 %
 Run: 26.7 %
 Pocket: 0.0 %

Substrate
 Organic: 0 %
 Sand: 17 %
 Gravel: 25 %
 Rubble: 41 %
 Boulder: 16 %
 Bedrock: 0 %

Water Chemistry
 Time: 1400
 H2O Temp(C): 15
 Air Temp(C):
 pH: 8.2
 Alkalinity (mg/l CaCO₃):
 Hardness (mg/l CaCO₃):
 Conductivity (uS/cm³): 170
 Species Sampled

WRB Wild rainbow/redband

Length Frequency

Species	CM	Method	Number
Group			Measured
WRB	5	EF	1
WRB	6	EF	1
WRB	10	EF	3
WRB	11	EF	2
WRB	12	EF	3
WRB	13	EF	6
WRB	14	EF	8
WRB	15	EF	2
WRB	16	EF	2
WRB	17	EF	4
WRB	18	EF	2
WRB	19	EF	1

Appendix E. continued

STREAM: DUKES CREEK SAMPLE DATE: 8/7/02
 SECTION: DUKES
 EPA REACH: 17050201 QUAD MAP: Brownlee Dam
 RTS: R5W, T17N, S12 UTM: 49 63.739 ; 50 9278
 SECTION DESCRIPTION: Drive up Dukes Creek 1 mile past gate at Hwy. 71, watch for green post on East bank of creek. The post is off the road, closer to the creek than to the road.

Transect Information:
 Section Length (m): 50.3
 Elevation (m): 744
 Gradient (%): 0.00%
 Population Est: 28.0 S.E(popest): 0.40
 Shade (%): 0.0
 Mean Width (m): 2.1
 Mean Depth (m): 0.1
 Fish Cover (%): 36

Habitat Type:
 Pool: 53.3 %
 Riffle: 46.7 %
 Run: 0.0 %
 Pocket: 0.0 %

Substrate
 Organic: 0 %
 Sand: 10 %
 Gravel: 25 %
 Rubble: 56 %
 Boulder: 9 %
 Bedrock: 0 %

Water Chemistry
 Time: 1143
 H2O Temp(C): 10
 Air Temp(C):
 pH: 8.5
 Alkalinity (mg/l CaCO₃):
 Hardness (mg/l CaCO₃):
 Conductivity (uS/cm³): 240
 Species Sampled

WRB Wild rainbow/redband

Length Frequency

Species	CM	Method	Number
	Group		Measured
WRB	4	EF	1
WRB	7	EF	1
WRB	9	EF	2
WRB	10	EF	7
WRB	11	EF	4
WRB	12	EF	1
WRB	13	EF	2
WRB	14	EF	1
WRB	15	EF	4
WRB	16	EF	1
WRB	17	EF	5
WRB	19	EF	2
WRB	22	EF	1

Appendix E. continued

STREAM: GRADE CREEK SAMPLE DATE: 8/1/02
 SECTION: GRADE CR
 EPA REACH: 17050201 QUAD MAP: Cuddy Mountain
 RTS: R4W, T17N, S32 UTM: 49 56.964 ; 51 358
 SECTION DESCRIPTION: Go through Grade Creek gate off of Hwy. 71, section is 1.5 miles up road, park at the first road crossing through the creek. Starting point is marked with a green post on the south stream bank. Post is approx. 40 yards US of road crossing.

Transect Information:
 Section Length (m): 53.7
 Elevation (m): 337
 Gradient (%): 0.00%
 Population Est: 40.0 S.E(popest): 2.00
 Shade (%): 0.0
 Mean Width (m): 3.0
 Mean Depth (m): 0.2
 Fish Cover (%): 86

Habitat Type:
 Pool: 40.0 %
 Riffle: 60.0 %
 Run: 0.0 %
 Pocket: 0.0 %

Substrate
 Organic: 0 %
 Sand: 10 %
 Gravel: 48 %
 Rubble: 30 %
 Boulder: 12 %
 Bedrock: 0 %

Water Chemistry
 Time: 1104
 H2O Temp(C): 9.5
 Air Temp(C):
 pH: 7.9
 Alkalinity (mg/l CaCO₃):
 Hardness (mg/l CaCO₃):
 Conductivity (uS/cm³): 310
 Species Sampled

WRB Wild rainbow/redband

Length Frequency

Species	CM	Method	Number
	Group		Measured
WRB	8	EF	1
WRB	9	EF	4
WRB	10	EF	7
WRB	11	EF	10
WRB	12	EF	6
WRB	13	EF	4
WRB	14	EF	3
WRB	15	EF	3
WRB	16	EF	1
WRB	17	EF	3
WRB	18	EF	1
WRB	19	EF	1

Appendix E. continued

STREAM: LITTLE BLUE TRIB. SAMPLE DATE: 6/13/02
 SECTION: TRIB.
 EPA REACH: 17050104063 QUAD MAP: LITTLE BLUE TABLE
 RTS: R3E, T13S, S4 UTM: 574060.19 E ; 4685068.9 N
 SECTION DESCRIPTION: 1st major trib. on the N side of Little Blue Creek Res. Follow dirt road on N side of reservoir approx. 2 miles, road forks, take the L fork. Stay on L fork 1.5 miles.

Transect Information:
 Section Length (m): 98
 Elevation (m): 1726
 Gradient (%): 0.00%
 Population Est: 20.0 S.E(popest): 168.3
 Shade (%): 0.0
 Mean Width (m): 1.32
 Mean Depth (m):
 Cover (%):

Habitat Type:
 Pool: %
 Riffle: %
 Run: %
 Pocket: %

Water Chemistry

Time:
 H2O Temp(C):
 Air Temp(C):
 pH:
 Alkalinity (mg/l CaCO₃):
 Hardness (mg/l CaCO₃):
 Conductivity (uS/cm3):

Substrate
 Organic: %
 Sand: %
 Gravel: %
 Rubble: %
 Boulder: %
 Bedrock: %

Species Sampled

LCT Lahontan cutthroat trout
 SCP Sculpin spp.
 SPD Speckled dace

Length Frequency

Species	CM	Method	Number
	Group		Measured
LCT	11	EF	1
LCT	14	EF	1
LCT	16	EF	1
LCT	44	EF	1
SCP	4	EF	2
SCP	5	EF	5
SCP	7	EF	1
SCP	9	EF	1
SPD	7	EF	1

Appendix E. continued

STREAM: LITTLE BLUE CREEK SAMPLE DATE: 6/13/02
 SECTION: LITTLE BLUE
 EPA REACH: 17050104066 QUAD MAP: LITTLE BLUE TABLE
 RTS: R3E, T13S, S11 UTM: 576976.11 E ; 4683849.7 N

SECTION DESCRIPTION: Follow the dirt road on N side of Little Blue Creek Res. around the reservoir. Cross the un-named tributary stream at the head of the reservoir, and follow the road along Little Blue Creek. Continue 2.5 miles past the barbed wire fence gate. Section is located in creek on the east side of the road.

Transect Information:		Habitat Type:	
Section Length (m):	108.7	Pool:	%
Elevation (m):	1671	Riffle:	%
Gradient (%):	0.00%	Run:	%
Population Est:	0.0 S.E(popest):	Pocket:	%
Shade (%):	0.0		
		Substrate	
Mean Width (m):	2.4	Organic:	%
Mean Depth (m):		Sand:	%
		Gravel:	%
		Rubble:	%
		Boulder:	%
		Bedrock:	%
Cover (%):			
Water Chemistry			
Time:			
H2O Temp(C):			
Air Temp(C):			
pH:			
Alkalinity(mg/l CaCO ₃):			
Hardness(mg/l CaCO ₃):			
Conductivity (uS/cm ³):			
Species Sampled			
RSS	Redside shiner		
SPD	Speckled dace		

Length Frequency

Species	CM	Method	Number
	Group		Measured
RSS	4	EF	3
RSS	5	EF	3
RSS	6	EF	2
RSS	7	EF	1
SPD	3	EF	2
SPD	4	EF	2
SPD	5	EF	1
SPD	6	EF	1

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