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DEPARTMENT OF FISH AND GAME**

Rod Sando, Director

FEDERAL AID IN FISH RESTORATION  
1998 Job Performance Report  
Project F-71-R-23

REGIONAL FISHERIES MANAGEMENT INVESTIGATIONS  
SOUTHEAST REGION (Subprojects I-F, II-F, III-F, IV-F)

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## 1998 ANNUAL PERFORMANCE REPORT

State of: Idaho Program: F-71-R-23  
Project I: Surveys and Inventories Subproject I-F: Southeast Region  
Job: b Title: Lowland Lakes Investigations  
Contract Period: July 1, 1998 to June 30, 1999

### ABSTRACT

Twin Lakes Reservoir was chemically renovated in 1994 to remove common carp *Cyprinus carpio* and was restocked with largemouth bass *Micropterus salmoides*, bluegill *Lepomis macrochirus*, and rainbow trout *Oncorhynchus mykiss*. From sampling at a bass tournament we found that the population is young and growth is slow, 89% of the catch was less than the 20-cm standard stock size and proportional stock density (PSD) was only 2%.

We electrofished the special trout regulation waters of Daniels and Treasureton reservoirs to capture and measure fluorescent-grit marked diploid (fertile) and triploid (sterile) rainbow trout as part of a statewide research project. We also used the samples salmonids (marked and unmarked) from Daniels Reservoir and Treasureton Reservoir to monitor overall population quality relative to the special regulations.

We conducted a shoreline electrofishing survey on American Falls Reservoir to determine species composition and compare results with a mid-summer survey from 1997.

We also conducted dissolved oxygen and water temperature surveys at eight locations on American Falls Reservoir. Water temperature near the surface frequently reached 23° C and remained above 21° C down to a depth typically between 9 and 12 m. Through the depth range of 9 to 12 meters, dissolved oxygen decreased from 5.5 mg/l to 3 mg/l.

We conducted a lowland lake survey at Weston Reservoir June 18 to obtain baseline data on relative species composition and length frequency distribution prior to a regulation change for largemouth bass harvest. We also conducted a lowland lake survey at Glendale Reservoir August 4, to document the status of the game fish community.

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## OBJECTIVES

1. To continue collection of data for evaluation of sterile rainbow trout *Oncorhynchus mykiss* growth in regional reservoirs.
2. To monitor the status of the newly developing smallmouth bass *Micropterus dolomieu* fishery in American Falls Reservoir.
3. To document temperature and dissolved oxygen levels in American Falls Reservoir during the hottest part of the summer.
4. To document and establish baseline data for the fishery status in Weston Reservoir prior to a regulation change.
5. To document and evaluate the health of the fishery in Glendale Reservoir following a winter fish kill of indeterminate size.

## INTRODUCTION AND METHODS

### Sterile Fish Evaluation

A statewide study was initiated to compare differential growth between sterile (triploid) and fertile (diploid) rainbow trout. The two groups of Kamloops strain rainbow trout were grit-marked using fluorescent pigments embedded beneath their scales. The pigment was applied through the use of a high-pressure sprayer. Consequently, large numbers of fish can be marked in a shorter amount of time and with less labor than the traditional method of fin clipping. The pigment is detected through the use of ultraviolet light. Care must be taken to eliminate all sources of ambient light while examining fish. The sterile fish were marked with a red dye and the fertile controls with a green one. Daniels and Treasureton reservoirs, along with others in the McCall Region, were chosen as study locations because of their restrictive harvest size limits. The restrictive limits allow an adequate number of marked fish to survive for multiple seasons.

We collected grit-marked fish, in conjunction with Fisheries Research personnel from the Magic Valley Region, using boat-mounted electrofishing equipment. Additionally, data on all fish captured was used in comparison with previous years' information.

### **Daniels Reservoir**

Daniels Reservoir is a 152 ha reservoir located in Oneida County at 1,573 m elevation. It is owned by the St. Johns Irrigation Company and is used primarily for flood control and irrigation. A secondary use is the excellent sportfishing opportunities it provides. After completion of construction in 1970, the reservoir enjoyed high productivity for several years. Non-game fish, notably Utah suckers *Catostomus ardens*, then colonized the reservoir. Department personnel chemically renovated Daniels Reservoir in 1988. It is currently managed as a trophy trout water with a regulation of two trout, none under 20 inches, and artificial flies and lures only. Fish species present include rainbow trout, cutthroat trout

*Oncorhynchus clarki* and rainbow x cutthroat trout hybrids *O. mykiss* x *O. clarki*. We electrofished Daniels Reservoir May 7 and October 13, 1998.

### **Treasureton Reservoir**

Treasureton Reservoir is a 58 ha reservoir located in Franklin County at 1,645 m elevation. It is owned by the Strongarm Reservoir Company and is used primarily for flood control and irrigation. A secondary use is the quality sportfishing opportunities it provides. The reservoir had been managed as a year round trout fishery centered on frequent plants of catchable rainbow trout. In 1994, the management changed to a quality trout management with a two trout, none between 12 and 16 inches limit, and artificial flies and lures only. Fish species present include rainbow trout, rainbow x cutthroat trout hybrids, brook trout *Salvelinus fontinalis*, redbreast shiner *Richardsonius balteatus*, and dace *Rhinichthys spp.*

### **American Falls Reservoir**

American Falls Reservoir is a 22,685 ha reservoir located in Bingham, Power, and Bannock counties. It is located at an elevation of 1,327 meters and is used primarily for irrigation storage, flood control and hydropower production. Irrigation use begins in April with drawdown beginning as irrigation demand exceeds inflow, usually in mid-June. Secondly, the reservoir provides opportunities for sportfishing, waterfowl hunting, and water recreation (boating). Completed in 1927 and modified in 1979, the dam and reservoir are managed by the U.S. Bureau of Reclamation while Idaho Power Company runs the powerhouse.

### **Electrofishing Survey**

Smallmouth bass recently colonized American Falls Reservoir. In 1990 and 1991, the Department stocked 4,600 20-28 cm smallmouth bass into Gem Lake Reservoir on the Snake River at Idaho Falls. Some of the original smallmouth bass may have moved downstream and spawned in American Falls Reservoir. Or younger smallmouth bass hatched at Gem Lake or in the river below Gem Lake, moved downstream to American Falls Reservoir. American Falls Reservoir, at a lower elevation and with a much larger storage to flow ratio than Gem Lake, may allow more successful spawning and young-of-the-year winter survival of smallmouth bass.

The presence of smallmouth bass in American Falls Reservoir was verified in a lowland lake survey during the summer of 1997 (Mende, et al 2000). On May 28, 1998, we conducted an electrofishing survey on American Falls Reservoir in order to monitor the growing smallmouth bass population. Fish species present in the reservoir include: smallmouth bass, yellow perch *Perca flavescens*, rainbow trout, brown trout *Salmo trutta*, carp *Cyprinus carpio*, redbreast shiner, Utah sucker *Catostomus ardens*, Utah chub *Gila atraria*, and mottled sculpin *Cottus bairdi*.

## Temperature and Dissolved Oxygen

During the end of July, we received numerous calls of concern about dead fish observed in the Snake River below American Falls Reservoir. As the daily high and low air temperatures had remained relatively high for an extended period (>32 and >24 °C respectively), we suspected that water temperature might be responsible for the fish kill. The warmer the temperature gets, the higher dissolved oxygen concentration is required to saturate a trout's bloodstream. We recorded water temperature and dissolved oxygen (DO) concentrations at 1-meter depth intervals at nine different sites on American Falls Reservoir. Sites numbered 1-8 were sampled on both July 24 and August 13, 1998 (Figure 1). Additionally, a ninth site (along dam face, near outlet) was added for the August 13 sampling date. The measurements were taken with a YSI 54ABP model dissolved oxygen meter. Measurements were conducted in the earliest hours of the day (4:00 am to 7:00 am) in order to record the lowest temperature possible.

## Lowland Lake Surveys

We assessed the health of fish populations in two regional reservoirs during the summer of 1998. When a lowland lake survey was conducted, the following standardized gear was used. One unit of effort for each of the gear types, combined, equals one unit of "sampling effort." The minimum standard amount of sampling effort is dependent upon the size of the body of water.

1. Gillnets – Floating and sinking monofilament nets, 150 ft x 6 ft, with six panels composed of ¾, 1, 1¼, 1½, 2, and 2½ inch bar mesh. One floating and one sinking net combined, fished overnight, equal one unit of gill net effort.
2. Trap nets – Fifty ft lead, 3 ft x 6 ft sized frame, crowfoot throats on the first and third of five loops, ¾ inch bar mesh, treated black. One trap net fished overnight equals one unit of trap net effort.
3. Electrofishing – A pulsed DC electrofishing boat with boom-mounted electrodes. One hour of current-on electrofishing equals one unit of electrofishing effort.

## Weston Reservoir

Weston Reservoir is located in Oneida County, east of Malad City. At full capacity, the reservoir is at 1682 m elevation and covers 45 ha. Its primary use is irrigation storage. Secondly, the reservoir provides sport-fishing opportunity, of which yellow perch is the primary targeted species. Fishing pressure is limited by the prohibition of boats on the reservoir, at the owners' request. Fish species present include rainbow trout, yellow perch, and largemouth bass *Micropterus salmoides*.

During public input for the 1998-1999 fishing regulations, many sportsmen reported that they frequently caught largemouth bass under the 12-inch minimum length regulation. However, they rarely caught any largemouth bass exceeding the minimum length and they requested a change in the regulations to 'thin out' the overabundant, small fish. The regulation was changed from general bass to a modified quality bass rule (2 bass <12 and >16 inches). We conducted a lowland lake survey on Weston Reservoir on June 18, 1998, in order to establish a baseline of information. Future surveys should be able to

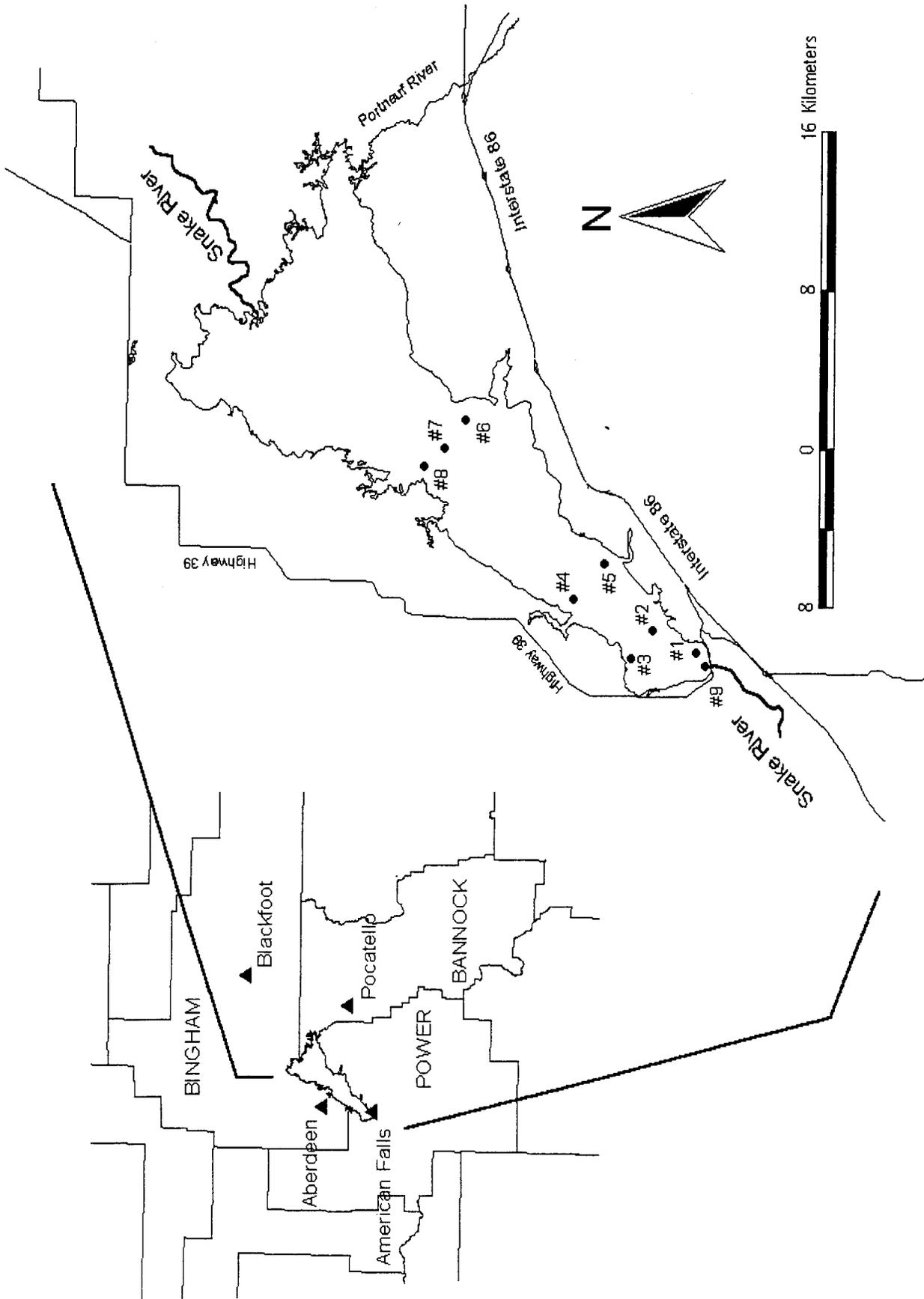


Figure 1. Map of American Falls Reservoir, Idaho, indicating locations of temperature and dissolved oxygen sampling sites July and August, 1998.

determine what, if any, impact this change has on the relative abundance and size structure of yellow perch. It is unknown how much harvest of largemouth bass will occur even with the rule liberalization, as local anglers generally regard a fish under 12 inches as 'too small.'

## **Glendale Reservoir**

Glendale Reservoir is located in Franklin County, northeast of Preston. It is owned by the Twin Lakes Canal Company and at full capacity sits at 1,509 meters elevation and covers 92.9 ha. Its primary functions are irrigation storage and flood control. Secondly, the reservoir provides sport-fishing opportunities as well as camping and watercraft recreation. Fish species present include rainbow trout, largemouth bass, bluegill *Lepomis macrochirus*, and white crappie *Pomoxis annularis*.

During the winter of 1997, there was at least a partial fish kill on Glendale Reservoir. In order to assess the health of the fishery, we conducted a lowland lake survey on Glendale Reservoir August 4, 1998.

## **RESULTS AND DISCUSSION**

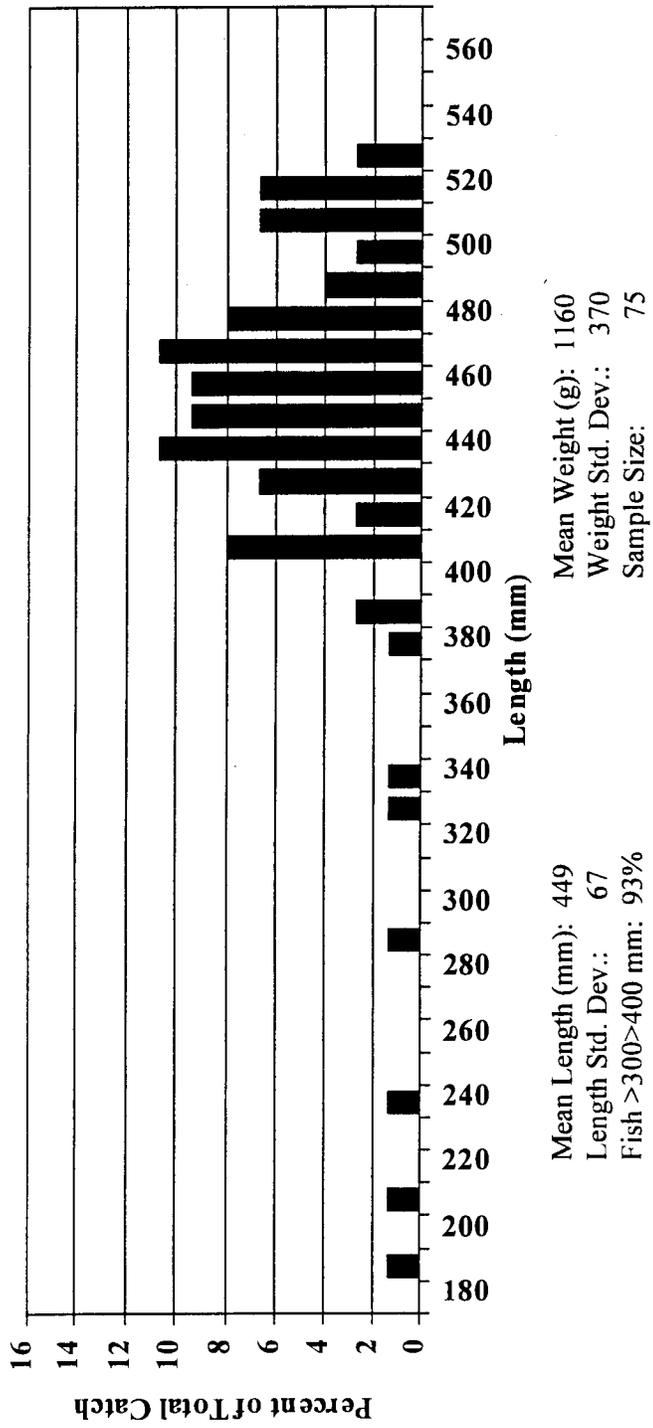
### **Sterile Fish Evaluation**

#### **Daniels Reservoir**

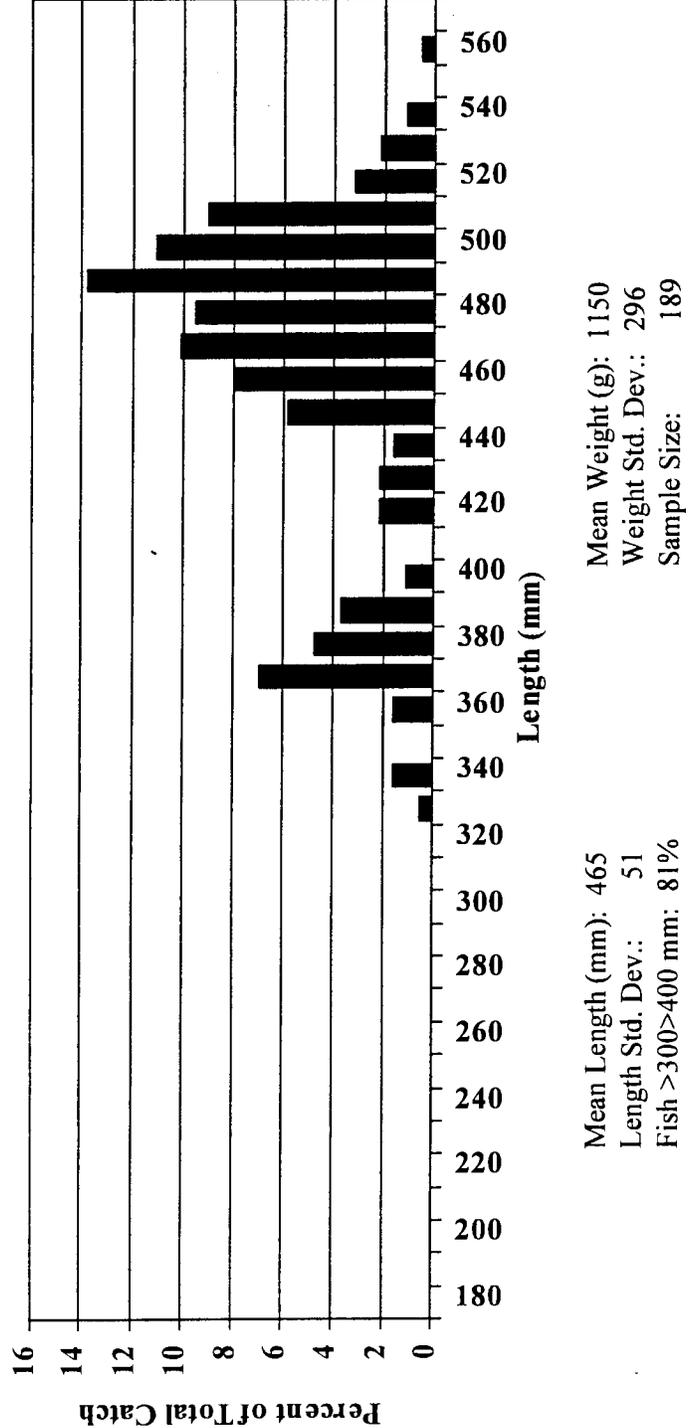
In May, 75 rainbow trout and four rainbow x cutthroat trout hybrids were collected. In October, 189 rainbow trout and 14 hybrids were collected. The hybrids are most likely fish planted by the Department and not wild fish spawning in Little Malad River and Wright's Creek. However, without further research that can not be known for certain. In May, rainbow trout lengths ranged from 196 to 532 mm with a mean length of 450 mm. In October, the length range shifted up to between 335 and 565 mm with a mean of 465 mm (Figure 2). The change in mean length reflects the growth of both fall-97 fingerlings and spring-98 catchables. It is very likely that many of the larger fish will die prior to next spring, due to false-spawning mortality, angler harvest, and senescence. This is reflected in the comparison of length frequency distributions between spring of 1997 and spring of 1998 (Figure 3). The system resets itself every spring with a typical length of 450 mm with some variation (a few larger individuals present in 1998).

One aspect of the Daniels Reservoir fishery that holds concern from a management perspective is the relative weights of rainbow trout. We used an updated standard-weight equation, developed specifically for lentic rainbow trout, to analyze the health of the fishery (Simpkins and Hubert 1996). Mean relative weight ( $W_r$ ) of rainbow trout in May was 103%. By October, that number had dropped significantly (at  $\alpha = .05$ ) to 96%. Viewing the distribution of  $W_r$ , it is apparent that the greatest drop occurs in fish greater than 450 mm (Figure 4). This suggests that competition for larger sized prey (i.e. small fish, crayfish, and dragonfly larva) is occurring. However, since  $W_r$  remains near 100% no action is needed at this time.

Another aspect of concern from a management perspective is whether the fishery meets the trophy management goal of greater than 20% of fish larger than 16 inches (IDFG 1996). In order to eliminate



May 1998



Oct. 1998

Figure 2. Length frequency distributions of rainbow trout sampled from Daniel's Reservoir, Idaho, May 7 and Oct. 13, 1998.

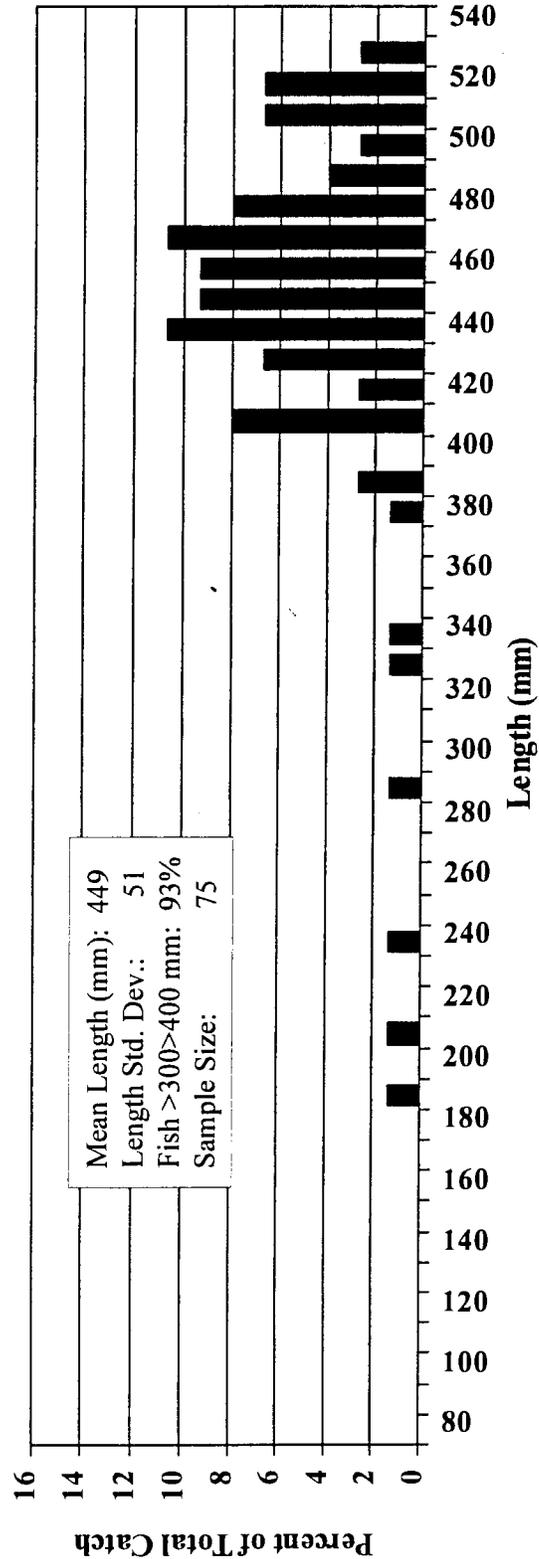
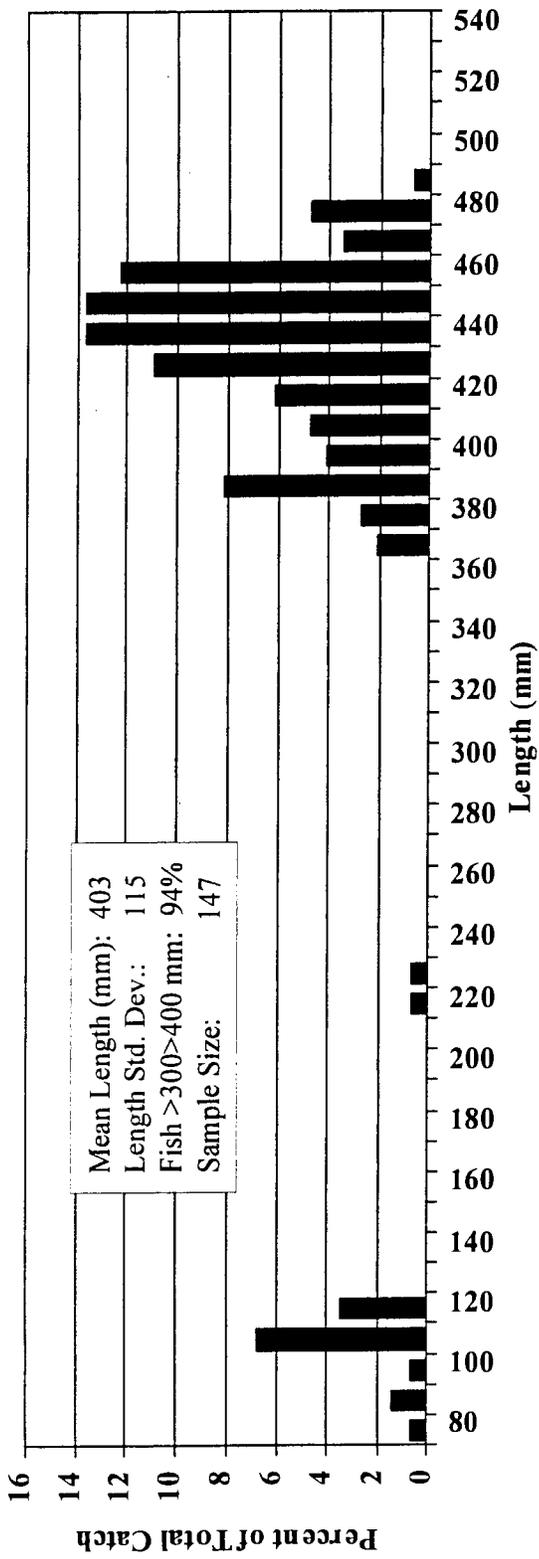
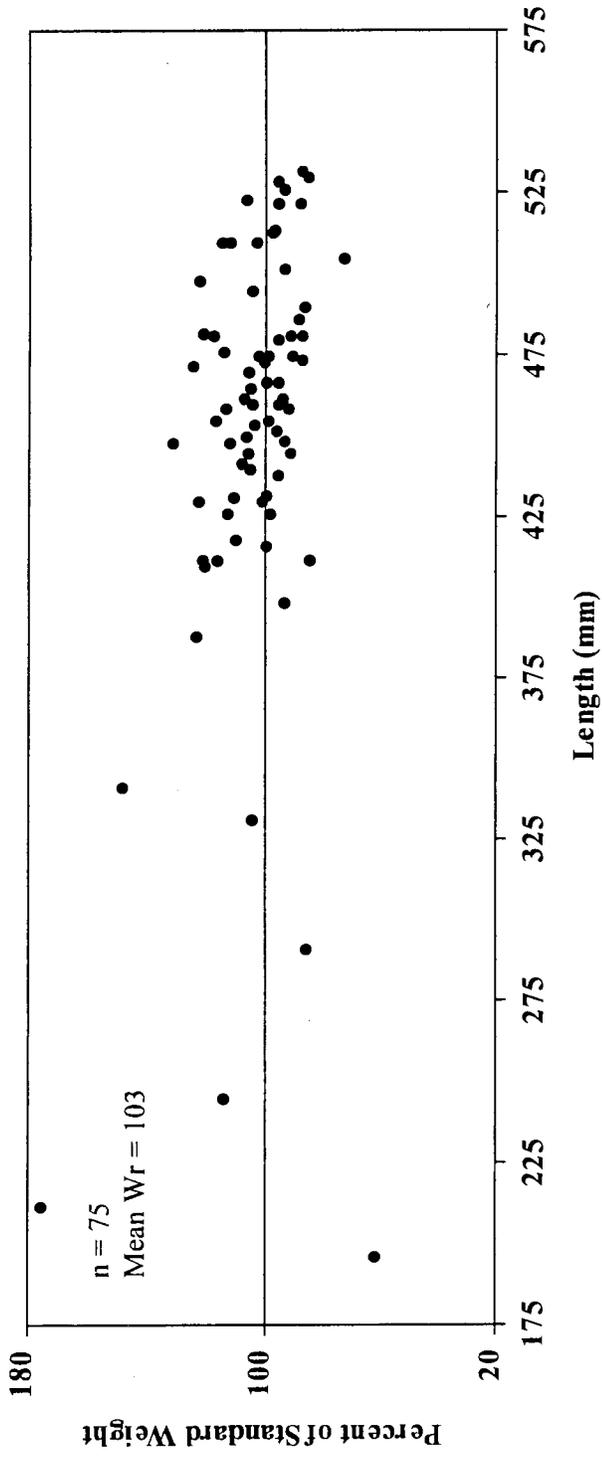
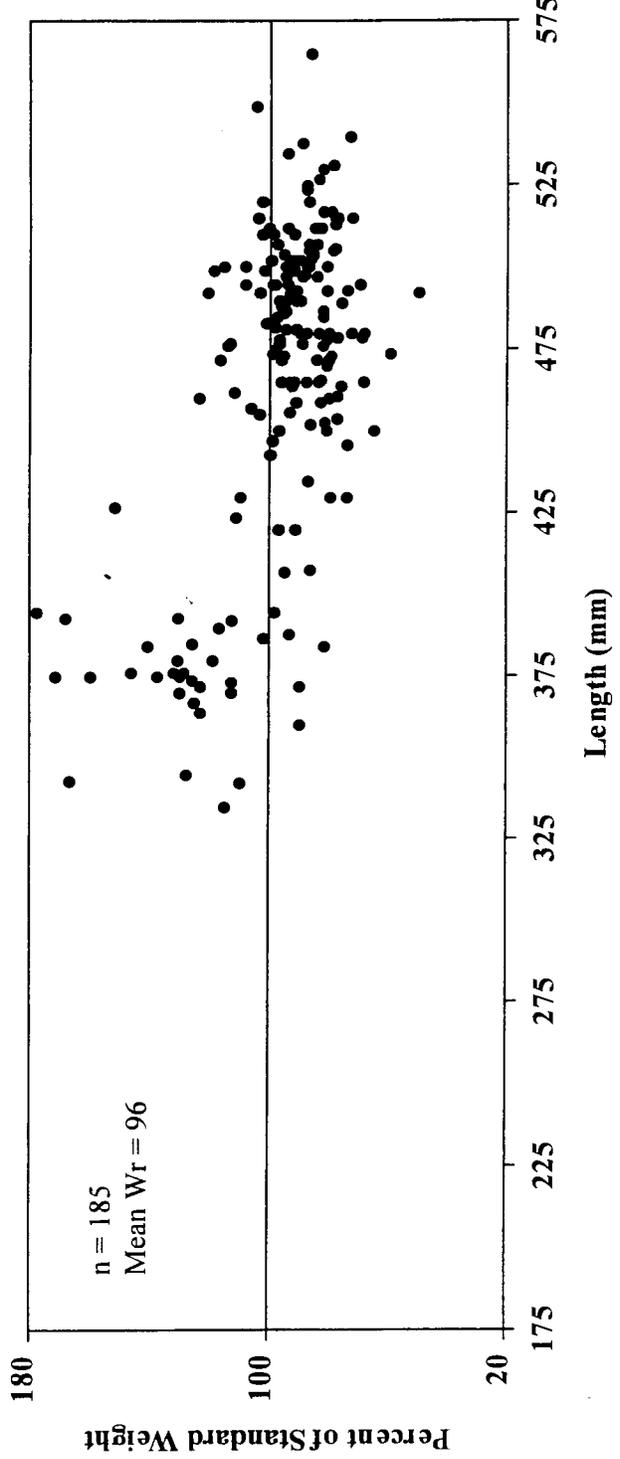


Figure 3. Length frequency distributions of rainbow trout sampled from Daniel's Reservoir, Idaho, late April, 1997 and early May, 1998.



May 1998



Oct. 1998

Figure 4. Relative weight analysis of rainbow trout sampled from Daniel's Reservoir, Idaho, May 7 and Oct. 13, 1998.

bias from recent stocking of catchable rainbow trout, we examine what percent of fish greater than 300 mm is also greater than 400 mm. For Daniels Reservoir, that number was 93% and 81% during May and October respectively (Figure 2). This greatly exceeds our target goal of 20%.

### **Treasureton Reservoir**

In May, 148 rainbow trout and five brook trout were collected. The rainbow trout ranged in length from 214 to 609 mm with a mean length of 412 mm. In October, 224 rainbow trout and 19 rainbow x cutthroat trout hybrids were collected. The rainbow trout ranged in length from 153 to 571 mm with a mean length of 407 mm. Analysis of length frequencies between May and October show only a small shift of the mode to a larger size (Figure 5). This contrasts greatly with the differences seen between spring of 1997 and spring of 1998 (Figure 6).

Once again, standard-weight analysis reveals an area of concern (Figure 7). The mean  $W_r$  of October, 94% differs significantly (at  $\alpha = .05$ ) from the standard weight. Additionally, viewing the scatterplots show a problem as the fish reach 400 mm or more. The numbers may indicate that there is competition for food preyed upon by larger fish. A reduction in the number of fish stocked into Treasureton Reservoir may be required to reduce the number of fish that reach larger sizes (assuming total angler harvest remains the same).

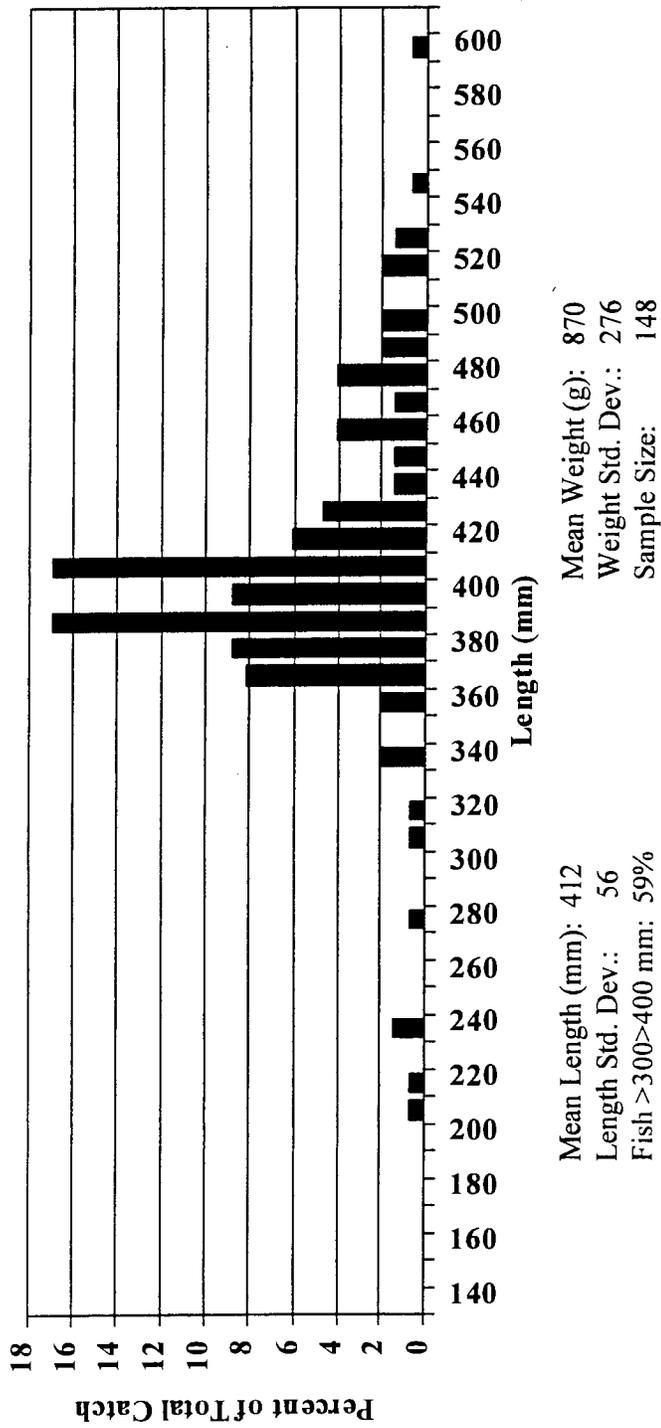
Regarding Treasureton Reservoir's designation as a quality trout water, in May 59% of fish > 300 mm were also > 400 mm. In October, that number had risen to 77%. Both of these statistics exceed even the requirement for trophy management.

### **American Falls Reservoir**

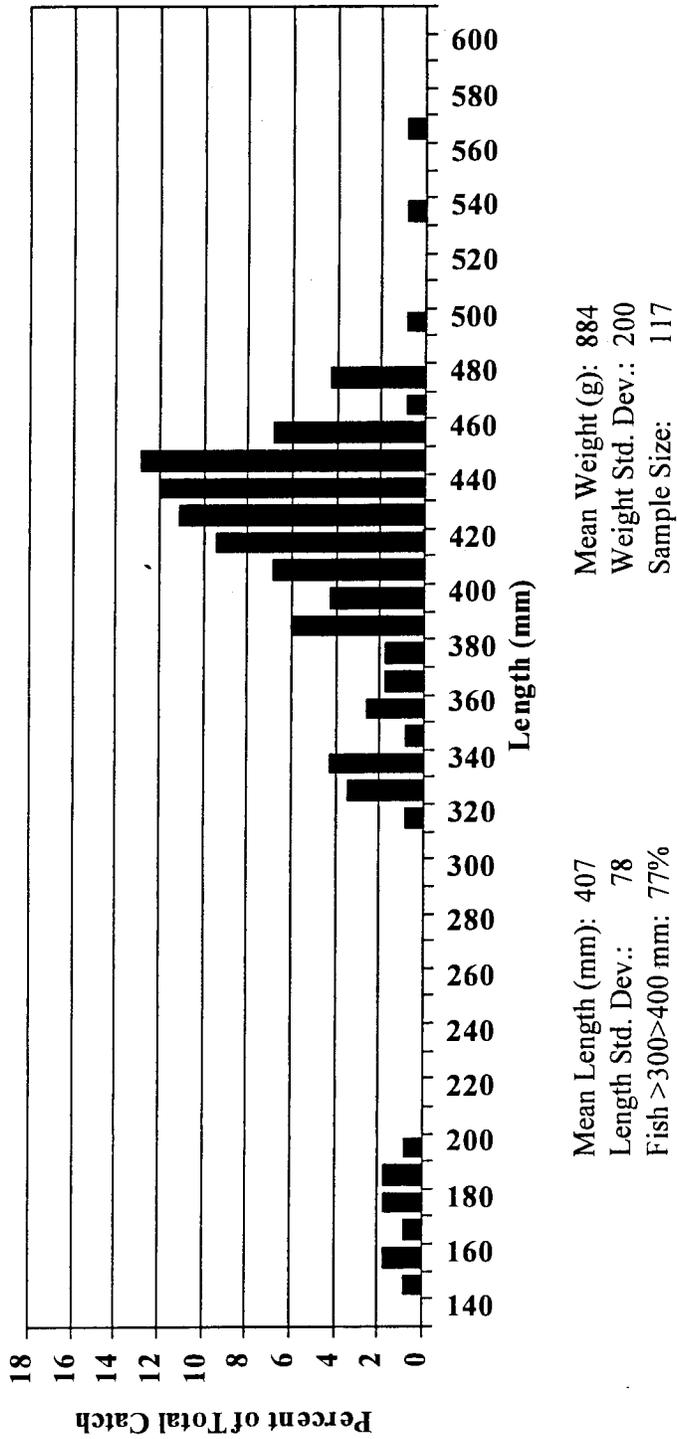
#### **Electrofishing Survey**

We conducted an electrofishing survey on 22, 660 ha American Falls Reservoir on May 28, 1998. Relative species composition of the sample was 34.1% smallmouth bass, 27.6% Utah sucker, 19.0% yellow perch, 14.7% redbreast shiner, 2.6% Utah chub, 1.2% sculpin, and <1% for both rainbow trout and brown trout (Table 1). The smallmouth bass ranged in size from 80 to 320 mm with an overall PSD (proportional stock density) of 21% (Figure 8). Yellow perch were the only other game fish caught in significant numbers with a size range of 75-225 mm, mean length of 117 mm, PSD of 18% and a mean  $W_r$  of 86% (Figure 9).

The overall increase in smallmouth bass numbers (Tables 1 and 2) more likely reflects the change in sample dates rather than any increase in the population at large. The overall increase in mean length is also probably due to sampling efforts conducted earlier in the year (Figure 8). This is the time of year when larger fish remain shallow to spawn and are thus susceptible to electrofishing techniques. The relative weight analysis of the sample indicates that the fish are experiencing competition for food early in life. They likely compete with yellow perch, Utah chubs, and redbreast shiners for the same food. However, when the smallmouth bass reach larger size and presumably turn to a more piscivorous diet, they experience a marked increase in their relative weight (Figure 10).

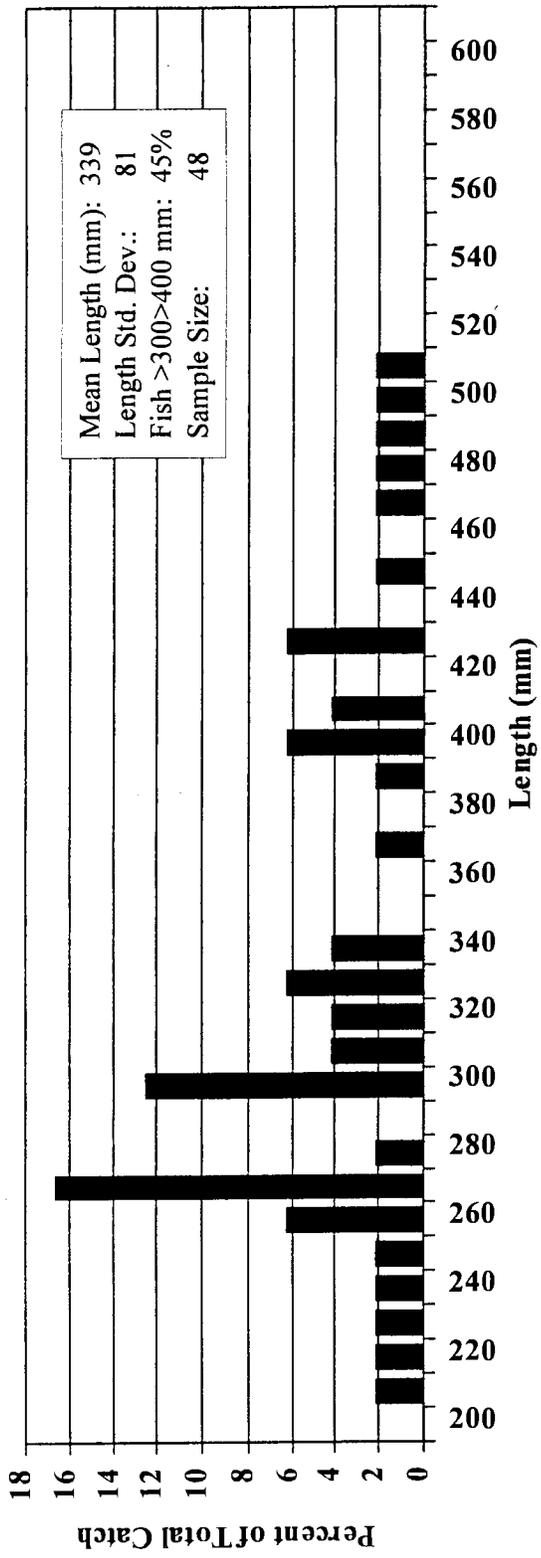


May 1998

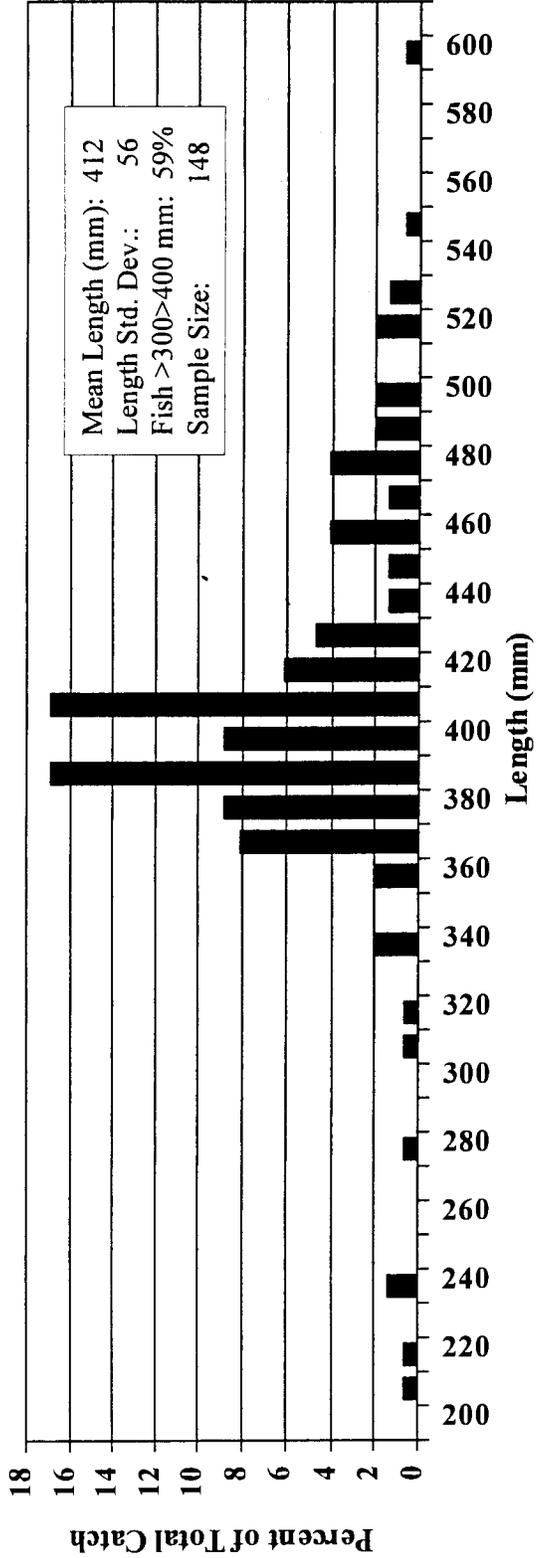


Oct. 1998

Figure 5. Length frequency distributions of rainbow trout sampled from Treasureton Reservoir, Idaho, May 6,14 and Oct. 20, 1998.

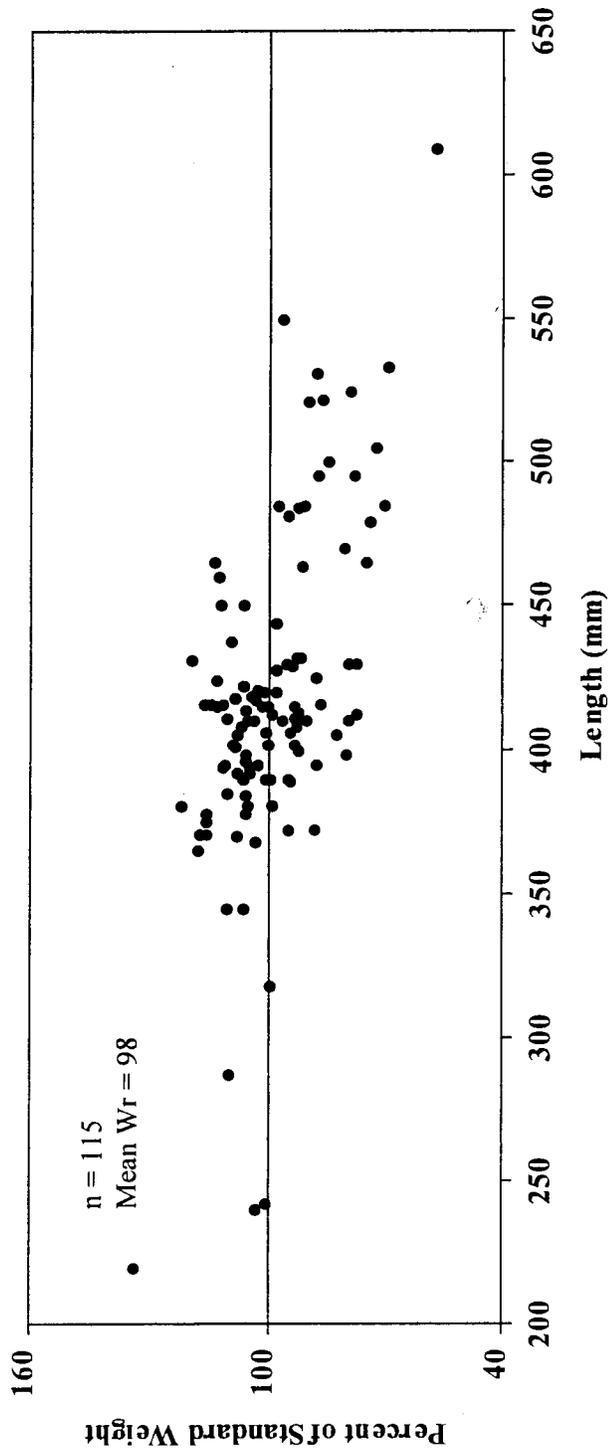


Spring 1997

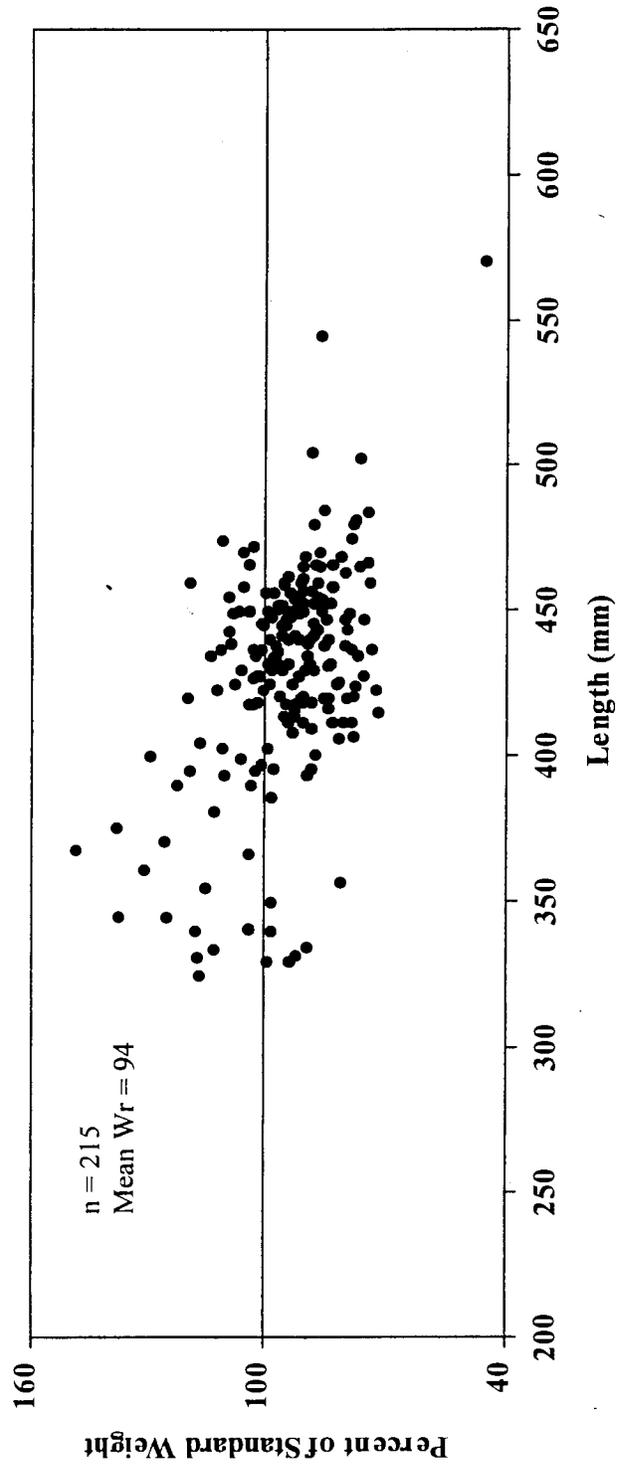


Spring 1998

Figure 6. Length frequency distributions of rainbow trout sampled from Treasureton Reservoir, Idaho, late April, 1997 and early May, 1998.



May 1998



Oct. 1998

Figure 7. Relative weight analysis of rainbow trout sampled from Treasureton Reservoir, Idaho, May 6, 14 and Oct. 20, 1998.

Table 1. Results of electrofishing survey on American Falls Reservoir, Idaho, May 28, 1998.

| Species                  | Catch per Unit Effort <sup>a</sup> | Relative % Species Composition | Mean Length (mm) | Length Range (mm) | Mean Relative Weight (W <sub>r</sub> ) |
|--------------------------|------------------------------------|--------------------------------|------------------|-------------------|--|
| Game Fish                |                                    |                                |                  |                   |  |
| Smallmouth bass          | 59.25                              | 34.1                           | 194              | 80-320            | 98                                     |
| Yellow perch             | 33.00                              | 19.0                           | 117              | 75-225            | 86                                     |
| Rainbow trout            | 0.75                               | 0.4                            | 204 <sup>b</sup> | NA                | 58 <sup>b</sup>                        |
| Brown trout              | 0.75                               | 0.4                            | 594 <sup>b</sup> | NA                |  |
| <b>Subtotal</b>          | <b>93.75</b>                       | <b>53.9</b>                    |                  |                   |  |
| Non-game Fish            |                                    |                                |                  |                   |  |
| Utah sucker              | 48.00                              | 27.6                           | 218              | 77-596            |  |
| Redside shiner           | 25.50                              | 14.7                           | 73               | 55-100            |  |
| Utah chub                | 4.50                               | 2.6                            | 104              | 85-130            |  |
| Sculpin                  | 2.25                               | 1.2                            | 100              | 84-110            |  |
| <b>Subtotal</b>          | <b>80.25</b>                       | <b>46.1</b>                    |                  |                   |  |
| <b>All Species Total</b> | <b>174.00</b>                      | <b>100.0</b>                   |                  |                   |  |

<sup>a</sup> One hour of electrofishing is equal to one unit of sampling effort.

<sup>b</sup> Based on sample of one fish only.

Table 2. Results from electrofishing portion of lowland lake survey on American Falls Reservoir, Idaho, July 22 and 30, 1997.

| Species                  | Catch per Unit Effort <sup>a</sup> | Relative % Species Composition | Mean Length (mm) | Length Range (mm) | Mean Relative Weight (W <sub>r</sub> ) |
|--------------------------|------------------------------------|--------------------------------|------------------|-------------------|--|
| Game Fish                |                                    |                                |                  |                   |  |
| Smallmouth bass          | 54.09                              | 22.9                           | 168              | 53-269            | 142                                    |
| Yellow perch             | 45.91                              | 19.5                           | 122              | 40-228            | 160                                    |
| Rainbow trout            | 0.29                               | 0.1                            | 372              | 300-480           | 106                                    |
| Largemouth bass          | 0.29                               | 0.1                            | 170 <sup>b</sup> | NA                |  |
| <b>Subtotal</b>          | <b>100.58</b>                      | <b>42.6</b>                    |                  |                   |  |
| Non-game Fish            |                                    |                                |                  |                   |  |
| Utah sucker              | 103.80                             | 44.0                           | 263              | 62-623            |  |
| Redside shiner           | 7.89                               | 3.3                            | 76               | 65-90             |  |
| Utah chub                | 20.47                              | 8.7                            | 240              | 82-457            |  |
| Carp                     | 2.63                               | 1.2                            | 559              | 66-718            |  |
| Sculpin                  | 0.58                               | 0.2                            | 52 <sup>b</sup>  | NA                |  |
| <b>Subtotal</b>          | <b>135.37</b>                      | <b>57.4</b>                    |                  |                   |  |
| <b>All Species Total</b> | <b>235.95</b>                      | <b>100.0</b>                   |                  |                   |  |

<sup>a</sup> One hour of electrofishing is equal to one unit of sampling effort.

<sup>b</sup> Based on sample of one fish only.

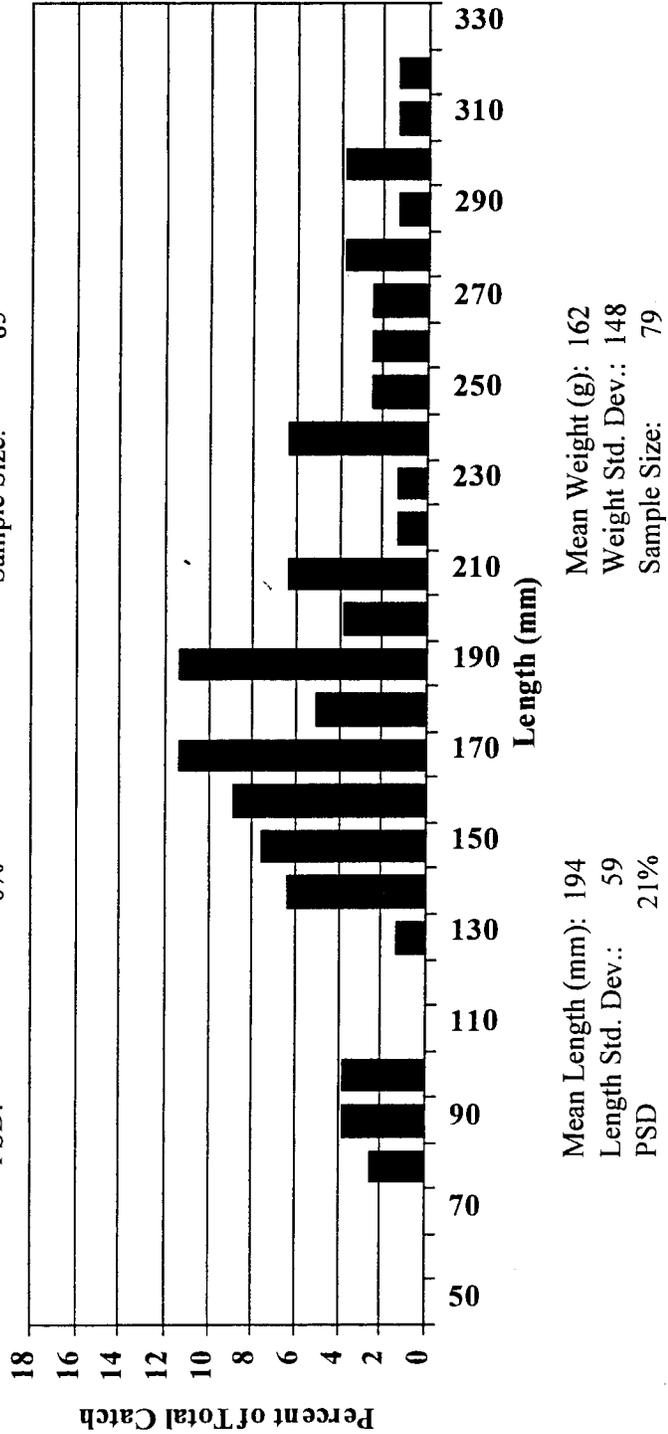
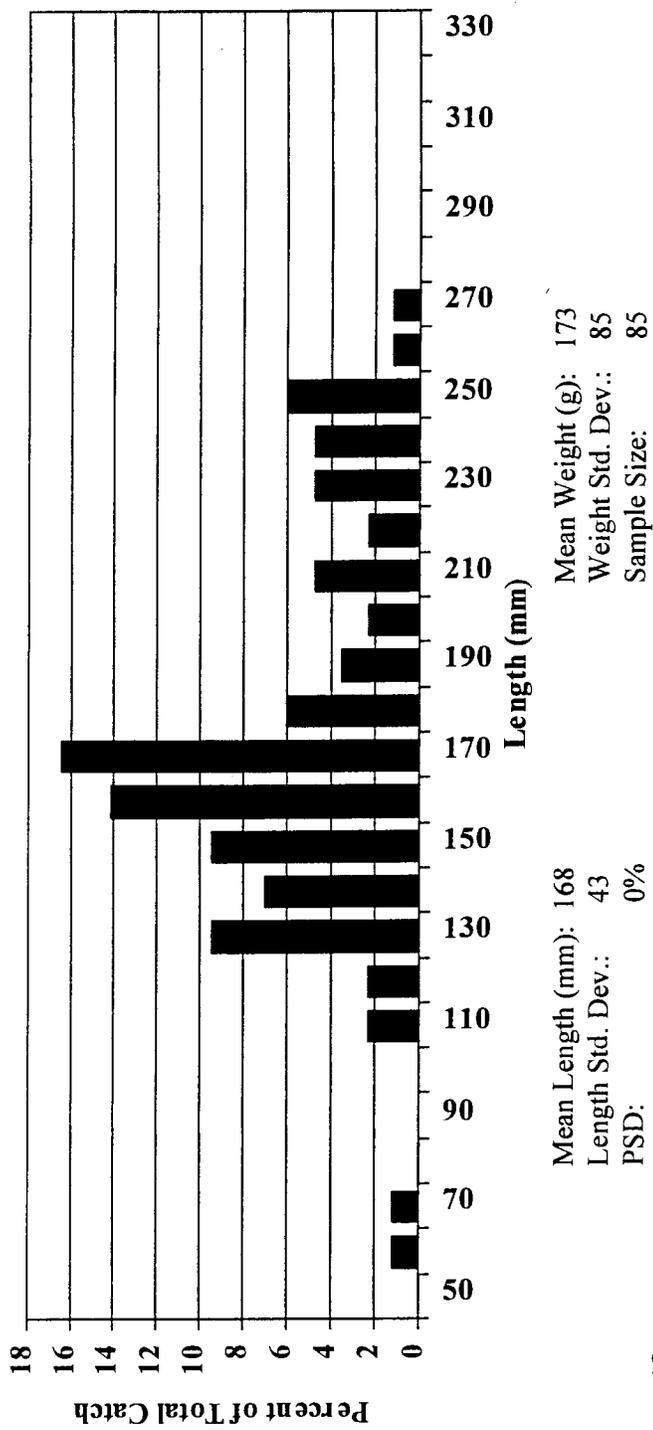


Figure 8. Length frequency distributions of smallmouth bass sampled from American Falls Reservoir, Idaho, July 22 and 30, 1997 and May 28, 1998.

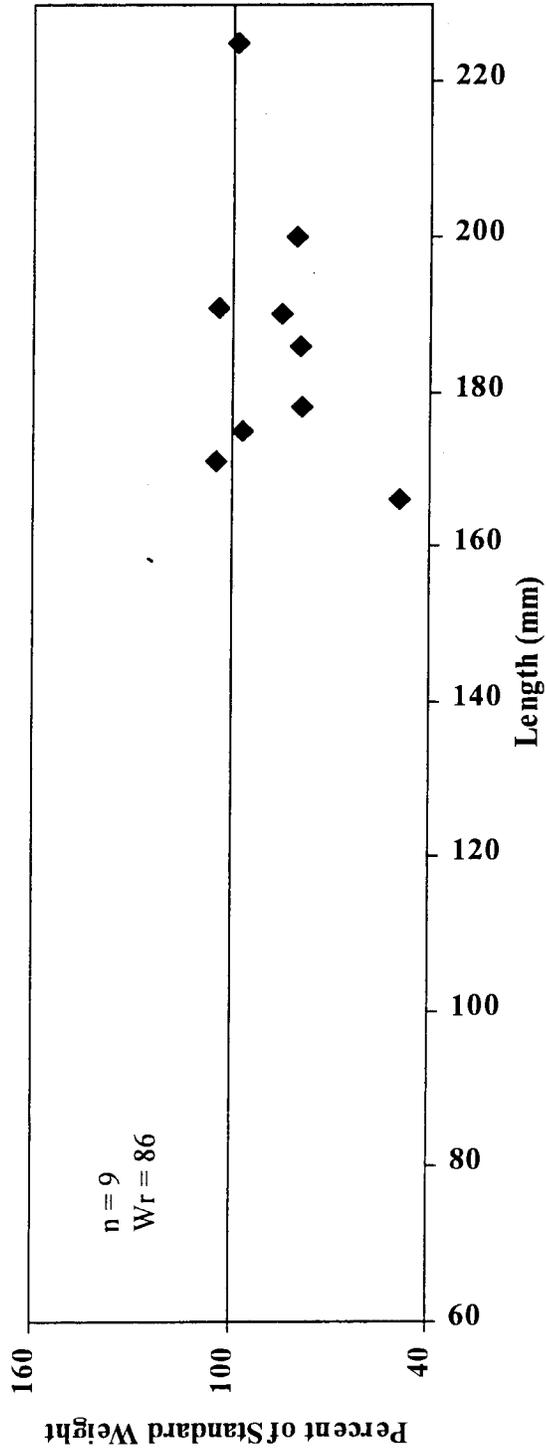
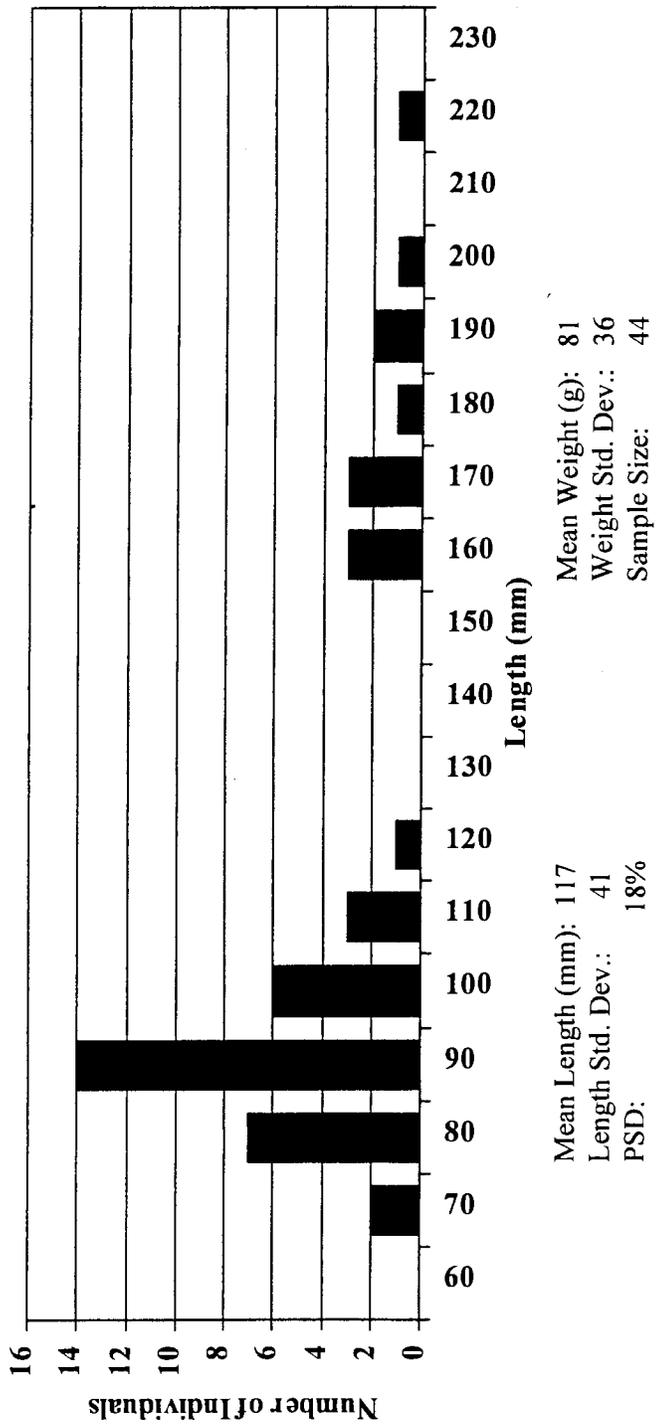
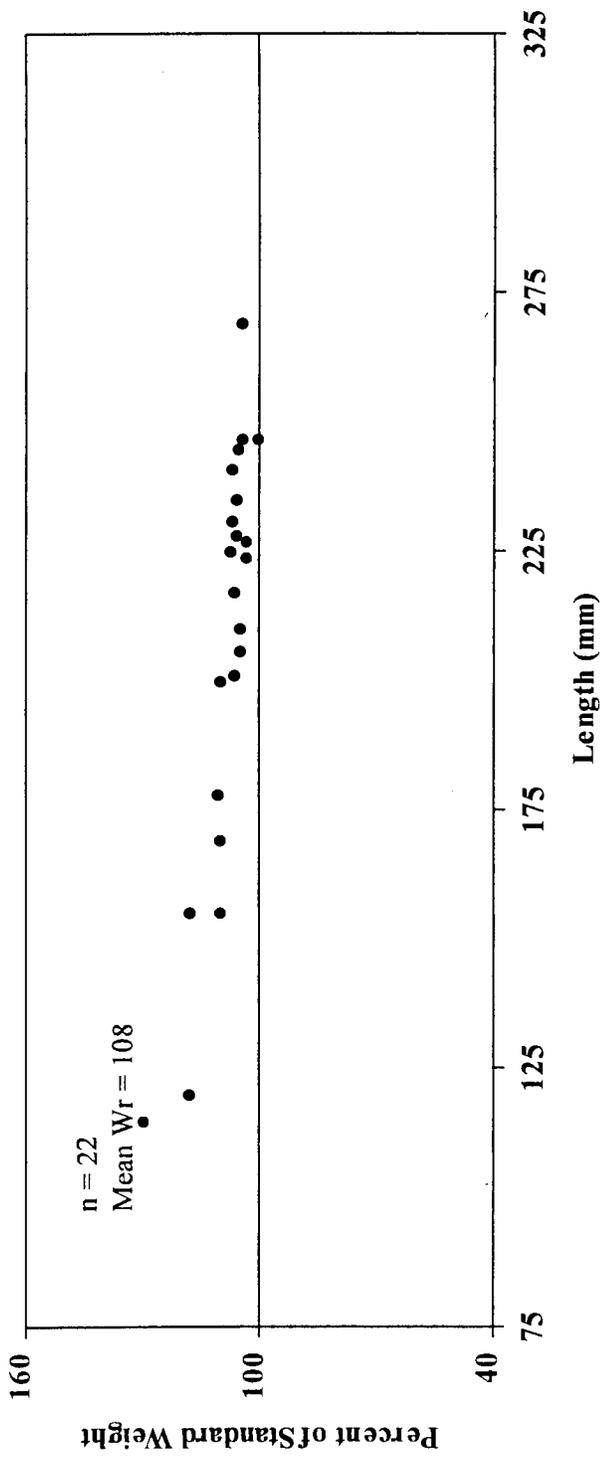
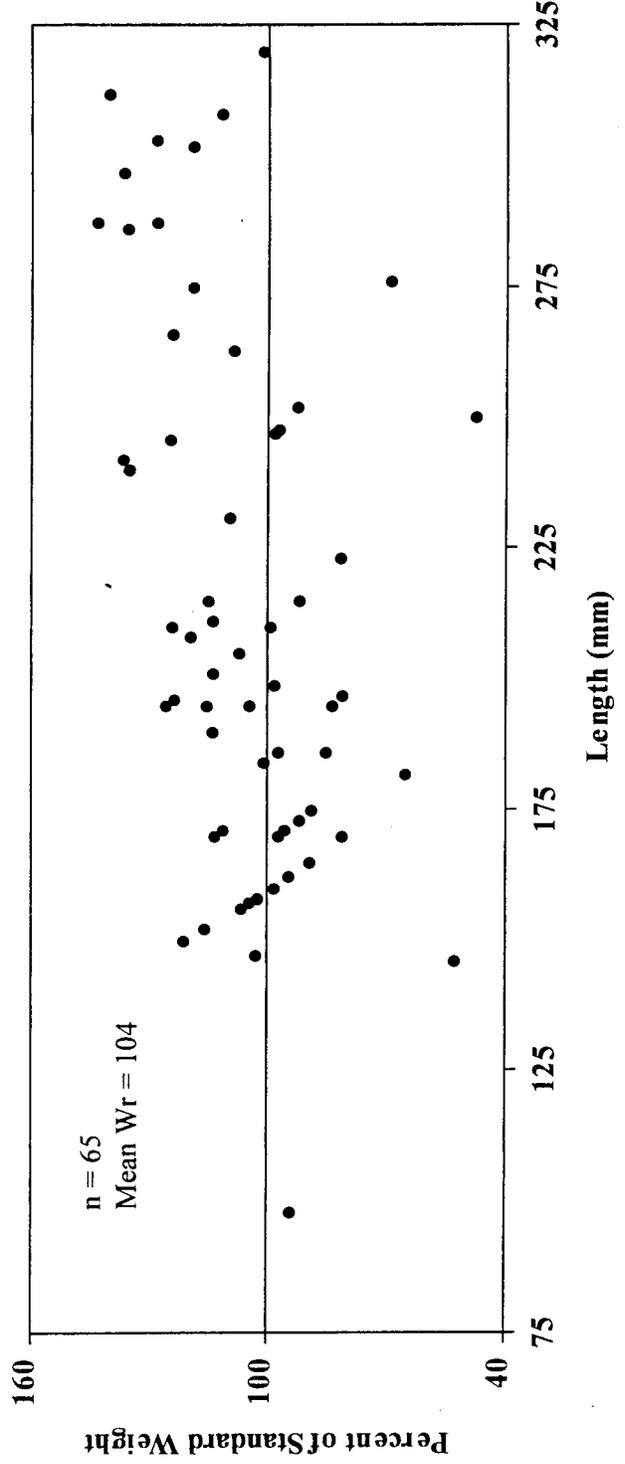


Figure 9. Length frequency distribution and relative weight analysis for yellow perch sampled from American Falls Reservoir, Idaho, May 28, 1998.



July 1997



May 1998

Figure 10. Relative weight analysis of smallmouth bass sampled from American Falls Reservoir, Idaho, July 22 and 30, 1997 and May 28, 1998.

It appears that the smallmouth bass population in American Falls Reservoir is firmly established. Continued shoreline electrofishing surveys could be used to monitor any effects this new population of predators has on the non-game fish communities. Our maximum length smallmouth bass of 320 mm is much smaller than what anglers have reported catching recently. Future sampling effort may be needed to determine the number of larger (>350 mm) smallmouth bass might be present in the reservoir.

## **Temperature and Dissolved Oxygen**

We conducted water temperature and dissolved oxygen (DO) sampling on American Falls Reservoir July 24 and August 13, 1998. A summary of the results is presented in Table 3 and Figure 11. Notably, water temperature remains above 20 °C down to a depth of nine meters in July and 14 meters in August. The problem is that DO readings at that depth are less than 5 mg/l. This would force trout to either remain in a cooler-low oxygen environment or a warmer-high oxygen one. In either case, the fish would be stressed and become more prone to parasites and infections. The sampling was done during the coolest part of the day (early morning hours) and thus the fish appear to have no reprieve from the temperature/oxygen “squeeze”. This squeeze likely lasted several weeks during a continuous heat wave. The only action open to the Department was to request Idaho Power to operate their aerators in the dam’s outflow to help reduce the stress on trout living in the Snake River below the dam. Temperature and dissolved oxygen profiles for all nine sites monitored are provided in the appendices.

## **Lowland Lake Surveys**

### **Weston Reservoir**

Figure 12 indicates the locations on the reservoir where sampling effort took place. The relative species composition was 64.7% largemouth bass, 31.2% yellow perch, and 4.1% rainbow trout (Table 4). Our sampling results support what the anglers had been telling us; there are very few largemouth bass in Weston Reservoir exceeding 300-mm (Figure 13). Only ten out of 219 were of harvestable size under the old regulations. However, the fish that are there seem healthy; they do not significantly differ from their standard weight (at  $\alpha = .05$ ).

The yellow perch population in Weston Reservoir appears to be strong. With a PSD of 62% and a large number of 250+ mm fish, the reservoir provides one of if not the best yellow perch fishery in the region (Figure 14). The only observable problem is with the mean relative weight of 95% differing significantly (at  $\alpha = .05$ ) with the standard. We will have to watch this population to determine if increased harvest of largemouth bass leads to a decrease in the health of the yellow perch (stunting).

Rainbow trout make up a very small portion of the species composition, but remain a highly targeted species (observations and angler interviews). As with other mixed (warmwater and coldwater) fisheries in the region, rainbow trout do not do as well in Weston Reservoir as they do in trout only fisheries (Scully and Mende 1997). Few rainbow trout exceed 330 mm and their  $W_r$  (95%) differs significantly (at  $\alpha = .05$ ) from the standard (Figure 15).

Table 3. Summarized water temperature and dissolved oxygen content of nine sites on American Falls Reservoir, Idaho, July 24 and August 13, 1998.

| Depth (m) | Mean Temperature (°C) |        | Temperature Range (°C) |             | Mean Dissolved Oxygen (mg/l) |        | Dissolved Oxygen Range (mg/l) |           |
|-----------|-----------------------|--------|------------------------|-------------|------------------------------|--------|-------------------------------|-----------|
|           | July                  | August | July                   | August      | July                         | August | July                          | August    |
| 1         | 23.2                  | 23.1   | 23.0 – 23.5            | 22.8 – 23.5 | 7.3                          | 7.2    | 6.8 – 7.9                     | 6.3 – 8.0 |
| 2         | 23.2                  | 23.1   | 23.0 – 23.5            | 22.8 – 23.5 | 7.3                          | 7.2    | 6.7 – 7.8                     | 6.4 – 8.1 |
| 3         | 23.2                  | 23.1   | 23.0 – 23.5            | 22.8 – 23.5 | 7.3                          | 7.2    | 6.7 – 7.7                     | 6.2 – 8.0 |
| 4         | 23.1                  | 23.0   | 22.0 – 23.5            | 22.5 – 23.5 | 7.1                          | 7.0    | 6.5 – 7.7                     | 6.2 – 7.5 |
| 5         | 22.9                  | 22.9   | 22.0 – 23.5            | 22.1 – 23.5 | 7.0                          | 6.4    | 6.4 – 7.6                     | 5.0 – 7.3 |
| 6         | 22.4                  | 22.6   | 21.0 – 23.1            | 22.0 – 23.2 | 6.7                          | 5.9    | 6.0 – 7.7                     | 4.0 – 7.1 |
| 7         | 22.0                  | 22.5   | 20.0 – 23.0            | 21.8 – 23.0 | 6.5                          | 5.3    | 5.6 – 7.6                     | 2.4 – 6.5 |
| 8         | 21.8                  | 22.4   | 20.3 – 23.0            | 21.8 – 23.0 | 6.2                          | 4.7    | 4.5 – 6.9                     | 1.8 – 6.2 |
| 9         | 21.5                  | 22.5   | 20.0 – 23.0            | 22.0 – 23.0 | 5.8                          | 5.1    | 4.1 – 6.7                     | 3.3 – 5.8 |
| 10        | 19.9                  | 22.3   | 19.0 – 21.0            | 22.0 – 22.8 | 3.7                          | 5.3    | 0.8 – 6.1                     | 4.8 – 5.8 |
| 11        | 19.3                  | 22.2   | 18.0 – 21.0            | 22.0 – 22.5 | 3.5                          | 5.0    | 0.4 – 6.1                     | 4.7 – 5.2 |
| 12        | 19.0                  | 21.9   | 18.0 – 20.2            | 21.5 – 22.1 | 3.3                          | 4.6    | 0.3 – 5.6                     | 4.2 – 5.0 |
| 13        | 18.3                  | 21.3   | 17.0 – 19.5            | 19.8 – 22.0 | 3.0                          | 3.6    | 2.0 – 5.2                     | 1.3 – 5.0 |
| 14        | 16.7                  | 19.4   | 16.1 – 17.5            | 18.0 – 21.8 | 1.4                          | 1.8    | 0.3 – 2.6                     | 0.3 – 4.2 |
| 15        | 16.4                  | 18.6   | 16.0 – 17.0            | 17.8 – 20.0 | 0.9                          | 0.5    | 0.2 – 1.6                     | 0.3 – 0.8 |
| 16        | 16.1                  | 18.0   | 16.0 – 16.2            | 18.0        | 0.7                          | 0.2    | 0.2 – 0.9                     | 0.2       |
| 17        | 16.0                  | 17.9   | 16.0                   | 17.9        | 0.9                          | 0.1    | 0.9                           | 0.1       |
| 18        | 16.0                  | 17.5   | 16.0                   | 17.5        | 0.8                          | 0.1    | 0.8                           | 0.1       |
| 19        |                       | 17.1   |                        | 17.1        |                              | 0.1    |                               | 0.1       |

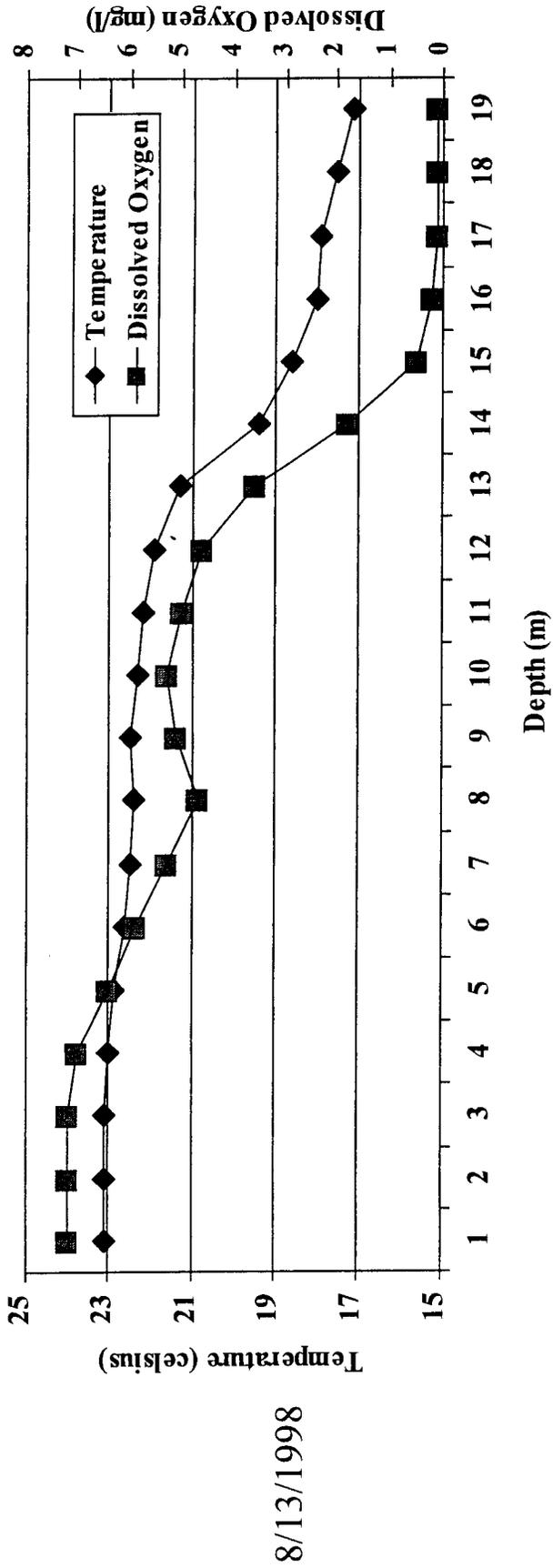
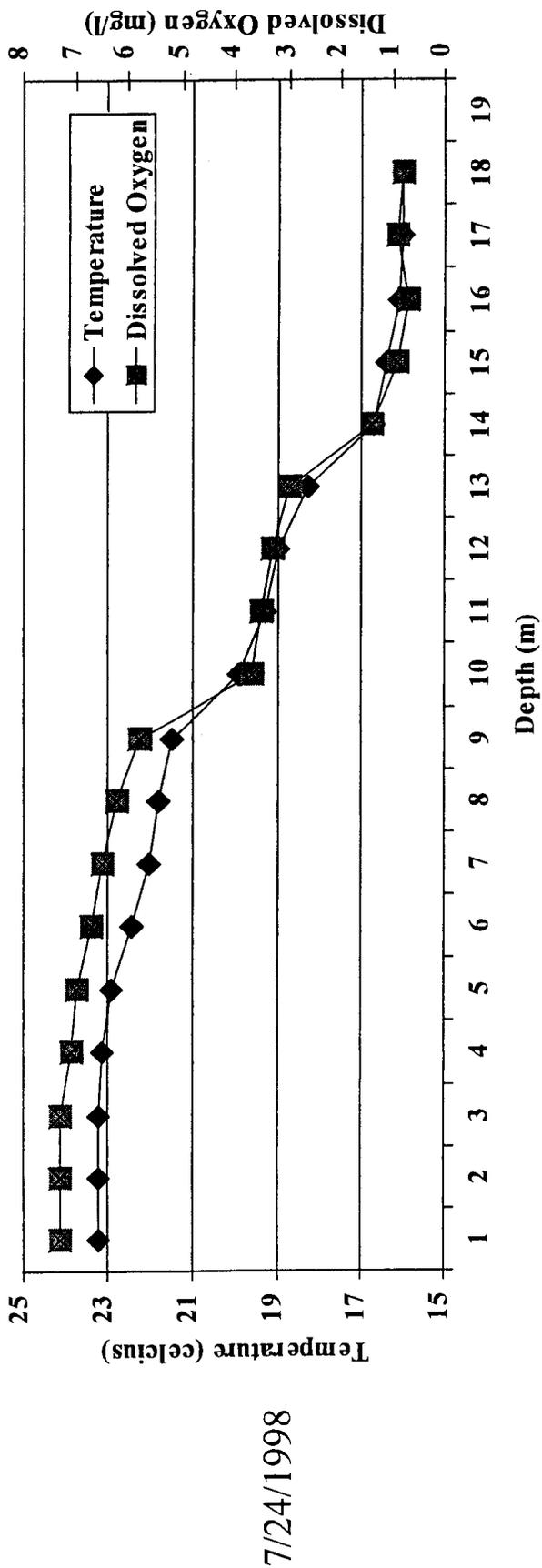


Figure 11. Mean temperature and dissolved oxygen levels from nine sites on American Falls Reservoir, Idaho, during mid-summer 1998.

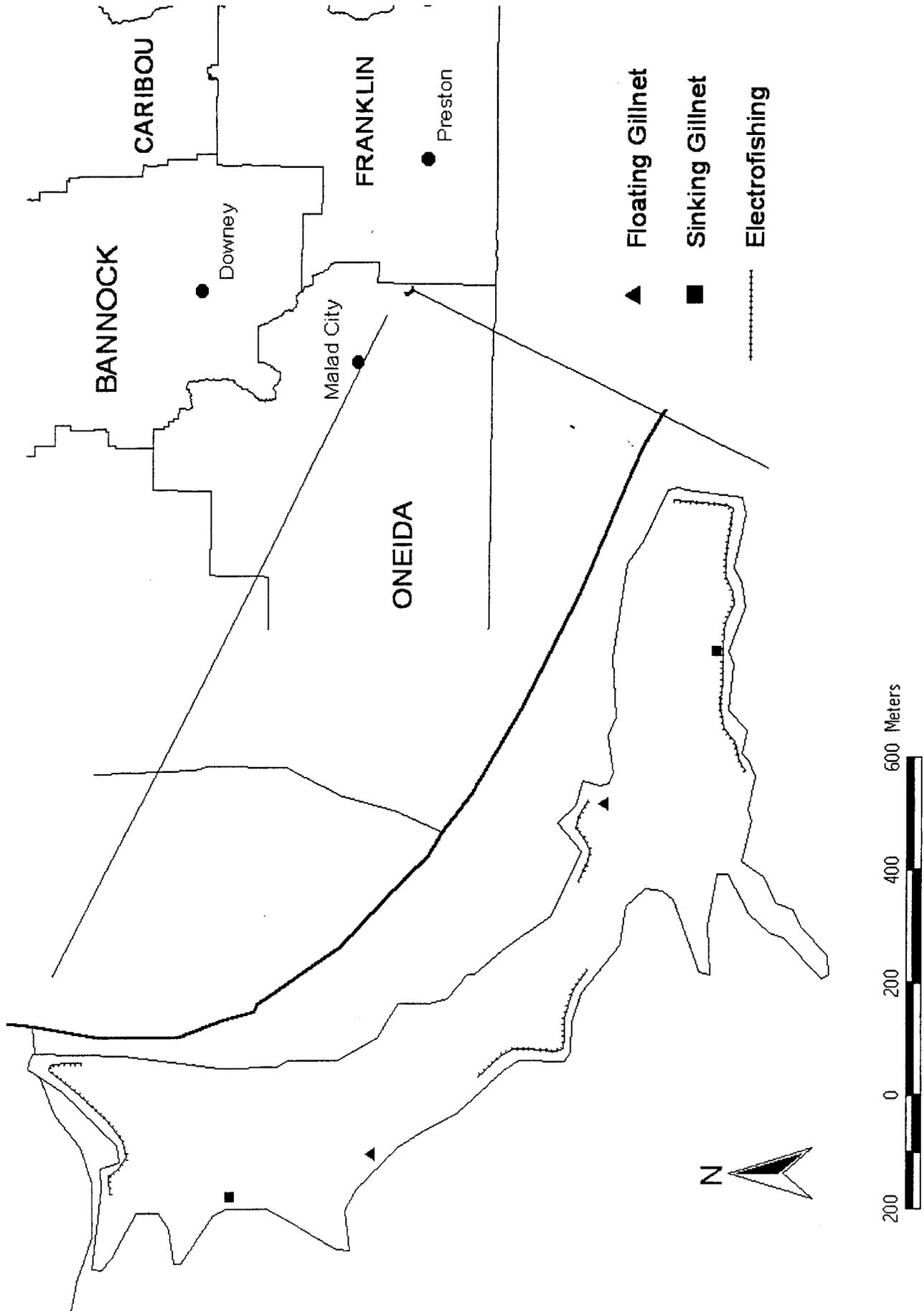


Figure 12. Map of Weston Reservoir, Idaho, indicating location of gillnet and electrofishing sites for sampling on June 18, 1998.

Table 4. Weston Reservoir, Idaho, standard survey findings of fish community characteristics June 18, 1998.

| Species         | Catch per Unit Effort <sup>a</sup> | Relative % Species Composition | Mean Length (mm) | Length Range (mm) | Relative Weight (W <sub>r</sub> ) |
|-----------------|------------------------------------|--------------------------------|------------------|-------------------|-----------------------------------|
| Largemouth Bass | 229.7                              | 64.7%                          | 186              | 45 – 445          | 102%                              |
| Yellow Perch    | 110.8                              | 31.2%                          | 182              | 45 – 290          | 95%                               |
| Rainbow Trout   | 14.4                               | 4.1%                           | 321              | 246 – 430         | 95%                               |
| <b>Total</b>    | <b>354.9</b>                       | <b>100.0%</b>                  |                  |                   |                                   |

<sup>a</sup> One hour electrofishing, one trap net night, and one combined floating and sinking gillnet night equals one unit of effort.

Table 5. Glendale Reservoir, Idaho, standard survey findings of fish community characteristics August 4, 1998.

| Species         | Catch per Unit Effort <sup>a</sup> | Relative % Species Composition | Mean Length (mm) | Length Range (mm) | Relative Weight (W <sub>r</sub> ) |
|-----------------|------------------------------------|--------------------------------|------------------|-------------------|-----------------------------------|
| Largemouth Bass | 29.4                               | 53.0%                          | 222              | 22 – 404          | 98%                               |
| White Crappie   | 9.3                                | 16.9%                          | 152              | 110 – 240         | 146%                              |
| Rainbow Trout   | 16.7                               | 31.1%                          | 348              | 305 – 518         | 98%                               |
| <b>Total</b>    | <b>55.4</b>                        | <b>100.0%</b>                  |                  |                   |                                   |

<sup>a</sup> One hour electrofishing, one trap net night, and one combined floating and sinking gillnet night equals one unit of effort.

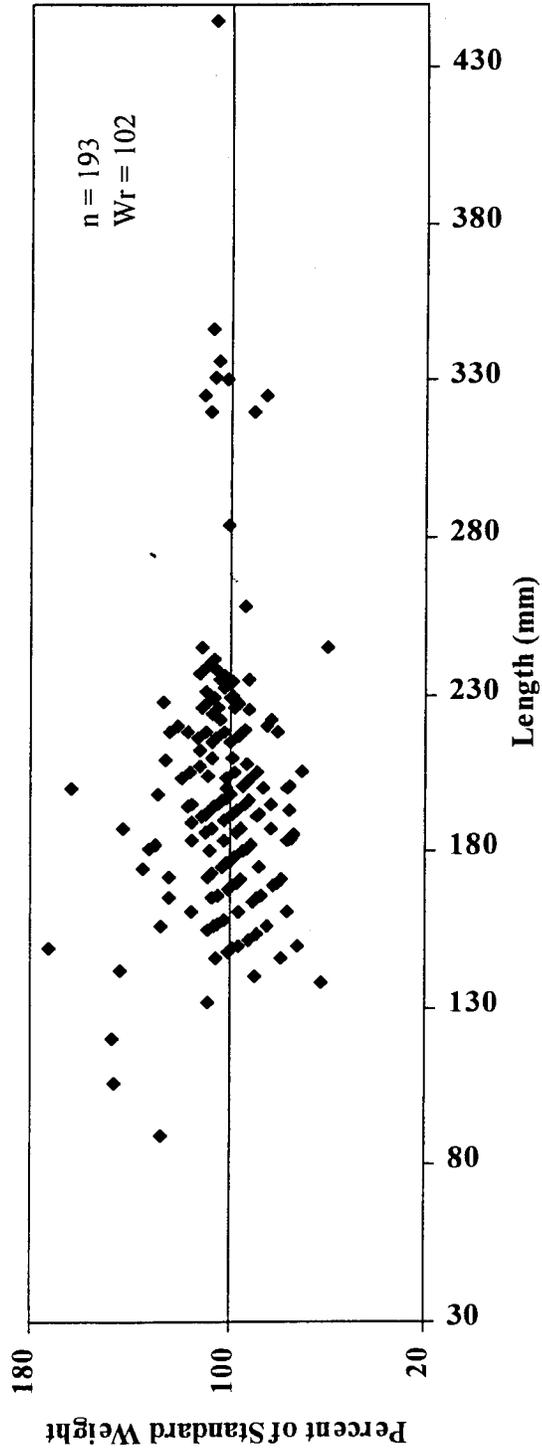
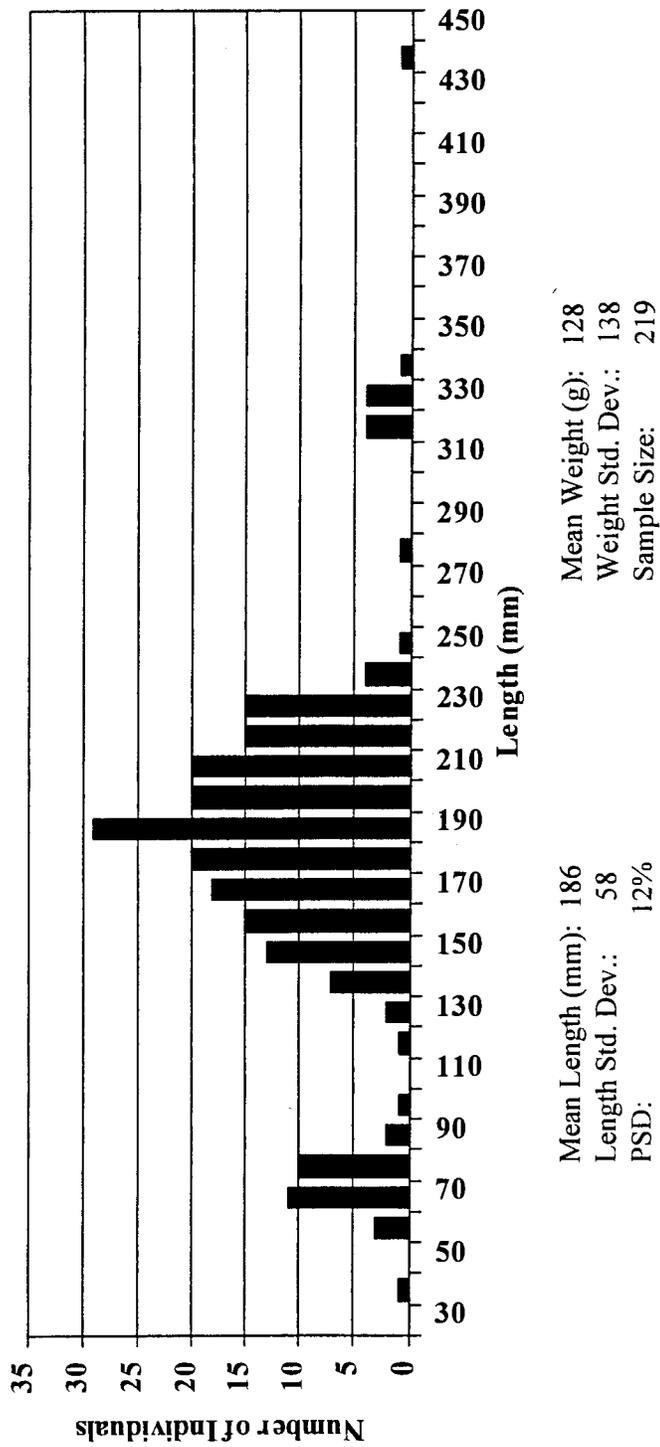


Figure 13. Length frequency distribution and relative weight analysis for largemouth bass sampled from Weston Reservoir, Idaho, June 18, 1998.

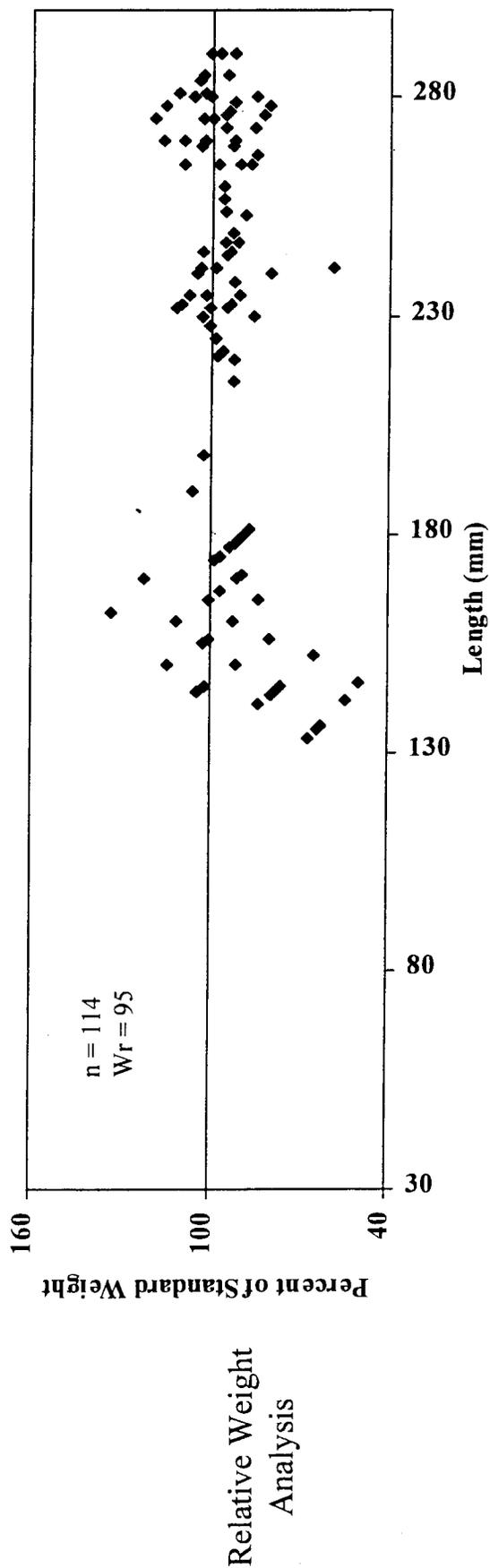
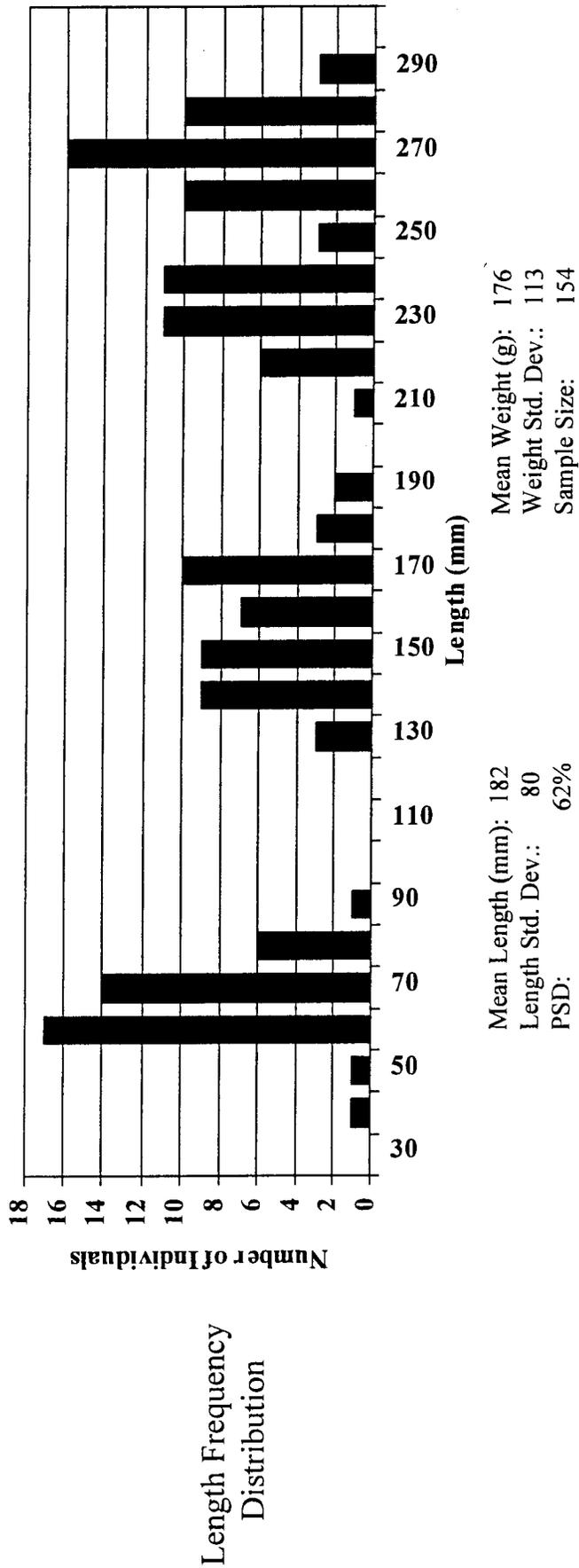
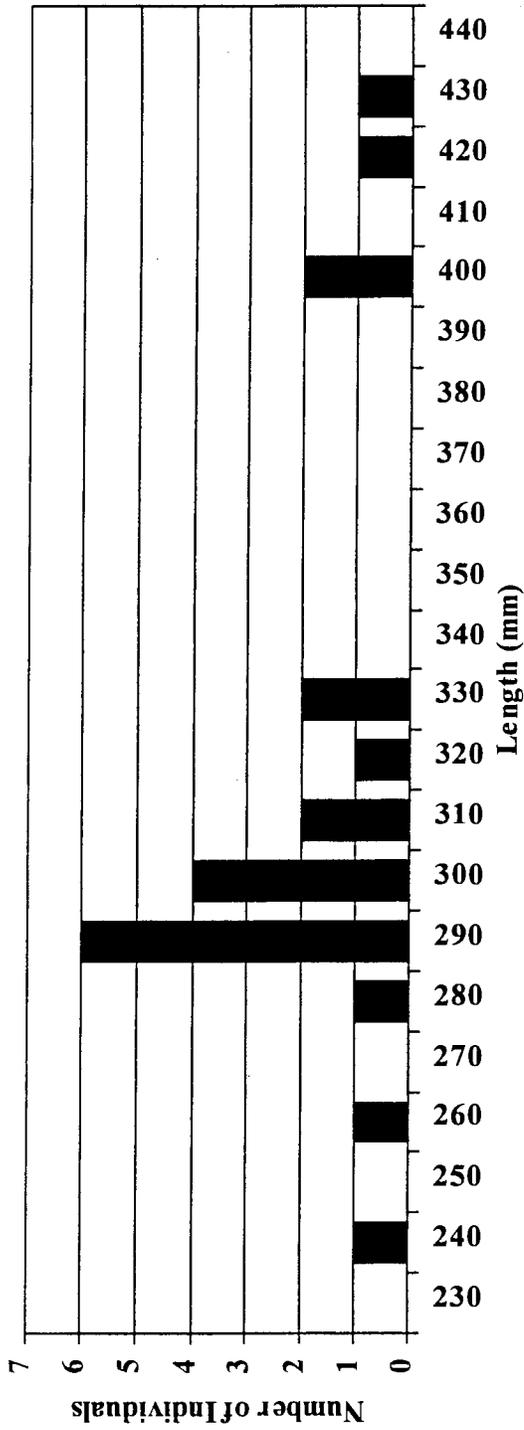


Figure 14. Length frequency distribution and relative weight analysis for yellow perch sampled from Weston Reservoir, Idaho, June 18, 1998.



Mean Length (mm): 321  
 Length Std. Dev.: 50  
 Fish >300 >400mm: 31%  
 Mean Weight (g): 400  
 Weight Std. Dev.: 220  
 Sample Size: 22

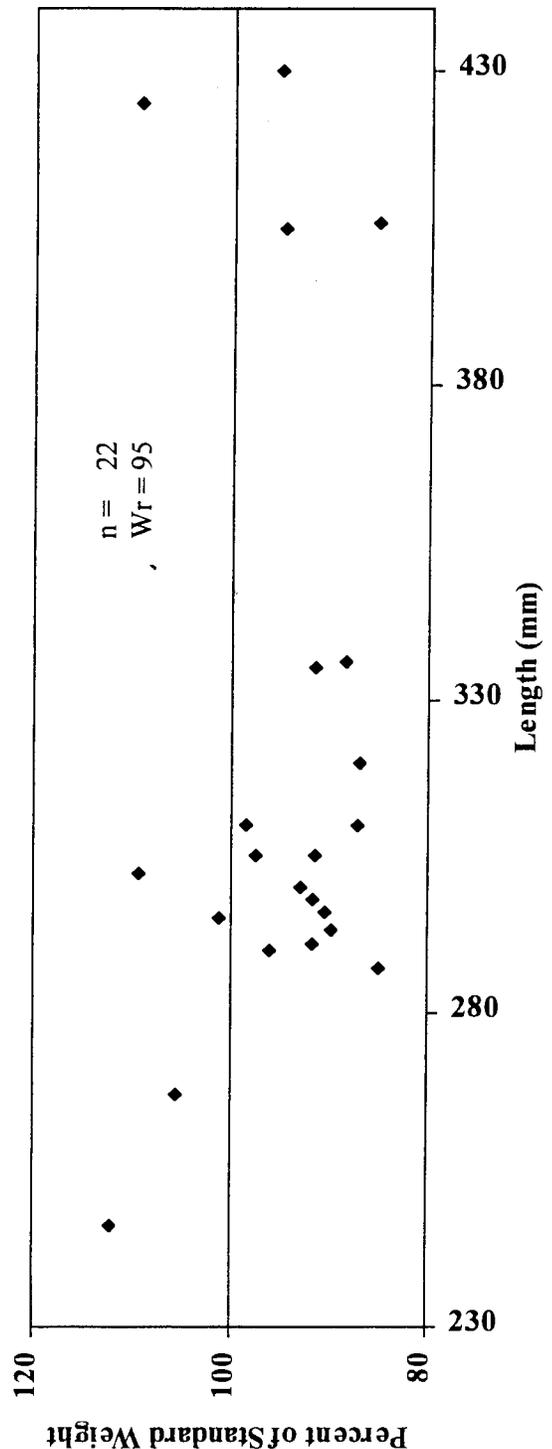


Figure 15. Length frequency distribution and relative weight analysis for rainbow trout sampled from Weston Reservoir, Idaho, June 18, 1998.

## Glendale Reservoir

Figure 16 indicates the locations on the reservoir where sampling effort took place. The relative species composition was 53.0% largemouth bass, 31.1% rainbow trout, and 16.9% white crappie (Table 5). The information that was gathered on largemouth bass (Figure 17) reflects data collected from a bass tournament in 1997 (Figure 18). Largemouth bass in Glendale Reservoir seem to grow well until they approach 400 mm in length. It is possible that our survey techniques would miss the larger sized largemouth bass because we sampled well into the post-spawning season (larger fish would be deeper and they don't gillnet well). However, the absence of larger fish in the tournament results (larger fish are specifically targeted) indicates that 400+ mm fish are truly absent from the water. It is unknown at this time whether they are all harvested immediately after reaching 16 inches, or whether growth is so slow in Glendale Reservoir that few reach harvestable length before natural mortality occurs. Future research should focus on the age-structure of the population to determine an answer.

Figure 19 indicates the catch statistics for white crappie sampled from Glendale Reservoir. The presence of several different age classes confirms that the species should recover from the fish kill of the previous winter. Future surveys should show a marked increase in the number crappie present barring any unforeseen disaster. Our survey, however, did not indicate the presence of any bluegill. However, personal contacts with reliable anglers verify that the species did in fact survive the fish kill. It is unknown whether bluegill numbers will bounce back enough to provide a satisfactory fishery. Very few rainbow trout in Glendale Reservoir reach large size (>400 mm) (Figure 20). However, it appears that the absence of yellow perch does allow the rainbow trout to maintain standard weight ( $W_t$ , not significantly different from standard weight at  $\alpha = .05$ ). It remains to be seen if the recovering white crappie population adversely affects rainbow trout growth in a similar manner to yellow perch (both a schooling, open-water feeder).

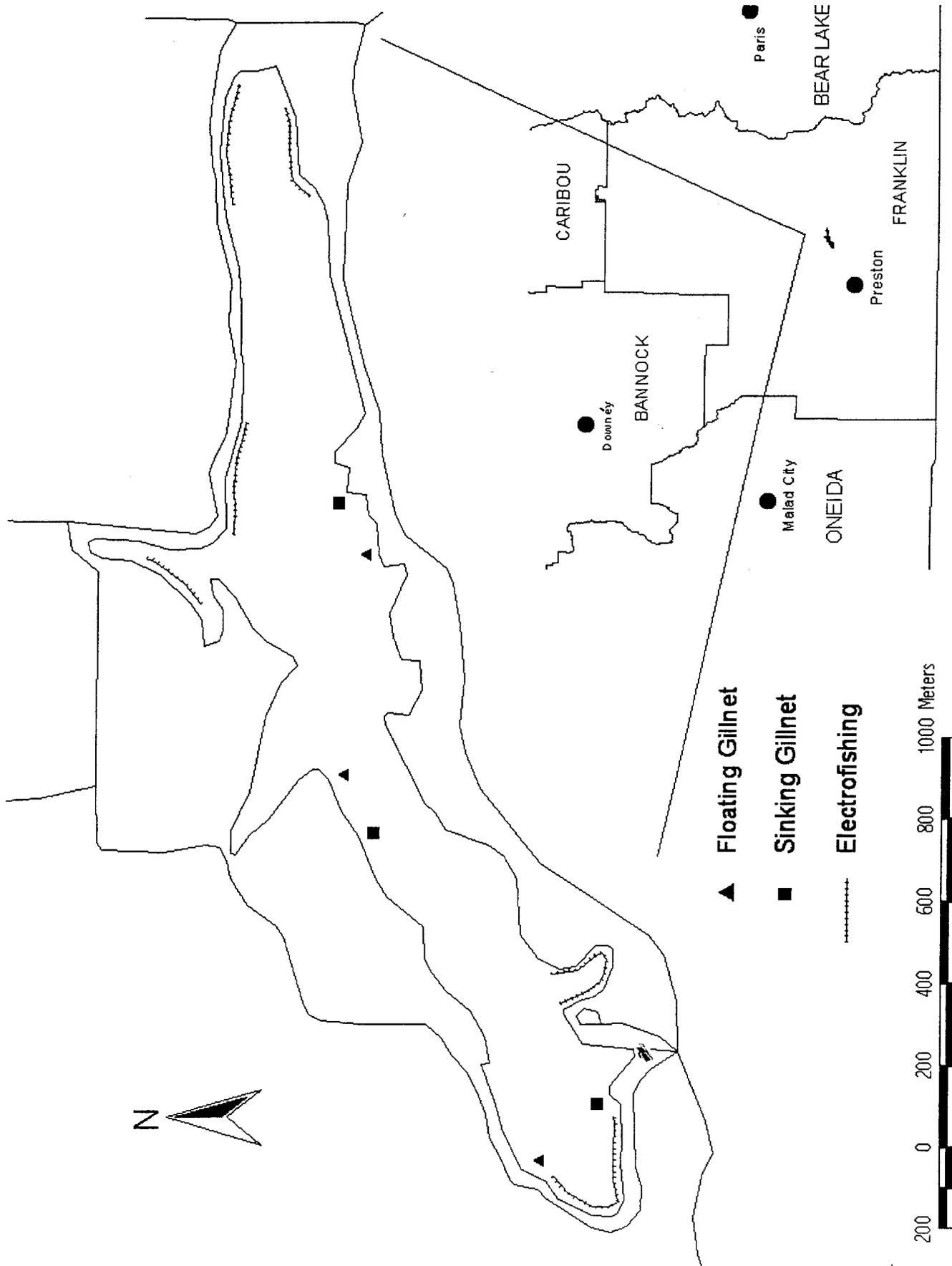


Figure 16. Map of Glendale Reservoir, Idaho, indicating location of gillnetting and electrofishing sample sites for August 4, 1998.

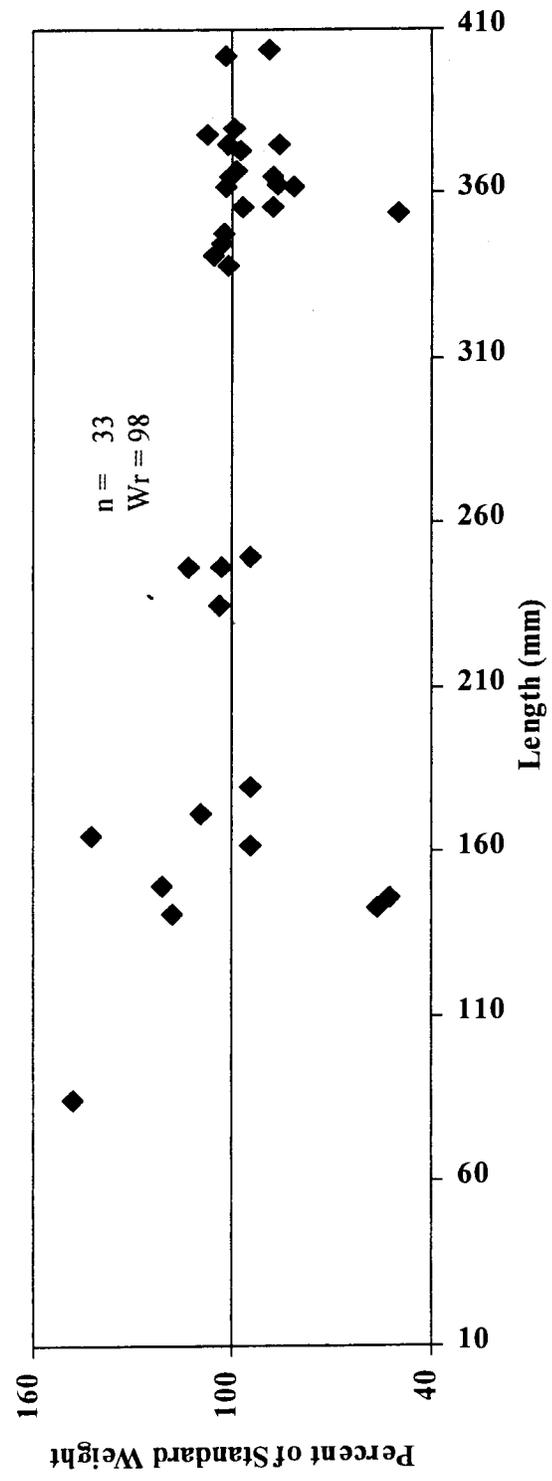
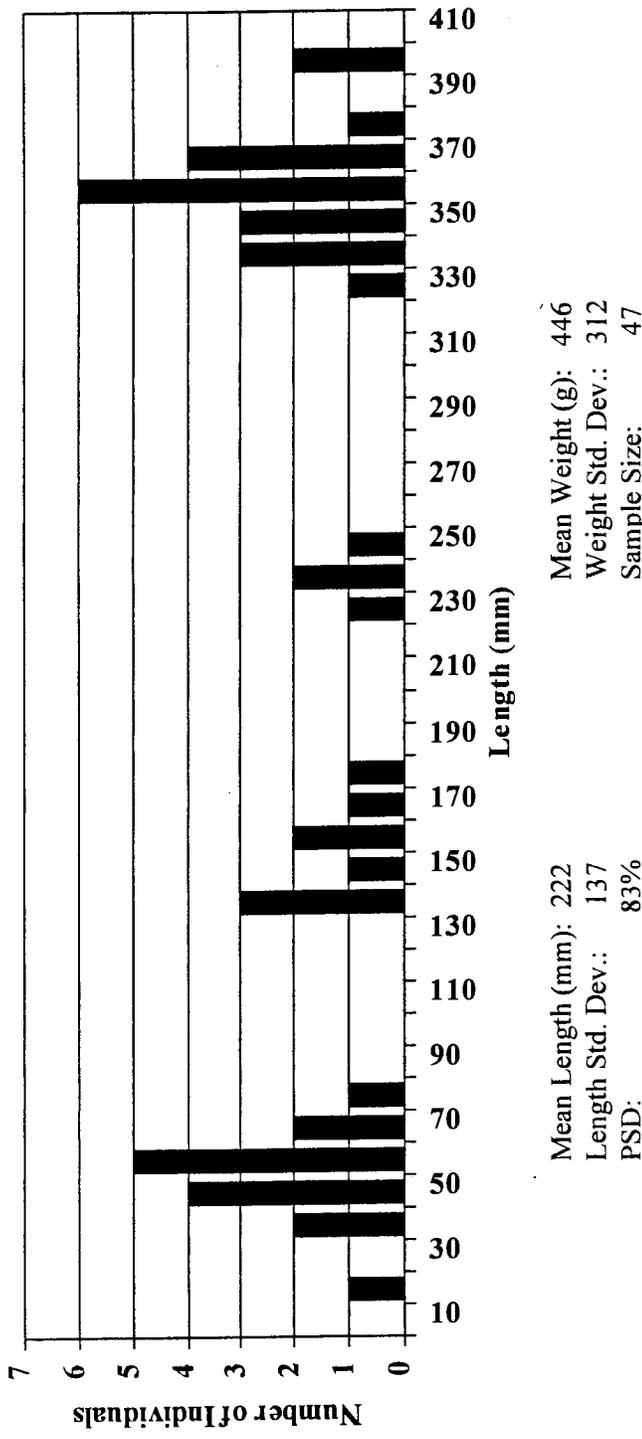
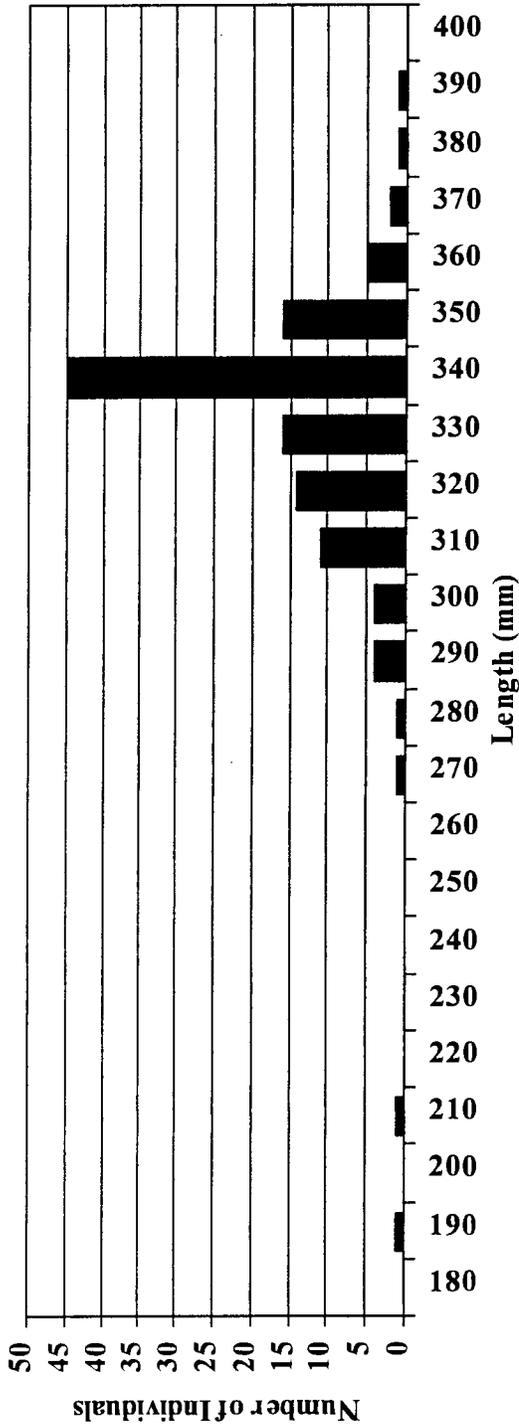


Figure 17. Length frequency distribution and relative weight analysis for largemouth bass sampled from Glendale Reservoir, Idaho, August 4, 1998.



Mean Weight (g): 574  
 Weight Std. Dev.: 108  
 Sample Size: 123

Mean Length (mm): 335  
 Length Std. Dev.: 25  
 PSD: 94%

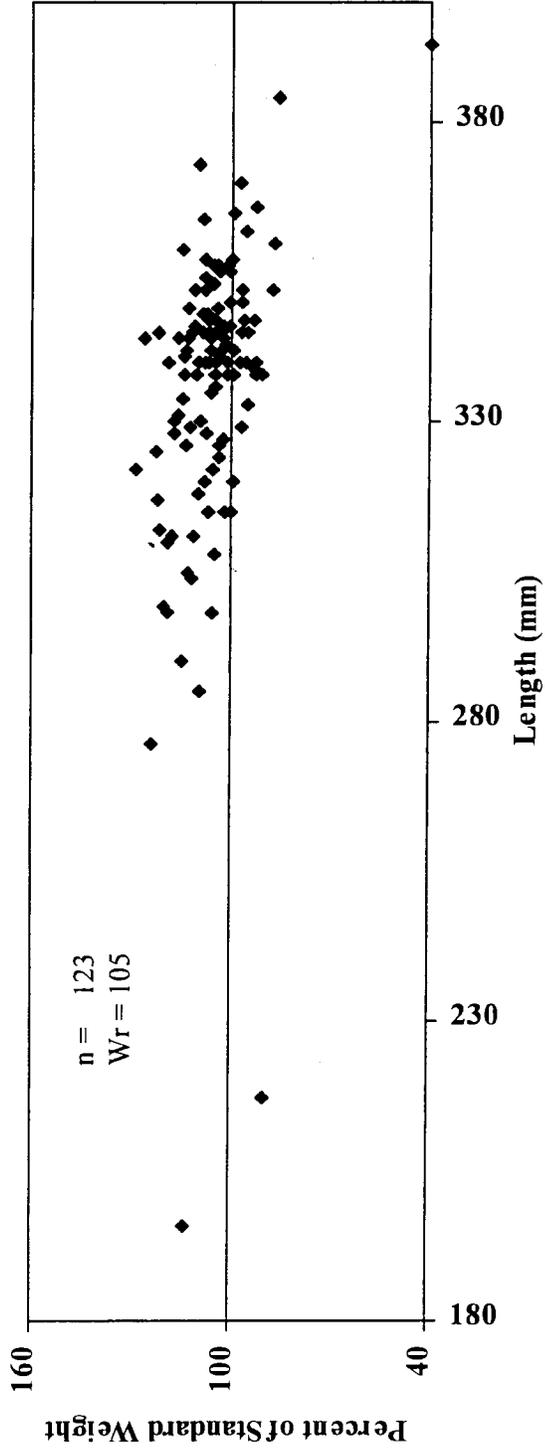
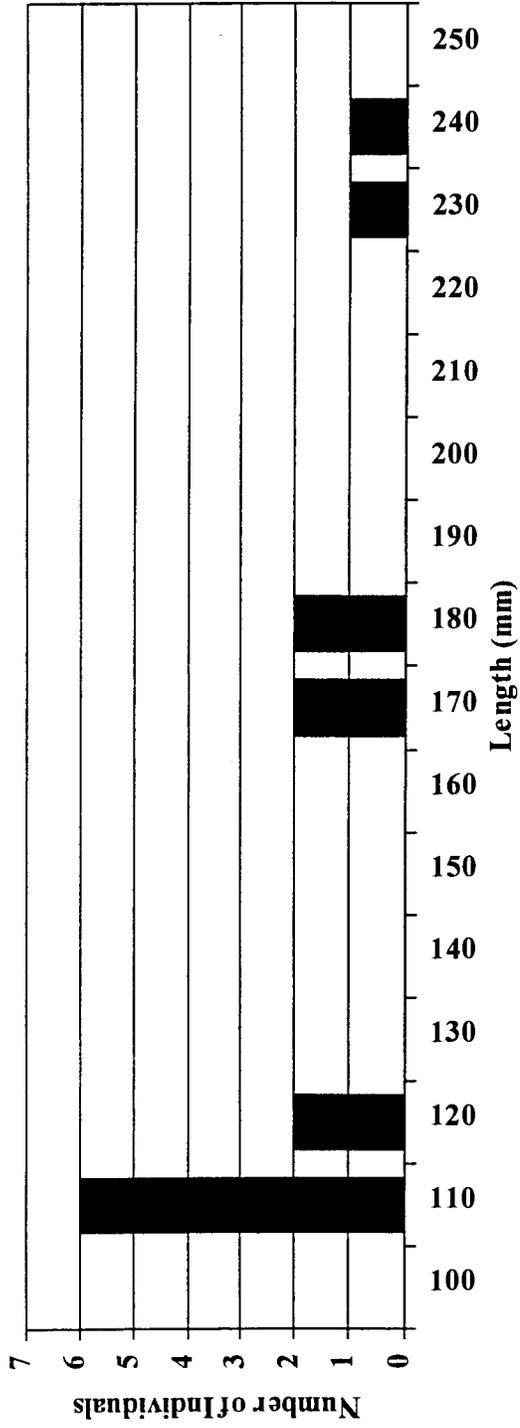
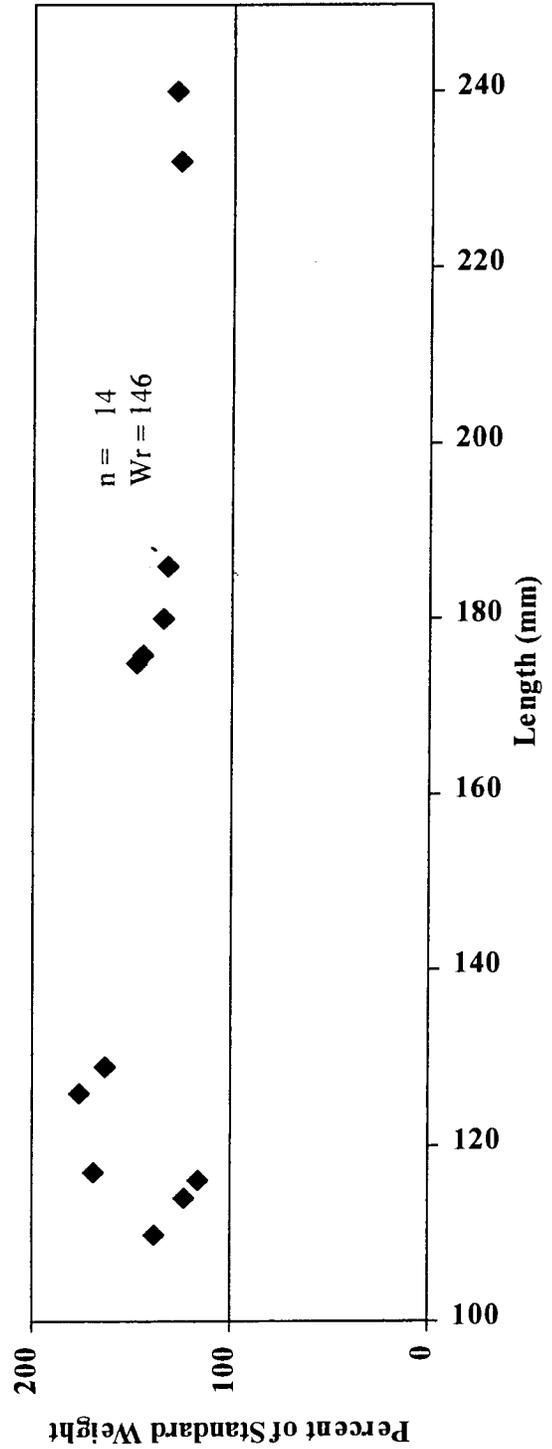


Figure 18. Length frequency distribution and relative weight analysis for largemouth bass sampled from a bass tournament on Glendale Reservoir, Idaho, June, 1997.



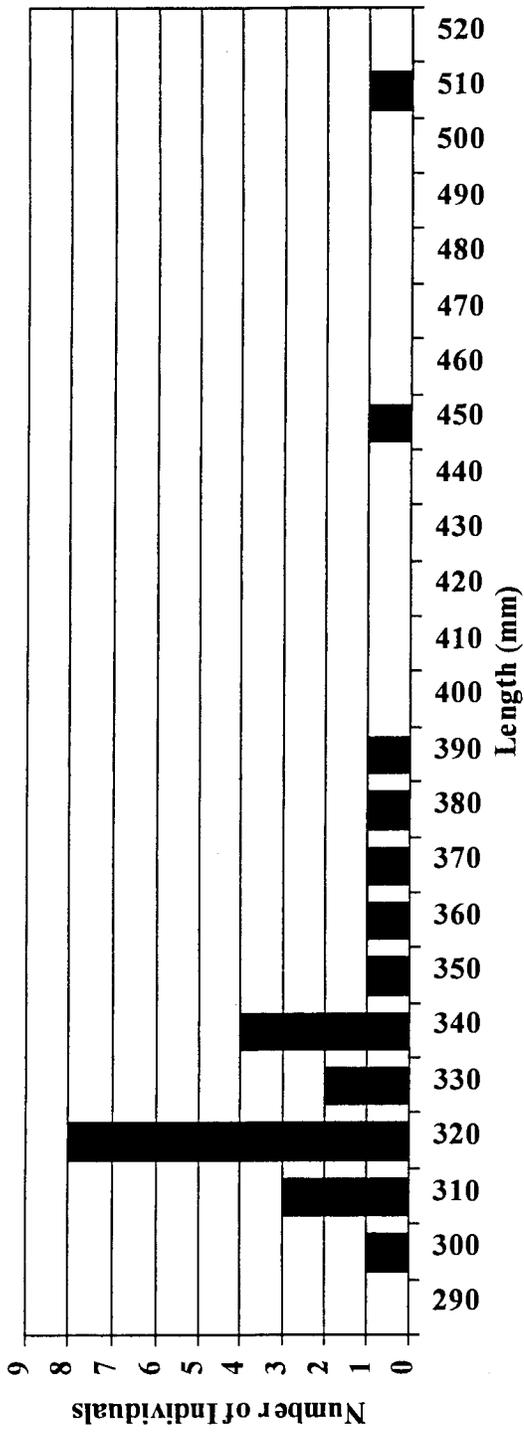
Length Frequency Distribution

Mean Length (mm): 152  
 Length Std. Dev.: 46  
 PSD: 33%  
 Mean Weight (g): 79  
 Weight Std. Dev.: 75  
 Sample Size: 14



Relative Weight Analysis

Figure 19. Length frequency distribution and relative weight analysis for white crappie sampled from Glendale Reservoir, Idaho, August 4, 1998.



Mean Length (mm): 348  
 Length Std. Dev.: 47  
 Fish >300 >400 mm: 8%

Mean Weight (g): 530  
 Weight Std. Dev.: 308  
 Sample Size: 25

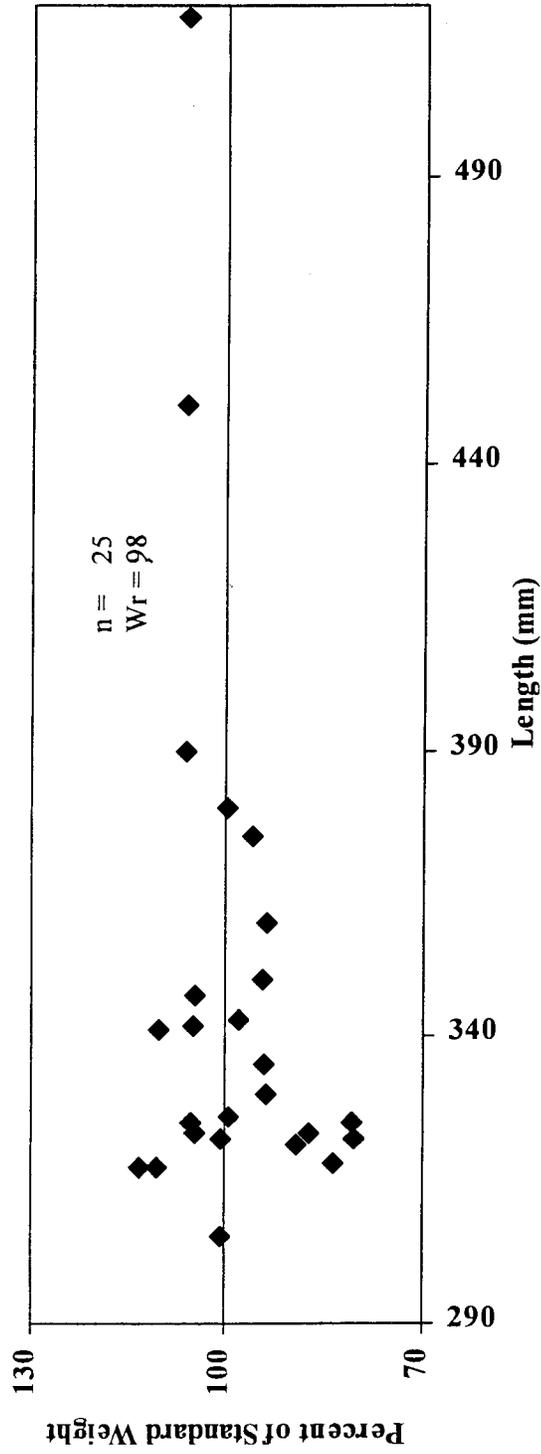
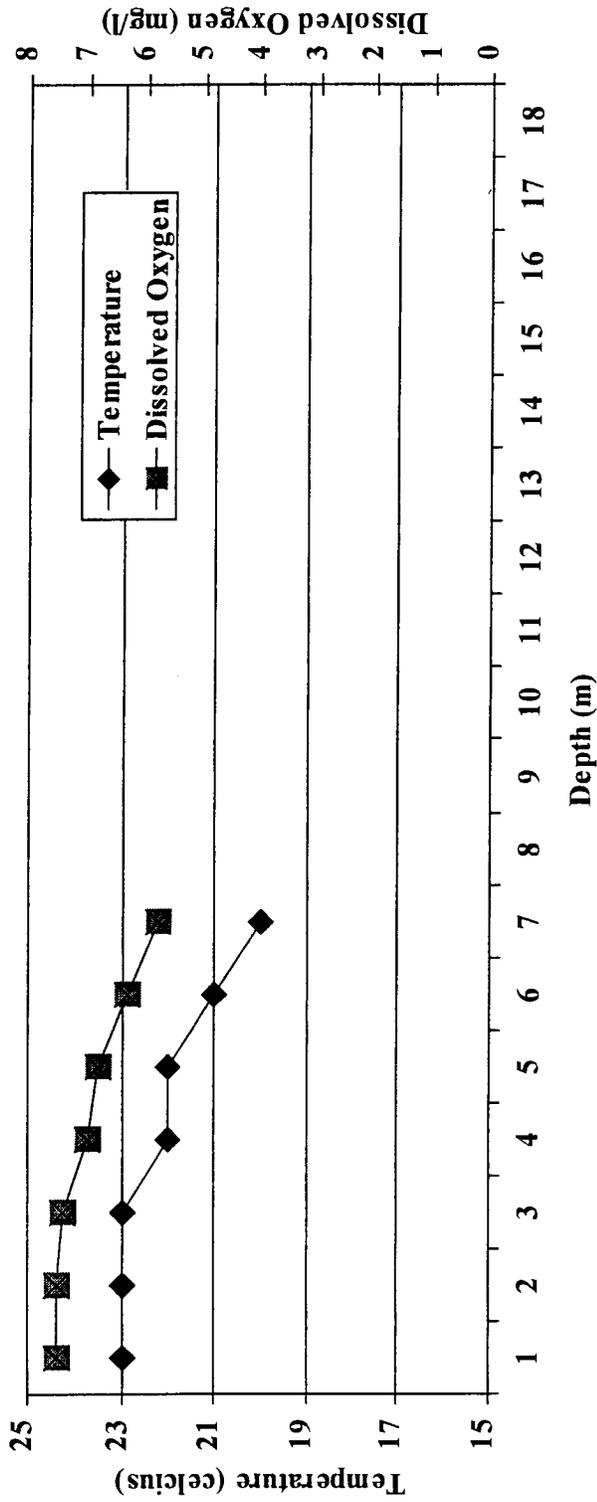


Figure 20. Length frequency distribution and relative weight analysis for rainbow trout sampled from Glendale Reservoir, Idaho, August 4, 1998.

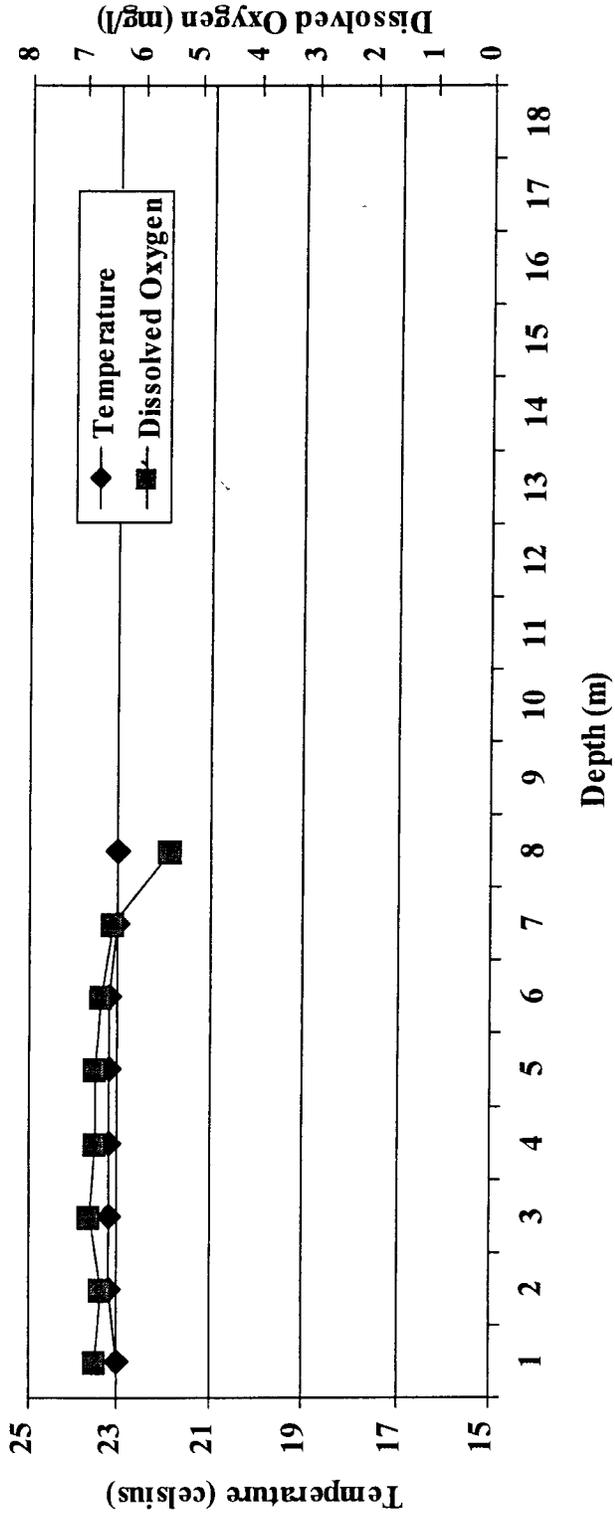
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- Idaho Department of Fish and Game. 1996. Fisheries Management Plan 1996-2000. Idaho Department of Fish and Game. Boise.

## **APPENDICES**

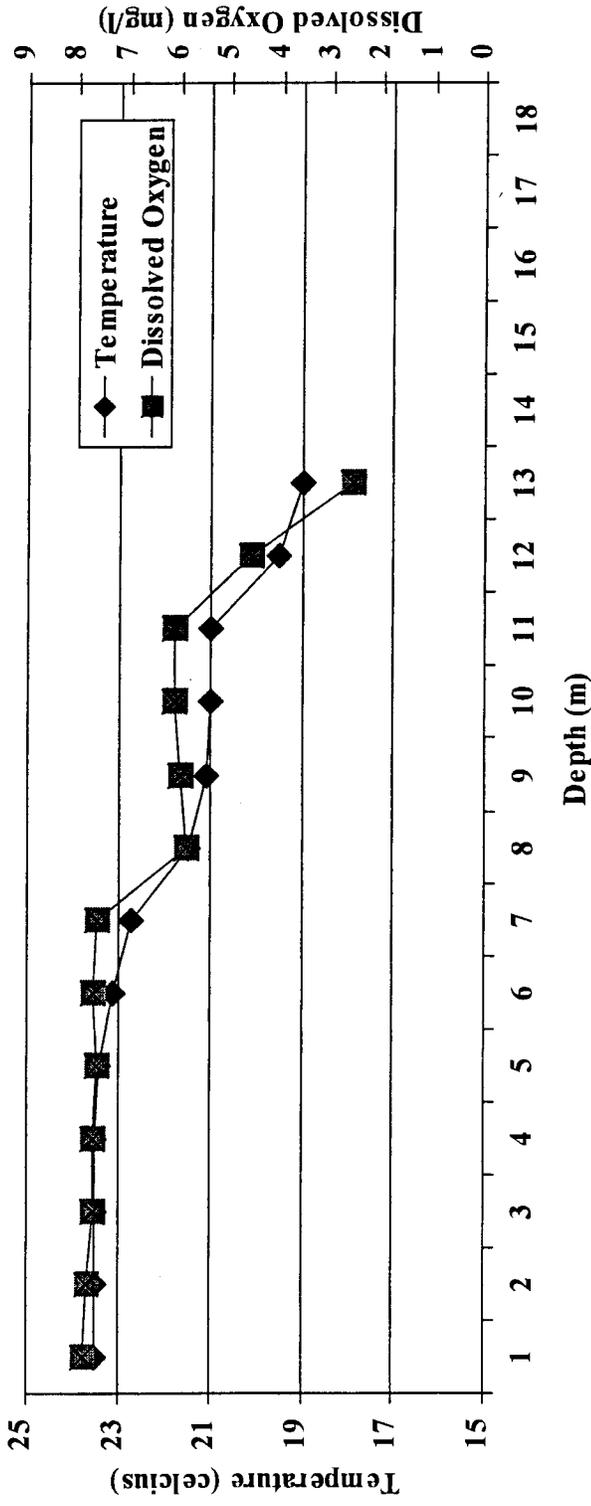


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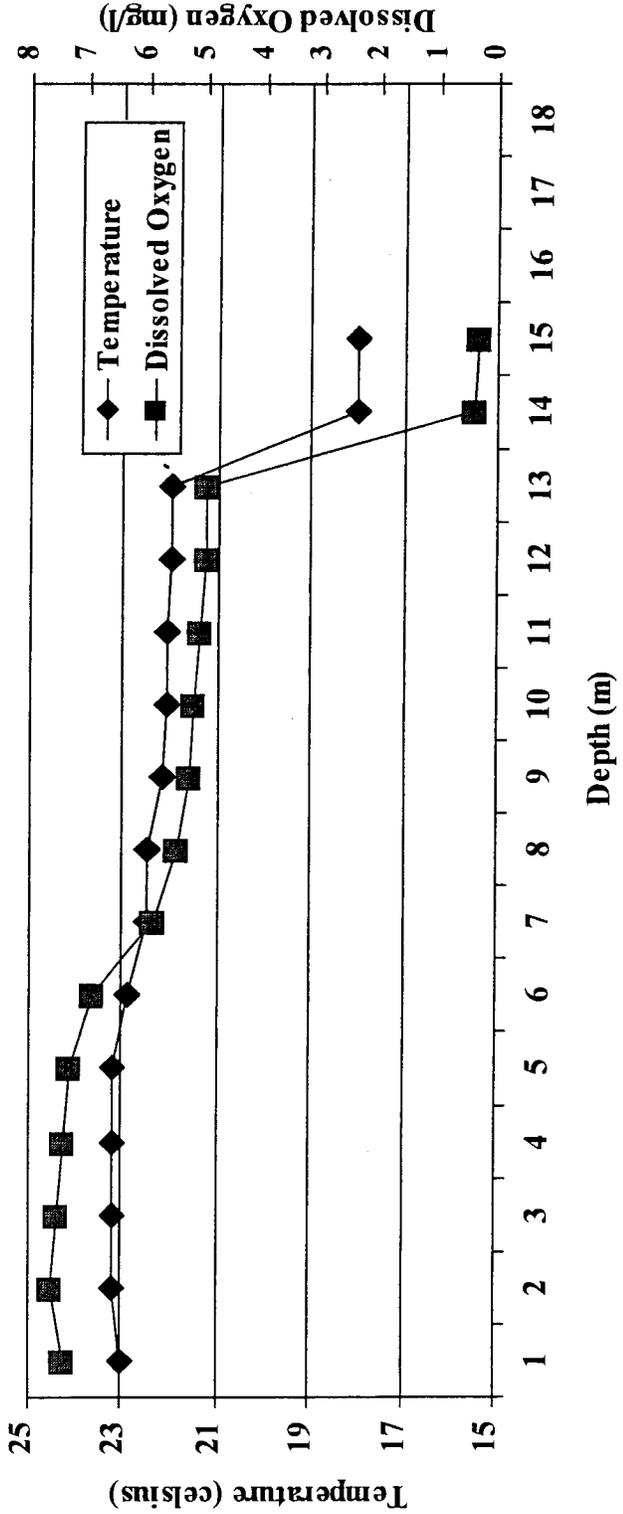


8/13/1998

Temperature and dissolved oxygen measurements for site #1 during mid-summer, 1998, on American Falls Reservoir, Idaho.

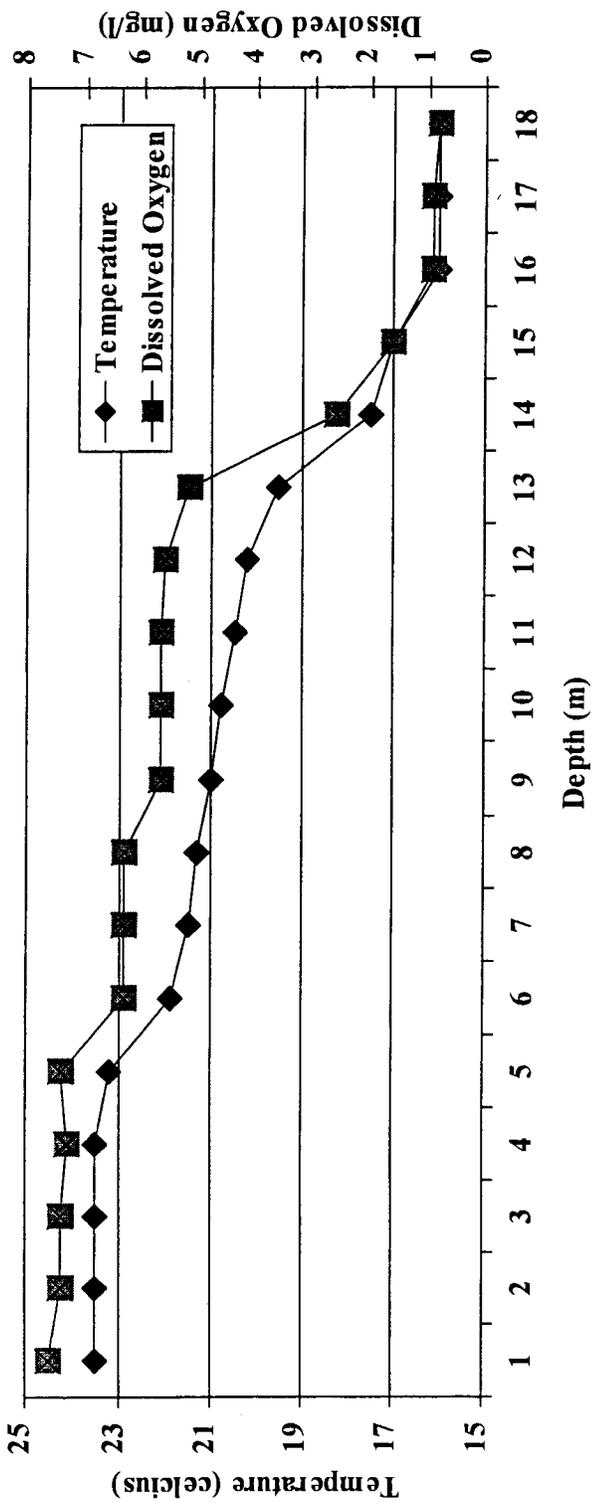


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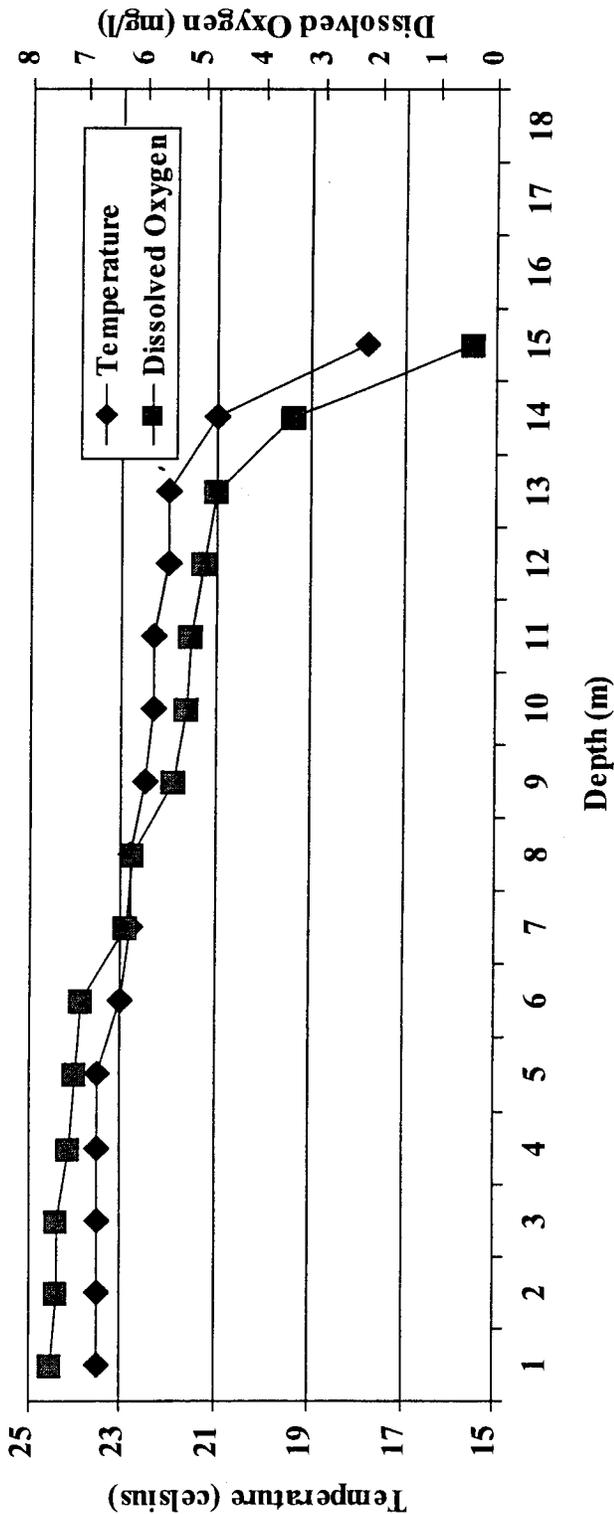


8/13/1998

Temperature and dissolved oxygen measurements for site #2 during mid-summer, 1998, on American Falls Reservoir, Idaho.

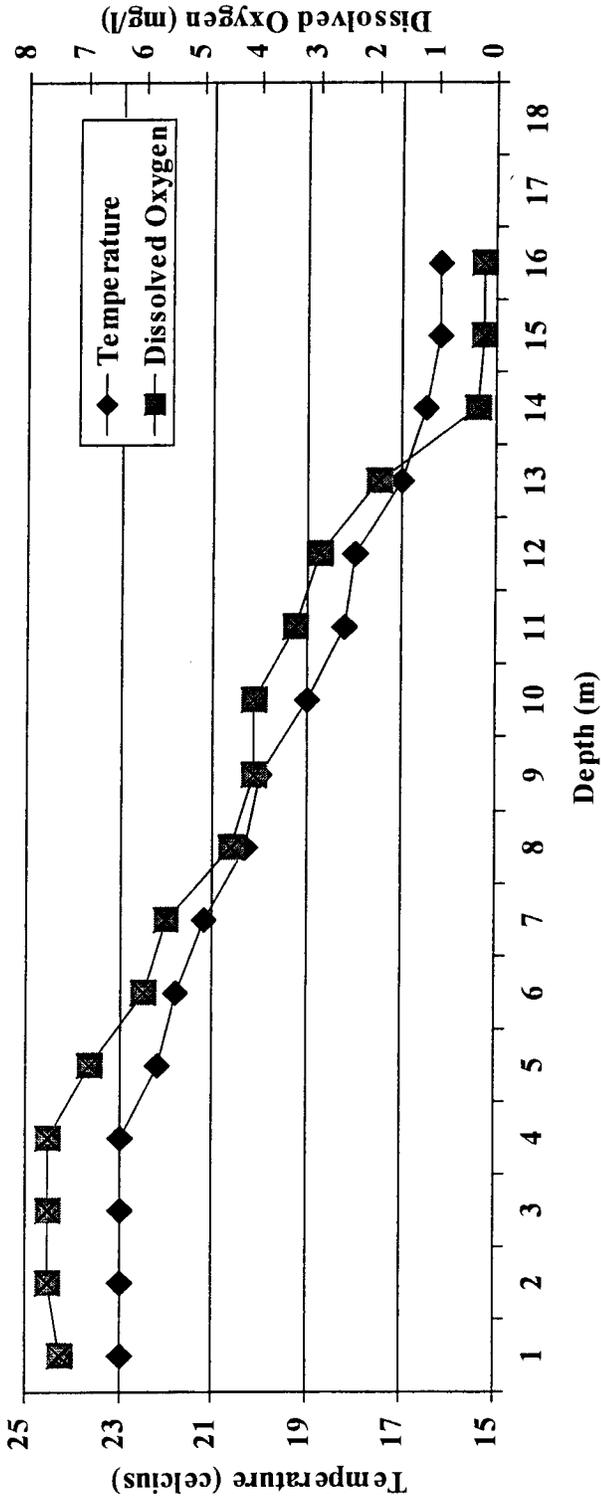


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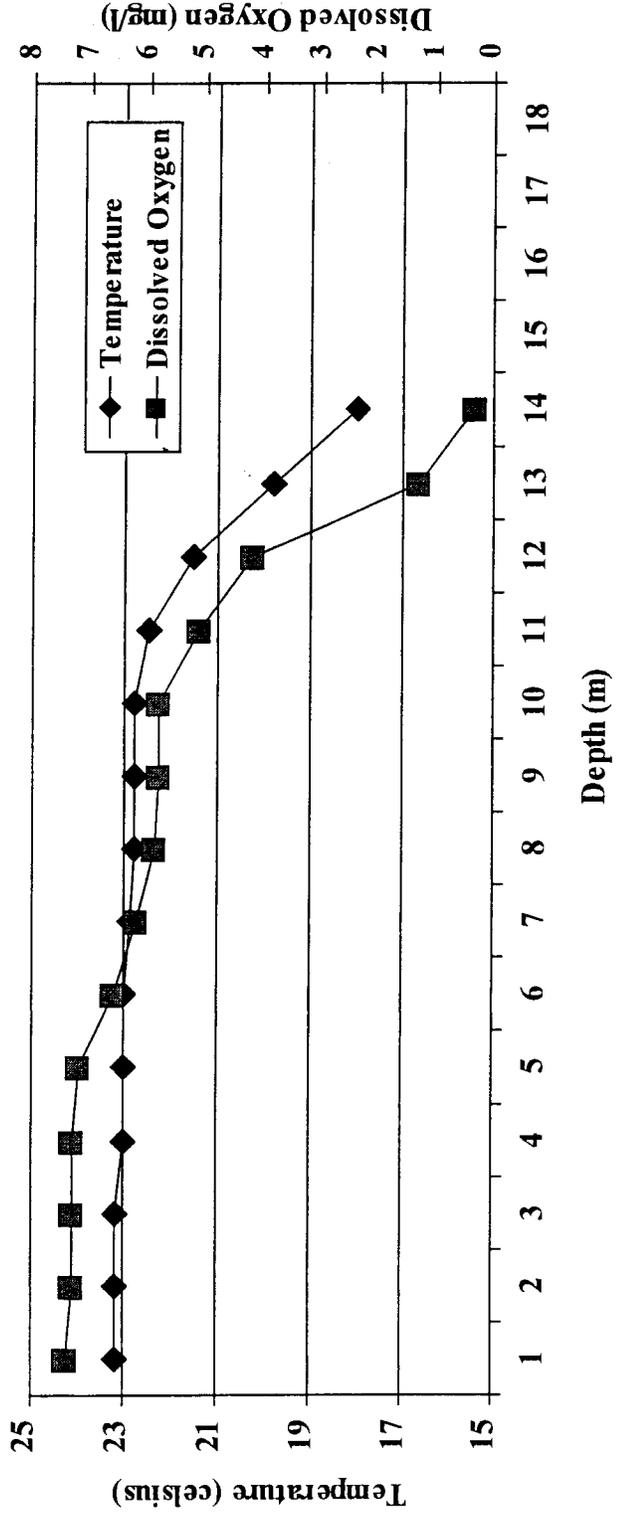


8/13/1998

Temperature and dissolved oxygen measurements for site #3 during mid-summer, 1998, on American Falls Reservoir, Idaho.

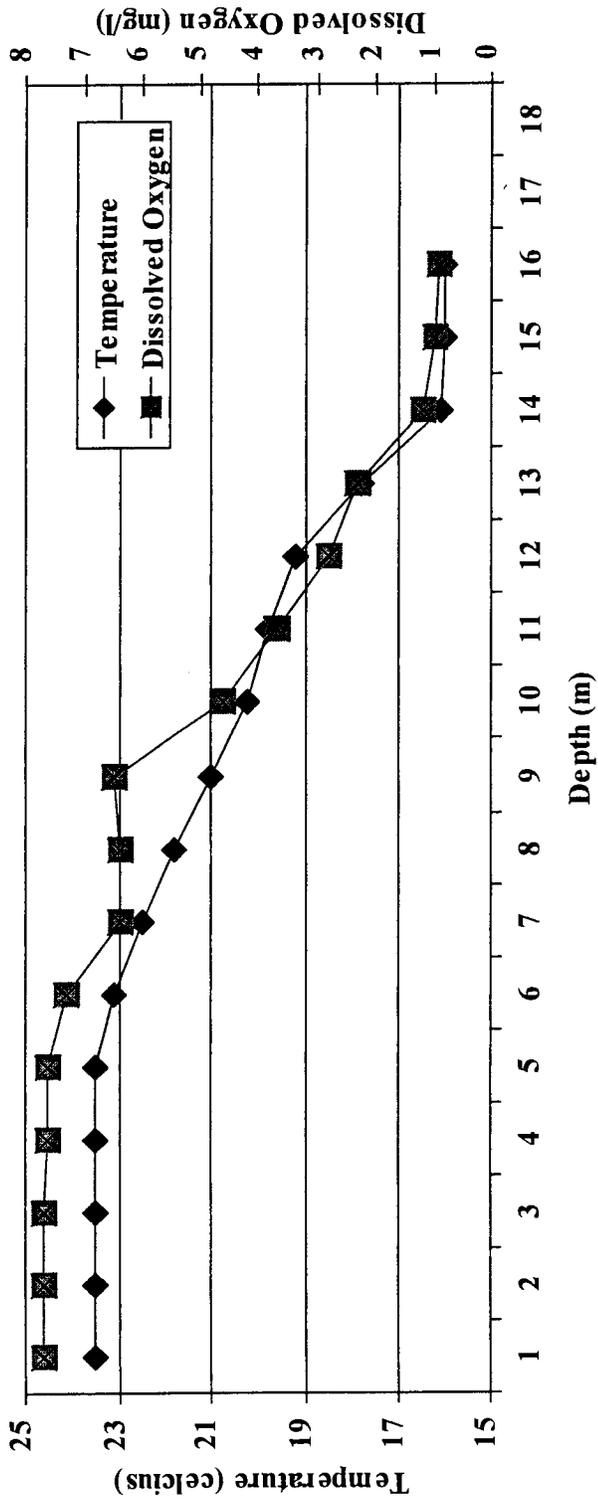


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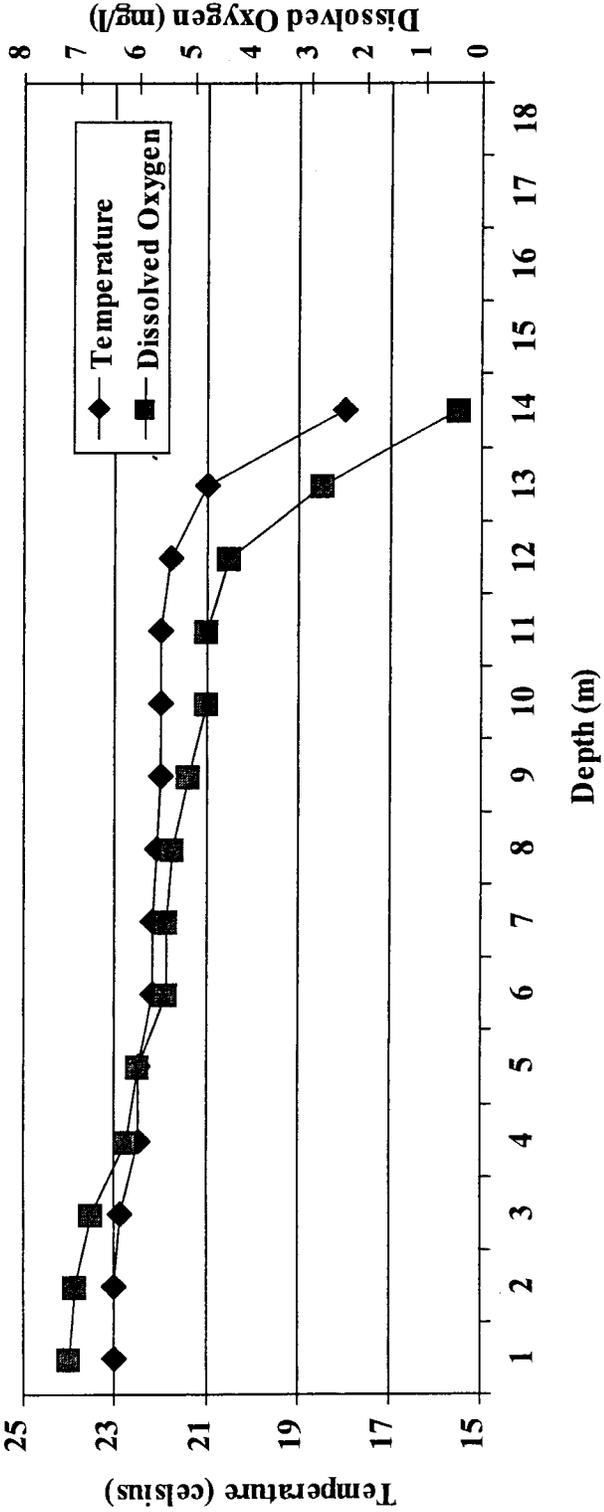


8/13/1998

Temperature and dissolved oxygen measurements for site #4 during mid-summer, 1998, on American Falls Reservoir, Idaho.

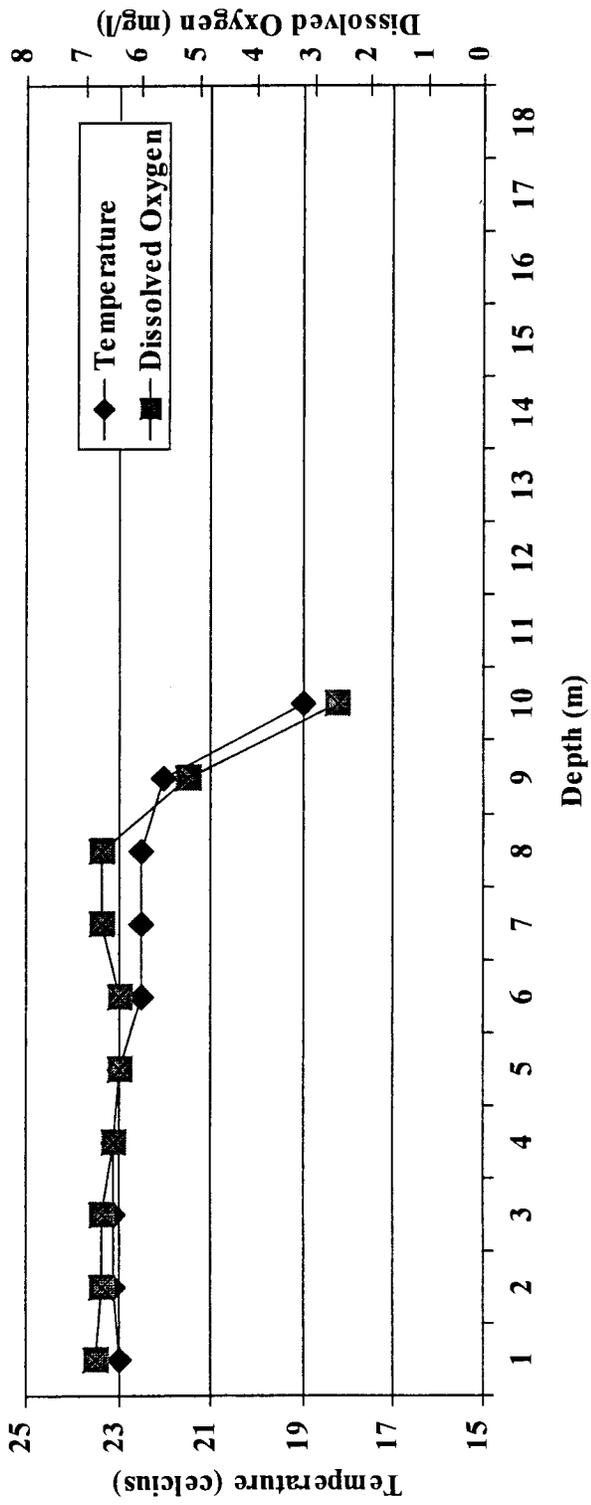


7/24/1998

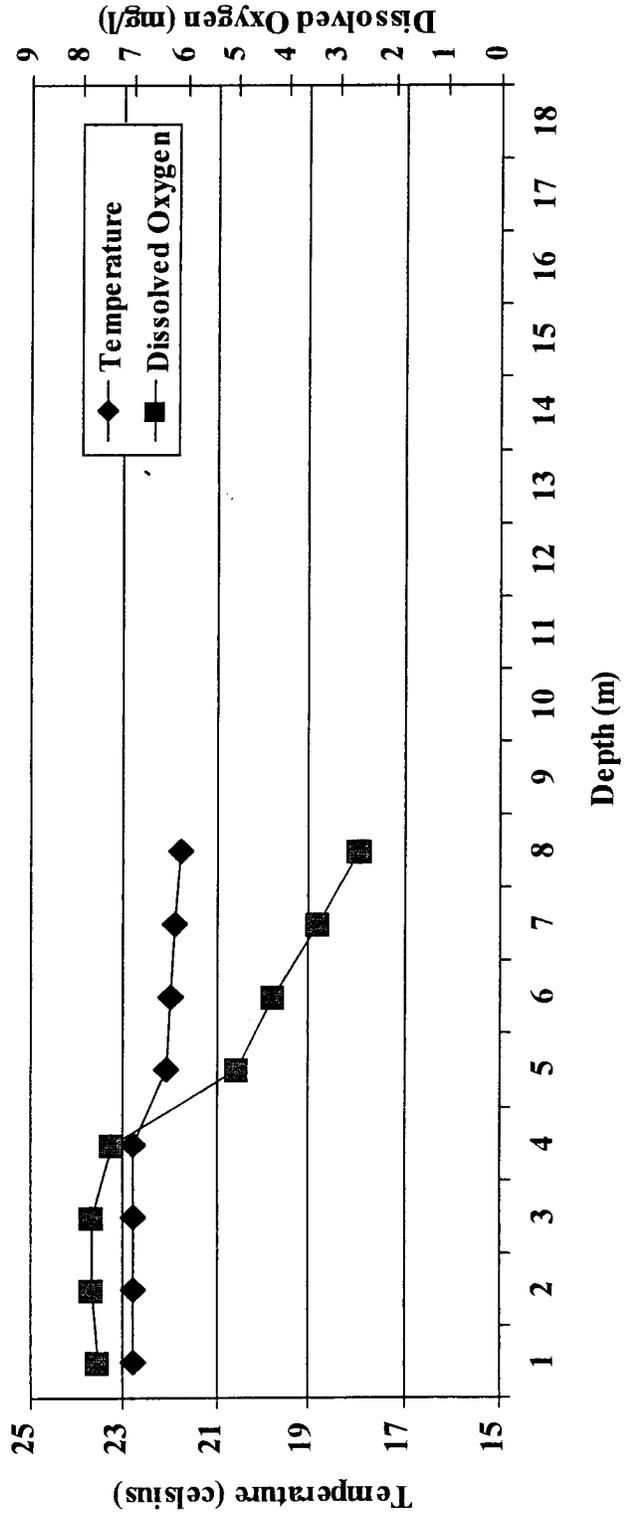


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Temperature and dissolved oxygen measurements for site #5 during mid-summer, 1998, on American Falls Reservoir, Idaho.

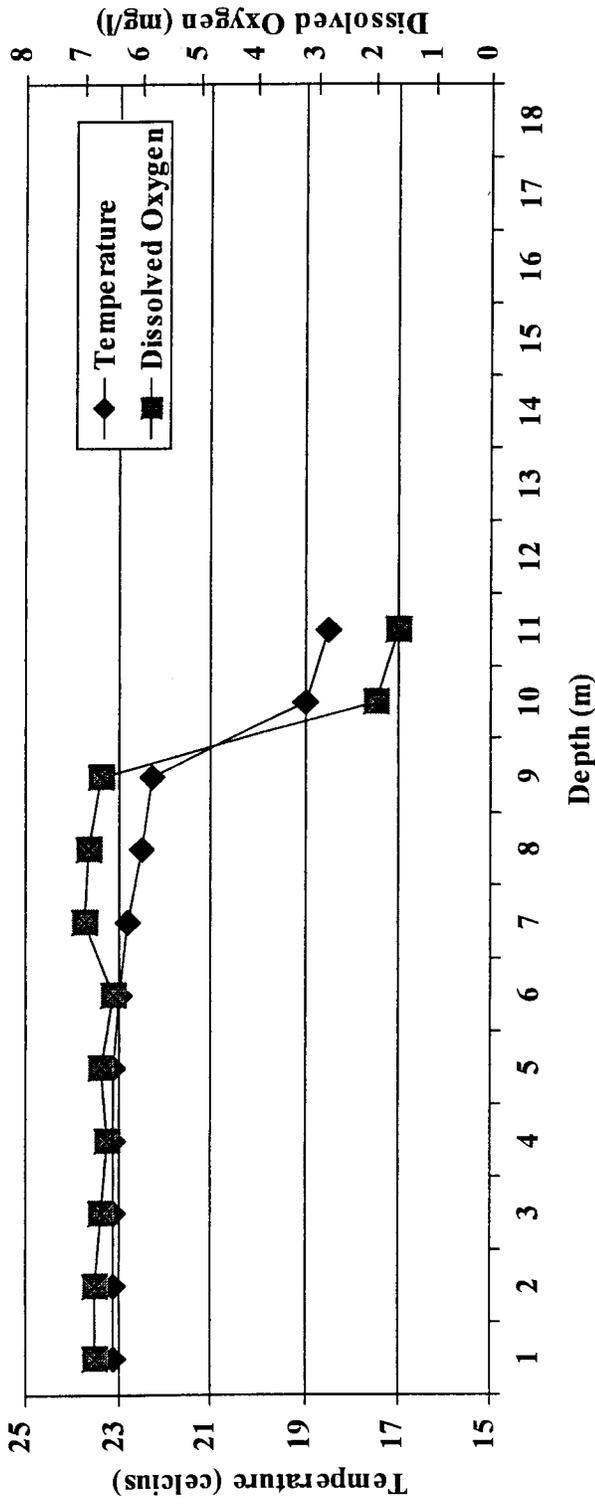


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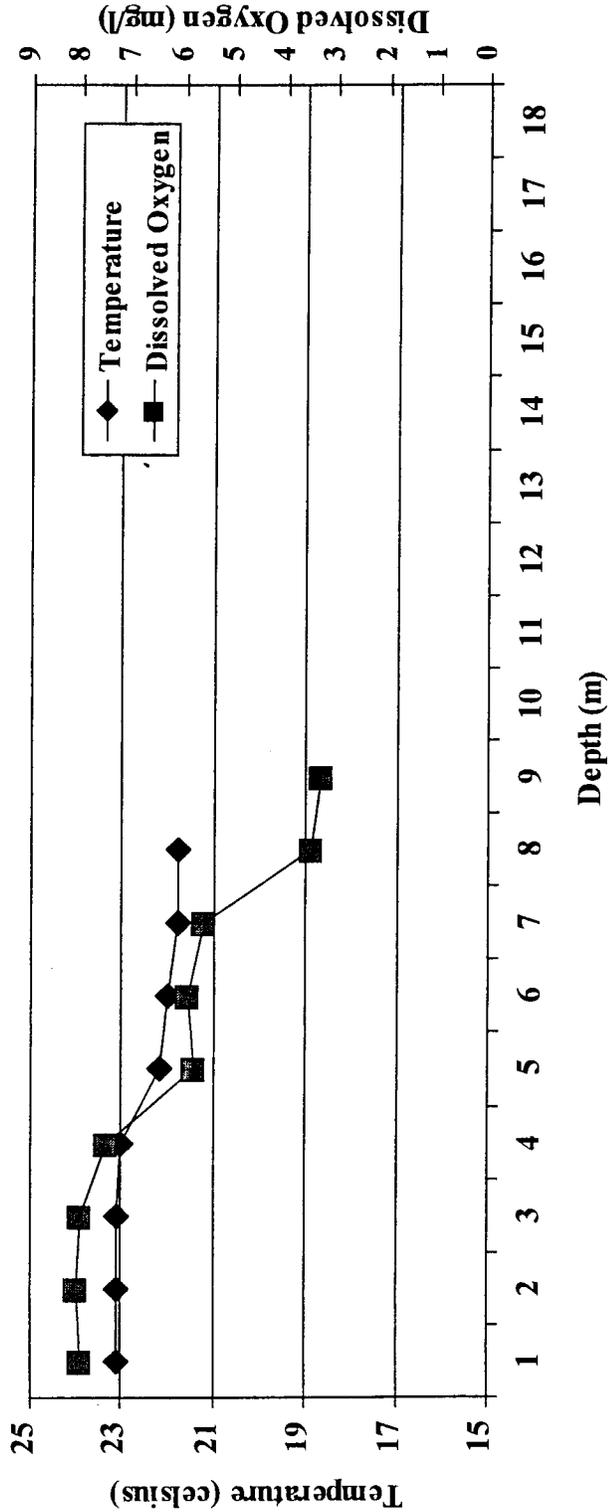


8/13/1998

Temperature and dissolved oxygen measurements for site #6 during mid-summer, 1998, on American Falls Reservoir, Idaho.

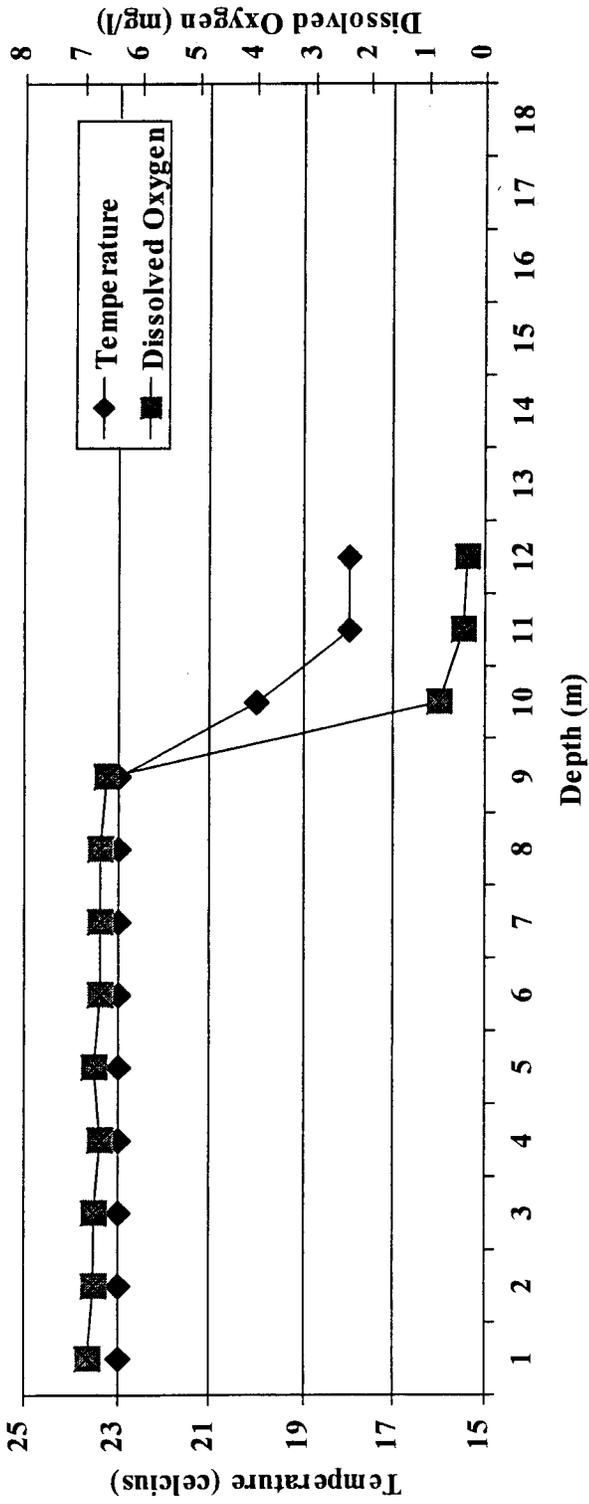


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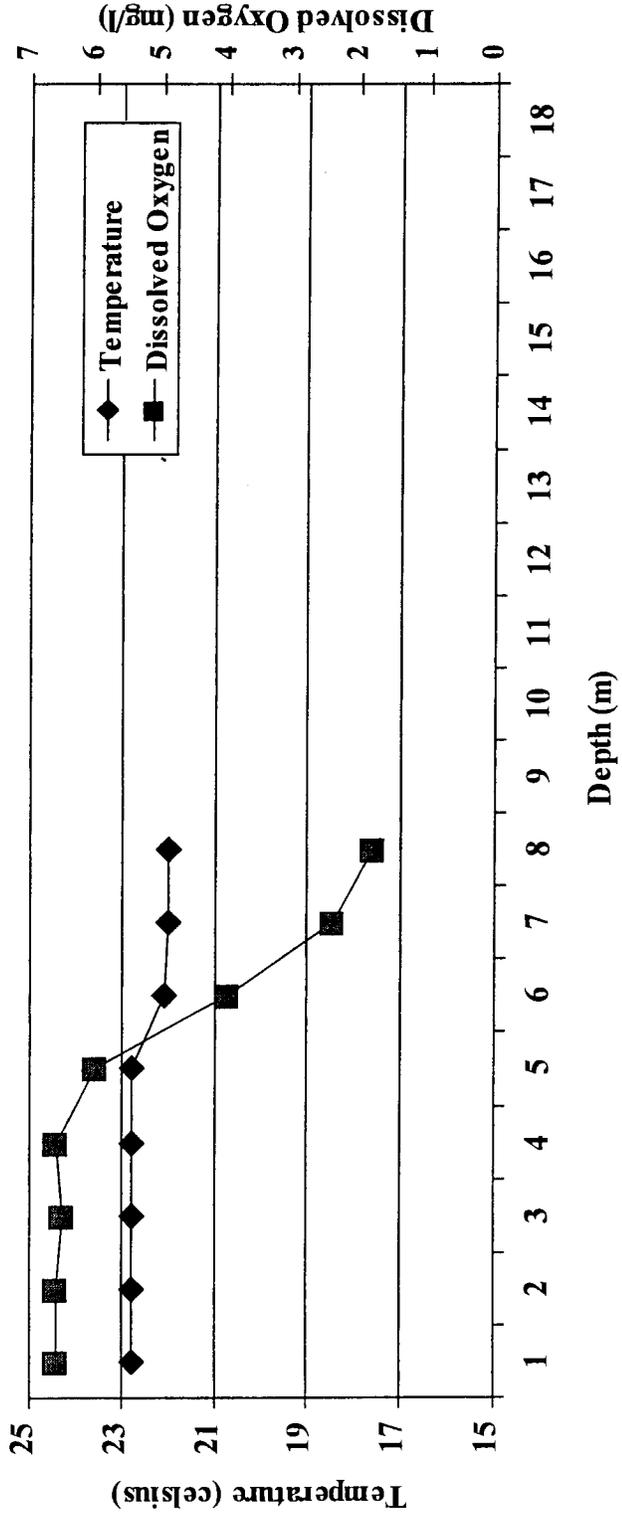


8/13/1998

Temperature and dissolved oxygen measurements for site #7 during mid-summer, 1998, on American Falls Reservoir, Idaho.

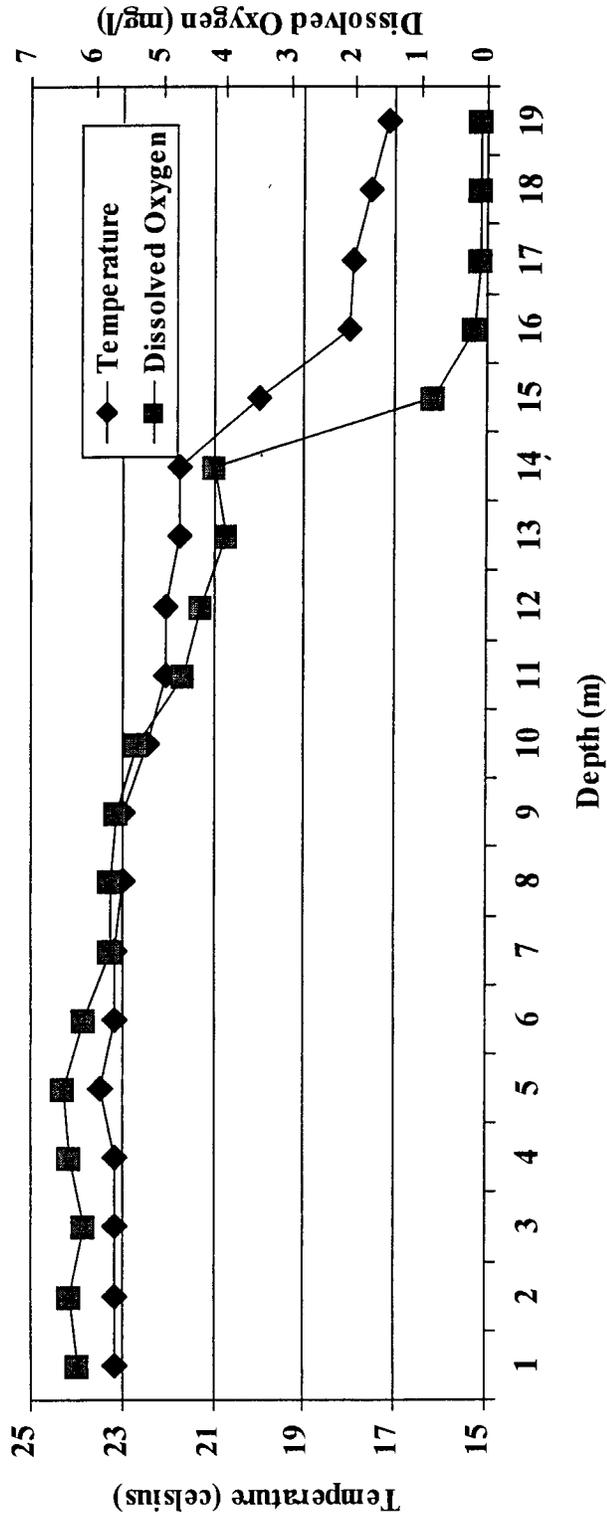


7/24/1998



8/13/1998

Temperature and dissolved oxygen measurements for site #8 during mid-summer, 1998, on American Falls Reservoir, Idaho.



Temperature and dissolved oxygen measurements for site #9 during mid-summer, 1998, on American Falls Reservoir, Idaho.

## 1998 ANNUAL PERFORMANCE REPORT

State: Idaho Program: F-71-R-23  
Project I: Surveys and Inventories Subproject I-F: Southeast Region  
Job: c Title: Rivers and Streams Investigations  
Contract Period: July 1, 1998 to June 30, 1999

### ABSTRACT

The upper Blackfoot River came under a new management plan in 1990 to recover wild Yellowstone cutthroat trout *Oncorhynchus clarki bouvieri*. In 1994, we began an opening day (July 1) creel survey to follow trends in quality of the fishery. There are no obvious changes between 1994 and 1998 in opening day fishery statistics for cutthroat trout. Catch rates remain near 1.5 trout/hour. The percent of rainbow trout in the catch has decreased and in 1998 we discontinued all stocking of rainbow trout *O. mykiss* in the upper Blackfoot River.

In 1997, anglers asked for new fishing regulations that would reduce harvest of quality size trout in the Snake River between American Falls Dam and Eagle Rock. The previous creel limit had been six trout of any size. Beginning in 1998, the regulation was changed to six trout of which only two could be 16 inches or longer. On the opening weekends of the 1997 and 1998 fishing seasons, we measured 387 and 967 harvested trout respectively. In 1997, 66% of the harvested trout larger than 300 mm also exceeded 400 mm. The same statistic from the 1998 opener was 51%, which may be a result of the regulation change.

We conducted a season-long creel survey in the Snake River between American Falls Dam and Eagle Rock, a river reach approximately 12.8 km long. Anglers fished 63,555 hours and caught 34,066 fish of which 26,102 were rainbow trout (77%). This was an increase of 44% in rainbow trout catch from 1997. Between the two years of 1997 and 1998 combined, anglers harvested 40% of 4,000 adipose-clipped, catchable-size rainbow trout stocked in 1997. Most were harvested during the 1997 season, but 197 were harvested in 1998. During the 1998 season, anglers harvested 22% of 8,000 adipose-clipped, catchable-size rainbow trout stocked at the beginning of the 1998 season.

Anglers reported dead trout in the Snake River below American Falls Dam in July 1998. On July 29 the regional fishery biologist collected 39 dead trout in a four-mile reach below the dam. At mid-day he recorded 5.0 to 5.1 mg/l dissolved oxygen and 22° C water temperature. The Department asked Idaho Power to turn on blowers in the dam to increase dissolved oxygen. At 6:00 am the following morning biological aides recorded a dissolved oxygen concentration of 5.7 mg/l and 22.5° C water temperature. The aides collected 22 dead trout in a ¼-mile reach below the dam.

Regional fisheries personnel electrofished sections of Giraffe and Dry creeks to estimate population densities of Bonneville cutthroat trout *O. clarki utah*. Mean parr densities in the streams were 11.3/100-m<sup>2</sup> and 17.3/100-m<sup>2</sup>, respectively. The densities are up considerably from 1993, when we found no parr in most sections. We also estimated population densities on Preuss Creek downstream from National Forest land. Densities were low (3.2 /100-m<sup>2</sup>). But since we sampled late into the fall, and there were abundant beaver ponds, most of the trout may have moved into the ponds where we were unable to sample them.

Richard Scully  
Regional Fishery Manager

James Mende  
Regional Fishery Biologist

Chad Rawlins  
Biological Aide

Paul Burnett  
Biological Aide

## OBJECTIVES

1. Continue monitoring of upper Blackfoot River fishery through use of an opening day check station.
2. Document possible changes in opening-day angler results on Snake River below American Falls Reservoir due to alterations of regulations.
3. Document season-long creel statistics on Snake River below American Falls Reservoir, especially concerning the return to creel of catchable fish stocked directly into the river.
4. Collect data concerning Bonneville cutthroat trout parr densities on several sample sites of Preuss, Dry, and Giraffe creeks in the Thomas Fork drainage.

## INTRODUCTION AND METHODS

### Upper Blackfoot River Opening-day Check Station

The upper Blackfoot River and Reservoir historically produced a large run of Yellowstone cutthroat trout *Oncorhynchus clarki bouvieri* that grew to large size. During the early 1980's, the fishery, first in the reservoir then in the river, collapsed. In order to restore the fishery, a management plan was developed for the entire system (Schill and LaBolle 1990). Included in the plan was elimination of all cutthroat trout harvest from the reservoir and a reduction in harvest (two fish greater than 18 inches) from the river. Due to requests from anglers, the river regulations were modified in 1998 to a catch-and-release requirement, in the hopes of speeding up the fishery's recovery.

Beginning in 1994, the department began monitoring the upper Blackfoot River fishery through the use of an opening-day creel survey and check station. The check station was set up in the same location used for wildlife check stations, north of Soda Springs. Anglers were questioned on their amount of time spent fishing, number of fish caught, and any harvested fish were measured. Game species present in the river include Yellowstone cutthroat trout, rainbow trout *Oncorhynchus mykiss*, rainbow x cutthroat trout hybrids *O. clarki x O. mykiss*, and brook trout *Salvelinus fontinalis*.

### Snake River Below American Falls Reservoir

#### **Opening-day Creel Survey**

The Snake River between American Falls Dam and Eagle Rock has become a very popular angler destination. It receives a relatively large amount of fishing pressure from boat anglers spread out along its length and intense pressure from bank anglers in selected spots. Traditionally, the fishing pressure has been greatest on the opening weekend and for the first couple of weeks during the season. Fishing pressure dropped dramatically after that. The decline in pressure resulted in a perceived drop in catch rates of "big" (>16 inches) fish by anglers. At the request of many anglers in the region, the regulations were changed on this stretch of the Snake River. They changed from a general regulation limit of six trout with a season closure on October 31, to a six trout with a maximum of two trout greater than 16

inches. The early season closure remained the same. The goal of such a change was to spread out the harvest of the targeted larger fish. Instead of having a very short season of phenomenal harvest, we attempted to create a longer season with a decreased daily harvest.

During the opening weekends of 1997 and 1998, we attempted to survey every single angler present on the water. Check stations were set up at the two major boat launches and conservation officers, reservists, and other personnel conducted roving surveys of the other launches and the favored bank angler holes. Anglers were asked where they were from, how many hours they had fished, how many fish were released, method of fishing, and all harvested fish were measured for length. We attempted to determine if any change had occurred in the harvest of trout during the opening weekend of 1998. Game species present in this stretch of the river include rainbow trout, cutthroat trout, brown trout *Salmo trutta*, white sturgeon *Acipenser transmontanus*, smallmouth bass *Micropterus dolomieu*, yellow perch *Perca flavescens*, and occasionally kokanee *Oncorhynchus nerka kennerlyi*, and coho salmon *O. kisutch*.

### **Season-long Creel Survey**

We conducted a creel survey in the Snake River reach immediately below American Falls Dam downstream, approximately 18 km, to Eagle Rock. A three-km section of the reach was not accessible due to non-navigable rapids. The survey began Memorial Day weekend and continued through October 1998, which is the entire fishing season for the river reach.

This section of the Snake River traditionally received concentrated fishing pressure during the opener and for 10 days to two weeks afterward, until catch rates begin to decline. The size and number of fish caught attracts anglers from distant locations to collect their "six fish". It is assumed that the large size of trout caught results from excellent growth conditions presented in American Falls Reservoir upstream. In the past, few hatchery catchables were stocked directly into the river. We assumed anglers would not be satisfied with the smaller catchables and possibly the stocked fish would be displaced downstream rapidly, preventing an adequate return to creel. To determine if this assumption was true 4,000 catchable rainbow trout in 1997 and 8,000 in 1998 were stocked directly into the river. To follow their performance a season long creel survey was conducted in both 1997 and 1998.

Survey intervals were approximately 28 days long and stratified by weekends and weekdays. Four randomly selected days were sampled from both the weekend days and weekdays per interval. We counted bank and boat anglers at least once each survey day. The counts were conducted either in the morning (AM) or afternoon (PM). Anglers were asked the number of hours they had fished, number of fish caught, and method of fishing. All fish harvested were measured to the nearest millimeter. Analysis of creel survey data was done using C-SAP (Creel Survey Analysis Program) developed by the Colorado Division of Wildlife-Aquatic Research. Since our opening day sampling effort was different from the standard survey day (we contacted every angler throughout the entire day) we did not enter it into the program. The statistics from the opening day were later added to the numbers generated for the entire season by the computer program.

### **Bonneville Cutthroat Trout Monitoring**

Wallace (1978 and 1980) and Behnke (1979) determined that essentially pure Bonneville cutthroat trout *Oncorhynchus clarki utah* populations inhabited the Thomas Fork of the Bear River and its tributaries (Preuss, Dry, and Giraffe creeks). Due to increased concern over the overall status of this

sensitive species, in 1994 a Conservation Agreement for the protection and enhancement of the Bonneville cutthroat trout was developed for the Thomas Fork tributaries on Forest Service land. In addition, cattle exclosures were constructed on selected reaches of each stream.

Department personnel have monitored fry ( $\leq 75$  mm) and parr ( $\geq 75$  mm) densities of cutthroat trout in the Thomas Fork tributaries since 1979. In recent years, sampling has been done in alternate years using backpack-shocking units. Sampling was done in measured stream sections using either the Seber two-pass removal technique or the Peterson mark and recapture technique (Everhart et al 1975). During 1998, we conducted slightly modified Seber two-pass removals on several sites of Dry, Giraffe, and Preuss creeks. The modification involves a rapid downstream pass, with current on, in conjunction with each individual upstream pass. This method helps capture previously stunned fish and has increased our first-pass capture efficiency. Each site was randomly chosen with different stratum on each creek. Additionally, each site was approximately 100 meters long. Detailed measurements of length, width, depth, habitat, and riparian condition were made for each site.

## **RESULTS AND DISCUSSION**

### **Upper Blackfoot River Opening-day Check Station**

The results from our upper Blackfoot River opening-day check station are provided in Table 1. The catch rate of 1.44 fish/h exceeds the goal of 0.7 fish/h established in the Upper Blackfoot River Management Plan (Schill and LaBolle 1990). However with the closure of cutthroat trout harvest, we are unable to determine if the goal of 20% of catch greater than 20 inches was met. The catch rate has remained relatively stable since collection of data began in 1994 (range = 1.43 to 1.90 fish/h). Personal communication with anglers seems to indicate that they are satisfied with the improvement of the fishery versus its low point in the late 1980's and early 1990's.

### **Snake River Below American Falls Reservoir**

#### **Opening-day Creel Survey**

On the first day of fishing season (Saturday of Memorial Day weekend) anglers fished a total of 1,448 hours on the Snake River between American Falls Dam and Eagle Rock. They caught a total of 1,940 trout (98.5% rainbow trout, 1.2% brown trout, and 0.3% cutthroat trout) for a catch rate of 1.34 fish/h. They released 52.5% of all trout caught up from 1997's release of 26.4%. Anglers reported that the difficulty in fishing there was no longer catching six fish, rather it was catching enough of the smaller fish ( $< 16$  inches) to fill their limit. The mean length of all harvested trout (all species) was 414 mm, significantly lower than 1997's 430 mm ( $\alpha = .05$ ). Figure 1 presents the length frequency distribution for all trout harvested on opening day of both 1997 and 1998. It appears that altering the harvest regulations has impacted the harvest of trout from the Snake River, however, only a comparison between season long creel surveys can determine if the goal of spreading out harvest of larger trout was accomplished.

Table 1. Comparison of creel statistics for the upper Blackfoot River, Idaho, on opening day, July 1, 1994 - 1998.

| Year | Number of Anglers |              | Hours Fished | Catch Rate | Hours/Angler | Fish/Angler | Cutthroat Trout |          | Rainbow Trout |          | Hybrids |          | Brook Trout |          |
|------|-------------------|--------------|--------------|------------|--------------|-------------|-----------------|----------|---------------|----------|---------|----------|-------------|----------|
|      | Residents         | Nonresidents |              |            |              |             | Kept            | Released | Kept          | Released | Kept    | Released | Kept        | Released |
| 1994 | 33                | 4            | 155          | 1.90       | 4.30         | 8.00        | 4               | 229      | 0             | 104      | 0       | 0        | 0           | 0        |
| 1995 | 38                | 17           | 223          | 1.52       | 4.05         | 6.15        | 20              | 208      | 7             | 103      | 0       | 0        | 0           | 0        |
| 1996 | 56                | 13           | 340          | 1.65       | 4.92         | 8.13        | 15              | 545      | 1             | 0        | 0       | 0        | 0           | 0        |
| 1997 | 65                | 23           | 333          | 1.43       | 3.78         | 5.42        | 22              | 453      | 2             | 0        | 0       | 0        | 0           | 0        |
| 1998 | 30                | 9            | 188          | 1.44       | 4.82         | 6.95        | NA <sup>a</sup> | 252      | 3             | 4        | 0       | 3        | 8           | 1        |

<sup>a</sup> Regulation changes prohibit harvest of cutthroat trout from upper Blackfoot River.

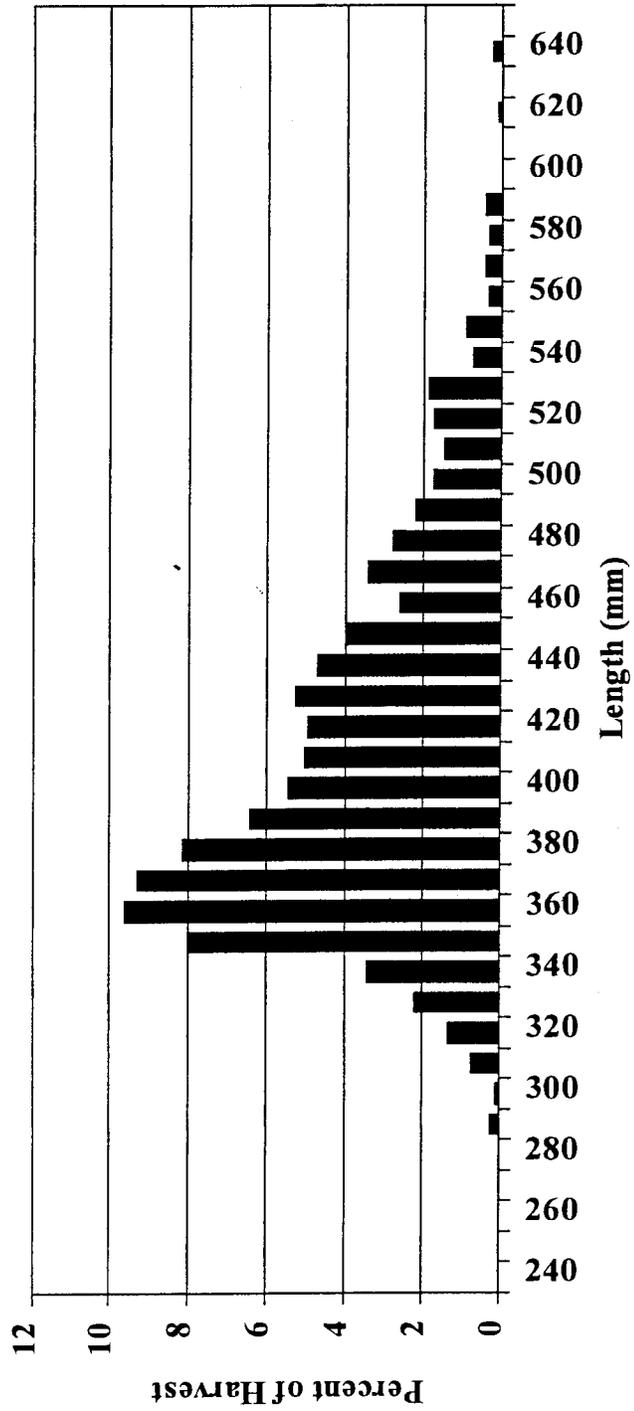
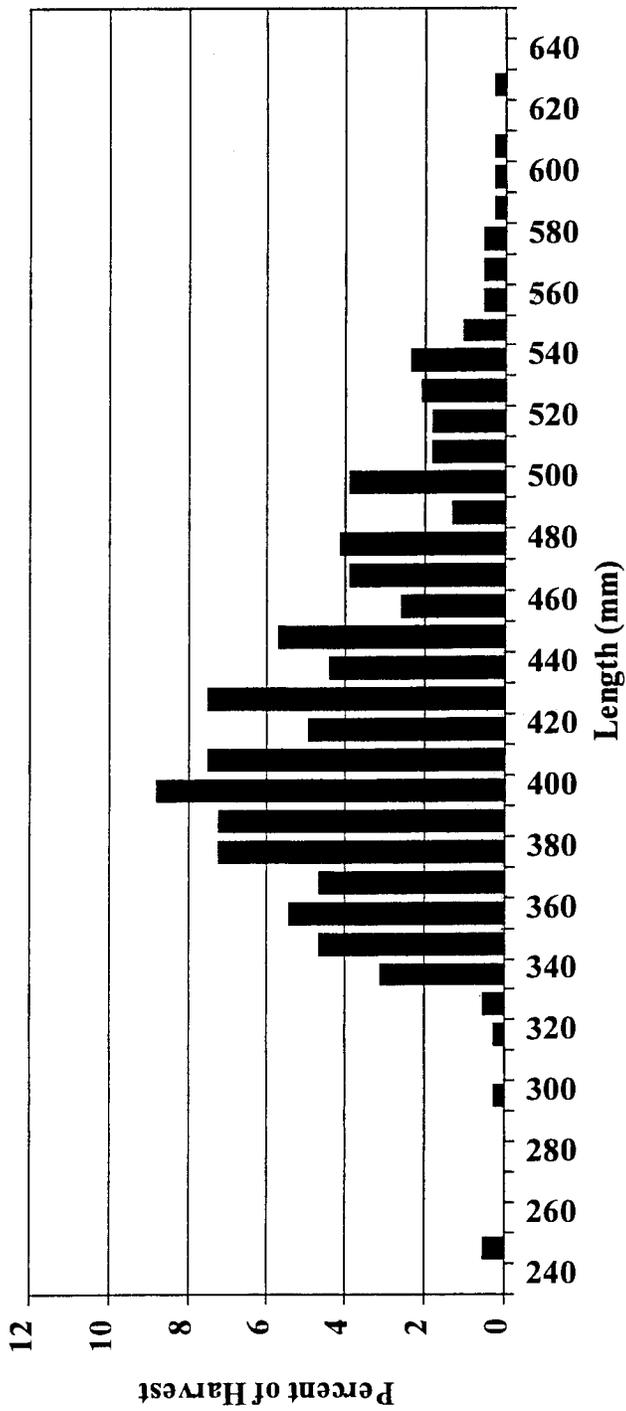


Figure 1. Length frequency distributions of trout (rainbow, cutthroat, and brown trout) harvested during the opening day of fishing season on the Snake River below American Falls Reservoir, Idaho, in 1997 and 1998.

## Season-long Creel Survey

During the 1998 creel survey on the Snake River below American Falls Reservoir, anglers fished an estimated total of 63,555 hours ( $\pm$  6,900) and caught 34,066 fish ( $\pm$  3,976) for a overall catch rate of 0.54 fish/h (Table 2). This is up over the previous season's 0.44 fish/h; however, consideration must be made for what was actually being caught. Few yellow perch were harvested in 1997, but in 1998, yellow perch made up over 20% of the total catch. In order to eliminate the bias caused by the yellow perch (only a few anglers ever targeted them, but they caught large numbers in only two locations), we must examine the catch rate for rainbow trout only. In 1997 0.42 rainbow trout/h were caught and 1998 was nearly identical with 0.41 rainbow trout/h (Table 2). Even though we see a 48% increase in angler effort from 1997, the catch rate for the main target species (rainbow trout) remains the same.

During 1997 we stocked 4,000 catchable rainbow trout (adipose-clipped) directly into the river and 1,441 (36.0%) of those were harvested during the 1997 season. An additional 196 fish carried over into the 1998 creel survey bringing the total return-to-creel to 40.3% (any adipose-clipped fish exceeding 400 mm in length was considered part of 1997 cohort). Additionally, those fish returning to the creel had shown a rapid growth rate (Mende et al 2000). In 1998, we increased the number of stocked catchable rainbow trout to 8,000 fish. Over 22% of the catchables returned to the creel in their first year. This is down markedly from the 1997 cohort's success and may indicate that there exists an optimal stocking level near the 4,000 number. The catchables began recruiting to the fishery within a few weeks, but really didn't make an impact until July, when they made up 20.1% of the entire rainbow trout harvest. They continued to be a significant source of harvest until October, when they only accounted for 6.6% of the rainbow trout harvest (Table 2).

The regulation change established in 1998, seems to have made some changes in the fishery overall. Release rates for rainbow trout are up from 29.8% to 44.6%. This reflects statements made to creel clerks that "it's harder to catch your four small fish than it is to catch your two big ones". We also noticed an increase in the presence of large fish later in the season (Figures 2-6). Even with the decreased limit on larger fish (> 400 mm), July and August saw an increased proportion of larger fish in the harvest over 1997's data (Figures 4 and 5). September does not follow the trend, however. This may be due to depletion of the larger fish. Even though release rates are up from 1997, the total number of rainbow trout harvested has increased (more anglers) from 12,681 to 14,463 fish. The regulation appears to spread the harvest out over more of the season, but anglers eventually harvest the same number of fish regardless.

### **Bonneville Cutthroat Trout Monitoring**

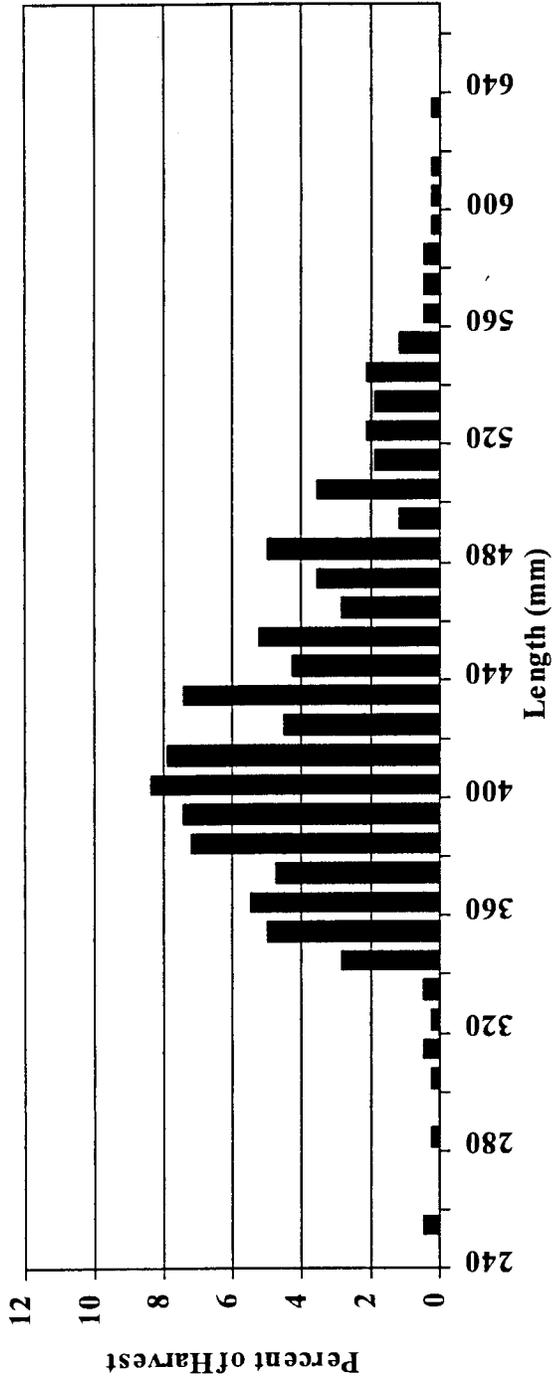
In 1998, we electrofished three sites on Preuss Creek, five sites on Giraffe Creek, and five sites on Dry Creek. The results for each creek are presented in Tables 3, 4, and 5 respectively. For Preuss Creek, stratum L is lowest on the creek located on private property directly downstream from the Forest Service boundary. Moving upstream, next is stratum A, B then C with stratum D located upstream from the Crow Creek road crossing. For Giraffe Creek, stratum A is located downstream from the enclosure, stratum B is inside the old enclosure, C is inside the new enclosure, D is the right fork above new enclosure and E is left fork above new enclosure. For Dry Creek, stratum A is located inside the enclosure, B extends for about 1,750 meters above enclosure, and C extends for about 1,450 meters above stratum B.

Table 2. Basic creel statistics from the 1997 and 1998 creel surveys on Snake River below American Falls Reservoir, Idaho.

|                        |                              | 1997         | 1998         |       |
|------------------------|------------------------------|--------------|--------------|-------|
| Fishing Effort (hours) |                              |              |              |       |
|                        | Bank                         | 22111        | 28520        |       |
|                        | Boat                         | 20174        | 33587        |       |
|                        | Opener                       | 506          | 1448         |       |
|                        | <b>Total</b>                 | <b>42791</b> | <b>63555</b> |       |
| Total Fish Caught      | Total                        | 18642        | 34066        |       |
| Catch Rate (fish/h)    |                              | .44          | .54          |       |
| Percent of Catch       | Rainbow Trout                | 96.8%        | 76.6%        |       |
|                        | Brown Trout                  | 0.9%         | 0.7%         |       |
|                        | Cutthroat Trout              | 0.5%         | 0.7%         |       |
|                        | Hybrid Trout                 |              | 1.0%         |       |
|                        | Yellow Perch                 | 1.4%         | 20.4%        |       |
|                        | White Sturgeon               | 0.4%         | 0.5%         |       |
|                        | Other                        |              | 0.1%         |       |
| Rainbow Trout          | # Caught                     | 18064        | 26102        |       |
|                        | Catch Rate                   | .42          | .41          |       |
|                        | # Kept                       | 12681        | 14463        |       |
|                        | % Kept                       | 70.2%        | 55.4%        |       |
|                        | % of Harvest AD-97           | 11.4%        | 0.6%         |       |
|                        | % of Harvest AD-98           |              | 12.3%        |       |
| 1997 AD Clips          | # Planted                    | 4000         |              |       |
|                        | Total # Harvested            | 1441         | 169          |       |
|                        | Cumulative % Return          | 36.0%        | 40.3%        |       |
|                        | % of RBT Harvest for -       | MAY          | 5.1%         | 3.2%  |
|                        |                              | JUN          | 23.2%        | 4.4%  |
|                        |                              | JUL          | 16.2%        | 0.6%  |
|                        |                              | AUG          | 6.5%         | 0.2%  |
|                        |                              | SEP          | 17.2%        | 0.7%  |
| OCT                    | 2.0%                         | 0.0%         |              |       |
| 1998 AD Clips          | # Planted                    |              | 8000         |       |
|                        | Total # Harvested            |              | 1776         |       |
|                        | Cumulative % Return          |              | 22.2%        |       |
|                        | % of RBT Harvest for -       | MAY          |              | 0.0%  |
|                        |                              | JUN          |              | 3.5%  |
|                        |                              | JUL          |              | 20.1% |
|                        |                              | AUG          |              | 15.0% |
|                        |                              | SEP          |              | 13.6% |
| OCT                    |                              | 6.6%         |              |       |
| All AD Clips           | 12000 Planted                |              |              |       |
|                        | Cumulative % Return of total | MAY          | 0.7%         | 11.5% |
|                        |                              | JUN          | 3.1%         | 12.8% |
|                        |                              | JUL          | 6.1%         | 16.5% |
|                        |                              | AUG          | 8.3%         | 23.1% |
|                        |                              | SEP          | 11.0%        | 25.3% |
|                        |                              | OCT          | 11.1%        | 25.5% |

1997

Mean Length = 429 mm  
65.3% > 400 mm



1998

Mean Length = 413 mm  
50.1% > 400 mm

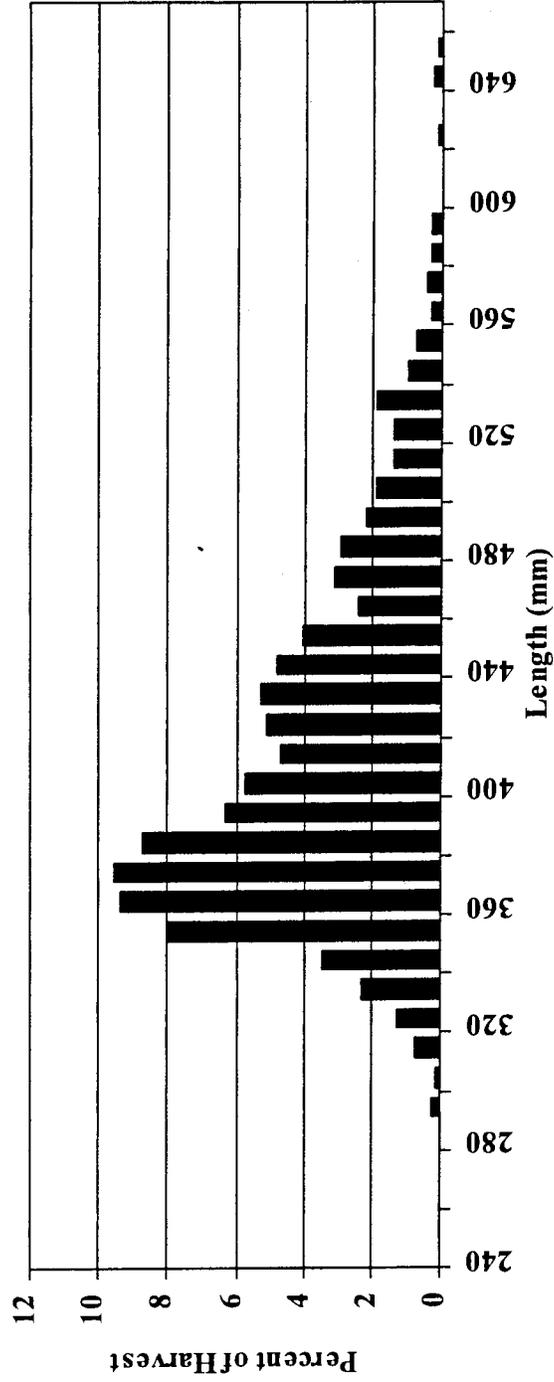


Figure 2. Length frequency distributions for trout harvested during May of the 1997 and 1998 seasons on the Snake River below American Falls Reservoir, Idaho.

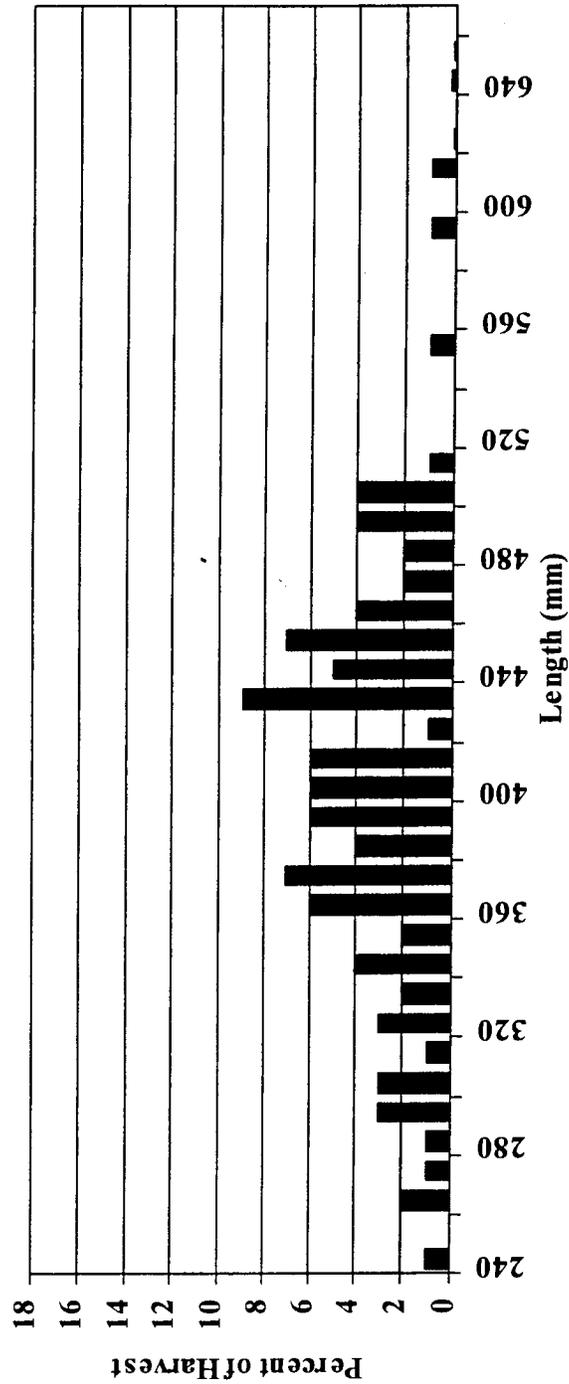
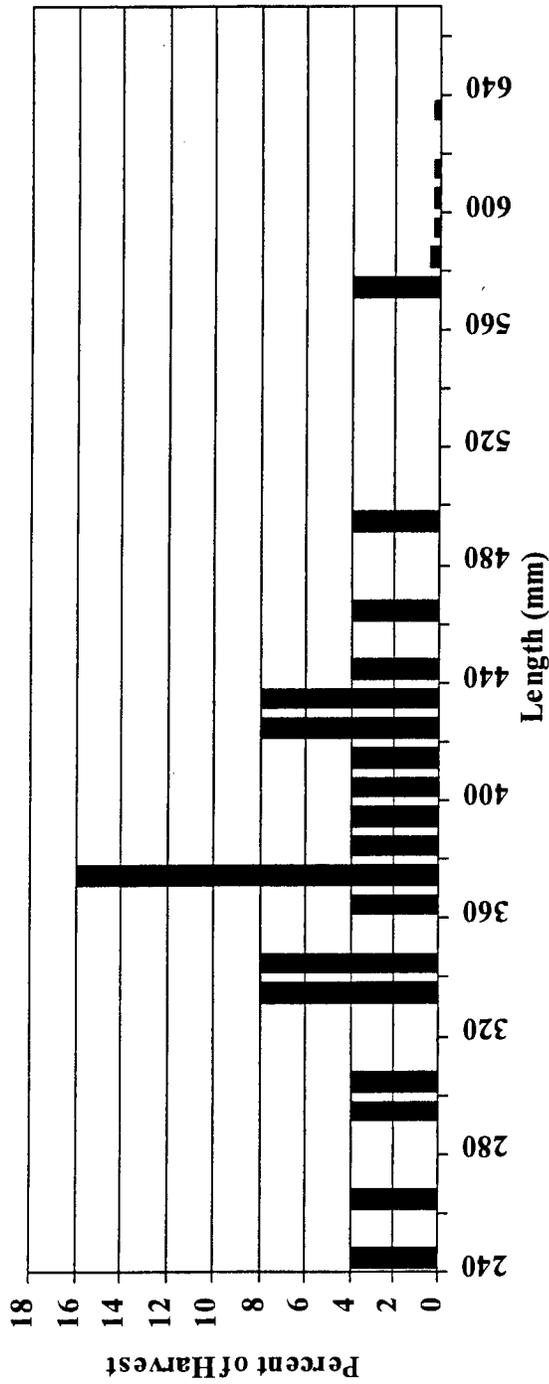


Figure 3. Length frequency distributions for trout harvested during June of the 1997 and 1998 seasons on the Snake River below American Falls Reservoir, Idaho.

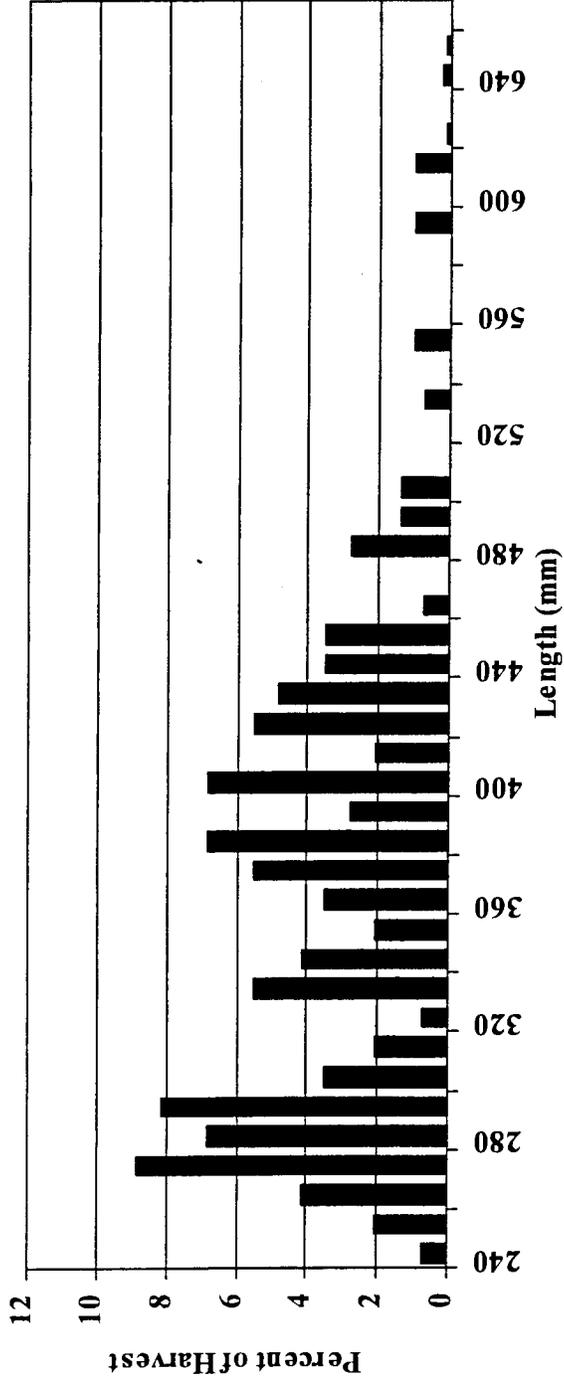
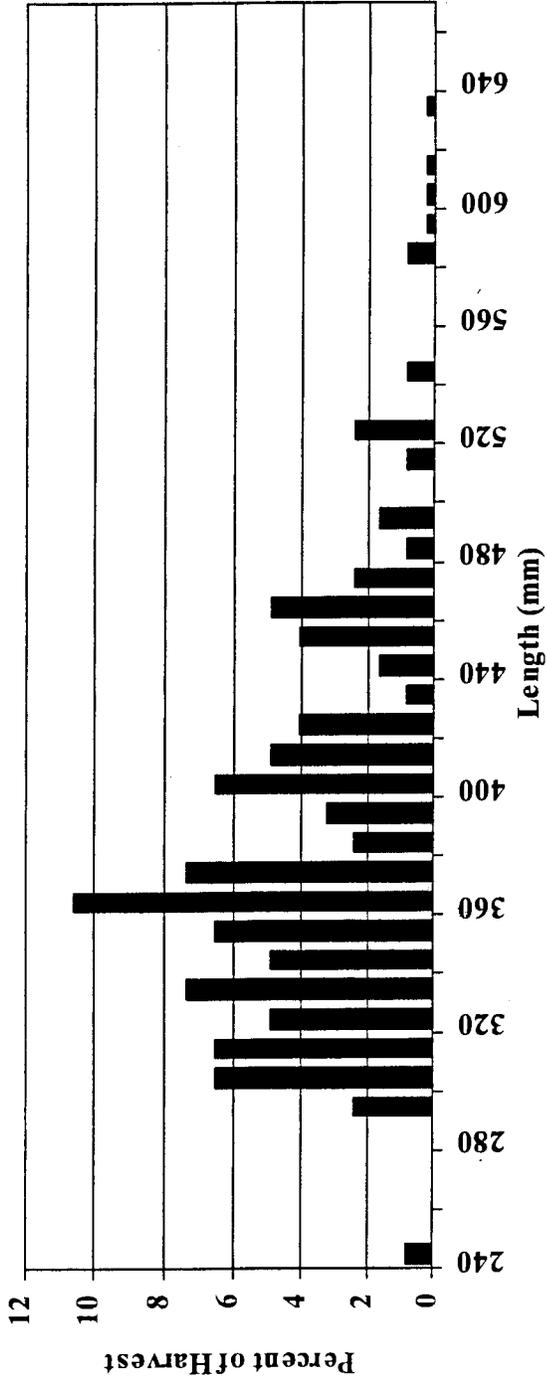
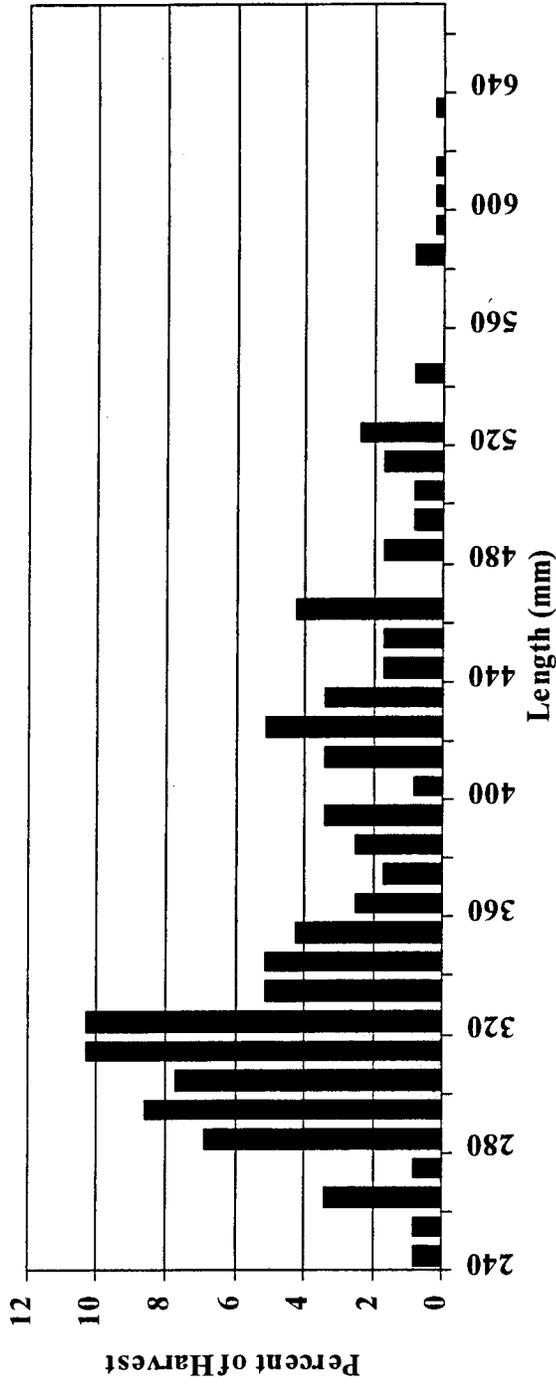


Figure 4. Length frequency distributions for trout harvested during July of the 1997 and 1998 seasons on the Snake River below American Falls Reservoir, Idaho.

1997

Mean Length = 392 mm  
35.9% > 400 mm



1998

Mean Length = 395 mm  
38.5% > 400 mm

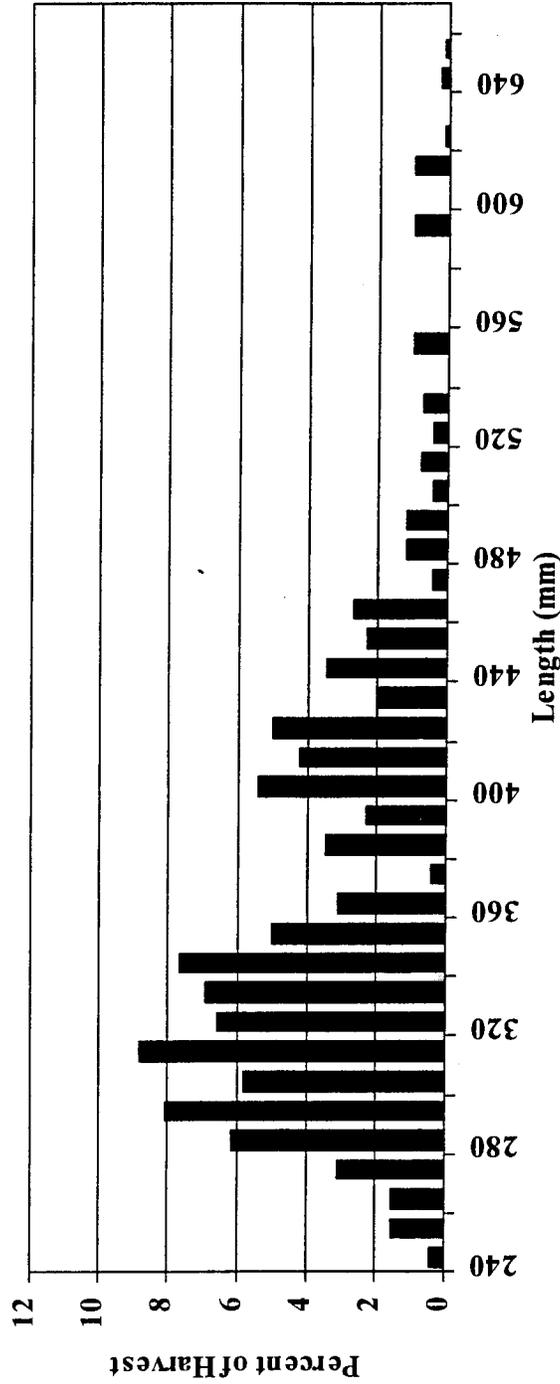


Figure 5. Length frequency distributions for trout harvested during August of the 1997 and 1998 seasons on the Snake River below American Falls Reservoir, Idaho.

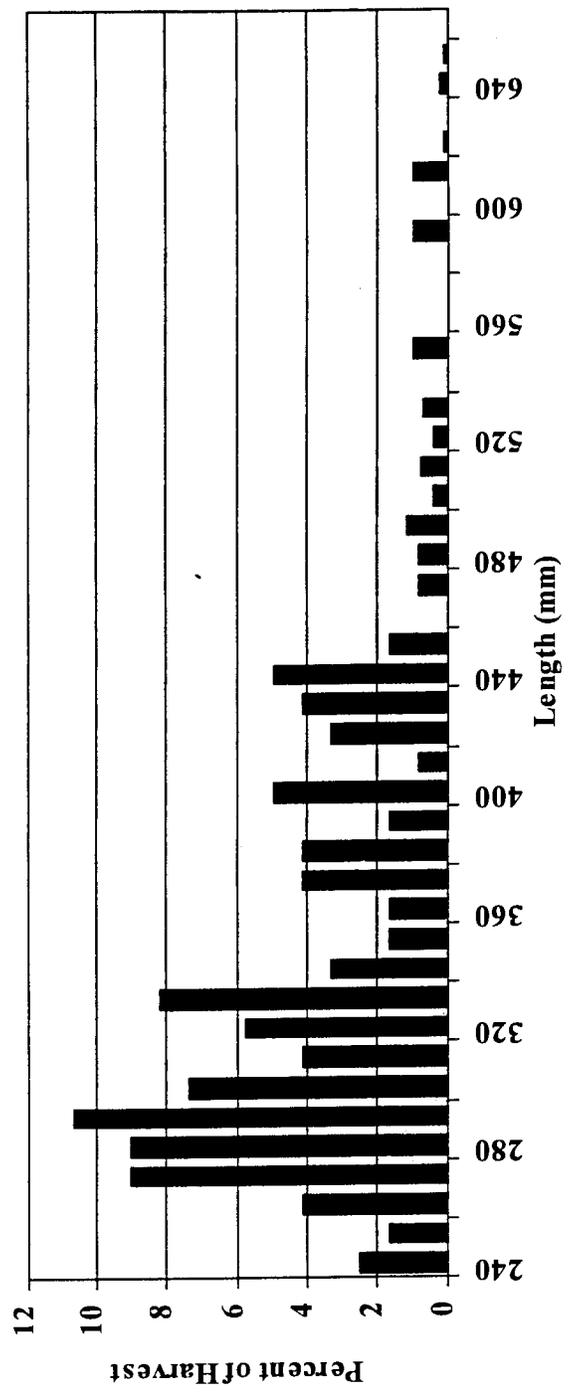
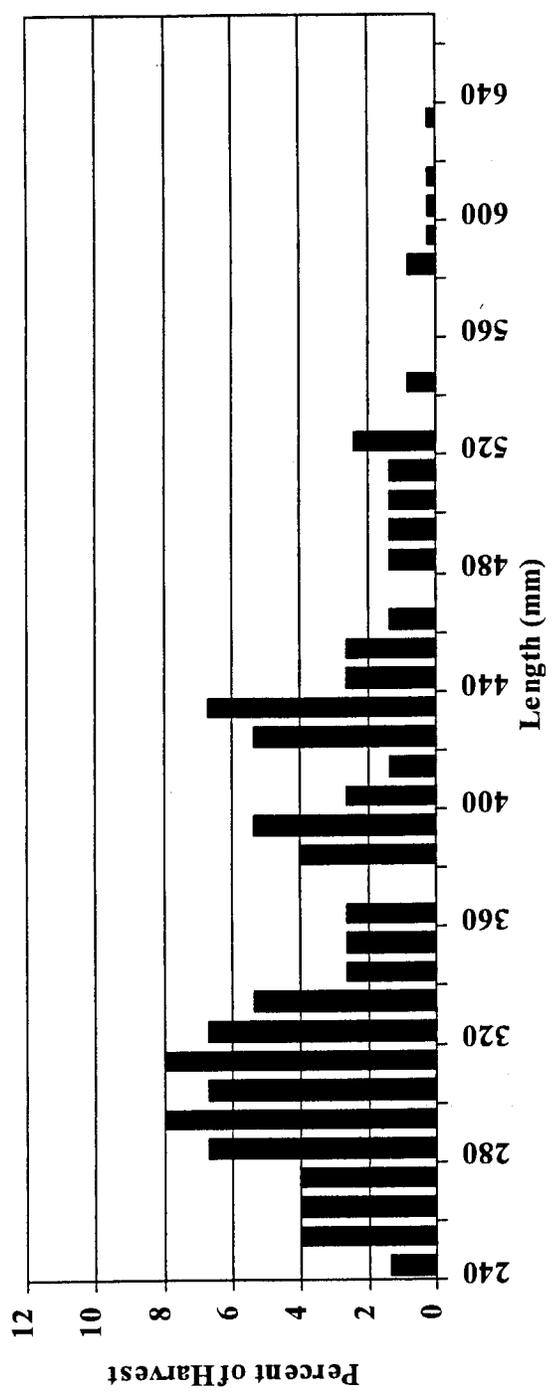


Figure 6. Length frequency distributions for trout harvested during September of the 1997 and 1998 seasons on the Snake River below American Falls Reservoir, Idaho.

Table 3. Bonneville cutthroat trout parr densities (number/100 m<sup>2</sup>) for Preuss Creek, Idaho, from 1981 through 1998.

| Year | Stratum A | Stratum B<br>inside enclosure | Stratum B<br>outside enclosure | Stratum C                | Stratum D                  | Stratum L                     |
|------|-----------|-------------------------------|--------------------------------|--------------------------|----------------------------|-------------------------------|
| 1981 |           | 16.3                          | 6.2                            |                          |                            |                               |
| 1985 |           | 31.6                          | 20.5                           |                          |                            |                               |
| 1986 |           | 17.5                          | 15                             |                          |                            |                               |
| 1987 | 21        | 15                            | 9.7                            |                          |                            |                               |
| 1988 |           |                               |                                |                          | 22                         |                               |
| 1989 | 1         | 2.6                           | 2.0                            |                          |                            |                               |
| 1990 |           | 3.5                           | 3.1                            |                          |                            |                               |
| 1991 |           | 2                             | 0, 0.6<br>(mean = 0.3)         | 0.7, 5.8<br>(mean = 3.3) | 5.5, 1.7<br>(mean = 3.6)   |                               |
| 1993 |           | 1.5                           | 0.5, 0.0<br>(mean = 0.3)       | 9.6, 3.0<br>(mean = 6.3) | 1.1, 9.5<br>(mean = 5.3)   |                               |
| 1995 |           | 5.9                           | 1.3, 3.5<br>(mean = 2.4)       | 2.6, 2.6<br>(mean = 2.6) | 2.5, 0.8<br>(mean = 1.7)   |                               |
| 1997 |           | 11.1                          | 3.5, 6.3<br>(mean = 4.9)       | 3.9, 6.7<br>(mean = 5.3) | 8.8, 19.2<br>(mean = 14.0) |                               |
| 1998 |           |                               |                                |                          |                            | 5.9, 1.3, 2.5<br>(mean = 3.2) |

Table 4. Bonneville cutthroat trout parr densities (number/100 m<sup>2</sup>) for Giraffe Creek, Idaho, 1981 through 1998.

| Year | Stratum A<br>below exclosure | Stratum B<br>inside old<br>exclosure | Stratum C<br>outside old<br>exclosure | Stratum D<br>right fork | Stratum E<br>left fork |
|------|------------------------------|--------------------------------------|---------------------------------------|-------------------------|------------------------|
| 1981 |                              | 4.2                                  | 0.2                                   |                         |                        |
| 1986 |                              | 21.4                                 | 19.1                                  |                         |                        |
| 1987 |                              | 32.7                                 | 41.5                                  |                         |                        |
| 1989 |                              | 19.0                                 | 33.9                                  |                         |                        |
| 1990 |                              | 14.1                                 | 5.5                                   |                         |                        |
| 1993 |                              | .5                                   | 0.0, 0.0                              |                         |                        |
| 1995 |                              | 5.0                                  | 2.0, 6.0<br>mean = 4.0                | 0.0                     | 4.7                    |
| 1998 | 13.0, 21.7<br>mean = 17.3    |                                      | 11.1                                  | 5.9                     | 9.7                    |

Table 5. Bonneville cutthroat trout parr densities (number/100 m<sup>2</sup>) for Dry Creek, Idaho, 1987 through 1998.

| Year | Unspecified<br>Locations           | Stratum A<br>inside exclosure | Stratum B                   | Stratum C                   |
|------|------------------------------------|-------------------------------|-----------------------------|-----------------------------|
| 1987 | 14.4                               |                               |                             |                             |
| 1990 | 4.3                                |                               |                             |                             |
| 1993 | 0.0, 0.0, 0.0, 0.0<br>(mean = 0.0) |                               |                             |                             |
| 1998 |                                    | 14.5                          | 38.7, 10.9<br>(mean = 24.8) | 12.3, 10.0<br>(mean = 11.2) |

The populations of Bonneville cutthroat trout in these tributaries of the Thomas Fork appear to be on the rebound. Drought conditions of the late 1980's and early 1990's appear to have been reversed with normal and above normal precipitation amounts for the past four years. Parr density numbers are up in all streams and fish have been detected in places previously barren (Tables 4 and 5). It is possible that the fishery could be opened back up to anglers within limits. Restrictive regulations like no bait, catch-and-release or one fish greater than 14 inches would most likely be attached to any season opening. Further monitoring of angling pressure, precipitation amounts and population fluctuations would also be necessary to insure minimal impact is made upon the species.

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## 1998 ANNUAL PERFORMANCE REPORT

State: Idaho Program: F-71-R-23  
Project II: Technical Guidance Subproject I-F: Southeast Region  
Contract Period: July 1, 1998 to June 30, 1999

### ABSTRACT

Regional fisheries participated in a Bonneville cutthroat trout *Oncorhynchus clarki utah* Conservation Agreement field tour and provided written observations and recommendations.

We participated in multiple meetings relating to the Federal Energy Regulatory Commission relicensing process for PacifiCorp projects on the Bear River. We also assisted other regional personnel in preparing written comments relative to the Draft License Applications.

We attended multiple meetings relative to the petition to list Bonneville cutthroat trout under the Federal Endangered Species Act. Additionally we wrote a review of the status of this species in Idaho and presented it to the U.S. Fish and Wildlife Service. Additionally we researched literature on Bonneville cutthroat trout and wrote an updated status report for use by the Fisheries Bureau and for further status information to the U. S. Fish and Wildlife Service.

We provided fishing advice to anglers through the state's internet web page and the 1-800-ASK-FISH service.

Author:

Richard Scully  
Regional Fishery Manager

## 1998 ANNUAL PERFORMANCE REPORT

State: Idaho Program: F-71-R-23  
Project III: Habitat Management Subproject I-F: Southeast Region  
Contract Period: July 1, 1998 to June 30, 1999

### ABSTRACT

We continued monitoring of several ongoing habitat restoration projects. Some, but not all, of the duties performed by regional personnel include: photo-point repetition and revetment inspections on the Portneuf River, upper Blackfoot River and Marsh Creek; inspection and repair of cattle exclosure fences along 6.5 km of the upper Portneuf River; assisted in establishing funding and construction of a new cattle exclosure fence along upper Portneuf River; monitored and adjusted outflow of water from upper Blackfoot River diversion dam to insure as much water as is feasible flows through the old winding channel.

Author:

Richard Scully  
Regional Fishery Manager

## 1998 ANNUAL PERFORMANCE REPORT

State: Idaho Program: F-71-R-23  
Project IV: Population Management Subproject I-F: Southeast Region  
Contract Period: July 1, 1998 to June 30, 1999

### ABSTRACT

Southeast Region fisheries management worked with Grace Hatchery and Shelley High School staff and students to capture adult Yellowstone cutthroat trout *Oncorhynchus clarki bouvieri* from the upper Blackfoot River, artificially spawn them and plant the eyed-eggs into stream-side incubation boxes on Blackfoot River tributaries. Participants planted 59,168 eggs into Mill, May and Timber creeks. Of these, 39,915 (67%) hatched. Most of the egg loss came from sites on Timber Creek where sediment and high flows proved unavoidable.

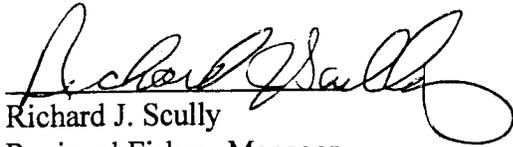
The regional fishery biologist renovated McTucker Pond #1 in November 1998 to remove non-game fish. All eight of the McTucker ponds were flooded by the Snake River in the spring of 1997 and repopulated with common carp *Cyprinus carpio*, Utah sucker *Catostomus ardens* and Utah chub *Gila atraria*. The Bingham County Highway Department was removing additional gravel from the flooded gravel pit (Pond #1) and pumped most of the water out during the operation. This presented the opportunity for renovation. The Department received a short-term activity exemption from the Idaho Division of Environmental Quality for the treatment.

In mid-September 1998, the Twin Lakes Canal Company drained Winder Reservoir. The Department was unaware of the draining until anglers called in. We arranged things with the watermaster and downstream landowner to allow salvage of some fish that had moved down a canal and into a small pond. Fisheries personnel and volunteers removed 186 largemouth bass *Micropterus salmoides* from Heber Swainston's 2-acre pond and transferred them to nearby Johnson Reservoir.

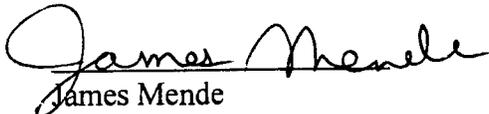
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