FISHERY MANAGEMENT INVESTIGATIONS

TETON RIVER INVESTIGATIONS
PART II: FISH POPULATION SURVEYS 25 YEARS AFTER TETON DAM

Final Progress Report

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William C. Schrader, Senior Fisheries Research Biologist

and

Kevin R. Brenden, Fishery Technician

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ABSTRACT

This report is the second part of a three-part series assessing the Teton River fishery 25 years after the collapse of Teton Dam, particularly in the Teton Canyon above the dam. We surveyed fish populations in one river reach in 1998 (by gillnetting) and six reaches in 1999 (by electrofishing), and then compared our findings to pre-dam surveys conducted in 1974 and 1975. Fifteen fish species currently inhabit all or parts of the Teton River. They include (in approximate decreasing order of abundance): mountain whitefish *Prosopium williamsoni*, Yellowstone cutthroat trout *Oncorhynchus clarki bouvieri*, suckers (Utah sucker *Catostomus ardens*, bluehead or Colorado sucker *C. discobolus*, and mountain sucker *C. platyrhynchus*), rainbow trout *O. mykiss*, hybrid rainbow x cutthroat trout *O. mykiss x O. clarki bouvieri*, Utah chub *Gila atraria*, Eastern brook trout *Salvelinus fontinalis*, and brown trout *Salmo trutta*. Also observed but not enumerated were redside shiner *Richardsonius balteatus*, longnose dace *Rhinichthys cataractae*, speckled dace *R. Osculus*, mottled sculpin *Cottus bairdi*, and Paiute sculpin *C. beldingi*. Since the dam failure, suckers and Utah chubs have almost replaced the trout population in the borrow pits that were excavated to construct the dam. Further, cutthroat, rainbow, and brook trout relative abundance has declined significantly ($P < 0.01$) in other portions of the Teton Canyon. In contrast, mountain whitefish and suckers have increased significantly ($P < 0.05$) relative to the other taxa. Unfortunately, fish density was not estimated prior to the dam, and our post-dam estimates were imprecise due to inefficient sampling. Yet cutthroat trout densities have clearly not followed the same upward trend observed in adjacent rivers with similar native trout management programs.

Median total length of game fish has increased significantly ($P < 0.01$) in the Teton Canyon since the dam collapse, probably due to fish living longer with the reduction in harvest. Quality stock densities (QSD) also increased but were not statistically compared. From 1974 to 1999, cutthroat trout lengths in the Teton Canyon increased from 210 mm to 350 mm, and QSDs climbed from 7% to 21%. Rainbow trout lengths increased from 246 mm to 324 mm, and QSDs climbed from 7% to 23%. Mountain whitefish lengths increased slightly from 302 mm to 309 mm, and QSDs increased slightly from 2% to 3%. Relatively few juvenile trout (age-0 and -1) were captured in 1999 compared to 1974. Although trout in the Teton Canyon were intermediate in size compared to the other Teton River study sections, they often attain trophy size (≥500 mm).

The aesthetic quality of fish in the Teton Canyon has declined due to blackspot disease. The incidence of this parasite in trout, mountain whitefish, and suckers was significantly higher ($P < 0.01$) in the Teton Canyon, where 93% of the fish were infected, compared to the other study sections (65 to 72%). Using an index count area on the side of mountain whitefish and suckers, the severity of the disease was also significantly higher ($P < 0.05$) in the Teton Canyon. The parasite was present prior to the dam but no data were recorded. The increase in pool habitat, sediment, and macrophytes that favor the intermediate snail host, as well as the increase in water temperature—all caused by the dam collapse—likely explain the high incidence and severity of the disease in the Teton Canyon. The effect of the disease on fish populations in the Teton Canyon is unknown, but it is a detriment to the quality of the angling experience.

Authors:

William C. Schrader, Senior Fisheries Research Biologist

Kevin R. Brenden, Fishery Technician

INTRODUCTION AND STUDY AREA

This report is the second part of a three-part series assessing the Teton River fishery 25 years after the collapse of Teton Dam, particularly in the Teton Canyon above the dam. The first report (Schrader, in press) assesses the overall impacts of the dam collapse on the recreational fishery using creel survey data. Also included are water temperature and streamflow data. The third and final report (Schrader and Jones, in press) presents fish movement and life history information. Here, we present fish population survey results. Although our focus is on the Teton Canyon, we include two other Teton River sections as field controls—one below Teton Dam (hereafter Lower Teton, which was also affected by the dam) and one above the Teton Canyon (hereafter Teton Valley, which was unaffected). Our overall strategy was to examine the Teton Canyon fishery, its fish populations, and fish movements over time (pre- versus post-Teton Dam) and space (between sections). This was necessary, as pre-dam information was often limited or lacking altogether.

Prior to this study, few fish population surveys had been conducted in the Teton Canyon. Fish abundance has never been estimated, either pre-dam (Irving et al. 1977) or post-dam. This lack of quantitative information is due to poor access, dangerous whitewater rapids, and the expectation that standard electrofishing gear would be ineffective in the deep pools and swift rapids. Limited surveys were conducted at the Borrow Ponds (from the dam site upstream 3 km) using gill nets in 1976 and 1980 (Jeppson 1981) and in 1991 (Idaho Department of Fish and Game, unpublished data). From the ponds upstream 6 km to Canyon Creek, boat electrofishing gear was used in 1992, but abundance estimates were not possible due to poor sampling efficiency. Above Canyon Creek, fish were tagged using hook-and-line gear from 1988 to 1991, but sample sizes were small. At Felt Dam (31 km above the dam site and 3 km above the old Teton Reservoir), fish were tagged using electrofishing in 1987 and 1988 as part of a hydroelectric relicensing study (Ecosystems Research Institute [ERI] 1987, 1988). Finally, a few fish in Teton Canyon tributaries were tagged in the 1980s and early 1990s. At best, these fish population data provide some limited movement information from tag returns (Schrader and Jones, in press) and some limited catch-per-unit-effort, species composition, and size structure information.

Background for this study and detailed descriptions of the Teton River drainage, including the three major study sections with several reaches in each section, can be found in Schrader (in press). Extensive marking, tagging, radio telemetry, and trapping data have shown almost no juvenile or adult trout movement between sections, and the populations can be considered independent or isolated (Irving et al. 1977; Schrader and Jones, in press).

OBJECTIVE

1) Survey fish populations in the Teton River 25 years after the Teton Dam failure.

METHODS

Electrofishing

Seven reaches of the mainstem Teton River were sampled by electrofishing in 1999 (Figure 1). Two reaches were in the Lower Teton study section—small portions of the North

Fork and South Fork with the best available habitat. Three reaches were in the Teton Canyon study section—Parkinson and lower and upper Spring Hollow. In addition, two reaches were in the Teton Valley study section—Breckenridge and Nickerson. These reaches are the standard Idaho Department of Fish and Game (IDFG) monitoring sites for the Teton River with the exception of Spring Hollow, which was not electrofished prior to 1999. Spring Hollow encompasses the 27 major landslides caused by the Teton Dam collapse (Randle et al. 2000). All data were eventually pooled by study section and compared with pre-dam electrofishing data that were collected in 1974 (Irving et al. 1975, 1977). Reach length ranged from 2.5 to 11.1 km (Table 1). All electrofishing was conducted between late July and early October, but mostly in August and September. Elapsed time from the first to last sample date, inclusive, ranged from two to 29 days.

In 1974, 55 reaches, ranging from 396 to 2,895 m, were electrofished in July through September (Irving et al. 1975, 1977). Unfortunately, reference photographs and detailed descriptions of the reaches were lost (T. Bjornn, University of Idaho, and J. Irving, Idaho National Engineering and Environmental Laboratory, personal communication), and an experimental design based on paired comparisons was not possible. We did retrieve the 1974 length frequency distribution computer output (reported in Irving 1975) but not the raw data. Irving also sampled in 1975, but only in the Lower Teton and Teton Valley because of major construction activity in the Teton Canyon to build the dam.

From one to five electrofishing runs or passes were made through each reach in 1999. Generally, one or two recapture runs were made about a week following the marking runs. However, a single marking run (and no recapture run) was made at upper Spring Hollow due to low flows. One day was needed to make a single run through each reach except Spring Hollow, where several days were needed due to poor access. Field crews left the boat and gear on the river overnight and hiked in and out of the Teton Canyon. Two days were needed at upper Spring Hollow (Felt Dam to Spring Hollow boat ramp, pools 1 to 9), and three days were needed at lower Spring Hollow (boat ramp to Canyon Creek, pools 10 to 27).

Fish were captured with direct current (DC) electrofishing gear (Coffelt VVP-15) mounted in a metal drift boat or, at Spring Hollow, in a rubber whitewater raft (Avon self-bailer). Two-person work crews used pulsed DC current through boom-and-dangler anodes fixed to the bow and floated downstream. The cathode was the metal boat hull or several dangler cables hanging off the whitewater raft frame. VVP settings were generally at 150-225 V, 5 A, 20% pulse width, and 60-90 Hz (pulses per second). Electrofishing time was logged to the nearest second from the VVP counter.

Field crews attempted to net all trout, mountain whitefish, and suckers; other non-game fish were not recorded. Captured fish were anesthetized, identified, measured (TL, in mm), and weighed (g) with a digital bench scale (Ohaus model B25AS20). Each fish was inspected for marks and signs of blackspot or whirling disease. On marking runs, fish >100 mm were marked with a temporary caudal fin punch.

Gillnetting

Sinking experimental gill nets were used to sample fish in the Borrow Ponds in 1998 (Figure 2). Forty daylight sets were made on July 23, 28, and 31 and August 12 and 18. Sets were generally 30 min each, but some were as long as 60 min because we wanted to use mark-recapture methods to estimate abundance. Combined effort was 23.0 h. A small jet boat was used to set and retrieve the nets after locating fish and determining depths with a fish finder. Six sets were in the lower pond, 12 were in the middle pond, and 22 were in the upper pond.

Captured fish were anesthetized, identified, measured (TL, in mm), and inspected for marks and signs of blackspot disease or whirling disease. All trout, mountain whitefish, suckers, and Utah chubs were marked with a permanent left pectoral fin clip.

Population Statistics and Assumptions

Relative Abundance and Fish Length

The relative abundance of each species was estimated as the proportion of all fish captured by electrofishing. We used all sizes of fish and assumed capture probabilities did not vary with species. Chi-square tests of homogeneity were performed between reaches, sections, and years. If heterogeneous, each species was tested for differences in uncorrected binomial proportions. We used two-tailed tests and 5% significance levels for all analyses.

Although capture probabilities are known to vary with fish length (Schill 1992), we assumed that variability was similar among reaches, sections, and years. Median and mean fish length and population size structure (length frequency distribution) was estimated using all sizes of fish captured. Quality stock density (QSD) was estimated by dividing the number of fish >400 mm by the number >200 mm then multiplying by 100 (Anderson 1980; Schill 1991). All these statistics were calculated for each reach and year after excluding recaptured fish.

Statistical tests follow those outlined in Zar (1984) and Daniel (1990). The computer software Statistix (version 7.1, Analytical Software, Tallahassee, Florida) was used for analyses.

Total Abundance and Density

Following the nomenclature of Ricker (1975), total fish abundance, N, was estimated with Chapman's modification of the Peterson method:

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

where M = number of fish marked, C = number of fish sampled and examined for marks, and R = number of recaptured marks in the sample. The variance of abundance was estimated according to Seber (1973):

$$\mathrm{var}\left[\hat{N}\right] = \frac{(M+1)(C+1)((M-R)(C-R)}{(R+1)^2(R+2)} \tag{2}$$

where the terms are as before. For this study, M was derived from electrofishing marking runs and C and R from recapture runs for all fish species combined rather than individual taxa. The computer program Mark Recapture for Windows (version 5.0 Beta or MR5; Montana Department of Fish, Wildlife, and Parks 1994) was used to calculate these statistics for fish ≥100 mm. The 95% confidence interval for the total abundance estimate was calculated as:

$$\hat{N} \pm 1.96\sqrt{\operatorname{var}\hat{N}} \tag{3}$$

We estimated fish density by dividing the abundance estimate by the electrofishing reach length to calculate fish per kilometer or by the reach area to calculate fish per hectare. The density variance estimate was calculated similarly. We estimated the density of each species by proportioning the total fish density estimate by the relative contribution of each species to the electrofishing catch (i.e. their relative abundance). For the seven reaches, channel center length ranged from 2.5 to 11.1 km, mean wetted width ranged from 16.4 m to 48.8 m, and surface area ranged from 4.10 ha to 54.17 ha (Table 1). Surface area was calculated as the product of channel center length and mean wetted width.

Capture efficiency (R/C) measures the effectiveness of the sampling gear and crew. It also varies with fish length and, if not accounted for, results in underestimating abundance (Schill 1992; Reynolds 1996). Although the MR5 program can use a log-likelihood model to correct this problem, the model was not used as one important case (lower Spring Hollow) had too few recaptures.

Following Ricker (1975), we made five general assumptions needed for valid mark recapture estimates. First, we assumed the population was closed, i.e. no mortality, recruitment, immigration, or emigration. Though electrofishing reaches were not blocked at each end, we assumed fish did not move beyond natural habitat boundaries between marking and recapture runs. Second, we assumed that marked fish were as vulnerable to subsequent electrofishing as unmarked fish, i.e. capturing and marking them did not affect their catchability. Third, the marked fish did not lose their mark. Fourth, the marked fish became randomly mixed with the unmarked fish. Fifth, all marks were recognized and recorded correctly.

Electrofishing Catch Rate

The total number of fish captured on marking and recapture runs (minus recaptured individuals, M+C-R) divided by the electrofishing effort in seconds (recorded from the VVP unit) is the electrofishing catch rate. Like the density estimates, this index of abundance was calculated for fish ≥100 mm, but a variance estimate is not possible. We assumed the effectiveness of the electrofishing gear was similar among species, locations, and years.

Survival and Mortality

We used a non-parametric Kaplan-Meier procedure, as modified by Pollock et al. (1989), to estimate the survival distribution of adult trout that were radio tagged in 1998 and 1999 (Schrader and Jones, in press). This procedure allows for new animals to be added gradually (or staggered) after the study has begun and is referred to as a staggered entry design.

Pollock et al. (1989) define the survival function (S[t]) as the probability of an arbitrary animal in a population surviving t units of time from the beginning of the study. We used four-week time periods (t) as we located fish at least once a month. The study ended on October 23, 1999, shortly after the last flight and 56 weeks (t = 14) after beginning. The survival function is estimated as:

$$\hat{S}(t) = \prod_{j|a_j<t} \left(1 - d_j / r_j\right) \tag{4}$$

where $a_1, a_2, \ldots, a_g$ are the discrete time points when deaths occur; $r_1, r_2, \ldots, r_g$ are the numbers at risk at these points; and $d_1, d_2, \ldots, d_g$ are the number of deaths at the same points. We used Greenwood's (Greenwood 1926, cited in Pollock et al. 1989) formula to estimate the variance:

$$\operatorname{var}\left[\hat{S}(t)\right] = \left[\hat{S}(t)\right]^2 \sum_{1}^{j|a_j<t} \frac{d_j}{r_j\left(r_j - d_j\right)} \tag{5}$$

where the summation is for all death times a_j less than the time t. Approximate 95% confidence intervals are calculated as:

$$\hat{S}(t_0) \pm 1.96\sqrt{\operatorname{var}\hat{S}(t_0)} \tag{6}$$

Pollock et al. (1989) extended the Kaplan-Meier procedure by adding a term (for added animals) when calculating numbers at risk (formula ours):

$$r_j = r_{j-1} - d_{j-1} - c_{j-1} + n_{j-1} \tag{7}$$

where c_{j-1} are the numbers of animals censored at the previous time period; n_{j-1} are the number of animals added at the previous time period; and other terms as defined.

The expectation of death, or mortality through time t, is estimated as the complement of the above survival estimates. Following the nomenclature of Ricker (1975):

$$A(t) = 1 - S(t) \tag{8}$$

where A(t) is the probability of an arbitrary animal in a population dying t units of time from the beginning of the study. Total mortality can be apportioned to two primary causes: fishing mortality, m(t), and natural mortality, n(t). If they are conditional rates, then total mortality is calculated as:

$$A(t) = [m(t) + n(t)] - [m(t) \times n(t)] \tag{9}$$

where the terms are defined above. Another approach is to calculate mortalities on a finite basis:

$$A(t) = u(t) + v(t) \tag{10}$$

where u(t) is exploitation rate and v(t) is natural mortality rate for one year. We used the Kaplan-Meier procedure to estimate fishing survival rates with fish known to have been harvested by anglers (d_j) and censoring natural deaths (c_j). Then we used the same process to estimate natural survival rates with fish not dying by anglers (d_j) and censoring those that were harvested (c_j).

We used Microsoft® Excel 97 and the Kaplan-Meier version 5.0 computer program (Pollack et al. 1989) to make the above calculations.

Teton Canyon Gear Evaluation

Post-dam fish population data for the Teton Canyon was very limited at the initiation of this study, partly due to the expectation that standard boat electrofishing gear would be ineffective in the deep pools and swift rapids. We evaluated this and other gear such as hook-and-line tackle, large beach seines, and various types of experimental gill nets (floating, vertical, and sinking) in the Teton Canyon prior to making fish population assessments. However, we did not test gill nets at Spring Hollow or electrofishing at the Borrow Ponds. No gear was tested in the impassable Narrows reach above Felt Dam, and this reach was not sampled during this study. All gear was tested during daylight hours. Gear effectiveness was evaluated by catch rates, determined by dividing the total catch by the number of workdays used. Roughly, one workday was an eight-hour day for one person.

Blackspot Disease

During the study period, the incidence of blackspot disease was recorded for all trout, mountain whitefish, and suckers sampled. Incidence was the proportion of fish that had one or more of the parasites as indicated by the blackspots. Fish were grouped by those sampled while moving (by ladder and screw trapping, Schrader and Jones, in press) versus those sampled while stationary (by electrofishing and gill netting, this study).

In addition, the severity of the disease, or the number of parasites infecting the fish, was indexed during electrofishing in 1999. Only mountain whitefish and suckers were indexed as the parasites are easily confused with natural spotting patterns on trout. Parasites were counted in a 7 by 32 mm (224 mm2) rectangular area between the lateral line and dorsal fin. To count the spots, a drawing template was placed lengthwise and parallel to the lateral line on the left side of the fish. The same template was used on all sizes of fish. Because accurate counts were not possible for severely infected fish (greater than 15 spots), they were considered outliers and omitted from analysis.

To compare incidence of the disease between sections, we conducted chi-square tests of homogeneity. If samples were not homogenous, we conducted binomial tests of proportions. The proportion of "successful" outcomes was the proportion of fish that were infected. To compare severity of the disease, we tested for differences in means and mean ranks between study sections. Standard one-way analysis of variance was used to test means, and the nonparametric Kruskal-Wallis one-way analysis of variance was used to test mean ranks. Data were grouped by species and analyzed with Statistix (version 7.1, Analytical Software). The significance level used throughout testing was alpha = 0.05.

RESULTS

Species Composition and Relative Abundance

Fifteen fish species currently inhabit the Teton River drainage (Table 2). Eleven are native and four are nonnative (introduced). In approximate decreasing order of abundance they are: mountain whitefish *Prosopium williamsoni*, Yellowstone cutthroat trout *Oncorhynchus clarki bouvieri*, suckers (Utah sucker *Catostomus ardens*, bluehead or Colorado sucker *C. discobolus*, and mountain sucker *C. platyrhynchus*), rainbow trout *O. mykiss*, hybrid rainbow x cutthroat trout *O. mykiss* x *O. clarki bouvieri*, Utah chub *Gila atraria*, Eastern brook trout *Salvelinus fontinalis*, and brown trout *Salmo trutta*. Also observed but not assessed during this portion of the study were redside shiner *Richardsonius balteatus*, longnose dace *Rhinichthys cataractae*, speckled dace *R. Osculus*, mottled sculpin *Cottus bairdi*, and Paiute sculpin *C. beldingi*. Hereafter, "rainbow" trout will refer to rainbow trout and hybrid rainbow x cutthroat trout combined unless specifically denoted.

Lake trout *Salvelinus namaycush* and kokanee salmon *O. nerka* were stocked as partial mitigation for Teton Reservoir (Appendix A). Lake trout fry and fingerlings were stocked in the reservoir in 1976. A single, large (730 mm) lake trout was gillnetted in the upper Borrow Pond fifteen years later (IDFG, unpublished data) and was probably a remnant of that stocking. Kokanee salmon eyed-eggs and fry were stocked in Badger Creek and the reservoir in 1975 and in the North Fork of Bitch Creek in 1976. Both species are now gone.

Trout, mountain whitefish, and sucker relative abundance was significantly different, or heterogeneous, over all electrofishing reaches in 1999 ($P < 0.01$; 6 x 5 contingency table, with brown trout and brook trout pooled as "other trout"; Figure 3). Lower and upper Spring Hollow were homogenous ($P = 0.48$), whereas other paired reaches in each study section were heterogeneous ($P < 0.01$; 2 x 5 tables). Despite these differences, we pooled the data to compare relative abundance between sections and between pre- and post-dam years (the 1974 data were already pooled; Figure 4). Relative abundance was significantly different between the three study sections in both 1974 ($P < 0.01$; 3 x 5 table) and 1999 ($P < 0.01$; 3 x 5 table). Relative abundance was also significantly different between 1974 and 1999 in the Lower Teton ($P < 0.01$; 2 x 5 table), Teton Canyon ($P < 0.01$; 2 x 5 table), and Teton Valley ($P < 0.01$; 2 x 5 table; Appendix B).

Cutthroat Trout

In 1999, cutthroat trout relative abundance ranged from 14% at Spring Hollow to 31% in the South Fork (Figure 3). After pooling reaches, they comprised 23% of the catch in the Lower Teton, 19% in the Teton Canyon, and 22% in the Teton Valley (Figure 4). Compared to 1974, their relative abundance decreased significantly in the Lower Teton ($P < 0.01$) and Teton Canyon ($P < 0.01$) but increased significantly in the Teton Valley ($P < 0.01$; Appendix B). They comprised 10% of the Borrow Ponds gillnetting catch in 1998.

IDFG stocking records (1967-2000) indicate cutthroat trout were routinely stocked as fry, but sometimes as fingerlings or catchables, throughout the drainage from 1968 to 1991 (Appendix A). Henrys Lake was probably the sole broodstock source during this period. Except for Packsaddle Lake (a high mountain lake in the Big Hole mountains), the stocking program was discontinued in 1992 due to poor return to the creel.

Rainbow Trout

In 1999, rainbow trout relative abundance ranged from 3% at Spring Hollow to 32% in the North Fork (Figure 3). Only in the North Fork were they relatively more abundant than cutthroat trout. They comprised 19% of the pooled catch in the Lower Teton, 4% in the Teton

Canyon, and 9% in the Teton Valley (Figure 4). Compared to 1974, their relative abundance decreased significantly in the Teton Canyon (P <0.01), but increased significantly in the Lower Teton (P <0.01) and Teton Valley (P <0.01; Appendix B). They comprised less than 1% of the Borrow Ponds gillnetting catch in 1998.

IDFG stocking records (1967-2000) indicate rainbow trout were routinely stocked as catchables, but sometimes as fry or fingerlings, throughout the drainage from 1968 to 1994 (Appendix A). Except for a single plant of 5,000 fingerlings in Spring Creek in 1998, they have not been stocked in the mainstem or tributaries since 1994. Beginning in 1995, and because of cutthroat trout conservation concerns, the hatchery allocation was transferred to the Trail Creek Pond near Victor. However, 10 hatchery fish were captured at Nickerson in 1999, possibly from illegal introductions by anglers or private pond owners. Historic IDFG broodstock sources include Arlee, domestic Kamloops, Hayspur, Mount Lassen, and Mount Shasta.

Rainbow x cutthroat hybrid trout are fertile and reproduce naturally in the drainage. Both first generation (F1) and second generation or greater fish (F2/backcross) have been identified by nDNA techniques (M. Campbell, IDFG, personal communication). Hybrids were also stocked by IDFG as fry in the mainstem and various tributaries in 1981 with unknown success (Appendix E). As mentioned, Irving et al. (1977) do not report catching any hybrid trout in 1974 or 1975.

Brown Trout

In 1999, brown trout were only observed in the Lower Teton (Figure 3). Their relative abundance was 1% in the South Fork and 2% in the North Fork, or 2% of the Lower Teton pooled catch (Figure 4). Compared to 1974, when none were caught, their relative abundance increased significantly (*P* <0.01; Appendix B). No brown trout were gillnetted at the Borrow Ponds in 1998. However, two brown trout were captured by electrofishing in the Teton Valley in 1987 and 1994 (IDFG, unpublished data), possibly from illegal introductions by anglers or private pond owners.

Brook Trout

In 1999, brook trout were caught only in the Teton Valley (Figure 3). Their relative abundance was 9% at Breckenridge and 13% at Nickerson, or 11% of the Teton Valley pooled catch (Figure 4). Compared to 1974, their relative abundance decreased significantly in the Teton Valley (P <0.01) and the Teton Canyon (P <0.01), but not the Lower Teton (P = 0.38; Appendix B). No brook trout were gillnetted at the Borrow Ponds in 1998.

Brook and brown trout have not been stocked since at least 1967. Brook trout probably arrived in the Teton River via previous plantings, but brown trout are likely invading from the Henrys Fork Snake River.

Mountain Whitefish

In 1999, mountain whitefish were the most common of the six species recorded in the Teton River. Their relative abundance ranged from 30% in the South Fork to 65% at Spring Hollow (Figure 3). They comprised 40% of the pooled catch in the Lower Teton, 63% in the

Teton Canyon, and 56% in the Teton Valley (Figure 4). Compared to 1974, their relative abundance decreased significantly in the Lower Teton ($P < 0.01$), but increased significantly in the Teton Canyon ($P < 0.05$; Appendix B). There was no significant difference in the Teton Valley ($P = 0.23$). They comprised 16% of the Borrow Ponds gillnetting catch in 1998.

Suckers

In 1999, sucker relative abundance ranged from none at Breckenridge to 33% in the South Fork (Figure 3). They comprised 16% of the pooled catch in the Lower Teton, 14% in the Teton Canyon, and 2% in the Teton Valley (Figure 4). Compared to 1974, their relative abundance increased significantly in the Lower Teton ($P < 0.01$) and Teton Canyon ($P < 0.01$; Appendix B). Although they decreased in the Teton Valley, the difference was only slightly insignificant ($P = 0.0545$). They comprised 38% of the Borrow Ponds gillnetting catch in 1998.

Utah Chubs

In 1999, four Utah chubs were electrofished in the South Fork. However, they comprised 36% of the Borrow Ponds gillnetting catch in 1998. As mentioned, Irving et al. (1977) did not report catching any Utah chubs in 1974 or 1975.

Length Statistics

To better illustrate length frequency distributions and compare length statistics, we pooled the 1999 electrofishing data for each species by study section (the 1974 data were already pooled). For all species except suckers, and in all sections, length frequency distributions were significantly different between 1974 and 1999 (Kolmogorov-Smirnov tests, $P < 0.01$; Figures 5 to 9; Appendix C).

Differences in length frequency distributions between years were always due to larger fish being sampled in 1999 (Figures 5 to 7; Appendix C). Trout median lengths in all sections, and for all trout species, were significantly larger in 1999 compared to 1974 (median tests, $P < 0.01$). Trout QSDs were also larger in 1999, but statistical analyses were not performed. Finally, the largest cutthroat and rainbow trout median lengths and QSDs in 1999 were observed in the Lower Teton, followed by the Teton Canyon and the Teton Valley.

Except in the Teton Valley, differences in mountain whitefish length frequency distributions between years were also due to larger fish being sampled in 1999 (Figure 8; Appendix C). Mountain whitefish median lengths were significantly larger in 1999 compared to 1974 in the Lower Teton ($P < 0.05$) and Teton Canyon ($P < 0.01$) but not in the Teton Valley ($P = 0.60$). However, QSDs were similar between years. Mountain whitefish median lengths and QSDs were similar among study sections in 1999.

Sucker length frequency distributions in the Lower Teton were not significantly different between years ($P = 0.23$), and low sucker sample size ($n = 15$) in 1974 precluded comparisons in the Teton Canyon (Figure 9; Appendix C). Likewise, sucker median lengths were not significantly different between years in these two sections ($P = 0.06$). In the Teton Valley, sucker length frequency distributions and median lengths were significantly different between years ($P < 0.01$), but this was likely due to a few larger Utah or Colorado suckers sampled there in

1974; the distributions and medians were similar otherwise. In 1999, only large Utah and Colorado suckers were observed in the Teton Canyon (M = 461 mm), and only small mountain suckers were observed in the Teton Valley (M = 140 mm), whereas a wide size-range of Utah and Colorado suckers were observed in the Lower Teton.

In both 1974 and 1999, relatively few young-of-the-year (age-0) fish of any taxa were captured, but they generally recruit poorly to the electrofishing gear (Figures 5 to 9). These were considered fish less than 100 mm for spring-spawning cutthroat trout, rainbow trout, and suckers. For fall-spawning brook trout and mountain whitefish, these were considered fish less than 150 mm. Relatively few yearling (age-1) trout but many yearling mountain whitefish and suckers were caught in 1999 compared to 1974. These were considered fish from 100 to 200 mm for spring spawners and fish from 150 to 200 mm for fall spawners.

Density and Electrofishing Catch Rate

Density

Density estimates are not possible for upper Spring Hollow because recapture runs were not made, nor for gillnetting at the Borrow Ponds as only one marked fish (a Utah chub) was recaptured. For the remaining six electrofishing surveys conducted in 1999, capture efficiencies (R/C) varied widely by location and species (range 0 to 42%) and were exceptionally poor at lower Spring Hollow (range 0 to 3%; Appendix D). Over all species, these efficiencies were highest in the Lower Teton (11 and 18%), followed by the Teton Valley (10 and 14%) and Teton Canyon (1 and 5%). In general, cutthroat trout were most vulnerable to the gear (range 14 to 42%), followed by rainbow trout (range 10 to 27%), brook trout (range 12 to 17%), mountain whitefish (range <1 to 13%), suckers (range 0 to 6%), and brown trout (0%).

Density estimates for all fish species combined ranged from 166 fish/ha at Breckenridge to 1,088 fish/ha at lower Spring Hollow (Figure 10; Appendix E). Similar results were observed when densities were calculated on a linear, rather than aerial, basis. The highest estimates were in the Teton Canyon (446 and 1,088 fish/ha), followed by the Lower Teton (176 and 351 fish/ha) and the Teton Valley (166 and 176 fish/ha). Although 95% confidence intervals overlapped between sections, the Teton Canyon intervals were particularly wide due to poor gear efficiency. Unfortunately, this carried through to the following species-specific estimates as well.

Cutthroat trout densities ranged from 36 fish/ha at Breckenridge to 149 fish/ha at lower Spring Hollow (Figure 11; Appendix E). The highest estimates were in the Teton Canyon (136 and 149 fish/ha), followed by the Lower Teton (54 and 56 fish/ha) and the Teton Valley (36 and 38 fish/ha). Rainbow trout densities ranged from 8 fish/ha at Nickerson to 112 fish/ha in the North Fork. Unlike cutthroat trout, the highest estimates were in the Lower Teton (10 and 112 fish/ha), followed by the Teton Canyon (23 and 33 fish/ha) and Teton Valley (8 and 30 fish/ha). Brown trout densities were 2 and 8 fish/ha in the Lower Teton, and brook trout densities were 15 and 22 fish/ha in the Teton Valley (Figure 12). Neither of these species was observed in the Teton Canyon.

Mountain whitefish are by far the most abundant species in the Teton River, equaling or exceeding all other species combined except in the South Fork. Their densities ranged from 53 fish/ha in the South Fork to 711 fish/ha at lower Spring Hollow (Figure 13; Appendix E). Like cutthroat trout, the highest estimates were in the Teton Canyon (268 and 711 fish/ha), followed by the Lower Teton (53 and 174 fish/ha) and the Teton Valley (84 and 103 fish/ha). Sucker densities ranged from 1 fish/ha in the North Fork to 195 fish/ha at lower Spring Hollow. Also like cutthroat trout, the highest estimates were in the Teton Canyon (19 and 195 fish/ha), followed by the Lower Teton (1 and 57 fish/ha) and the Teton Valley (5 fish/ha).

Electrofishing Catch Rate

Electrofishing catch rates were similar among sections, and except for the Teton Canyon they mirrored the density estimates. Catch rates ranged from 24 to 50 fish/hr for cutthroat trout and from 5 to 26 fish/hr for rainbow trout (excluding the North Fork; Figure 11). Brook trout catch rates ranged from 13 to 24 fish/hr, and brown trout catch rates ranged from 2 to 6 fish/hr (Figure 12). Mountain whitefish catch rates ranged from 49 to 135 fish/hr, and sucker catch rates ranged from <1 to 54 fish/hr (Figure 13). Catch rates for all species combined were similar between the Lower Teton (164 and 272 fish/hr), the Teton Canyon (141 and 175 fish/hr), and the Teton Valley (144 and 189 fish/hr; Figure 10).

Survival and Mortality

Of 53 adult trout (>385 mm, TL) radio tagged in all Teton River sections combined, 19 are assumed to have survived and 34 are known to have died as of October 23, 1999 (Appendix F; Schrader and Jones, in press). Ten of the assumed survivors were lost or "censored" on this date. Anglers harvested three fish, and all remaining mortality was assumed to have been from natural causes. Estimated survival through one year (t = 13) was 37%, with a 95% confidence interval of 23 to 51%; estimated mortality was 63%. Survival rates declined with the onset of spawning (April 11, 1999) and with the onset of fishing (June 6, 1999). Estimated survival in the Teton Canyon was imprecise (14 to 93%) due to the small sample size (n = 8 fish; Appendix G) and was not compared to the other sections.

For the 53 trout in all sections combined, estimated fishing survival through one year (t = 13) was 91%, with a 95% confidence interval of 80 to 100% (Appendix H). Estimated conditional fishing mortality was 9%, whereas the finite estimate was 3/53 = 6%. Estimated natural survival through one year (t = 13) was 41%, with a 95% confidence interval of 26 to 56% (Appendix I). Estimated conditional natural mortality was 59%, whereas the finite estimate was 31/53 = 58%. Estimated total annual mortality, calculated using the fishing and natural conditional rates, was 63%, which is the same as the original estimate.

The finite fishing mortality estimate is a minimum as it includes two sublegal, radio tagged cutthroat trout (<400 mm) at large but disregards the 10 lost fish that may have been, in fact, harvested. A maximum estimate (derived by subtracting these two sublegal fish then adding back the ten lost fish) is 25%.

Teton Canyon Gear Evaluation

Of the various gear tested in the Teton Canyon from 1997 to 1999 (hook-and-line, beach seines, experimental gill nets, and electrofishing), electrofishing had the highest catch rates and was the most effective sampling method (Table 3). A total of 322 fish were electrofished above Spring Hollow in four workdays for a catch rate of 80.5 fish/workday. Another 1,353 fish were caught below Spring Hollow in 22 workdays for a catch rate of 61.5 fish/workday. Only sinking gill nets in the Borrow Ponds approached these catch rates: 639 fish were caught in 10 workdays for a catch rate of 63.9 fish/workday. Other types of gear, including hook-and-line, had catch rates less than 20.0 fish/work day.

Blackspot Disease

Incidence

The incidence of blackspot disease was significantly higher in the Teton Canyon (93%, n = 2,412) compared to the Teton Valley (72%, n = 1,373, P <0.01, binomial proportion test) or Lower Teton (65%, n = 620, P <0.01, binomial proportion test) for all fish sampled by electrofishing in 1999. This was also true for cutthroat trout (n = 898), rainbow trout (n = 339), mountain whitefish (n = 2,534), and suckers (n = 459), except that cutthroat trout in the Lower Teton (P = 0.16), and rainbow trout in the Teton Valley (P = 0.69), were not significantly different from the Teton Canyon. In the Lower Teton, 80% of the brown trout (n = 10) had the disease. In the Teton Valley, 88% of the brook trout (n = 155) and 50% of the hatchery rainbow trout (n = 10) were infected. Surprisingly, adult Utah chubs gillnetted in the Borrow Ponds in 1998 (n = 167) were not infected.

For all species combined, incidence was significantly higher at the South Fork ladder trap (44%, n = 1,066) compared to the Felt Dam ladder trap (12%, n = 96, P <0.01, binomial proportion test). Incidence was also significantly higher at the Hog Hollow screw trap (74%, n = 3,950) compared to the Narrows screw trap (57%, n = 3,925, P <0.01, binomial proportion test) after excluding brook trout, trout fry, and unknown non-salmonid fry. For both ladder traps combined, 94% of the cutthroat trout (n = 67), 50% of the rainbow trout (n = 16), 12% of the mountain whitefish (n = 90), and 40% of the suckers (n = 989) had blackspot disease. For both screw traps combined, 36% of the cutthroat trout (n = 76), 33% of the rainbow trout (n = 27), 6% of the mountain whitefish (n = 475), and 65% of the suckers (n = 613) had the disease. In addition, 77% of the dace (n = 3,566), 67% of the redside shiners (n = 2,858), 17% of the cottids (n = 251), and 56% of the Utah chubs (n = 9) were infected.

Severity

For 1,449 infected mountain whitefish in the Teton Canyon, an average 2.6 parasites were counted in the template window (224 mm^2), which was significantly greater than the Lower Teton (0.4 parasites, n = 150, P <0.05, one-way ANOVA) or Teton Valley (0.2 parasites, n = 524, P <0.05, one-way ANOVA). Similarly for 259 infected suckers in the Teton Canyon, the average number was 3.6 parasites, which was significantly greater than the Lower Teton (0.3 parasites, n = 40, P <0.05, one-way ANOVA) or Teton Valley (where no fish were infected). There was no significant difference between the Lower Teton and Teton Valley for either species. The nonparametric Kruskal-Wallis analysis of variance for mean ranks showed the same results.

Relative frequency distributions of the parasite index counts are highly skewed towards zero for both species and in all sections, but less so in the Teton Canyon (Figure 14). No parasites were counted in the template window for about 80% of the fish in the Lower Teton and Teton Valley versus 25% in the Teton Canyon. Further, high counts (greater than 5 spots) were more common in the Teton Canyon—12% of the mountain whitefish and 40% of the suckers—

than in the Lower Teton and Teton Valley combined (1%, or three mountain whitefish). Finally, only suckers in the Teton Canyon (20%) had extremely high counts of the parasite (greater than 15 spots).

DISCUSSION

Unfortunately, the impact of the Teton Dam collapse on most of the Teton Canyon fish population (upstream of the Borrow Ponds) is inconclusive. This is partly because of the lack of pre-dam density estimates (Irving et al. 1977) and partly because of our imprecise estimates in 1999. Irving et al. (1977) report pre-dam relative abundance and size structure results but, lacking density data, their information is of limited value. We recognized this early and unsuccessfully pursued an experimental design based on paired comparisons over time at their specific electrofishing reaches. Our next approach was to compare Teton Canyon densities over space, i.e. with those in the Lower Teton (which was affected by the dam collapse; Moore and Andrews 1983) and with those in the Teton Valley (which was not affected). Our imprecise Teton Canyon density estimates were the result of inefficient sampling in the deep pools and swift rapids, which was and may never be resolved. Because unbiased, species-specific estimates were not possible (as $R < 3$; Ricker 1975), we had to pool the data to derive these estimates for each species. This is the least desirable method as additional error is introduced when estimating relative abundance.

However, suckers and Utah chubs are the predominant fish fauna and have almost replaced the trout population in the 3 km Borrow Ponds reach. This is a direct result of constructing Teton Dam and its ultimate failure (Jeppson 1981). Utah chubs were not recorded in the drainage prior to Teton Dam (Irving et al. 1977). Like much of the altered Teton Canyon, the Borrow Ponds are salient examples of the replacement of a "blue ribbon" trout fishery by a series of deep, stagnant pools dominated by rough fish. What was once a productive pool-riffle habitat meandering through a rich and diverse cottonwood floodplain—historically referred to as "the little South Fork"—has been replaced by a series of slack water "gravel pits" surrounded by a floodplain of reed canary grass (Beddow 1999; Randle 2000).

Despite these dramatic changes, cutthroat trout and mountain whitefish are currently the most common game fish in the Teton Canyon as well as most of the Teton River. However, this does not imply that they are as abundant as they should be. Compared to other eastern Idaho rivers, cutthroat trout densities in the Lower Teton and Teton Valley—and probably in the Teton Canyon based on comparable electrofishing catch rates—have declined to near the bottom of the scale (Figure 15). Viewed in context of fish population changes in adjacent rivers, this decline over 25 years seems remarkable. For example, cutthroat trout density in the upper South Fork Snake River in 1982 (shortly after Teton Dam) was about 79 fish/ha (Moore and Schill 1984). Following the increase in catch and release fishing, as well as special cutthroat trout regulations enacted in 1984, the same regulations enacted on the Teton River in 1990, South Fork densities increased dramatically. By 1999, cutthroat trout density had increased almost four-fold to 294 fish/ha (Meyer et al. 2001, 2003) compared to an average 78 fish/ha in the Teton River. Clearly, cutthroat trout densities in the Teton River, as well as angling effort, catch, and catch rates (Schrader, in press), have not followed the same trend observed in this adjacent river with a similar native trout management program.

Besides Utah chubs, Irving et al. (1977) do not report brown trout, hybrid rainbow x cutthroat trout, mountain suckers, or speckled dace in the Teton River drainage prior to Teton

Dam. With the exception of brown trout, their omission may have been an oversight. Brown trout likely invaded the Lower Teton from the lower Henrys Fork Snake River. Cutthroat and rainbow were abundant prior to the dam and they were likely hybridizing, but hybrids may not have been recorded. Both pre- and post-dam length frequency distributions suggest the larger-sized sucker species (Utah and Colorado) inhabit the Lower Teton and Teton Canyon, whereas the smaller-sized mountain sucker inhabits the Teton Valley. Speckled dace are common in the drainage today and were reported by Simpson and Wallace (1982).

One improvement in Teton River game fish populations has been the increase in median fish size as well as QSDs. However, this trend probably reflects fish living longer with reduction in harvest (Schrader, in press) rather than any improvements in habitat. It is also possible there are fewer small, juvenile fish relative to large, adult fish. In general, the largest trout are found in the Lower Teton followed by the Teton Canyon and Teton Valley. These trout often attain trophy size (>500 mm), especially in the Lower Teton and Teton Canyon where large numbers of forage fish (dace and redside shiners) were observed moving downstream (Irving et al. 1977; Schrader and Jones, in press).

Although Teton River game fish have increased in size, their quality has declined, at least from an aesthetic standpoint, due to blackspot disease. The causal agent for blackspot disease is a digenetic trematode whose larvae burrow into the skin of fish. Digenetic refers to the need for several animal hosts, including fish, to complete its life cycle. Trematode is a class of parasites that includes flukes or flatworms. The adult worm inhabits the gut of a fish-eating bird (e.g., kingfishers, gulls, and herons), the definitive host. Droppings from the bird carry eggs into the water where they hatch into miracidia, which attack several species of snail, the first intermediate host. From the snail, enormous numbers of cercariae emerge, which infect fish, the second intermediate host. The cercariae burrow directly into the skin and encyst as metacercariae or larvae. The fish surrounds this cyst with dark melanin pigment giving rise to the blackspots (about 1-2 mm in diameter) in the skin, fins, and gills. If a fish is heavily infected, a condition known as “popeye” appears, in which the eyes bulge out from their sockets. The infected fish is eaten by a bird, which completes the lifecycle.

The metacercariae are collectively referred to by the name Neascus, even though there are numerous species causing the disease (e.g., Apophallus imperator, Crassiphiala bulboglossa, and Uvulifer ambloplitis). Species identification is difficult without the adult worm (K. Johnson, IDFG, personal communication). Bangham (1951, cited in Mitchum 1995) reported the parasite in cutthroat trout in northwestern Wyoming, and Stagner (1977, cited in Mitchum 1995) reported it in brown trout, mountain whitefish, mottled sculpin, redside shiner, longnose and speckled dace, and Utah suckers collected in western Wyoming. All these fish species were observed to have blackspot disease in the Teton River, as well as mountain and Colorado suckers and brook, rainbow (wild and hatchery), and hybrid trout. Juvenile Utah chubs were also infected but not adults.

The incidence and severity of blackspot disease was significantly higher in the Teton Canyon compared to the other study sections. At least some of this difference can be attributed to changes in hydrology and geomorphology caused by the dam failure. Field studies from 1998 showed a possible rise of 1°C from hydrologic changes associated with the landslides (Bowser 1999; Randle et al. 2000). Most of the temperature increase was from Spring Hollow to Canyon Creek, where most of the major landslides are located, and where water temperatures often exceed 20°C (Schrader, in press). Prolonged exposure to water temperatures >20°C can lead to increased stress and susceptibility to disease for coldwater fish. Further, Teton Canyon pools, which provide more habitat and macrophytes for the intermediate snail host, have increased

(Randle et al. 2000). Although the disease was observed throughout the drainage prior to Teton Dam (S. Elle, IDFG, personal communication), its incidence and severity was not quantified.

The effect of blackspot disease on fish populations in the Teton Canyon and on wild fish populations in general is unknown. The high physiological stress caused by warm water temperatures and blackspot disease may have caused high post-surgery mortality of radio-tagged fish in the Teton Canyon (Schrader and Jones, in press). Further, blackspot disease may exacerbate or be synergistic with the high incidence of whirling disease in the Teton River (Elle and Schill 1999). The ubiquitous presence of blackspot disease is a detriment to the quality of the angling experience and may cause anglers to fish elsewhere. Virtually all fish are infected in the Teton Canyon, and many to the point where natural spotting patterns are completely obscured. Reducing or eliminating the disease from the Teton River is not practical, as it would require removing large numbers of snails or birds or disinfecting large amounts of water. The disease poses no known health threats to humans after cooking the infected fish.

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Table 1. Electrofishing dates and characteristics of Teton River, Idaho, electrofishing reaches, 1999.

Electrofishing reach	Electrofishing dates	Mean wetted width (m)	Width source	Channel center length (km)	Area (ha)[a]
		Lower Teton			
North Fork	9/15, 22	16.4	Moore & Andrews (1983)	2.5	4.10
South Fork	9/1, 7	19.4	Moore & Andrews (1983)	3.1	6.01
		Teton Canyon			
Parkinson	9/8, 13, 14, 20, 27	30.5	Randle et al. (2000)	5.6	17.08
L. Spring Hollow	7/22, 23, 26, 27, 28; 8/10, 11, 12, 17, 18, 19	48.8	Randle et al. (2000)	11.1	54.17
U. Spring Hollow	8/3, 4	42.5	Randle et al. (2000)	6.4	27.20
		Teton Valley			
Breckenridge	9/28, 29; 10/6, 8	26.0	Field measure (1994), n = 9	4.9	12.74
Nickerson	8/31; 9/2, 3, 9	42.1	Field measure (1994), n = 9	5.8	24.42

[a] Product of mean wetted width and channel center length.

Table 2. Fish species in the Teton River, Idaho, drainage.

Common name	Family	Scientific name
	Native species	
Bluehead (Colorado) sucker	Catostomidae	*C. discobolus*
Longnose dace	Cyprinidae	*Rhinichthys cataractae*
Mottled sculpin	Cottidae	*Cottus bairdi*
Mountain sucker	Catostomidae	*C. platyrhynchus*
Mountain whitefish	Salmonidae	*Prosopium williamsoni*
Paiute sculpin	Cottidae	*C. beldingi*
Redside shiner	Cyprinidae	*Richardsonius balteatus*
Speckled dace	Cyprinidae	*R. osculus*
Utah chub	Cyprinidae	*Gila atraria*
Utah sucker	Catostomidae	*Catostomus ardens*
Yellowstone cutthroat trout	Salmonidae	*Oncorhynchus clarki bouvieri*
	Non-native species	
Brown trout	Salmonidae	*Salmo trutta*
Eastern brook trout	Salmonidae	*Salvelinus fontinalis*
Kokanee salmon[a]	Salmonidae	*O. nerka*
Lake trout[a]	Salmonidae	*S. namaycush*
Rainbow trout	Salmonidae	*O. mykiss*
Rainbow x cutthroat trout	Salmonidae	*O. mykiss x O. clarki bouvieri*

[a] Extirpated.

Table 3. Catch statistics for different fish sampling gear tested in the Teton Canyon study section, Idaho, 1997-1999. Effort data are approximate and are based on an eight-hour workday per person.

Date	Location	Gear	Fish caught	Effort (workdays)	Catch rate (fish/workday)	Comments
8/4, 7, 11, 14, 15, 22, 27; 9/4 1998	Felt to Teton Dam	**Hook & line** - flies, lures, & bait	154[a]	44.0	3.5	From whitewater rafts; not all fishing was in pools
9/23 1997	Pools # 10 & 11 (Spring Hollow)	**Beach seine** - 150 ft x 6 ft x 1/8 in with bag; 150 ft x 12 ft x 1 in without bag	26	1.5	17.3	From jet boat; 4 hauls; many snags & rolls with 1 in mesh - small fish gilled
6/18 1998	Borrow Ponds	**Beach seine** - 150 ft x 12 ft x 1 in without bag	0	3.0	0.0	From jet boat; no fish captured; several hauls
7/23 1998	Borrow Ponds	**Gill net - floating**, six panel experimental 150 ft x 6 ft	1	0.5	2.0	From jet boat; one shiner captured; 3 sets, 15 min each
7/23 1998	Borrow Ponds	**Gill net - vertical**, six panel experimental 150 ft x 6 ft	0	0.5	0.0	From jet boat; no fish captured; 4 sets, 30 to 45 min each
7/23, 28, 31 8/12, 18 1998	Borrow Ponds	**Gill net - sinking**, six panel experimental 150 ft x 6 ft	639	10.0	63.9	From jet boat; 40 sets, 15 to 60 min each
8/3, 4 1999	Pools # 1-9 (U. Spring Hollow)	**Electrofishing** - pulsed DC from dangler anodes	322	4.0	80.5	From whitewater rafts; not all fishing was in pools
7/22, 23, 26, 27, 28; 8/10, 11, 12, 17, 18, 19 1999	Pools # 10-27 (L. Spring Hollow)	**Electrofishing** - pulsed DC from dangler anodes	1,353	22.0	61.5	From whitewater rafts; not all fishing was in pools

[a] Includes 12 fish that were radio tagged.

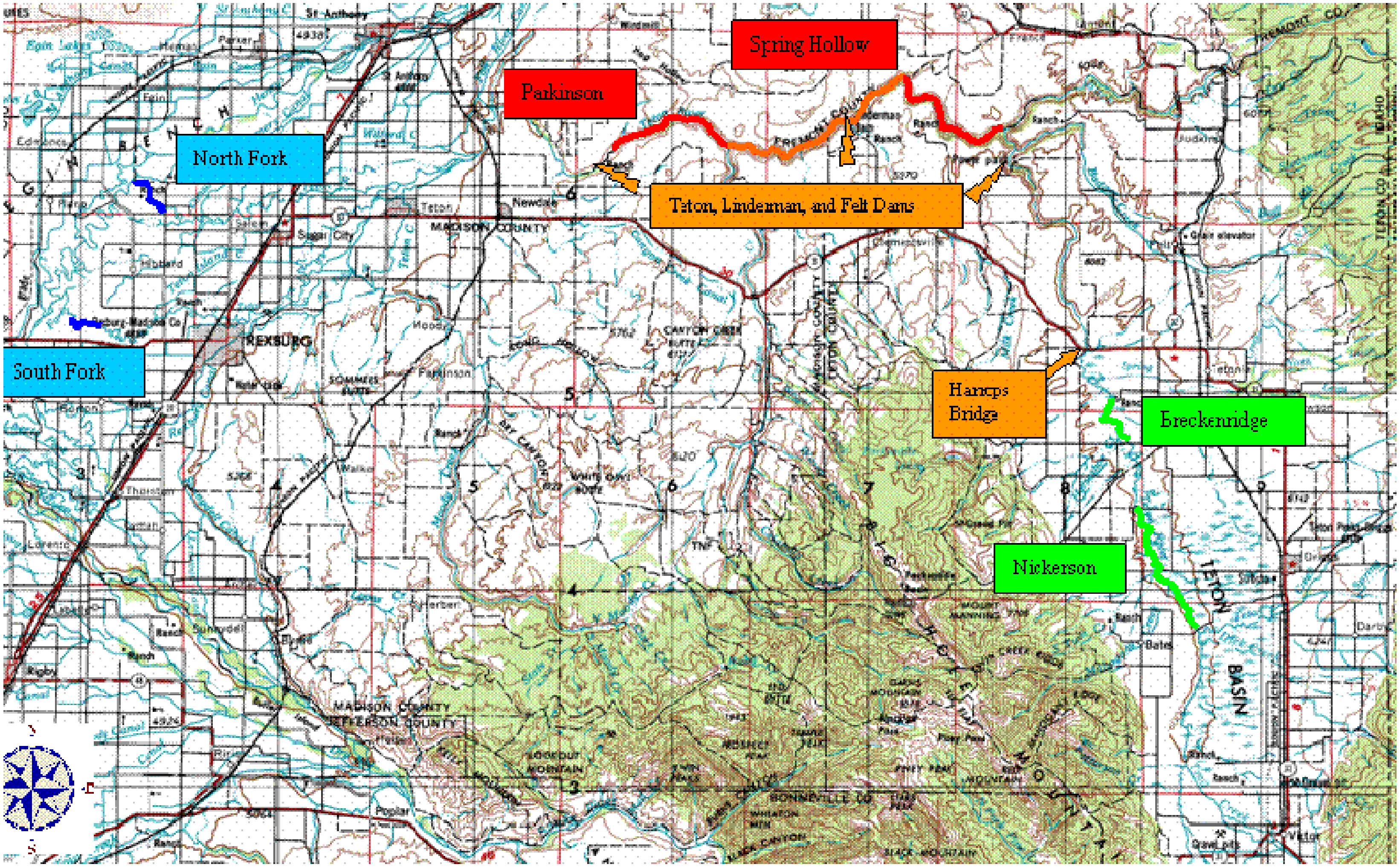


Figure 1. Location of Teton River, Idaho, electrofishing reaches, 1999.

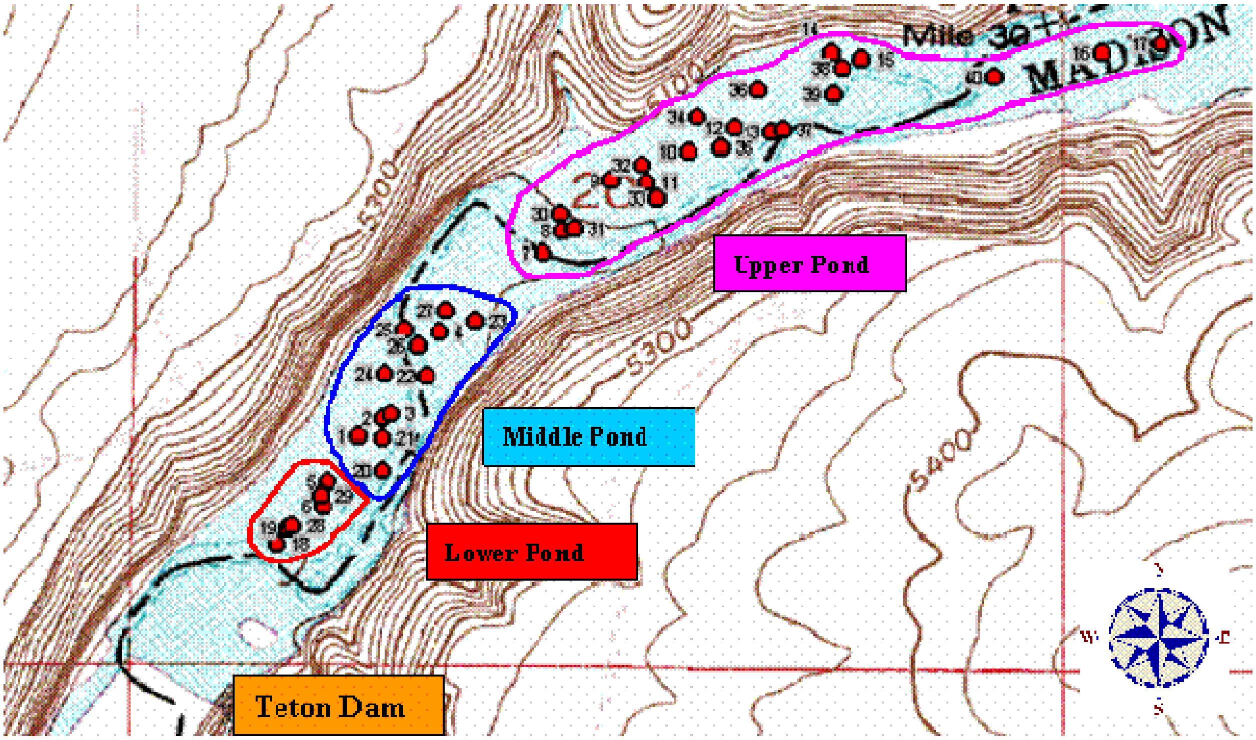


Figure 2. Location of gillnets set in the lower, middle, and upper Borrow Ponds just upstream from Teton Dam, Idaho, 1998.

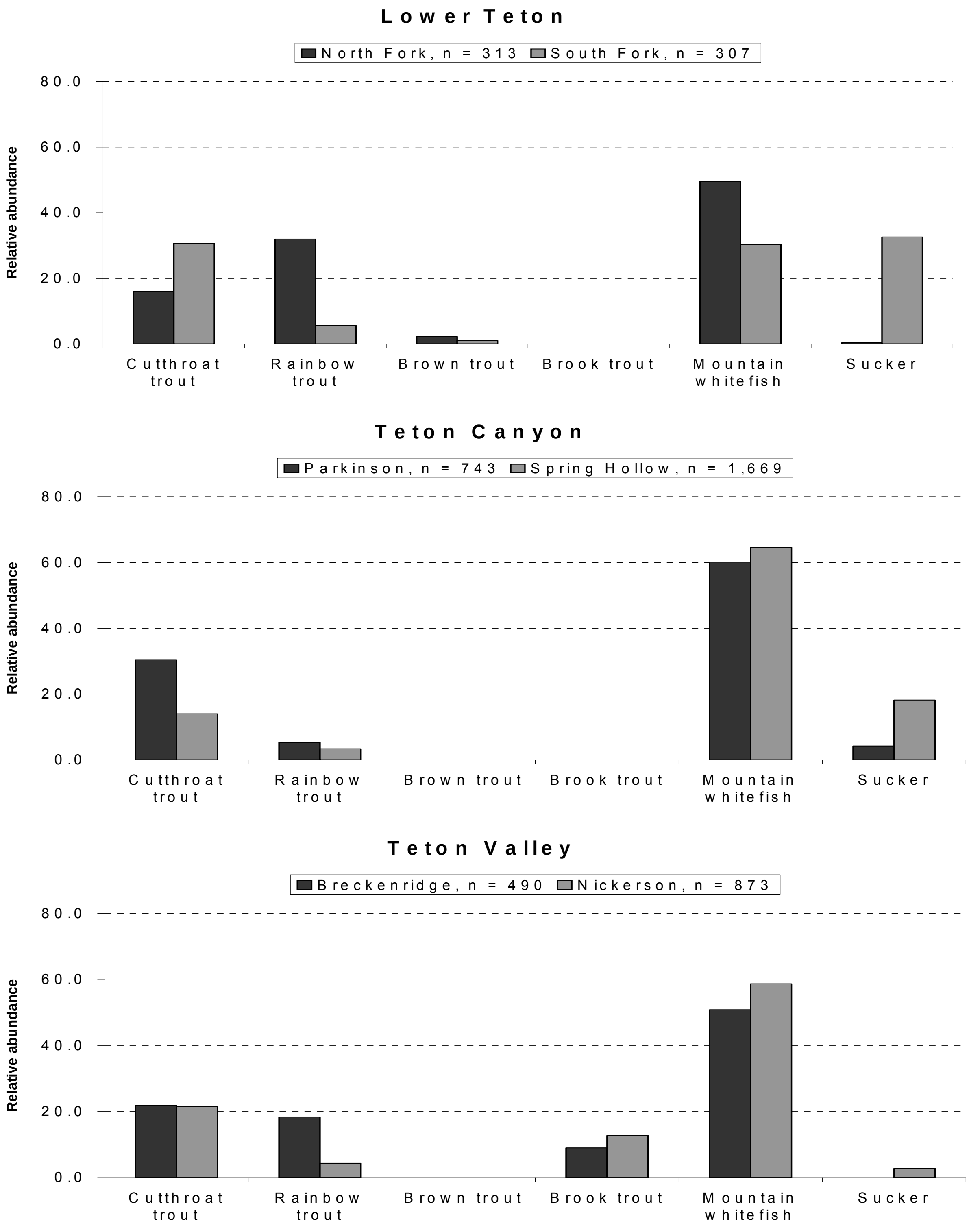


Figure 3. Species relative abundance (%) by electrofishing reach in 1999, Teton River, Idaho. Lower and upper Spring Hollow were combined as they were not statistically different (P = 0.48). Sample size (n) includes all sizes of fish but not hatchery rainbow trout in the Teton Valley study section (n = 10).

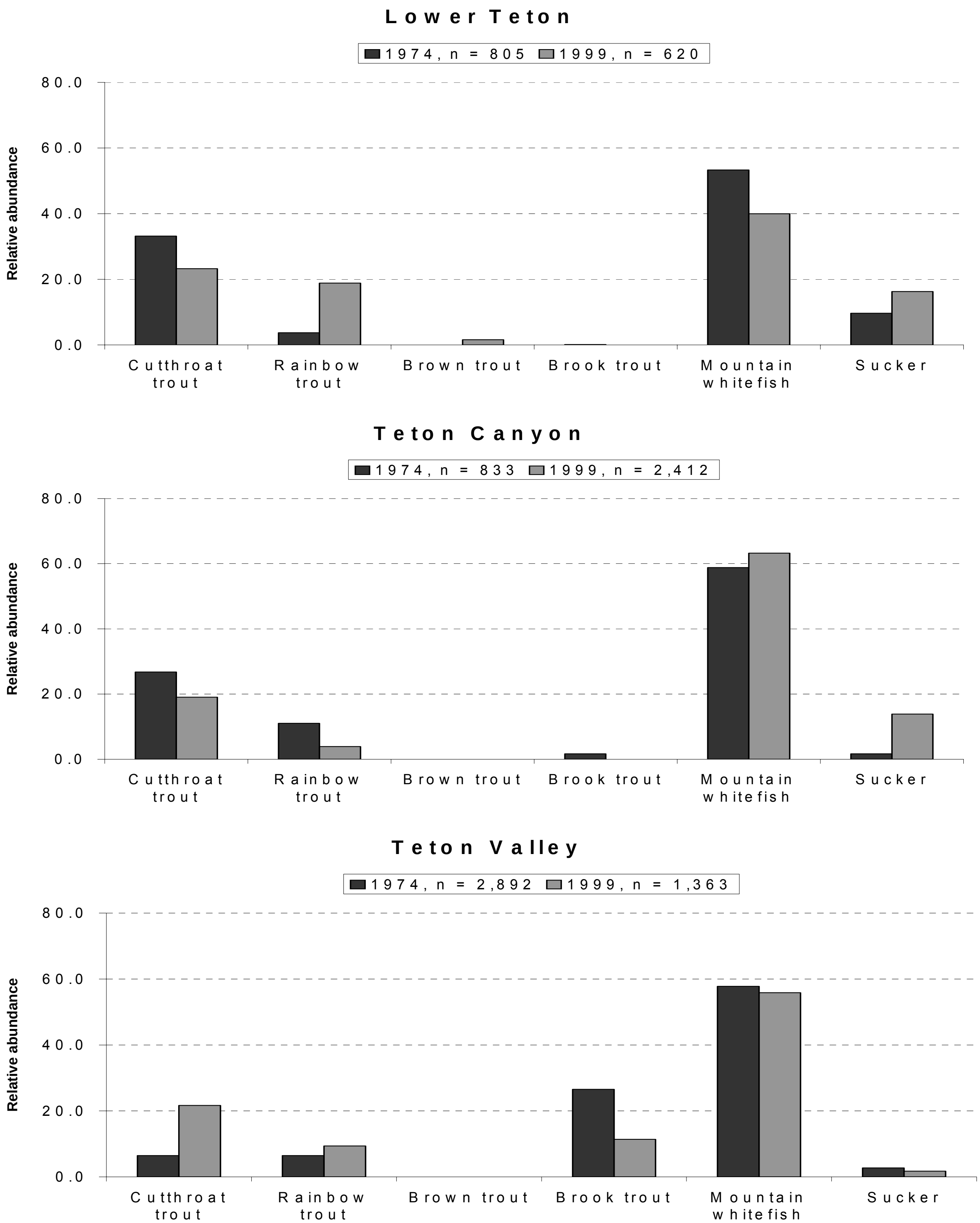


Figure 4. Species relative abundance (%) in 1974 (pre-dam; Irving et al. 1975) versus 1999 (post-dam; present study), Teton River, Idaho. Electrofishing sample size (n) includes all sizes of fish but not hatchery rainbow trout in the Teton Valley study section (n = 130 in 1974, and n = 10 in 1999).

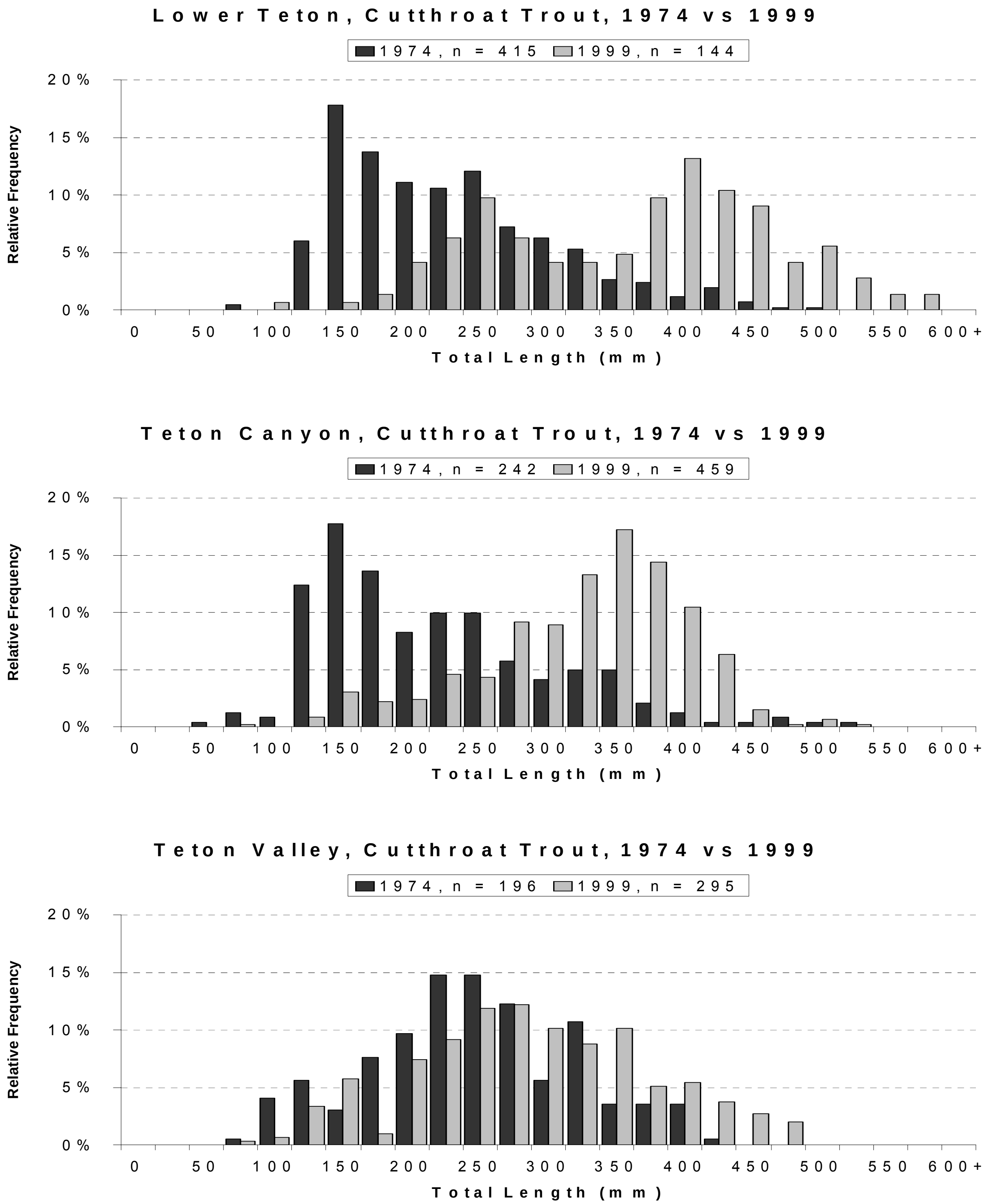


Figure 5. Cutthroat trout relative length frequency distributions (%) from electrofishing in 1974 (pre-dam; Irving et al. 1975) versus 1999 (post-dam; present study), Teton River, Idaho.

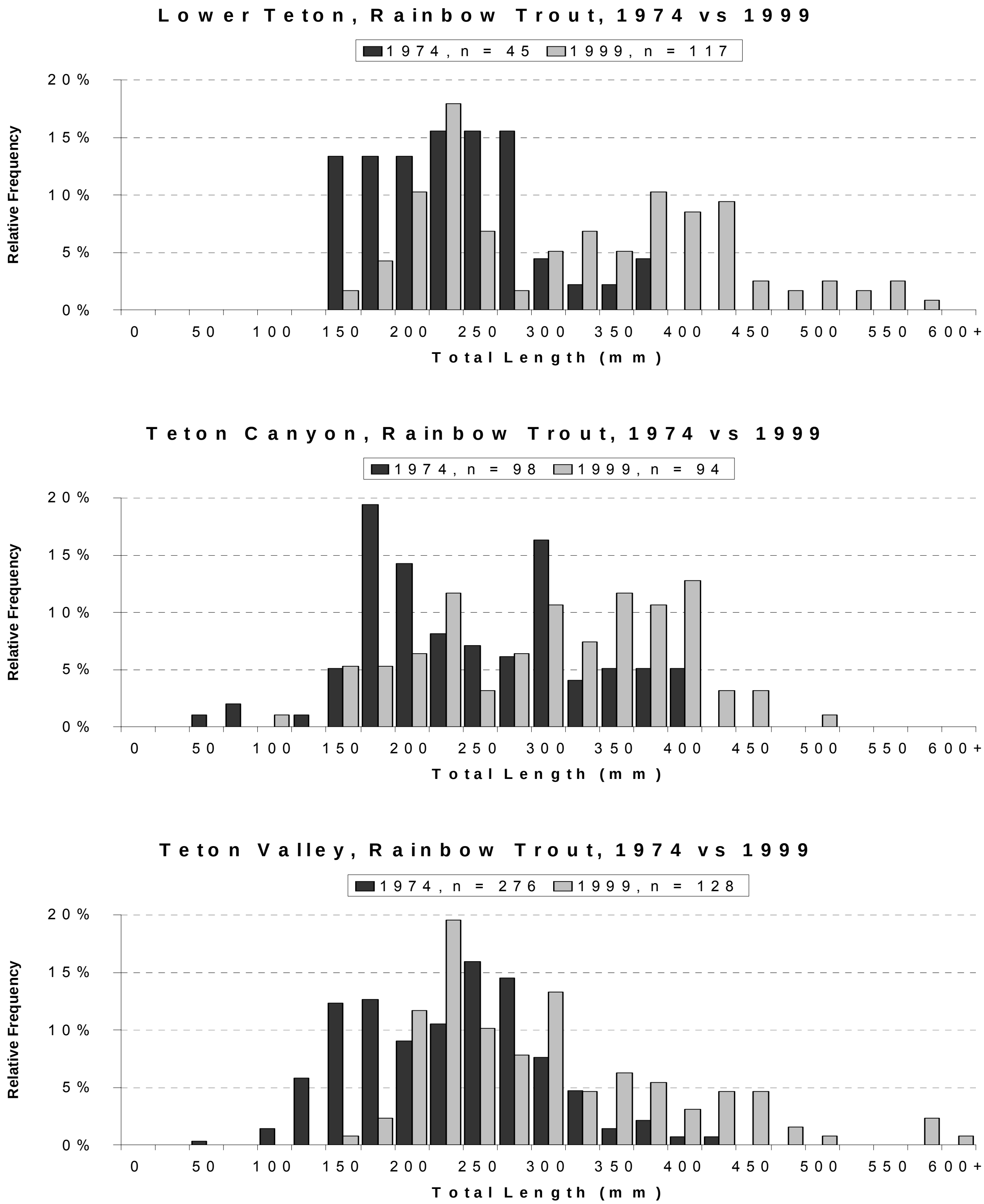


Figure 6. Rainbow trout relative length frequency distributions (%) from electrofishing in 1974 (pre-dam; Irving et al. 1975) versus 1999 (post-dam; present study), Teton River, Idaho. Hatchery rainbow trout in the Teton Valley study section (n = 130 in 1974, and n = 10 in 1999) are excluded.

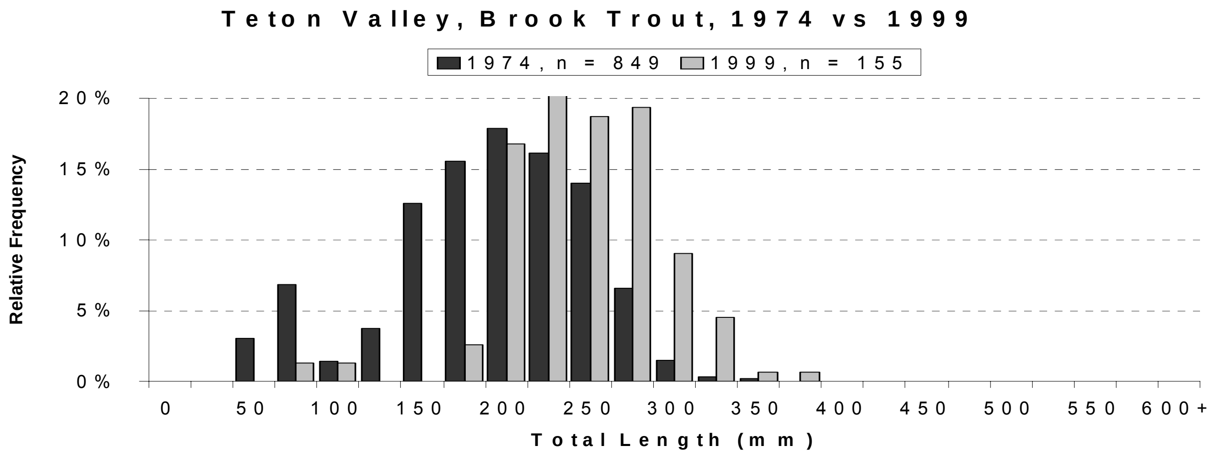


Figure 7. Brook trout relative length frequency distributions (%) from electrofishing in 1974 (pre-dam; Irving et al. 1975) versus 1999 (post-dam; present study), Teton River, Idaho.

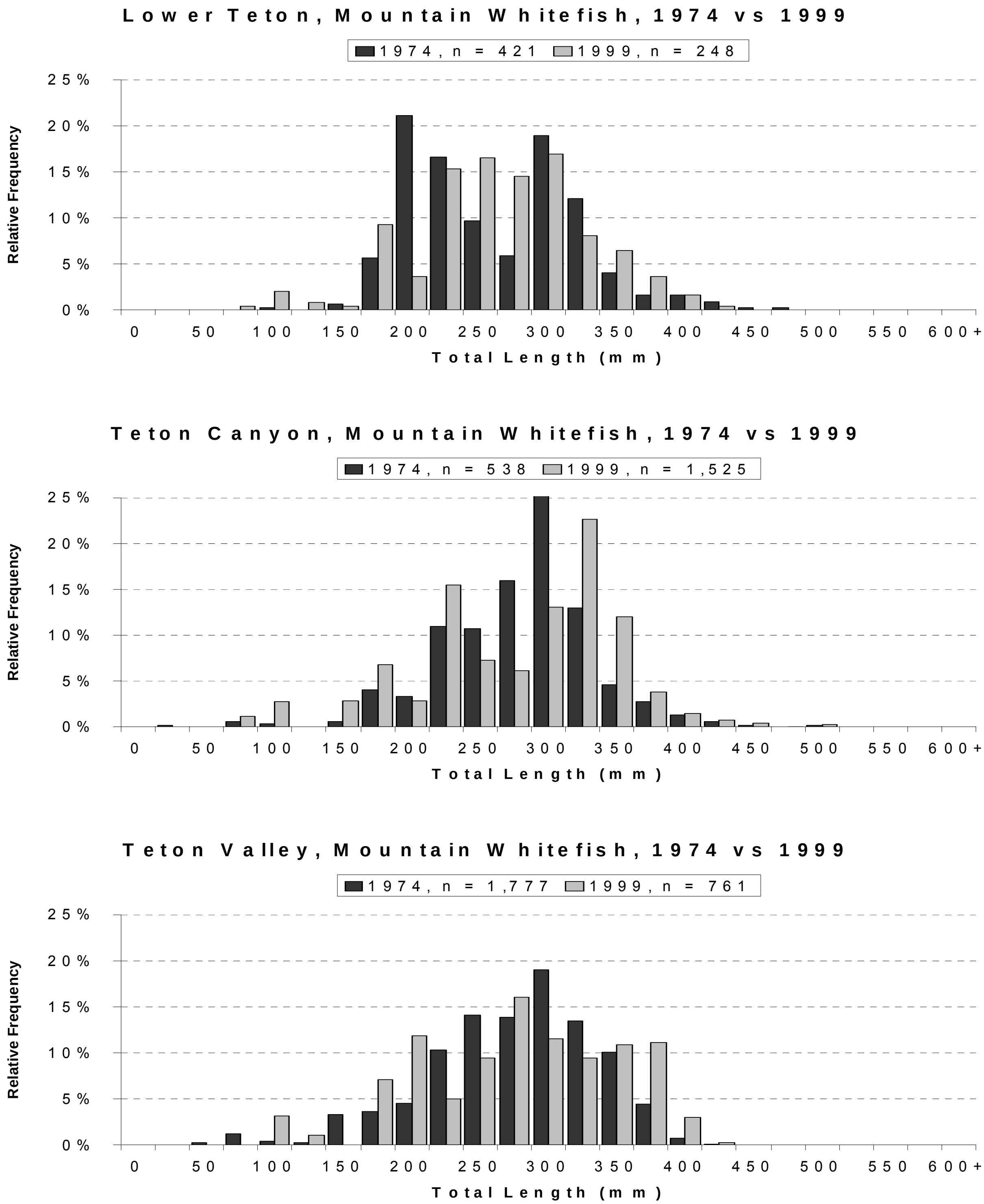


Figure 8. Mountain whitefish relative length frequency distributions (%) from electrofishing in 1974 (pre-dam; Irving et al. 1975) versus 1999 (post-dam; present study), Teton River, Idaho.

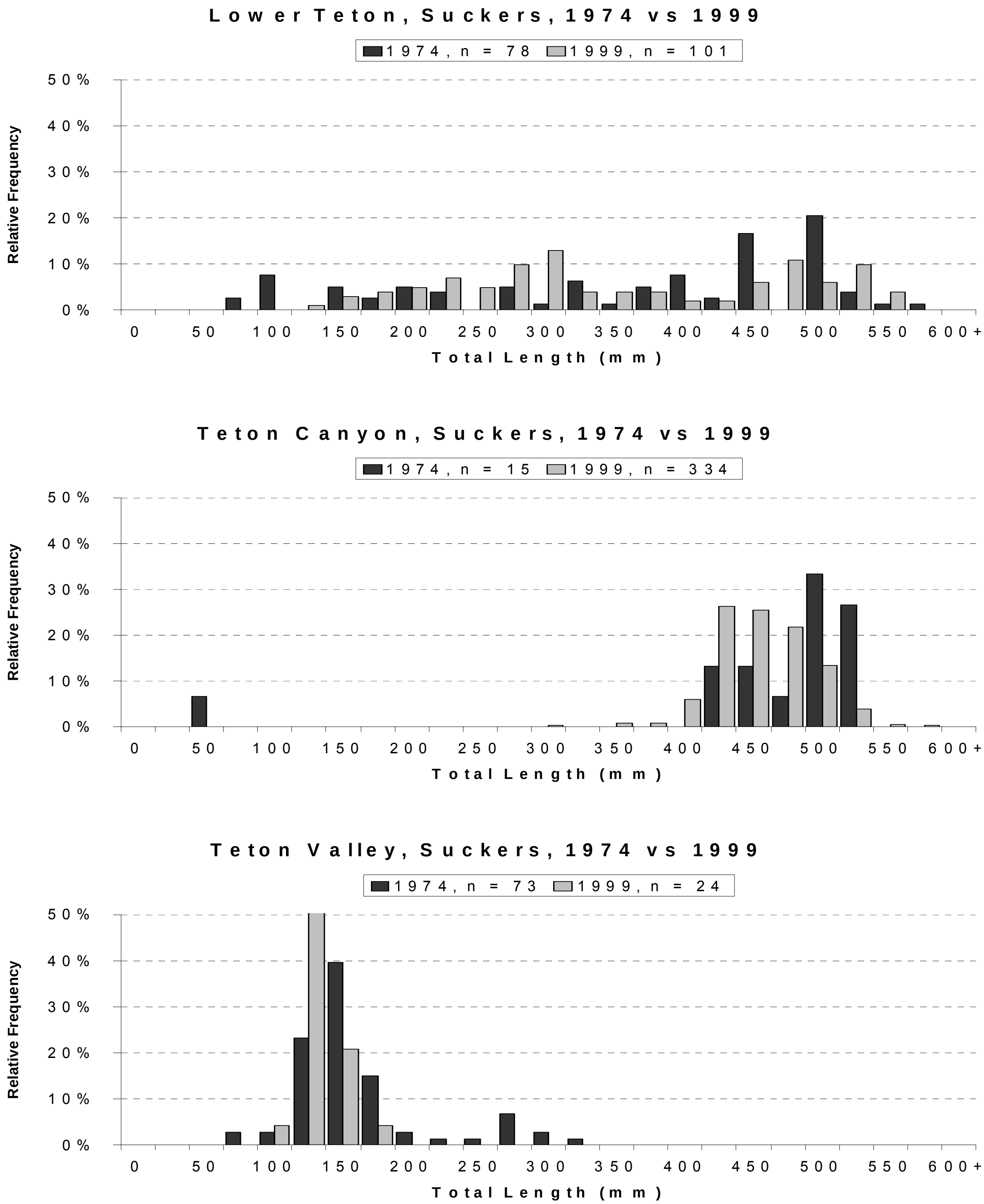
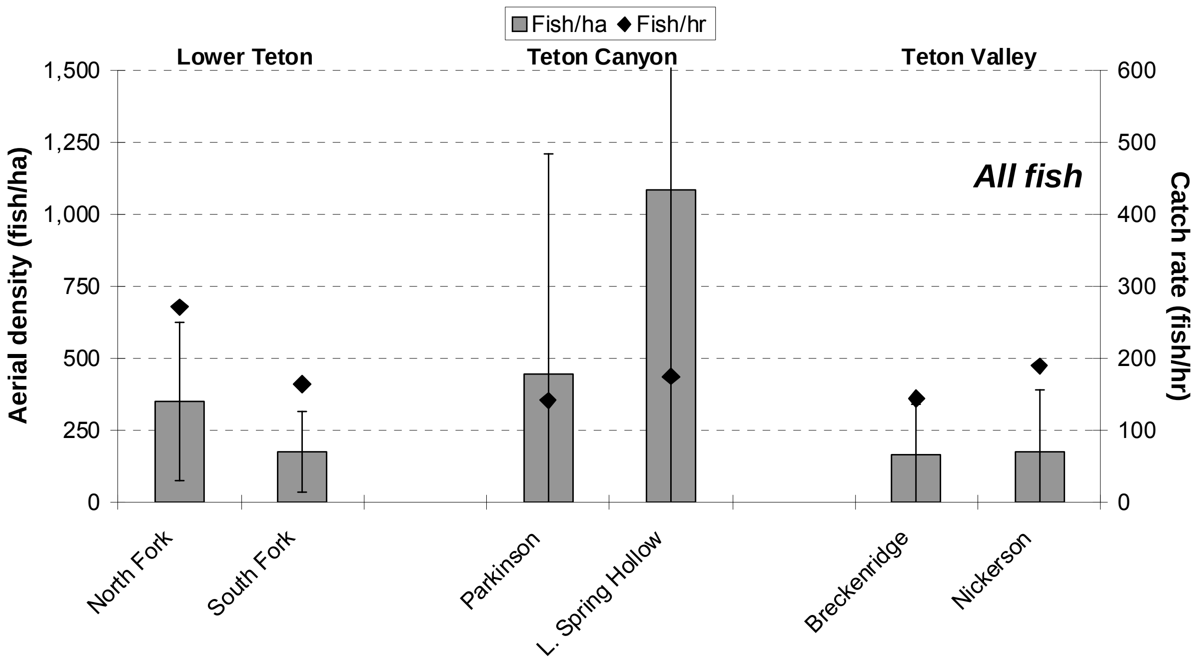


Figure 9. Sucker relative length frequency distributions (%) from electrofishing in 1974 (pre-dam; Irving et al. 1975) versus 1999 (post-dam; present study), Teton River, Idaho.



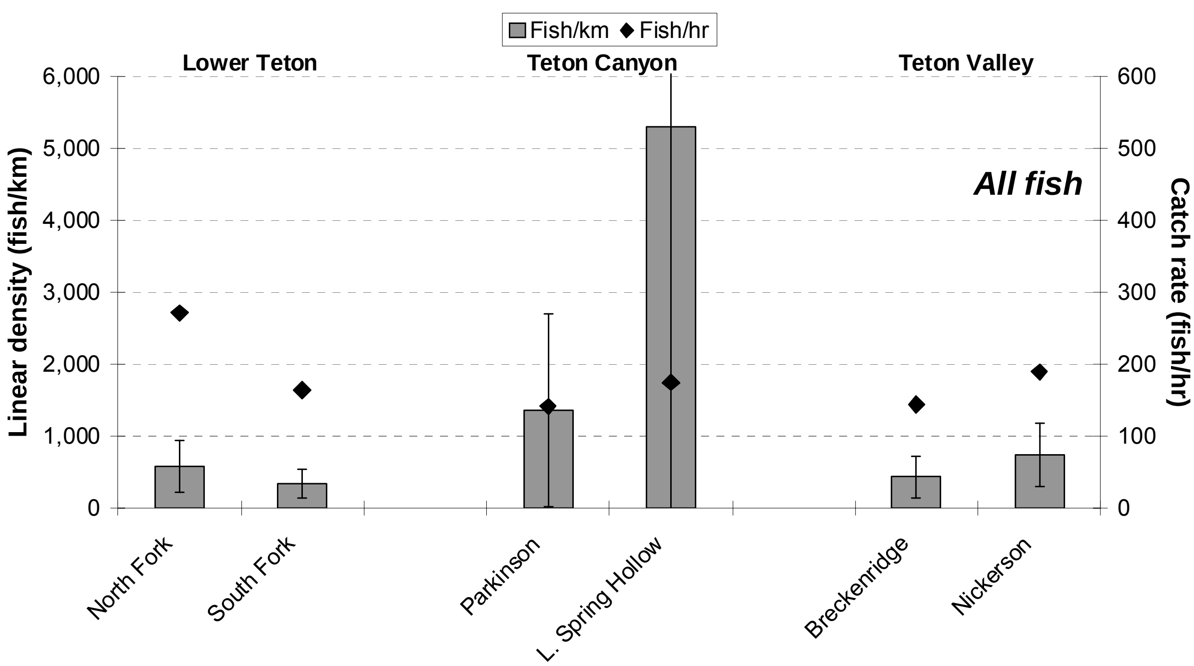
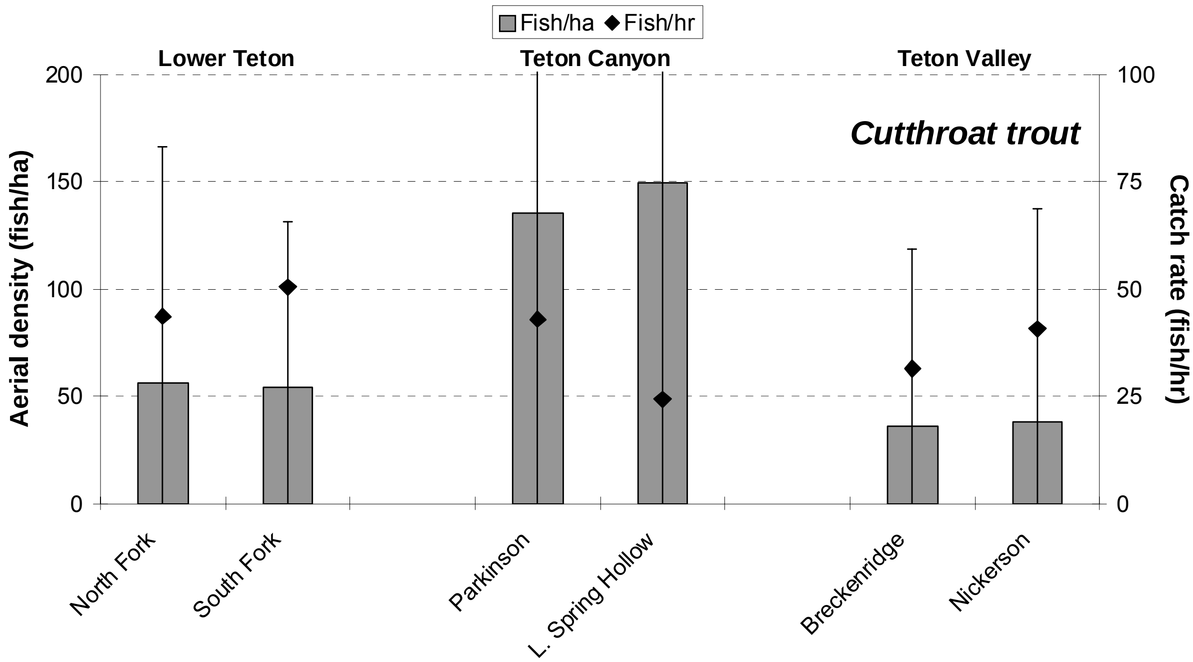


Figure 10. Fish density estimates (top in fish/ha; bottom in fish/km) with 95% confidence intervals for reaches electrofished in 1999, Teton River, Idaho. Results are for all species of fish ≥100 mm (trout, mountain whitefish, and suckers) using the modified Peterson estimator. Also shown are corresponding electrofishing catch rates (fish/hr). Several confidence intervals are off scale.



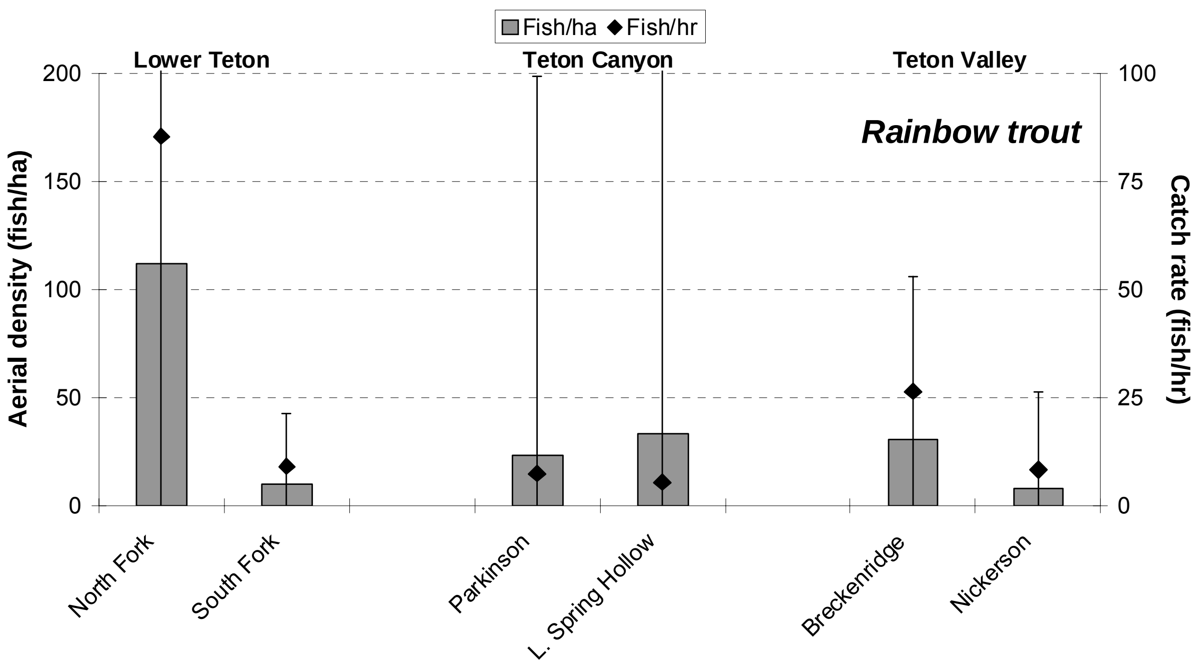
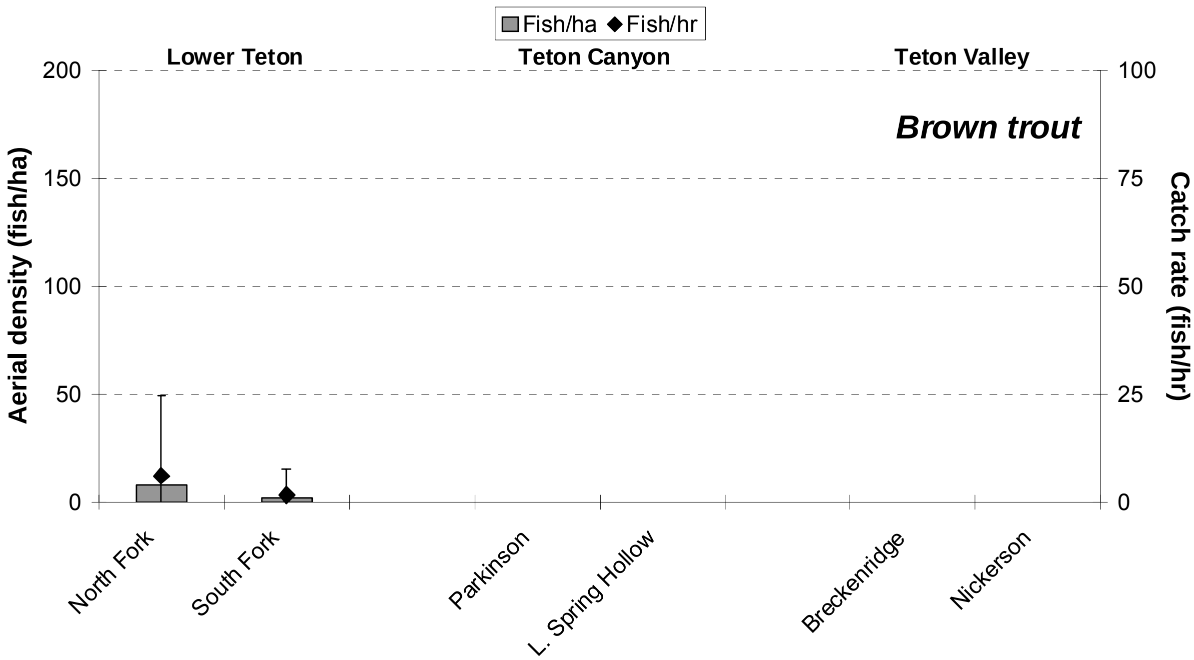


Figure 11. Cutthroat and rainbow trout density estimates (fish/ha) with 95% confidence intervals for reaches electrofished in 1999, Teton River, Idaho. Results are for all species of fish ≥100 mm (trout, mountain whitefish, and suckers) using the modified Peterson estimator, then proportioned by the species relative catch. Also shown are corresponding electrofishing catch rates (fish/hr). Several confidence intervals are off scale.



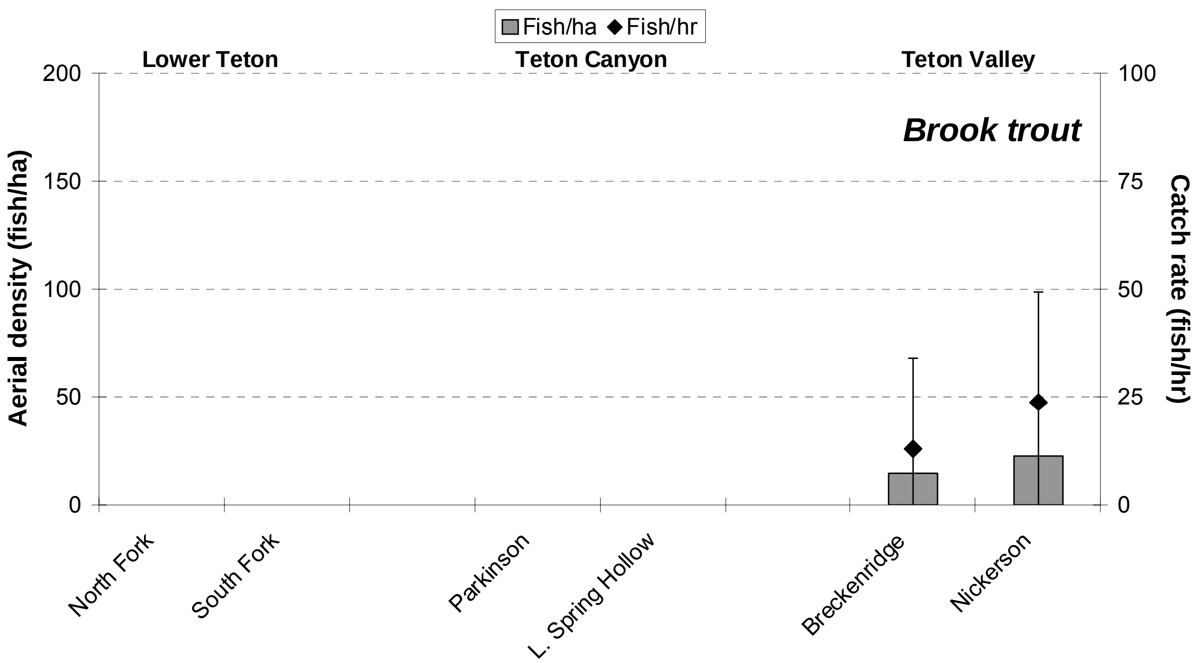


Figure 12. Brown and brook trout density estimates (fish/ha) with 95% confidence intervals for reaches electrofished in 1999, Teton River, Idaho. Results are for all species of fish ≥100 mm (trout, mountain whitefish, and suckers) using the modified Peterson estimator, then proportioned by the species relative catch. Also shown are corresponding electrofishing catch rates (fish/hr). Several confidence intervals are off scale.

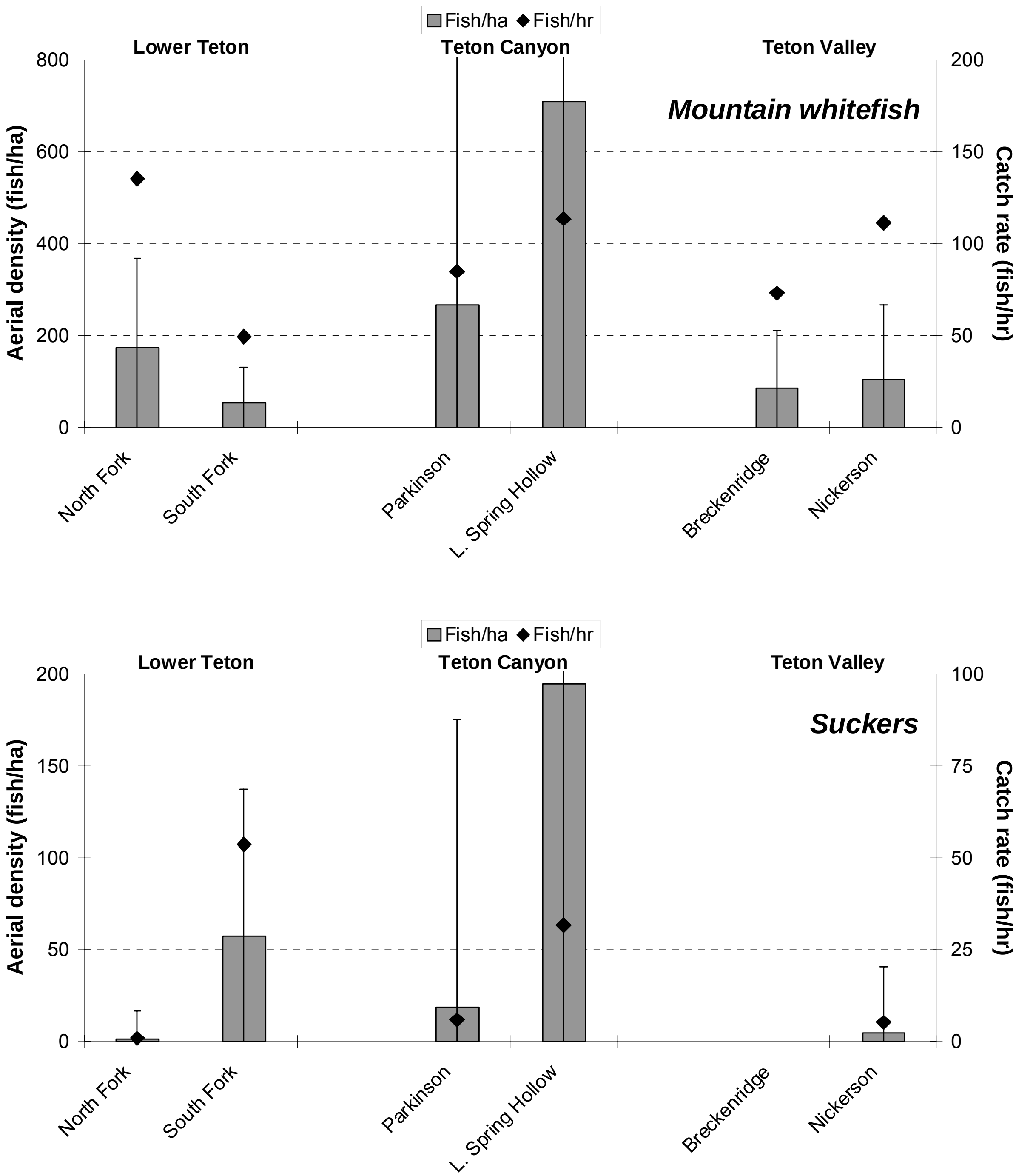


Figure 13. Mountain whitefish and sucker density estimates (fish/ha) with 95% confidence intervals for reaches electrofished in 1999, Teton River, Idaho. Results are for all species of fish ≥100 mm (trout, mountain whitefish, and suckers) using the modified Peterson estimator, then proportioned by the species relative catch. Also shown are corresponding electrofishing catch rates (fish/hr). Several confidence intervals are off scale. Note different scales for mountain whitefish.

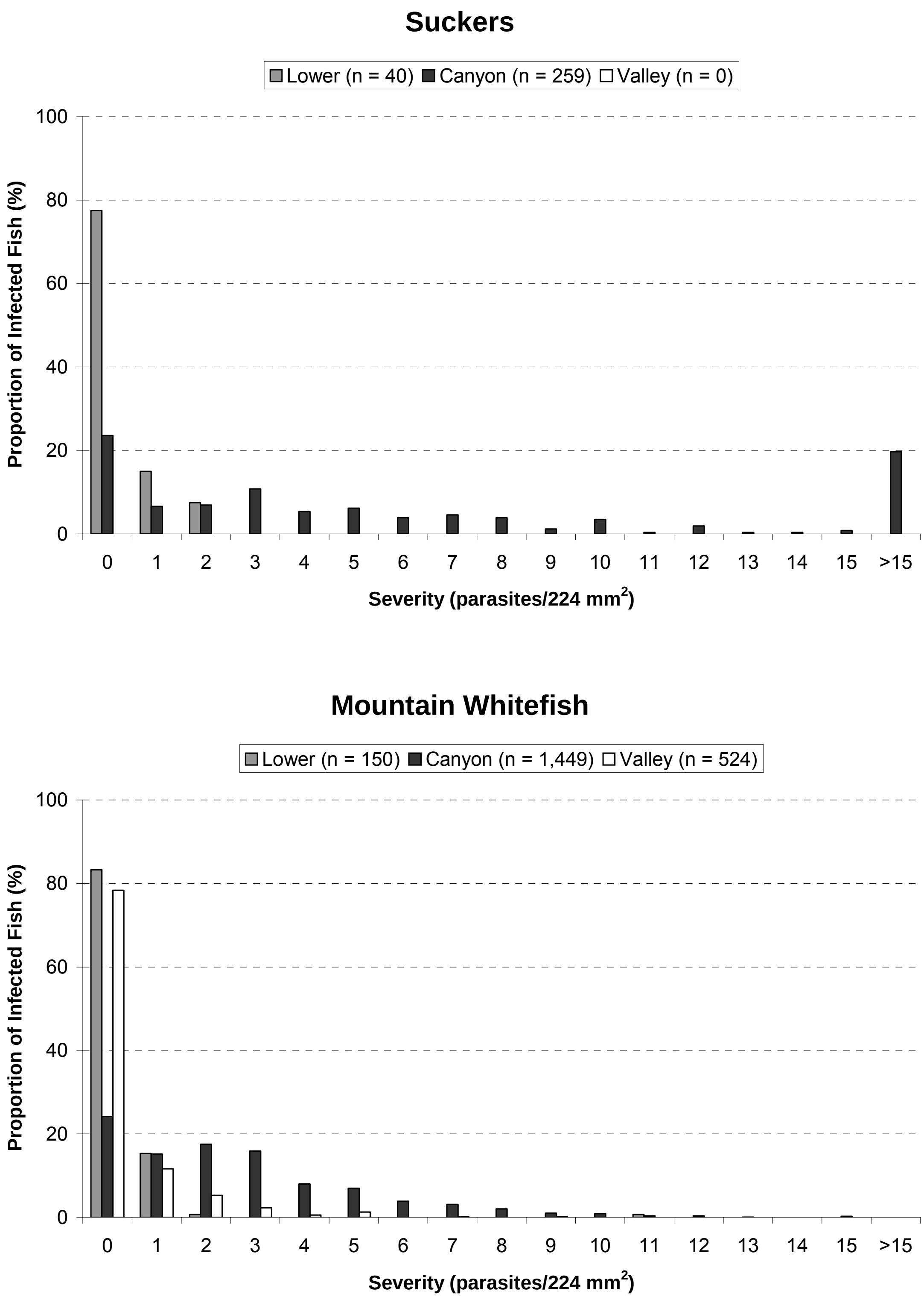


Figure 14. Relative severity of blackspot infections observed in mountain whitefish and suckers captured by electrofishing in 1999, Teton River, Idaho. All fish graphed were infected, but parasites were generally absent from the 224 mm^2 index area.

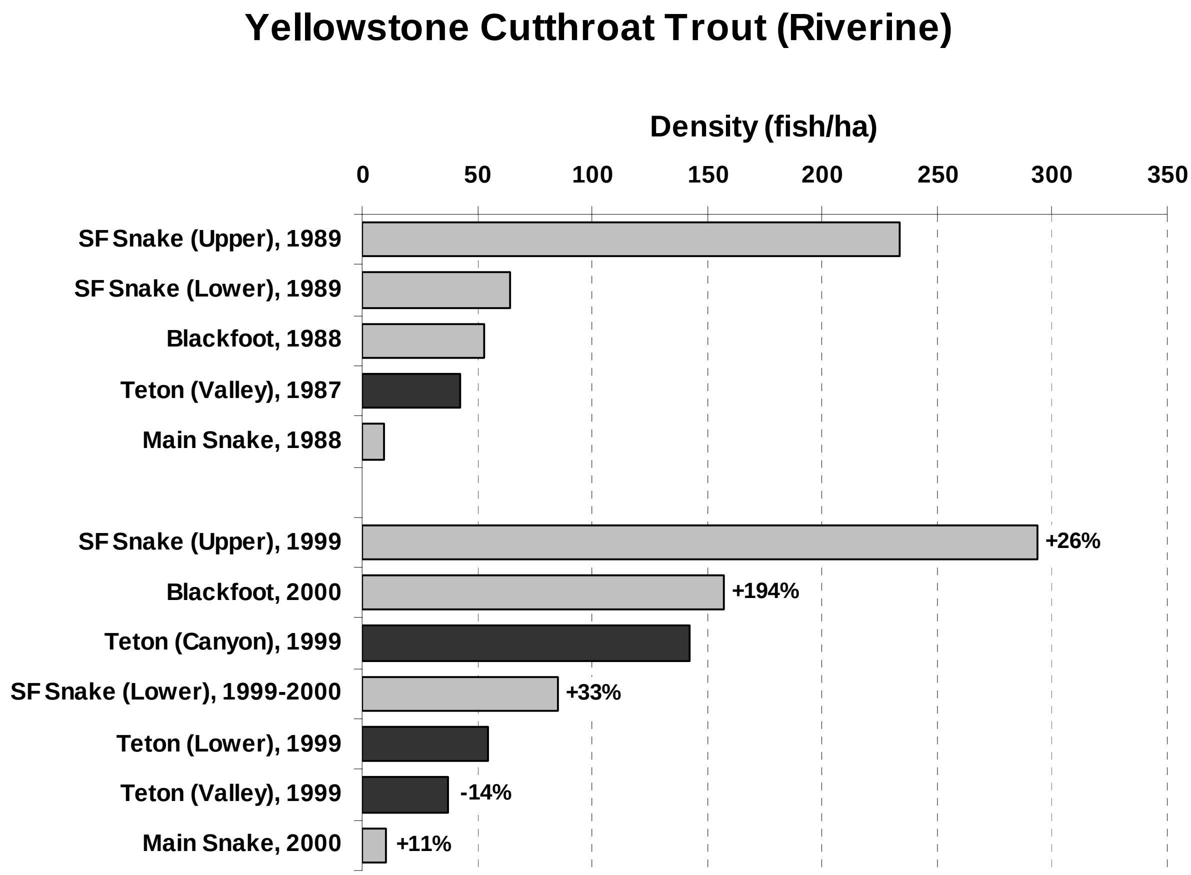


Figure 15. Cutthroat trout densities (fish/ha) in Eastern Idaho, late 1980s versus 1999-2000. Teton River estimates (dark bars) are averages mostly from the present study; other river estimates are from Meyer et al. (2001, 2003). Results are for fish ≥100 mm using various estimators.

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APPENDICES

Appendix A. Fish stocking records for the Teton River, Idaho, drainage, 1967-2000.

County	Stream Name	Date planted	Year	Species Common Name	Size	Number planted	Planting Method	Rearing Hatchery
Teton	Badger Cr	11-Oct-75	1975	October Spawner Kokanee	Eyed Eggs	118,910	Truck	Ashton
Teton	Badger Cr	11-Oct-75	1975	October Spawner Kokanee	Eyed Eggs	118,910	Truck	Ashton
Teton	Badger Cr	30-Oct-75	1975	October Spawner Kokanee	Eyed Eggs	105,248	Truck	Ashton
Teton	Badger Cr	06-Jul-76	1976	Cutthroat	Fry (0-3)	117,920	Truck	Ashton
Teton	Badger Cr	07-Jul-76	1976	Cutthroat	Fry (0-3)	85,760	Truck	Ashton
Teton	Badger Cr	12-May-81	1981	Rainbow X Cutthroat	Fry (0-3)	11,840	Truck	Ashton
	Badger Cr Total					**558,588**		
Madison	Canyon Cr	25-Sep-78	1978	Cutthroat	Fry (0-3)	3,600	Truck	Ashton
Madison	Canyon Cr	21-Aug-85	1985	Henrys Lake Cutthroat	Fry (0-3)	73,500	Truck	Ashton
Madison	Canyon Cr	10-Sep-85	1985	Henrys Lake Cutthroat	Fry (0-3)	84,000	Truck	Ashton
	Canyon Cr Total					**161,100**		
Teton	Horseshoe Cr	19-Aug-68	1968	Cutthroat	Fry (0-3)	40,000	Truck	Ashton
Teton	Horseshoe Cr	20-Aug-69	1969	Cutthroat	Fry (0-3)	29,250	Truck	Ashton
Teton	Horseshoe Cr	08-Sep-70	1970	Cutthroat	Fry (0-3)	30,000	Truck	Ashton
Teton	Horseshoe Cr	30-Jul-73	1973	Cutthroat	Fry (0-3)	40,960	Truck	Nampa
Teton	Horseshoe Cr	08-Aug-75	1975	Cutthroat	Fry (0-3)	32,800	Truck	Ashton
Teton	Horseshoe Cr	21-Jun-78	1978	Cutthroat	Fry (0-3)	36,000	Truck	Ashton
	Horseshoe Cr Total					**209,010**		
Teton	Mahogany Cr	25-Sep-78	1978	Cutthroat	Fry (0-3)	3,600	Truck	Ashton
	Mahogany Cr Total					**3,600**		
Madison	Moody Cr	25-Sep-78	1978	Cutthroat	Fry (0-3)	2,400	Truck	Ashton
	Moody Cr Total					**2,400**		
Teton	Moose Cr	19-May-80	1980	Unspecified Rainbow	Fingerling (3-6 Inches)	1,000	Truck	Ashton
	Moose Cr Total					**1,000**		
Fremont	N F Bitch Cr	23-May-68	1968	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,600	Truck	Ashton
Fremont	N F Bitch Cr	11-Aug-69	1969	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	2,100	Truck	Ashton
Fremont	N F Bitch Cr	07-Aug-70	1970	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,290	Truck	Ashton
Fremont	N F Bitch Cr	21-Jul-71	1971	Unspecified Rainbow	Fingerling (3-6 Inches)	1,240	Truck	Ashton
Fremont	N F Bitch Cr	20-Jul-72	1972	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	2,000	Truck	Ashton
Fremont	N F Bitch Cr	17-Jul-73	1973	Cutthroat	Fry (0-3)	234,000	Truck	Ashton
Fremont	N F Bitch Cr	18-Jul-73	1973	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,200	Truck	Ashton
Fremont	N F Bitch Cr	08-Jul-74	1974	Cutthroat	Fry (0-3)	170,100	Truck	Ashton
Fremont	N F Bitch Cr	07-Aug-74	1974	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	800	Truck	Ashton
Fremont	N F Bitch Cr	02-Jul-75	1975	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	600	Truck	Ashton
Fremont	N F Bitch Cr	29-Jul-75	1975	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	2,900	Truck	Ashton

Appendix A. Continued.

County	Stream Name	Date planted	Year	Species Common Name	Size	Number planted	Planting Method	Rearing Hatchery
Fremont	N F Bitch Cr	07-Jul-76	1976	Cutthroat	Fry (0-3)	98,624	Truck	Ashton
Fremont	N F Bitch Cr	04-Jun-76	1976	October Spawner Kokanee	Fry (0-3)	52,164	Truck	Magic Valley
Fremont	N F Bitch Cr	13-Jul-76	1976	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	2,800	Truck	Ashton
Fremont	N F Bitch Cr	12-May-81	1981	Rainbow X Cutthroat	Fry (0-3)	11,840	Truck	Ashton
	N F Bitch Cr Total					**583,258**		
Teton	Pack Saddle Cr	28-Jun-81	1981	Rainbow X Cutthroat	Fry (0-3)	5,000	Truck	Ashton
	Pack Saddle Cr Total					**5,000**		
Teton	Packsaddle L	25-Aug-78	1978	Cutthroat	Fry (0-3)	1,974	Truck	Ashton
Teton	Packsaddle L	26-Oct-93	1993	Henrys Lake Cutthroat	Fry (0-3)	2,000	Backpack	Mackay
Teton	Packsaddle L	23-Aug-96	1996	Henrys Lake Cutthroat	Fry (0-3)	2,070	Backpack	Mackay
Teton	Packsaddle L	09-Sep-99	1999	Henrys Lake Cutthroat	Fingerling (3-6 Inches)	2,017	Backpack	Ashton
	Packsaddle L Total					**8,061**		
Teton	Spring Cr	16-Sep-85	1985	Henrys Lake Cutthroat	Fry (0-3)	69,300	Truck	Ashton
Teton	Spring Cr	29-Apr-98	1998	Hayspur Rainbow	Fingerling (3-6 Inches)	5,046	Truck	Ashton
	Spring Cr Total					**74,346**		
Teton	Teton Cr	17-Jun-68	1968	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,350	Truck	Ashton
Teton	Teton Cr	26-Aug-69	1969	Cutthroat	Fry (0-3)	22,500	Truck	Ashton
Teton	Teton Cr	07-Jul-69	1969	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,000	Truck	Ashton
Teton	Teton Cr	03-Sep-70	1970	Cutthroat	Fry (0-3)	10,000	Truck	Ashton
Teton	Teton Cr	29-Jun-70	1970	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,200	Truck	Ashton
Teton	Teton Cr	02-Sep-71	1971	Cutthroat	Fry (0-3)	17,190	Truck	Nampa
Teton	Teton Cr	11-Jun-71	1971	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,200	Truck	Ashton
Teton	Teton Cr	19-Jun-72	1972	Unspecified Rainbow	Fingerling (3-6 Inches)	1,200	Truck	Ashton
Teton	Teton Cr	30-Jul-73	1973	Cutthroat	Fry (0-3)	20,480	Truck	Nampa
Teton	Teton Cr	26-Jun-74	1974	Unspecified Rainbow	Fingerling (3-6 Inches)	1,000	Truck	Ashton
Teton	Teton Cr	22-Sep-82	1982	Henrys Lake Cutthroat	Fry (0-3)	118,125	Truck	Ashton
Teton	Teton Cr	23-Sep-82	1982	Henrys Lake Cutthroat	Fry (0-3)	29,812	Truck	Henrys Lake
Teton	Teton Cr	23-Sep-82	1982	Henrys Lake Cutthroat	Fry (0-3)	42,864	Truck	Henrys Lake
Teton	Teton Cr	16-Sep-85	1985	Henrys Lake Cutthroat	Fry (0-3)	66,000	Truck	Ashton
	Teton Cr Total					**333,921**		
Teton	Teton R	26-Jul-68	1968	Cutthroat	Fry (0-3)	23,000	Truck	Ashton
Teton	Teton R	01-Aug-68	1968	Cutthroat	Fry (0-3)	30,000	Truck	Ashton
Teton	Teton R	16-May-68	1968	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	5,100	Truck	Ashton
Teton	Teton R	07-Jun-68	1968	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	870	Truck	Ashton
Teton	Teton R	27-Jun-68	1968	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	3,440	Truck	Ashton
Teton	Teton R	18-Jul-68	1968	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	2,880	Truck	Ashton
Teton	Teton R	16-Aug-68	1968	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,620	Truck	Ashton

Appendix A. Continued.

County	Stream Name	Date planted	Year	Species Common Name	Size	Number planted	Planting Method	Rearing Hatchery
Teton	Teton R	22-Aug-68	1968	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,620	Truck	Ashton
Teton	Teton R	13-Aug-69	1969	Cutthroat	Fry (0-3)	18,000	Truck	Ashton
Teton	Teton R	20-Aug-69	1969	Cutthroat	Fry (0-3)	22,500	Truck	Ashton
Teton	Teton R	09-Sep-69	1969	Cutthroat	Fry (0-3)	13,600	Truck	Mackay
Teton	Teton R	09-Sep-69	1969	Cutthroat	Fry (0-3)	26,400	Truck	Mackay
Teton	Teton R	14-May-69	1969	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	900	Truck	Ashton
Teton	Teton R	22-May-69	1969	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,500	Truck	Ashton
Teton	Teton R	05-Jun-69	1969	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,800	Truck	Ashton
Teton	Teton R	13-Jun-69	1969	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	2,400	Truck	Ashton
Teton	Teton R	24-Jun-69	1969	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,715	Truck	Ashton
Teton	Teton R	07-Jul-69	1969	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	875	Truck	Ashton
Teton	Teton R	01-Aug-69	1969	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,050	Truck	Ashton
Teton	Teton R	14-Aug-69	1969	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,750	Truck	Ashton
Teton	Teton R	28-Aug-69	1969	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	2,100	Truck	Ashton
Teton	Teton R	09-Sep-69	1969	Unspecified Rainbow	Fry (0-3)	66,000	Truck	Mackay
Teton	Teton R	09-Sep-69	1969	Unspecified Rainbow	Fry (0-3)	34,000	Truck	Mackay
Teton	Teton R	22-Sep-69	1969	Unspecified Rainbow	Fry (0-3)	40,600	Truck	Mackay
Teton	Teton R	03-Sep-70	1970	Cutthroat	Fry (0-3)	30,000	Truck	Ashton
Teton	Teton R	08-Sep-70	1970	Cutthroat	Fry (0-3)	20,000	Truck	Ashton
Teton	Teton R	28-May-70	1970	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	2,310	Truck	Ashton
Teton	Teton R	08-Jun-70	1970	Unspecified Rainbow	Fingerling (3-6 Inches)	2,400	Truck	Ashton
Teton	Teton R	01-Jul-70	1970	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	2,220	Truck	Ashton
Teton	Teton R	15-Jul-70	1970	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,350	Truck	Ashton
Teton	Teton R	24-Jul-70	1970	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	2,580	Truck	Ashton
Teton	Teton R	04-Aug-70	1970	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,290	Truck	Ashton
Teton	Teton R	20-Aug-70	1970	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	2,795	Truck	Ashton
Teton	Teton R	01-Sep-70	1970	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,505	Truck	Ashton
Teton	Teton R	03-Sep-70	1970	Unspecified Rainbow	Fingerling (3-6 Inches)	3,900	Truck	Ashton
Teton	Teton R	11-Sep-70	1970	Unspecified Rainbow	Fingerling (3-6 Inches)	1,950	Truck	Ashton
Teton	Teton R	11-Sep-70	1970	Unspecified Rainbow	Fingerling (3-6 Inches)	1,950	Truck	Ashton
Teton	Teton R	27-Aug-71	1971	Cutthroat	Fry (0-3)	101,000	Truck	Nampa
Teton	Teton R	01-Sep-71	1971	Cutthroat	Fry (0-3)	8,595	Truck	Nampa
Teton	Teton R	07-Jun-71	1971	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	2,400	Truck	Ashton
Teton	Teton R	02-Jul-71	1971	Unspecified Rainbow	Fingerling (3-6 Inches)	1,550	Truck	Ashton
Teton	Teton R	14-Jul-71	1971	Unspecified Rainbow	Fingerling (3-6 Inches)	1,860	Truck	Ashton
Teton	Teton R	20-Jul-71	1971	Unspecified Rainbow	Fingerling (3-6 Inches)	1,240	Truck	Ashton
Teton	Teton R	23-Jul-71	1971	Unspecified Rainbow	Fingerling (3-6 Inches)	1,860	Truck	Ashton
Teton	Teton R	03-Aug-71	1971	Unspecified Rainbow	Fingerling (3-6 Inches)	1,560	Truck	Ashton
Teton	Teton R	04-Aug-71	1971	Unspecified Rainbow	Fingerling (3-6 Inches)	1,980	Truck	Ashton
Teton	Teton R	12-Aug-71	1971	Unspecified Rainbow	Fingerling (3-6 Inches)	1,320	Truck	Ashton
Teton	Teton R	17-Aug-71	1971	Unspecified Rainbow	Fingerling (3-6 Inches)	2,475	Truck	Ashton
Teton	Teton R	17-Aug-71	1971	Unspecified Rainbow	Fingerling (3-6 Inches)	1,650	Truck	Ashton

Appendix A. Continued.

County	Stream Name	Date planted	Year	Species Common Name	Size	Number planted	Planting Method	Rearing Hatchery
Teton	Teton R	25-Aug-71	1971	Unspecified Rainbow	Fingerling (3-6 Inches)	1,980	Truck	Ashton
Teton	Teton R	26-Aug-71	1971	Unspecified Rainbow	Fingerling (3-6 Inches)	1,980	Truck	Ashton
Teton	Teton R	01-Sep-71	1971	Unspecified Rainbow	Fingerling (3-6 Inches)	1,750	Truck	Ashton
Teton	Teton R	02-Sep-71	1971	Unspecified Rainbow	Fingerling (3-6 Inches)	1,750	Truck	Ashton
Teton	Teton R	03-Sep-71	1971	Unspecified Rainbow	Fry (0-3)	17,892	Truck	Nampa
Teton	Teton R	07-Sep-71	1971	Unspecified Rainbow	Fingerling (3-6 Inches)	5,000	Truck	Ashton
Teton	Teton R	01-Sep-72	1972	Cutthroat	Fry (0-3)	27,520	Truck	Nampa
Teton	Teton R	29-Jun-72	1972	Unspecified Rainbow	Fingerling (3-6 Inches)	3,000	Truck	Ashton
Teton	Teton R	22-Jun-73	1973	Cutthroat	Fry (0-3)	186,000	Truck	Ashton
Teton	Teton R	30-Jul-73	1973	Cutthroat	Fry (0-3)	20,480	Truck	Nampa
Teton	Teton R	16-May-73	1973	Unspecified Rainbow	Fingerling (3-6 Inches)	2,400	Truck	Ashton
Teton	Teton R	07-Jun-73	1973	Unspecified Rainbow	Fingerling (3-6 Inches)	2,750	Truck	Ashton
Teton	Teton R	05-Jul-73	1973	Unspecified Rainbow	Fingerling (3-6 Inches)	1,000	Truck	Ashton
Teton	Teton R	12-Jul-73	1973	Unspecified Rainbow	Fingerling (3-6 Inches)	2,500	Truck	Ashton
Teton	Teton R	27-Jul-73	1973	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,200	Truck	Ashton
Teton	Teton R	03-Aug-73	1973	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,200	Truck	Ashton
Teton	Teton R	03-Aug-73	1973	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	2,800	Truck	Ashton
Teton	Teton R	27-Aug-73	1973	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	3,200	Truck	Ashton
Teton	Teton R	13-Sep-73	1973	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,200	Truck	Ashton
Teton	Teton R	13-Sep-73	1973	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	3,600	Truck	Ashton
Teton	Teton R	05-Aug-74	1974	Cutthroat	Fry (0-3)	9,000	Truck	Ashton
Teton	Teton R	28-May-74	1974	Unspecified Rainbow	Fingerling (3-6 Inches)	8,000	Truck	Ashton
Teton	Teton R	11-Jul-74	1974	Unspecified Rainbow	Fingerling (3-6 Inches)	1,875	Truck	Ashton
Teton	Teton R	08-Aug-74	1974	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	4,000	Truck	Ashton
Teton	Teton R	12-Aug-74	1974	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	2,560	Truck	Ashton
Teton	Teton R	31-Jul-75	1975	Cutthroat	Fry (0-3)	29,360	Truck	Ashton
Teton	Teton R	11-Dec-75	1975	October Spawner Kokanee	Fry (0-3)	210,000	Truck	American Falls
Teton	Teton R	15-May-75	1975	Unspecified Rainbow	Fingerling (3-6 Inches)	2,400	Truck	Ashton
Teton	Teton R	21-May-75	1975	Unspecified Rainbow	Fingerling (3-6 Inches)	6,000	Truck	Ashton
Teton	Teton R	19-Jun-75	1975	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	3,150	Truck	Ashton
Teton	Teton R	20-Jun-75	1975	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	3,300	Truck	Ashton
Teton	Teton R	09-Jul-75	1975	Unspecified Rainbow	Fingerling (3-6 Inches)	1,500	Truck	Ashton
Teton	Teton R	23-Jul-75	1975	Unspecified Rainbow	Fingerling (3-6 Inches)	2,500	Truck	Ashton
Teton	Teton R	28-Jul-75	1975	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	2,900	Truck	Ashton
Teton	Teton R	05-Aug-75	1975	Unspecified Rainbow	Fingerling (3-6 Inches)	1,800	Truck	Ashton
Teton	Teton R	26-Jul-76	1976	Cutthroat	Fry (0-3)	880	Truck	Ashton
Teton	Teton R	26-Jul-76	1976	Cutthroat	Fingerling (3-6 Inches)	56,320	Truck	Ashton
Teton	Teton R	15-Sep-76	1976	Cutthroat	Fry (0-3)	113,668	Truck	Henry's Lake
Teton	Teton R	27-May-76	1976	Lake Trout	Fry (0-3)	97,917	Truck	U.S. Jackson
Teton	Teton R	02-Jun-76	1976	Lake Trout	Fingerling (3-6 Inches)	2,000	Truck	U.S. Jackson
Teton	Teton R	02-Jun-76	1976	Lake Trout	Fry (0-3)	60,240	Truck	U.S. Jackson
Teton	Teton R	10-May-76	1976	Unspecified Rainbow	Fingerling (3-6 Inches)	5,900	Truck	Ashton

Appendix A. Continued.

County	Stream Name	Date planted	Year	Species Common Name	Size	Number planted	Planting Method	Rearing Hatchery
Teton	Teton R	11-May-76	1976	Unspecified Rainbow	Fingerling (3-6 Inches)	5,900	Truck	Ashton
Teton	Teton R	02-Jun-76	1976	Unspecified Rainbow	Fingerling (3-6 Inches)	1,500	Truck	Ashton
Teton	Teton R	03-Jun-76	1976	Unspecified Rainbow	Fingerling (3-6 Inches)	1,750	Truck	Ashton
Teton	Teton R	30-Jun-76	1976	Unspecified Rainbow	Fingerling (3-6 Inches)	2,500	Truck	Ashton
Teton	Teton R	09-Aug-76	1976	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	4,000	Truck	Ashton
Teton	Teton R	08-Jun-77	1977	Cutthroat	Fry (0-3)	215,680	Truck	Ashton
Teton	Teton R	10-May-77	1977	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	4,230	Truck	Ashton
Teton	Teton R	18-May-77	1977	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	4,400	Truck	Ashton
Teton	Teton R	27-Jun-77	1977	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,680	Truck	Ashton
Teton	Teton R	16-Aug-77	1977	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	3,000	Truck	Ashton
Teton	Teton R	22-Jun-78	1978	Cutthroat	Fry (0-3)	29,000	Truck	Ashton
Teton	Teton R	25-Sep-78	1978	Cutthroat	Fry (0-3)	4,000	Truck	Ashton
Teton	Teton R	18-May-78	1978	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	4,200	Truck	Ashton
Teton	Teton R	07-Jun-78	1978	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	3,000	Truck	Ashton
Teton	Teton R	15-Jun-78	1978	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	4,700	Truck	Ashton
Teton	Teton R	01-Aug-78	1978	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	3,800	Truck	Ashton
Teton	Teton R	09-Aug-78	1978	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,140	Truck	Ashton
Teton	Teton R	20-Sep-78	1978	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	3,640	Truck	Ashton
Teton	Teton R	10-May-79	1979	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	4,000	Truck	Ashton
Teton	Teton R	23-Jun-79	1979	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	3,400	Truck	Ashton
Teton	Teton R	16-Aug-79	1979	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	2,500	Truck	Ashton
Fremont	Teton R	18-Jun-79	1979	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	3,400	Truck	Ashton
Fremont	Teton R	22-Aug-79	1979	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	750	Truck	Ashton
Teton	Teton R	01-May-80	1980	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	4,700	Truck	Ashton
Teton	Teton R	08-May-80	1980	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	4,700	Truck	Ashton
Teton	Teton R	09-May-80	1980	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	4,700	Truck	Ashton
Teton	Teton R	10-Jun-80	1980	Unspecified Rainbow	Fingerling (3-6 Inches)	14,674	Truck	Ashton
Teton	Teton R	01-Jul-80	1980	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	3,300	Truck	Ashton
Teton	Teton R	16-Jul-80	1980	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	2,077	Truck	Ashton
Teton	Teton R	20-Aug-80	1980	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,560	Truck	Ashton
Fremont	Teton R	20-Aug-80	1980	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,040	Truck	Ashton
Teton	Teton R	18-May-81	1981	Rainbow X Cutthroat	Fry (0-3)	4,440	Truck	Ashton
Teton	Teton R	25-Mar-81	1981	Unspecified Rainbow	Fry (0-3)	42,200	Truck	Ashton
Teton	Teton R	24-Apr-81	1981	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	3,800	Truck	Ashton
Teton	Teton R	06-May-81	1981	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	3,500	Truck	Ashton
Teton	Teton R	19-May-81	1981	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	3,255	Truck	Ashton
Teton	Teton R	09-Jun-81	1981	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	3,000	Truck	Ashton
Teton	Teton R	17-Aug-81	1981	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,680	Truck	Ashton
Teton	Teton R	27-Aug-81	1981	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,760	Truck	Ashton
Teton	Teton R	09-Sep-81	1981	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	6,210	Truck	Mackay
Fremont	Teton R	25-Mar-81	1981	Unspecified Rainbow	Fry (0-3)	42,200	Truck	Ashton
Fremont	Teton R	22-Jun-81	1981	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	3,080	Truck	Ashton

Appendix A. Continued.

County	Stream Name	Date planted	Year	Species Common Name	Size	Number planted	Planting Method	Rearing Hatchery
Teton	Teton R	16-Jul-82	1982	Henrys Lake Cutthroat	Fry (0-3)	78,592	Truck	Henry's Lake
Teton	Teton R	16-Apr-82	1982	Unspecified Rainbow	Fingerling (3-6 Inches)	5,500	Truck	Ashton
Teton	Teton R	19-Apr-82	1982	Unspecified Rainbow	Adults	4,300	Truck	Ashton
Teton	Teton R	20-Apr-82	1982	Unspecified Rainbow	Fry (0-3)	36,000	Truck	Ashton
Teton	Teton R	28-Apr-82	1982	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	4,620	Truck	Ashton
Teton	Teton R	29-Apr-82	1982	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	4,300	Truck	Ashton
Teton	Teton R	29-Apr-82	1982	Unspecified Rainbow	Fingerling (3-6 Inches)	5,300	Truck	Ashton
Teton	Teton R	13-May-83	1983	Unspecified Rainbow	Fingerling (3-6 Inches)	5,500	Truck	Ashton
Teton	Teton R	24-May-83	1983	Unspecified Rainbow	Fingerling (3-6 Inches)	4,950	Truck	Ashton
Teton	Teton R	09-Aug-83	1983	Unspecified Rainbow	Fingerling (3-6 Inches)	5,120	Truck	Ashton
Teton	Teton R	15-Aug-83	1983	Unspecified Rainbow	Fingerling (3-6 Inches)	9,900	Truck	Hagerman
Teton	Teton R	25-May-84	1984	Henrys Lake Cutthroat	Fry (0-3)	470,250	Truck	Ashton
Teton	Teton R	28-May-84	1984	Henrys Lake Cutthroat	Fry (0-3)	484,500	Truck	Ashton
Teton	Teton R	19-Jun-84	1984	Henrys Lake Cutthroat	Fry (0-3)	356,250	Truck	Ashton
Teton	Teton R	25-Jun-84	1984	Henrys Lake Cutthroat	Fry (0-3)	356,250	Truck	Ashton
Teton	Teton R	26-Jun-84	1984	Henrys Lake Cutthroat	Fry (0-3)	171,000	Truck	Ashton
Teton	Teton R	19-Jul-84	1984	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	14,335	Truck	Hagerman
Teton	Teton R	25-Jul-84	1984	Unspecified Rainbow	Fingerling (3-6 Inches)	10,500	Truck	Hagerman
Teton	Teton R	20-Aug-85	1985	Henrys Lake Cutthroat	Fry (0-3)	245,494	Truck	Mccall
Teton	Teton R	21-Aug-85	1985	Henrys Lake Cutthroat	Fry (0-3)	130,000	Truck	Ashton
Teton	Teton R	11-Sep-85	1985	Henrys Lake Cutthroat	Fry (0-3)	84,000	Truck	Ashton
Teton	Teton R	17-Sep-85	1985	Henrys Lake Cutthroat	Fry (0-3)	71,500	Truck	Ashton
Teton	Teton R	17-Sep-85	1985	Henrys Lake Cutthroat	Fry (0-3)	102,600	Truck	Ashton
Teton	Teton R	26-Sep-85	1985	Henrys Lake Cutthroat	Fingerling (3-6 Inches)	36,354	Truck	Mackay
Teton	Teton R	27-Sep-85	1985	Henrys Lake Cutthroat	Fry (0-3)	109,200	Truck	Mackay
Teton	Teton R	27-Sep-85	1985	Henrys Lake Cutthroat	Fry (0-3)	209,925	Truck	Mackay
Teton	Teton R	27-Sep-85	1985	Henrys Lake Cutthroat	Fry (0-3)	22,400	Truck	Mackay
Teton	Teton R	27-Sep-85	1985	Henrys Lake Cutthroat	Fingerling (3-6 Inches)	106,700	Truck	Mackay
Fremont	Teton R	20-Aug-85	1985	Henrys Lake Cutthroat	Fry (0-3)	122,747	Truck	Mccall
Teton	Teton R	26-Aug-85	1985	Mt Lassen Rainbow	Catchable (6 Inches+)(Ls)	10,560	Truck	Hagerman
Teton	Teton R	10-Jul-85	1985	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	8,400	Truck	Hagerman
Teton	Teton R	28-May-86	1986	Henrys Lake Cutthroat	Catchable (6 Inches+)(Ls)	1,600	Truck	Salvaged Fish
Teton	Teton R	08-Jul-86	1986	Henrys Lake Cutthroat	Fry (0-3)	101,694	Truck	Ashton
Teton	Teton R	22-Jul-86	1986	Henrys Lake Cutthroat	Fry (0-3)	153,600	Truck	Ashton
Teton	Teton R	23-Jul-86	1986	Henrys Lake Cutthroat	Fry (0-3)	172,032	Truck	Ashton
Teton	Teton R	25-Aug-86	1986	Henrys Lake Cutthroat	Fry (0-3)	115,000	Truck	Ashton
Teton	Teton R	26-Aug-86	1986	Henrys Lake Cutthroat	Fry (0-3)	100,000	Truck	Ashton
Teton	Teton R	27-Aug-86	1986	Henrys Lake Cutthroat	Fry (0-3)	115,000	Truck	Ashton
Teton	Teton R	17-Sep-86	1986	Henrys Lake Cutthroat	Fry (0-3)	153,000	Truck	Ashton
Teton	Teton R	18-Sep-86	1986	Henrys Lake Cutthroat	Fry (0-3)	86,400	Truck	Ashton
Teton	Teton R	22-Sep-86	1986	Henrys Lake Cutthroat	Fry (0-3)	90,720	Truck	Ashton
Teton	Teton R	30-Jul-86	1986	Mt Lassen Rainbow	Catchable (6 Inches+)(Ls)	6,435	Truck	Hagerman

Appendix A. Continued.

County	Stream Name	Date planted	Year	Species Common Name	Size	Number planted	Planting Method	Rearing Hatchery
Fremont	Teton R	29-Jul-86	1986	Mt Lassen Rainbow	Catchable (6 Inches+)(Ls)	4,200	Truck	American Falls
Fremont	Teton R	15-Jul-86	1986	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	11,760	Truck	Grace
Teton	Teton R	13-Aug-87	1987	Henrys Lake Cutthroat	Fry (0-3)	75,000	Truck	Ashton
Teton	Teton R	13-Aug-87	1987	Henrys Lake Cutthroat	Fry (0-3)	150,000	Truck	Ashton
Teton	Teton R	25-Aug-87	1987	Henrys Lake Cutthroat	Fry (0-3)	76,500	Truck	Ashton
Teton	Teton R	02-Sep-87	1987	Henrys Lake Cutthroat	Fry (0-3)	152,000	Truck	Ashton
Teton	Teton R	09-Sep-87	1987	Henrys Lake Cutthroat	Fry (0-3)	152,000	Truck	Ashton
Teton	Teton R	15-Sep-87	1987	Henrys Lake Cutthroat	Fry (0-3)	165,000	Truck	Ashton
Teton	Teton R	02-Jun-87	1987	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	5,100	Truck	Grace
Teton	Teton R	14-Jul-87	1987	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	5,100	Truck	Grace
Teton	Teton R	15-Jul-87	1987	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	3,915	Truck	Grace
Teton	Teton R	15-Jun-88	1988	Arlee Rainbow	Catchable (6 Inches+)(Ls)	2,590	Truck	Ashton
Teton	Teton R	23-Sep-88	1988	Henrys Lake Cutthroat	Fry (0-3)	81,662	Truck	Ashton
Teton	Teton R	28-Sep-88	1988	Henrys Lake Cutthroat	Fry (0-3)	74,480	Truck	Ashton
Teton	Teton R	21-Jul-88	1988	Mt Lassen Rainbow	Catchable (6 Inches+)(Ls)	3,360	Truck	Ashton
Teton	Teton R	03-Aug-88	1988	Mt Lassen Rainbow	Catchable (6 Inches+)(Ls)	1,140	Truck	Ashton
Teton	Teton R	22-Aug-88	1988	Mt Lassen Rainbow	Catchable (6 Inches+)(Ls)	1,500	Truck	Ashton
Teton	Teton R	01-Sep-88	1988	Mt Lassen Rainbow	Catchable (6 Inches+)(Ls)	1,500	Truck	Ashton
Fremont	Teton R	23-Jun-88	1988	Mt Lassen Rainbow	Catchable (6 Inches+)(Ls)	3,000	Truck	Ashton
Fremont	Teton R	03-Aug-88	1988	Mt Lassen Rainbow	Catchable (6 Inches+)(Ls)	1,500	Truck	Ashton
Fremont	Teton R	04-Aug-88	1988	Mt Lassen Rainbow	Catchable (6 Inches+)(Ls)	1,500	Truck	Ashton
Teton	Teton R	31-Aug-89	1989	Henrys Lake Cutthroat	Fry (0-3)	25,556	Truck	Ashton
Teton	Teton R	13-Sep-89	1989	Henrys Lake Cutthroat	Fry (0-3)	100,759	Truck	Ashton
Teton	Teton R	13-Sep-89	1989	Henrys Lake Cutthroat	Fry (0-3)	24,099	Truck	Ashton
Teton	Teton R	12-Jun-89	1989	Mt Lassen Rainbow	Catchable (6 Inches+)(Ls)	2,703	Truck	Ashton
Teton	Teton R	29-Jun-89	1989	Mt Lassen Rainbow	Catchable (6 Inches+)(Ls)	2,703	Truck	Ashton
Teton	Teton R	10-Jul-89	1989	Mt Lassen Rainbow	Catchable (6 Inches+)(Ls)	1,350	Truck	Ashton
Teton	Teton R	24-Jul-89	1989	Mt Lassen Rainbow	Catchable (6 Inches+)(Ls)	1,600	Truck	Ashton
Teton	Teton R	07-Aug-89	1989	Mt Lassen Rainbow	Catchable (6 Inches+)(Ls)	1,360	Truck	Ashton
Teton	Teton R	28-Jun-90	1990	Domestic Kamloops	Catchable (6 Inches+)(Ls)	2,001	Truck	Ashton
Teton	Teton R	10-Jul-90	1990	Domestic Kamloops	Catchable (6 Inches+)(Ls)	1,512	Truck	Ashton
Teton	Teton R	30-Aug-90	1990	Henrys Lake Cutthroat	Fry (0-3)	25,038	Truck	Ashton
Teton	Teton R	07-Sep-90	1990	Henrys Lake Cutthroat	Fry (0-3)	100,000	Truck	Ashton
Teton	Teton R	07-Sep-90	1990	Henrys Lake Cutthroat	Fry (0-3)	25,000	Truck	Ashton
Teton	Teton R	20-Jun-90	1990	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	2,000	Truck	Ashton
Teton	Teton R	24-Jul-90	1990	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,752	Truck	Ashton
Teton	Teton R	26-Jun-91	1991	Arlee Rainbow	Catchable (6 Inches+)(Ls)	2,000	Truck	Ashton
Teton	Teton R	03-Jul-91	1991	Arlee Rainbow	Catchable (6 Inches+)(Ls)	3,000	Truck	Ashton
Teton	Teton R	22-Jul-91	1991	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	3,480	Truck	Ashton
Teton	Teton R	26-Aug-91	1991	Henrys Lake Cutthroat	Fry (0-3)	25,360	Truck	Ashton
Teton	Teton R	06-Sep-91	1991	Henrys Lake Cutthroat	Fry (0-3)	125,381	Truck	Ashton
Teton	Teton R	22-May-92	1992	Arlee Rainbow	Catchable (6 Inches+)(Ls)	2,001	Truck	Ashton

Appendix A. Continued.

County	Stream Name	Date planted	Year	Species Common Name	Size	Number planted	Planting Method	Rearing Hatchery
Teton	Teton R	04-Jun-92	1992	Arlee Rainbow	Catchable (6 Inches+)(Ls)	2,006	Truck	Ashton
Teton	Teton R	16-Jun-92	1992	Arlee Rainbow	Catchable (6 Inches+)(Ls)	2,005	Truck	Ashton
Teton	Teton R	31-Jul-92	1992	Arlee Rainbow	Catchable (6 Inches+)(Ls)	2,188	Truck	Ashton
Teton	Teton R	01-Jul-92	1992	Mt Shasta Rainbow	Catchable (6 Inches+)(Ls)	1,247	Truck	Ashton
Teton	Teton R	17-Jul-92	1992	Mt Shasta Rainbow	Catchable (6 Inches+)(Ls)	1,258	Truck	Ashton
Teton	Teton R	15-Jun-93	1993	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	2,024	Truck	Ashton
Teton	Teton R	21-Jun-93	1993	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	2,030	Truck	Ashton
Teton	Teton R	02-Jul-93	1993	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	1,524	Truck	Ashton
Teton	Teton R	19-Jul-93	1993	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	1,632	Truck	Ashton
Teton	Teton R	09-Aug-93	1993	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	1,496	Truck	Ashton
Teton	Teton R	08-Jun-94	1994	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	1,575	Truck	Ashton
Teton	Teton R	21-Jun-94	1994	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	1,495	Truck	Ashton
Teton	Teton R	08-Jul-94	1994	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	1,500	Truck	Ashton
Teton	Teton R	20-Jul-94	1994	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	1,500	Truck	Ashton
Teton	Teton R	04-Aug-94	1994	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	1,500	Truck	Ashton
	Teton R Total					**7,742,948**		
Teton	Trail Cr	05-Jun-69	1969	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	900	Truck	Ashton
Teton	Trail Cr	08-Jun-70	1970	Unspecified Rainbow	Fingerling (3-6 Inches)	1,200	Truck	Ashton
Teton	Trail Cr	04-Aug-70	1970	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,290	Truck	Ashton
Teton	Trail Cr	21-Jun-71	1971	Unspecified Rainbow	Fingerling (3-6 Inches)	1,240	Truck	Ashton
Teton	Trail Cr	25-Jun-73	1973	Unspecified Rainbow	Fingerling (3-6 Inches)	1,250	Truck	Ashton
Teton	Trail Cr	11-Jul-74	1974	Unspecified Rainbow	Fingerling (3-6 Inches)	1,500	Truck	Ashton
Teton	Trail Cr	02-Jul-75	1975	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	600	Truck	Ashton
Teton	Trail Cr	10-Jul-75	1975	Unspecified Rainbow	Fingerling (3-6 Inches)	1,250	Truck	Ashton
Teton	Trail Cr	30-Jun-76	1976	Unspecified Rainbow	Fingerling (3-6 Inches)	2,500	Truck	Ashton
Teton	Trail Cr	27-Jun-77	1977	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	2,520	Truck	Ashton
Teton	Trail Cr	26-Jun-78	1978	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	3,358	Truck	Ashton
Teton	Trail Cr	29-May-79	1979	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	2,975	Truck	Ashton
Teton	Trail Cr	17-Jul-79	1979	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	980	Truck	Ashton
Teton	Trail Cr	19-May-80	1980	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,000	Truck	Ashton
Teton	Trail Cr	16-Jul-80	1980	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	1,089	Truck	Ashton
Teton	Trail Cr	10-Sep-85	1985	Henrys Lake Cutthroat	Fry (0-3)	50,000	Truck	Ashton
	Trail Cr Total					**73,652**		
Teton	Trail Creek P	24-May-95	1995	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	500	Truck	Ashton
Teton	Trail Creek P	08-Jun-95	1995	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	1,501	Truck	Ashton
Teton	Trail Creek P	28-Jun-95	1995	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	496	Truck	Ashton
Teton	Trail Creek P	13-Jul-95	1995	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	500	Truck	Ashton
Teton	Trail Creek P	26-Jul-95	1995	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	498	Truck	Ashton
Teton	Trail Creek P	20-Aug-96	1996	Domestic Kamloops	Catchable (6 Inches+)(Ls)	249	Truck	Ashton
Teton	Trail Creek P	21-May-96	1996	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	769	Truck	Ashton

Appendix A. Continued.

County	Stream Name	Date planted	Year	Species Common Name	Size	Number planted	Planting Method	Rearing Hatchery
Teton	Trail Creek P	06-Jun-96	1996	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	505	Truck	Ashton
Teton	Trail Creek P	20-Jun-96	1996	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	250	Truck	Ashton
Teton	Trail Creek P	10-Jul-96	1996	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	250	Truck	Ashton
Teton	Trail Creek P	25-Jul-96	1996	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	251	Truck	Ashton
Teton	Trail Creek P	06-Aug-96	1996	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	252	Truck	Ashton
Teton	Trail Creek P	27-Aug-97	1997	Domestic Kamloops	Catchable (6 Inches+)(Ls)	406	Truck	Ashton
Teton	Trail Creek P	05-Sep-97	1997	Domestic Kamloops	Catchable (6 Inches+)(Ls)	400	Truck	Ashton
Teton	Trail Creek P	15-Sep-97	1997	Domestic Kamloops	Catchable (6 Inches+)(Ls)	406	Truck	Ashton
Teton	Trail Creek P	02-May-97	1997	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	501	Truck	Ashton
Teton	Trail Creek P	27-May-97	1997	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	408	Truck	Ashton
Teton	Trail Creek P	05-Jun-97	1997	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	406	Truck	Ashton
Teton	Trail Creek P	24-Jun-97	1997	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	795	Truck	Ashton
Teton	Trail Creek P	28-Jul-97	1997	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	399	Truck	Ashton
Teton	Trail Creek P	12-Aug-97	1997	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	400	Truck	Ashton
Teton	Trail Creek P	06-May-98	1998	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	396	Truck	Ashton
Teton	Trail Creek P	21-May-98	1998	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	400	Truck	Ashton
Teton	Trail Creek P	02-Jun-98	1998	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	403	Truck	Ashton
Teton	Trail Creek P	23-Jun-98	1998	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	399	Truck	Ashton
Teton	Trail Creek P	08-Jul-98	1998	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	400	Truck	Ashton
Teton	Trail Creek P	20-Aug-98	1998	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	400	Truck	Ashton
Teton	Trail Creek P	10-Sep-98	1998	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	405	Truck	Ashton
Teton	Trail Creek P	15-May-99	1999	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	438	Truck	Ashton
Teton	Trail Creek P	10-Jun-99	1999	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	409	Truck	Ashton
Teton	Trail Creek P	23-Jun-99	1999	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	407	Truck	Ashton
Teton	Trail Creek P	21-Jul-99	1999	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	400	Truck	Ashton
Teton	Trail Creek P	26-Aug-99	1999	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	399	Truck	Ashton
Teton	Trail Creek P	04-May-00	2000	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	359	Truck	Ashton
Teton	Trail Creek P	24-May-00	2000	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	360	Truck	Ashton
Teton	Trail Creek P	16-Jun-00	2000	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	259	Truck	Ashton
Teton	Trail Creek P	11-Jul-00	2000	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	440	Truck	Ashton
Teton	Trail Creek P	26-Jul-00	2000	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	434	Truck	Ashton
Teton	Trail Creek P	10-Aug-00	2000	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	430	Truck	Ashton
Teton	Trail Creek P	25-Aug-00	2000	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	420	Truck	Ashton
Teton	Trail Creek P	07-Sep-00	2000	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	340	Truck	Ashton
Teton	Trail Creek P	19-Sep-00	2000	Hayspur Rainbow	Catchable (6 Inches+)(Ls)	364	Truck	Ashton
	Trail Creek P Total					**18,404**		
Teton	Woolstenhulme P	26-Jun-78	1978	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	621	Truck	Ashton
Teton	Woolstenhulme P	29-May-79	1979	Unspecified Rainbow	Catchable (6 Inches+)(Ls)	525	Truck	Ashton
	Woolstenhulme P Total					**1,146**		
	Grand Total					**9,776,434**		

Appendix B. Trout, mountain whitefish, and sucker relative abundance (%) or reaches electrofished in 1999 (present study) and 1974 (Irving et al. 1975), Teton River, Idaho. Sample size is in parentheses and includes all sizes of fish, but not hatchery rainbow trout in the Teton Valley study section (n = 10 in 1999, n = 130 in 1974). Asterisks denote significance (*P* <0.05*, *P* <0.01**) between years for chi-square tests of homogeneity (first column) and, if heterogeneous, for differences in uncorrected binomial species proportions (remaining columns).

Location and year	Cutthroat trout	Rainbow trout	Other trout[a]	Mountain whitefish	Sucker	Total
		Lower Teton				
North Fork, 1999	16.0	31.9	2.2	49.5	0.3	99.9
	(50)	(100)	(7-BRN)	(155)	(1)	(313)
South Fork, 1999	30.6	5.5	1.0	30.3	32.6	100.0
	(94)	(17)	(3-BRN)	(93)	(100)	(307)
1999 Total:	23.2	18.9	1.6**	40.0	16.3	100.0
	(144)	(117)	(10-BRN)	(248)	(101)	(620)
1974 Total:**	33.2**	3.7**	0.1	53.3**	9.7**	100.0
	(267)	(30)	(1-EBT)	(429)	(78)	(805)
		Teton Canyon				
Parkinson, 1999	30.4	5.2	ND	60.2	4.2	100.0
	(226)	(39)		(447)	(31)	(743)
L. Spring Hollow, 1999	13.7	3.0	ND	65.3	17.9	99.9
	(185)	(41)		(880)	(241)	(1,347)
U. Spring Hollow, 1999	14.9	4.3	ND	61.5	19.3	100.0
	(48)	(14)		(198)	(62)	(322)
Spring Hollow Combined, 1999	14.0	3.3	ND	64.6	18.2	100.1
	(233)	(55)		(1,078)	(303)	(1,669)
1999 Total:	19.0	3.9	ND	63.2	13.8	99.9
	(459)	(94)		(1,525)	(334)	(2,412)
1974 Total:**	26.8**	11.0**	1.7**	58.8*	1.7**	100.0
	(223)	(92)	(14-EBT)	(490)	(14)	(833)
		Teton Valley				
Breckenridge, 1999	21.8	18.4	9.0	50.8	ND	100.0
	(107)	(90)	(44-EBT)	(249)		(490)
Nickerson, 1999	21.5	4.4	12.7	58.6	2.7	99.9
	(188)	(38)	(111-EBT)	(512)	(24)	(873)
1999 Total:	21.6	9.4	11.4	55.8	1.8	100.0
	(295)	(128)	(155-EBT)	(761)	(24)	(1,363)
1974 Total:**	6.5**	6.5**	26.6**	57.8	2.7	100.1
	(187)	(187)	(768-EBT)	(1,671)	(79)	(2,892)

[a] BRN = brown trout; EBT = brook trout.
[b] ND = no data; no fish captured.

Appendix C. Median fish length (M) and quality stock density (QSD) for reaches electrofished in 1999 (present study) and 1974 (Irving et al. 1975), Teton River, Idaho. Sample size = n and includes all sizes of fish. QSD = (number fish ≥400 mm / number fish ≥200 mm) x 100. Asterisks denote significance (*P* <0.05*, *P* <0.01**) between years for Kolmogorov-Smirnov length frequency distribution tests (n columns) and median tests (M columns).

	Cutthroat trout			Rainbow trout			Other trout[a]			Mountain whitefish			Sucker		
Location and year	**n**	**M (mm)**	**QSD (%)**	**n**	**M (mm)**	**QSD (%)**	**n**	**M (mm)**	**QSD (%)**	**n**	**M (mm)**	**QSD (%)**	**n**	**M (mm)**	**QSD (%)**
Lower Teton															
North Fork, 1999	50	401	55.1	100	337	32.3	BRN 7	282	28.6	155	272	0.7	1	572	100.0
South Fork, 1999	94	386	46.2	17	257	28.6	BRN 3	376	33.3	93	292	5.2	100	332	43.5
1999 Total:	144	392	49.3	117	334	31.8	BRN 10	329	30.0	248	280	2.3	101	334	44.1
1974 Total:	415**	227**	7.0	45**	231**	0.0	EBT 3	222	0.0	421**	262*	3.3	78	413	65.6
Teton Canyon															
Parkinson, 1999	226	366	27.4	39	350	28.2	ND	ND	ND	447	320	5.0	31	464	96.8
Spring Hollow, 1999	233	325	13.5	55	305	18.2	ND	ND	ND	1,078	304	2.7	303	461	98.0
1999 Total:	459	350	20.7	94	324	22.9	ND	ND	ND	1,525	309	3.4	334	461	97.9
1974 Total:	242**	210**	6.9	98**	246**	7.1	EBT 12	268	0.0	538**	302**	2.4	15	500	100.0
Teton Valley															
Breckenridge, 1999	107	315	19.0	90	260	11.6	EBT 44	273	0.0	249	304	6.4	ND	ND	ND
Nickerson, 1999	188	287	13.4	38	354	34.2	EBT 111	242	0.0	512	291	2.3	24	140	0.0
1999 Total:	295	296	15.6	128	292	18.5	EBT 155	253	0.0	761	294	3.7	24	140	0.0
1974 Total:	196**	260**	5.2	276**	242**	2.2	EBT 849**	209**	0.0	1,777**	296	1.0	73**	159**	0.0

[a] BRN = brown trout; EBT = brook trout.
[b] ND = no data; no fish captured.

Appendix D. Mark-recapture statistics for reaches electrofished in 1999, Teton River, Idaho. Results are from the MR5 database and analyses for fish ≥100 mm (TL). Capture efficiencies (R/C) are in percent.

Location and year	Cutthroat trout				Rainbow trout				Brown trout				Brook trout				Mountain whitefish				Suckers				Total			
	M[a]	C[a]	R[a]	R/C	M	C	R	R/C	M	C	R	R/C	M	C	R	R/C	M	C	R	R/C	M	C	R	R/C	M	C	R	R/C
Lower Teton																												
North Fork	39	19	8	42	52	51	5	10	2	5	0	0	ND[b]	ND	ND	ND	69	91	5	5	1	0	0	0	163	166	18	11
South Fork	60	53	19	36	7	12	2	17	1	2	0	0	ND	ND	ND	ND	36	59	3	5	93	7	0	0	197	133	24	18
Teton Canyon																												
Parkinson	141	99	14	14	20	22	3	14	ND	ND	ND	ND	ND	ND	ND	ND	223	225	1	<1	26	5	0	0	410	351	18	5
L. Spring Hollow	117	69	2	3	27	14	0	0	ND	ND	ND	ND	ND	ND	ND	ND	525	340	4	1	177	63	0	0	846	486	6	1
Teton Valley																												
Breckenridge	66	58	17	29	55	41	6	15	ND	ND	ND	ND	29	17	2	12	139	116	6	5	ND	ND	ND	ND	289	232	31	13
Nickerson	121	97	31	32	24	19	5	26	ND	ND	ND	ND	74	42	7	17	260	255	4	2	8	17	1	6	487	430	48	11

[a] M = number of fish marked on marking runs; C = number of fish captured on recapture runs; R = number of marked fish recaptured on recapture runs.
[b] ND = no data; no fish captured.

Appendix E. Trout, mountain whitefish, and sucker density estimates (fish/ha) with 95% confidence intervals (CI) for reaches electrofished in 1999, Teton River, Idaho. Density was estimated for all species combined using the modified Peterson estimator, then proportioned by the relative contribution of each species to the electrofishing catch. Estimates are for fish ≥100 mm.

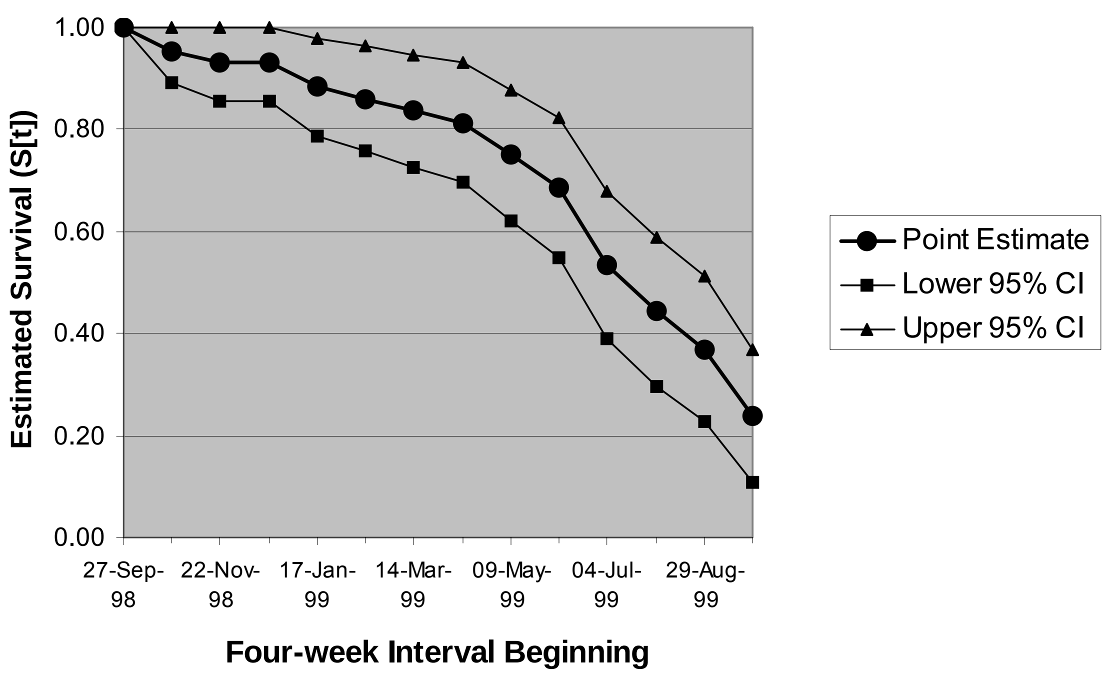
Location and year	Cutthroat trout			Rainbow trout			Brown trout			Brook trout		
	% Catch	Fish/ ha	95% CI (±)	% Catch	Fish/ ha	95% CI (±)	% Catch	Fish/ ha	95% CI (±)	% Catch	Fish/ ha	95% CI (±)
Lower Teton												
North Fork	16.0	56	110	31.9	112	156	2.2	8	41	ND[a]	ND	ND
South Fork	30.6	54	78	5.5	10	33	1.0	2	14	ND	ND	ND
Teton Canyon												
Parkinson	30.4	136	423	5.2	23	176	ND	ND	ND	ND	ND	ND
L. Spring Hollow	13.7	149	2,033	3.0	33	957	ND	ND	ND	ND	ND	ND
Teton Valley												
Breckenridge	21.8	36	83	18.4	30	76	ND	ND	ND	9.0	15	53
Nickerson	21.5	38	100	4.4	8	45	ND	ND	ND	12.7	22	77

Location and year	All trout			Mountain whitefish			Suckers			All species combined		
	% Catch	Fish/ ha	95% CI (±)	% Catch	Fish/ ha	95% CI (±)	% Catch	Fish/ ha	95% CI (±)	% Catch	Fish/ ha	95% CI (±)
Lower Teton												
North Fork	50.2	176	196	49.5	174	194	0.3	1	16	100.0	351	276
South Fork	37.1	65	85	30.3	53	77	32.6	57	80	100.0	176	140
Teton Canyon												
Parkinson	35.7	159	458	60.2	268	595	4.2	19	157	100.0	446	767
L. Spring Hollow	16.8	183	2,247	65.3	711	4,434	17.9	195	2,320	100.0	1,088	5,485
Teton Valley												
Breckenridge	49.2	81	124	50.8	84	126	ND	ND	ND	100.0	166	177
Nickerson	38.6	68	134	58.6	103	165	2.7	5	36	100.0	176	215

[a] ND = no data; no fish captured.

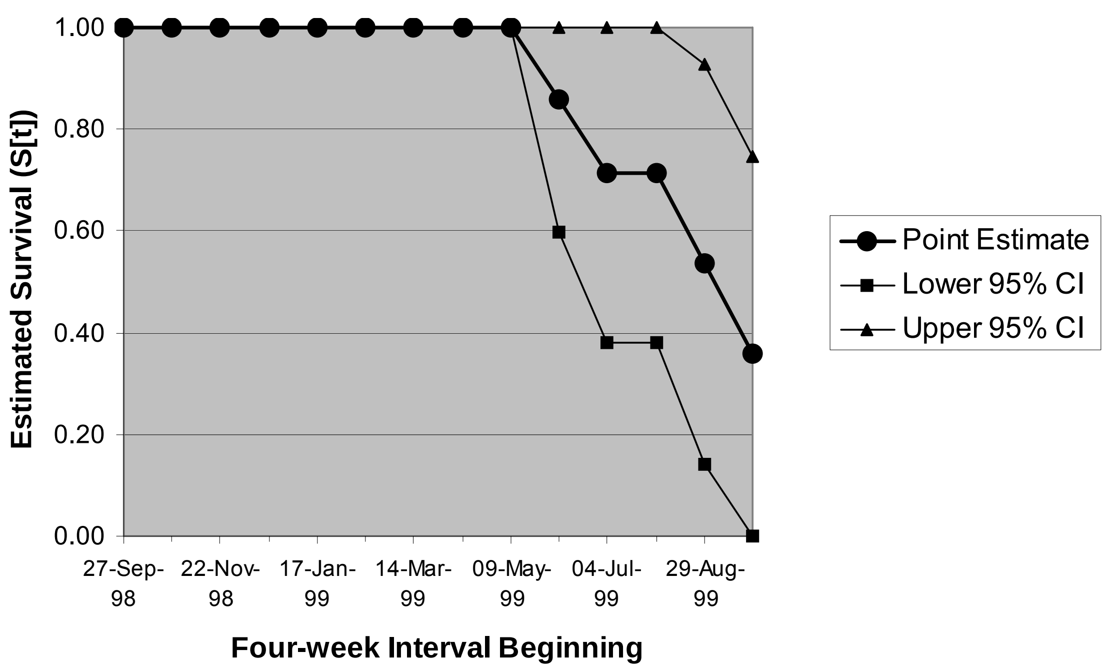
Appendix F. Estimated survival distribution with 95% confidence intervals for 53 adult trout (≥385 mm, TL) radio tagged in all study sections combined, 1998-1999, Teton River, Idaho. Statistics were calculated using the Kaplan-Meier procedure as modified by Pollock et al. (1989).

Four-week number (t)	Four-week Interval dates	Number at risk (rj)	Number of deaths (dj)	Number censored (cj)	Number of new added (nj)	Estimated survival (S[t])	95% Confidence interval
0	08/02/98 - 08/29/98	0	0	0	0		
0	08/30/98 - 09/26/98	0	1	0	39		
1	09/27/98 - 10/24/98	38	0	1	6	1.00000	1.00000 - 1.00000
2	10/25/98 - 11/21/98	43	2	1	1	0.95349	0.89054 - 1.00000
3	11/22/98 - 12/19/98	41	1	0	0	0.93023	0.85409 - 1.00000
4	12/20/98 - 01/16/99	40	0	0	0	0.93023	0.85409 - 1.00000
5	01/17/99 - 02/13/99	40	2	0	0	0.88372	0.78791 - 0.97954
6	02/14/99 - 03/13/99	38	1	1	0	0.86047	0.75690 - 0.96403
7	03/14/99 - 04/10/99	36	1	0	0	0.83656	0.72578 - 0.94735
8	04/11/99 - 05/08/99	35	1	1	6	0.81266	0.69556 - 0.92977
9	05/09/99 - 06/05/99	39	3	2	1	0.75015	0.62246 - 0.87784
10	06/06/99 - 07/03/99	35	3	0	0	0.68585	0.54995 - 0.82175
11	07/04/99 - 07/31/99	32	7	2	0	0.53582	0.39117 - 0.68047
12	08/01/99 - 08/28/99	23	4	1	0	0.44263	0.29714 - 0.58813
13	08/29/99 - 09/25/99	18	3	1	0	0.36886	0.22566 - 0.51207
14	09/26/99 - 10/23/99	14	5	0	0	0.23713	0.10656 - 0.36769
15	10/24/99 - 11/20/99	9					
Sum:			**34**	**10**	**53**		
Analysis Sum:			**33**	**10**	**14**		



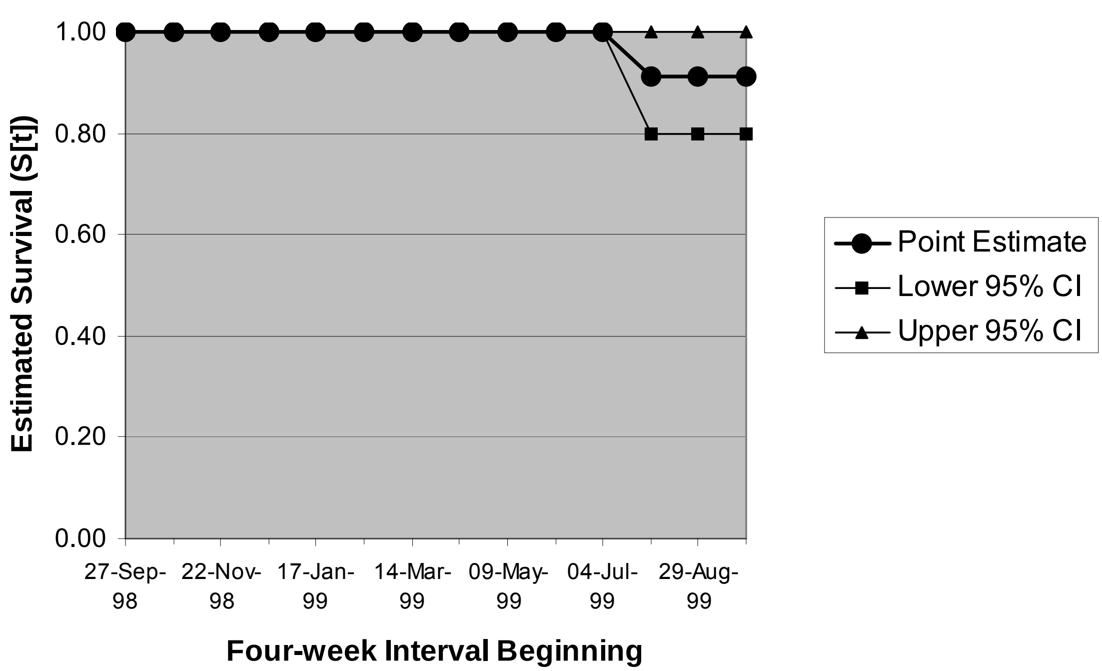
Appendix G. Estimated survival distribution with 95% confidence intervals for eight adult trout (≥385 mm, TL) radio tagged in the Teton Canyon study section, Idaho, 1998-1999. Statistics were calculated using the Kaplan-Meier procedure as modified by Pollock et al. (1989).

Four-week number (t)	Four-week Interval dates	Number at risk (rj)	Number of deaths (dj)	Number censored (cj)	Number of new added (nj)	Estimated survival (S[t])	95% Confidence interval
0	08/02/98 - 08/29/98	0	0	0	0		
0	08/30/98 - 09/26/98	0	0	0	7		
1	09/27/98 - 10/24/98	7	0	0	0	1.00000	1.00000 - 1.00000
2	10/25/98 - 11/21/98	7	0	1	0	1.00000	1.00000 - 1.00000
3	11/22/98 - 12/19/98	6	0	0	0	1.00000	1.00000 - 1.00000
4	12/20/98 - 01/16/99	6	0	0	0	1.00000	1.00000 - 1.00000
5	01/17/99 - 02/13/99	6	0	0	0	1.00000	1.00000 - 1.00000
6	02/14/99 - 03/13/99	6	0	0	0	1.00000	1.00000 - 1.00000
7	03/14/99 - 04/10/99	6	0	0	0	1.00000	1.00000 - 1.00000
8	04/11/99 - 05/08/99	6	0	0	0	1.00000	1.00000 - 1.00000
9	05/09/99 - 06/05/99	6	0	0	1	1.00000	1.00000 - 1.00000
10	06/06/99 - 07/03/99	7	1	0	0	0.85714	0.59791 - 1.00000
11	07/04/99 - 07/31/99	6	1	1	0	0.71429	0.37962 - 1.00000
12	08/01/99 - 08/28/99	4	0	0	0	0.71429	0.37962 - 1.00000
13	08/29/99 - 09/25/99	4	1	0	0	0.53571	0.14217 - 0.92926
14	09/26/99 - 10/23/99	3	1	0	0	0.35714	0.00000 - 0.74509
15	10/24/99 - 11/20/99	2					
Sum:			**4**	**2**	**8**		
Analysis Sum:			**4**	**2**	**1**		



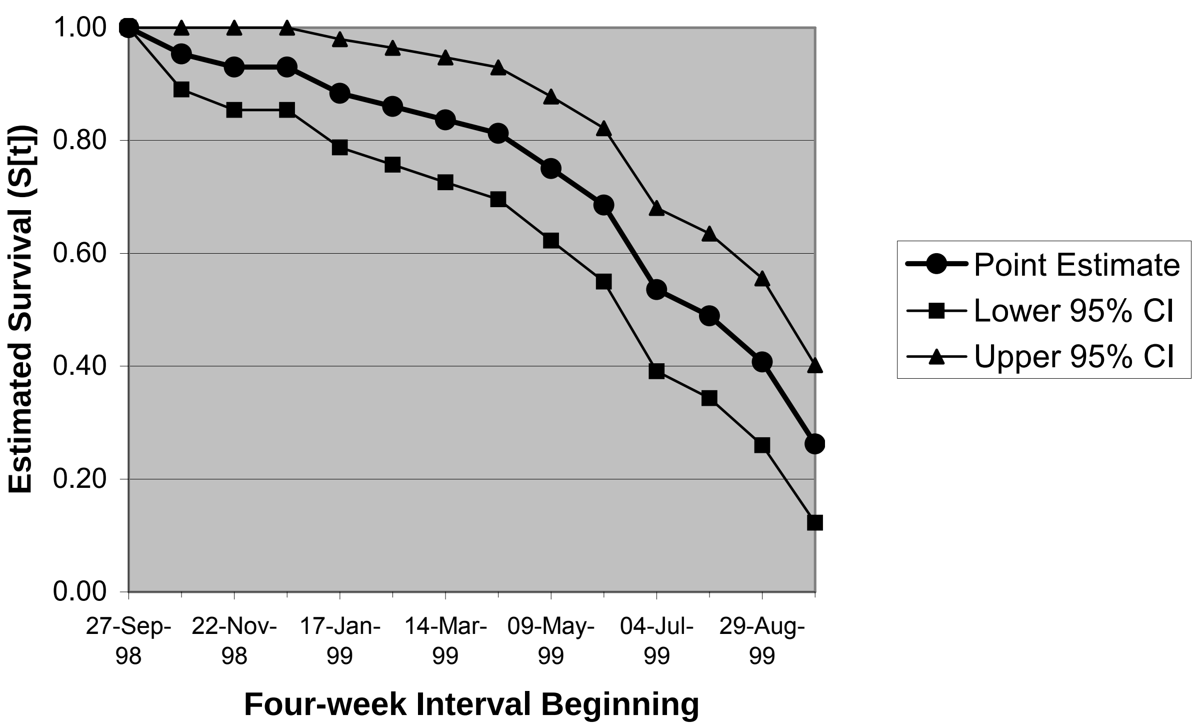
Appendix H. Estimated fishing survival distribution with 95% confidence intervals for 53 adult trout (≥385 mm, TL) radio tagged in all study sections combined, 1998-1999, Teton River, Idaho. Estimates are for survival from fishing only; other deaths (i.e. natural) are censored. Statistics were calculated using the Kaplan-Meier procedure as modified by Pollock et al. (1989).

Four-week number (t)	Four-week Interval dates	Number at risk (rj)	Number of deaths (dj)	Number censored (cj)	Number of new added (nj)	Estimated survival (S[t])	95% Confidence interval
0	08/02/98 - 08/29/98	0	0	0	0		
0	08/30/98 - 09/26/98	0	1	0	39		
1	09/27/98 - 10/24/98	38	0	1	6	1.00000	1.00000 - 1.00000
2	10/25/98 - 11/21/98	43	0	3	1	1.00000	1.00000 - 1.00000
3	11/22/98 - 12/19/98	41	0	1	0	1.00000	1.00000 - 1.00000
4	12/20/98 - 01/16/99	40	0	0	0	1.00000	1.00000 - 1.00000
5	01/17/99 - 02/13/99	40	0	2	0	1.00000	1.00000 - 1.00000
6	02/14/99 - 03/13/99	38	0	2	0	1.00000	1.00000 - 1.00000
7	03/14/99 - 04/10/99	36	0	1	0	1.00000	1.00000 - 1.00000
8	04/11/99 - 05/08/99	35	0	2	6	1.00000	1.00000 - 1.00000
9	05/09/99 - 06/05/99	39	0	5	1	1.00000	1.00000 - 1.00000
10	06/06/99 - 07/03/99	35	0	3	0	1.00000	1.00000 - 1.00000
11	07/04/99 - 07/31/99	32	0	9	0	1.00000	1.00000 - 1.00000
12	08/01/99 - 08/28/99	23	2	3	0	0.91304	0.79789 - 1.00000
13	08/29/99 - 09/25/99	18	0	4	0	0.91304	0.79789 - 1.00000
14	09/26/99 - 10/23/99	14	0	5	0	0.91304	0.79789 - 1.00000
15	10/24/99 - 11/20/99	9		0			
Sum:			**3**	**41**	**53**		
Analysis Sum:			**2**	**41**	**14**		



Appendix I. Estimated natural survival distribution with 95% confidence intervals for 53 adult trout (≥385 mm, TL) radio tagged in all study sections combined, 1998-1999, Teton River, Idaho. Estimates are for survival from natural causes only; other deaths (i.e. fishing) are censored. Statistics were calculated using the Kaplan-Meier procedure as modified by Pollock et al. (1989).

Four-week number (t)	Four-week Interval dates	Number at risk (rj)	Number of deaths (dj)	Number censored (cj)	Number of new added (nj)	Estimated survival (S[t])	95% Confidence interval
0	08/02/98 - 08/29/98	0	0	0	0		
0	08/30/98 - 09/26/98	0	0	1	39		
1	09/27/98 - 10/24/98	38	0	1	6	1.00000	1.00000 - 1.00000
2	10/25/98 - 11/21/98	43	2	1	1	0.95349	0.89054 - 1.00000
3	11/22/98 - 12/19/98	41	1	0	0	0.93023	0.85409 - 1.00000
4	12/20/98 - 01/16/99	40	0	0	0	0.93023	0.85409 - 1.00000
5	01/17/99 - 02/13/99	40	2	0	0	0.88372	0.78791 - 0.97954
6	02/14/99 - 03/13/99	38	1	1	0	0.86047	0.75690 - 0.96403
7	03/14/99 - 04/10/99	36	1	0	0	0.83656	0.72578 - 0.94735
8	04/11/99 - 05/08/99	35	1	1	6	0.81266	0.69556 - 0.92977
9	05/09/99 - 06/05/99	39	3	2	1	0.75015	0.62246 - 0.87784
10	06/06/99 - 07/03/99	35	3	0	0	0.68585	0.54995 - 0.82175
11	07/04/99 - 07/31/99	32	7	2	0	0.53582	0.39117 - 0.68047
12	08/01/99 - 08/28/99	23	2	3	0	0.48923	0.34345 - 0.63500
13	08/29/99 - 09/25/99	18	3	1	0	0.40769	0.25987 - 0.55551
14	09/26/99 - 10/23/99	14	5	0	0	0.26209	0.12244 - 0.40174
15	10/24/99 - 11/20/99	9					
Sum:			**31**	**13**	**53**		
Analysis Sum:			**31**	**12**	**14**		



Prepared by:

William C. Schrader
Senior Fisheries Research Biologist

Kevin R. Brenden
Fishery Technician

Approved by:

IDAHO DEPARTMENT OF FISH AND GAME

Virgil K. Moore, Chief
Bureau of Fisheries

Steve Yundt
Resident Fish Manager