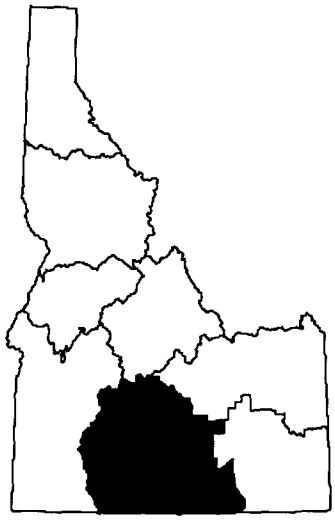
FISHERY MANAGEMENT INVESTIGATIONS

IDAHO DEPARTMENT OF FISH AND GAME

FISHERY MANAGEMENT ANNUAL REPORT

Cal Groen, Director



MAGIC VALLEY REGION

2004

By

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ABSTRACT

A high mountain lake survey was conducted on Green Creek Lake on September 14 and 15, 2004 following standard high mountain lake protocols. The resulting sample included 44 Arctic grayling *Thymallus arcticus* and no cutthroat trout *Oncorhynchus clarkii.* It is recommended that Green Creek Lake continues to be stocked with Arctic grayling and cutthroat trout.

Hideway Lake was surveyed on August 25 and 26, 2004 following standard high mountain lake protocols. Fish sampled included six cutthroat trout and three Arctic grayling. Depth soundings were collected to create a bathymetric map of the lake. Recommendations include the stocking of Arctic grayling or cutthroat trout in a three year rotation to maintain adequate numbers for this fishery.

INTRODUCTION

Green Creek Lake encompasses approximately one hectare at the headwaters of Green Creek, a tributary to the South Fork Boise River (UTM Z11, 631, 3000 m E, 4, 826,400 m N). Surface elevation of the lake is 2,425 meters (m). Green Creek Lake is accessed from a trailhead off a logging road crossing Park's Creek. The lake is intermittently stocked with cutthroat trout and Arctic grayling.

A standard mountain lake survey was completed on Green Creek Lake on September 14 and 15, 2004 to evaluate the success of previous cutthroat and grayling out-plants. Sampling locations were taken from Warren et al. 2003. No weight or measurement information was collected for fish other than grayling. Water quality data collected included only day time surface water temperature.

Hideway Lake is a cirque lake located in Elmore County. The lake encompasses approximately one hectare (ha), located at the headwaters of Rainbow Creek, a tributary to the South Fork Boise River (UTM Z11; 629,184 m E; 4,827,543 m N). Surface elevation of the lake is approximately 2,550 m. Access is from a trail off a logging road crossing Park's Creek. The lake is intermittently stocked with cutthroat trout and Arctic grayling. A standard mountain lake survey was conducted on Hideway Lake in 2004.

A standard mountain lake survey was completed on Hideway Lake on August 25 and 26, 2004. Fish were classified by length range. No weight measures were taken. Depth soundings were collected using a hand held digital depth finder to create a bathymetric map of Hideway Lake (Figure 1).

METHODS

Mountain Lake surveys are conducted using Idaho Department of Fish and Game (IDFG) standard protocols. Fish are sampled with one overnight gillnet set. Nets are set and retrieved using a small inflatable raft or tube. Mountain lake gillnets are Swedish-made Lundgrens Type-A lightweight multi-filament sinking gillnets measuring 1.5 m wide, with six 7.6 m panels, in bar mesh sizes: 46, 38, 33, 30, 25, and 19 millimeters (mm). All fish are identified to species, measured to total length, with a sub-sample weighed to the nearest gram. Catch data is summarized by species for length, weight, relative abundance, relative biomass, and catch per unit of effort. Water quality measures including alkalinity, total hardness, pH and specific conductivity are measured from mid-lake surface samples within 48 hours of taking the water sample. A cursory survey of amphibians is made near the shoreline by turning over rocks and logs and visually searching the littoral zone of the lake. Angler use and area development is observed around the lake. A description of equipment used in mountain lake surveys is listed in Appendix 1.

RESULTS AND DISCUSSION

A total of 44 Arctic grayling averaging 230 ± 40 mm (SD) were sampled during the Green Creek Lake survey. No cutthroat trout were sampled. An evaluation of grayling length frequency (Figure 2) suggested sampled fish represented three potential cohorts. A cohort most likely represented out-plants from 2001, 2002, and 2003. Results showed stocked grayling exhibit relatively good survival and have successfully recruited to the fishery. Absence of cutthroat indicates a lack of natural reproduction. Cutthroat trout were last stocked in 1994. Warren et al. 2003 found cutthroat trout exhibited adequate survival and recruited to the Green Creek Lake fishery when stocked. It is suggested that routine out-plants of grayling and/or cutthroat trout be continued. However, it may not be necessary to stock on an annual basis.

Surface day time water temperature measured 9°C. No amphibians were noted. Suspected lake use was low. Only one fire pit was identified.

A total of six cutthroat trout 300 to 349 mm in length and three Arctic grayling 300 to 399 mm in length were collected from Hideway Lake. Survey results suggested natural recruitment does not occur in either species present. However, survival of out-plants is adequate to maintain fishable numbers. The last recorded stockings of grayling and cutthroat trout occurred in 1998 and 2000, respectively. Fish collected most likely represent these out-plants. Continued out-plants of cutthroat and/or grayling is recommended to maintain a fishable population.

Total alkalinity and total hardness were measured at eight mg/L, respectively. Secchi depth was measured at 5.5 m. One long-toed salamander *Ambystoma macrodactylum* was observed in the vicinity of the lake outflow. General observations of the area indicated that access was limited to a poorly marked trail. Three campsites with fire pits were present.

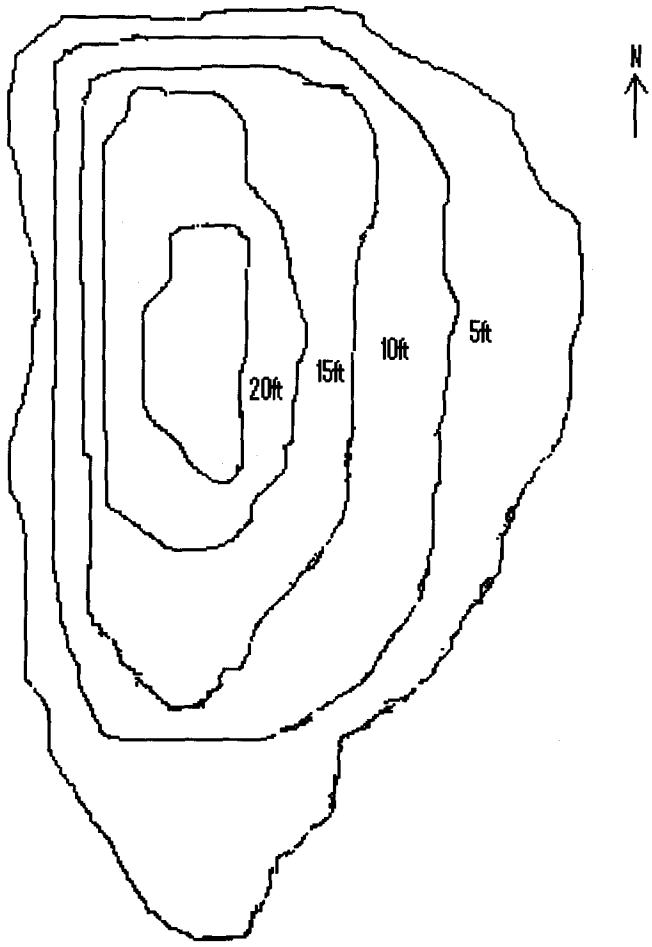

Figure 1. Contour diagram of Hideway Lake. Contour intervals are in five foot (1.5 m) increments.

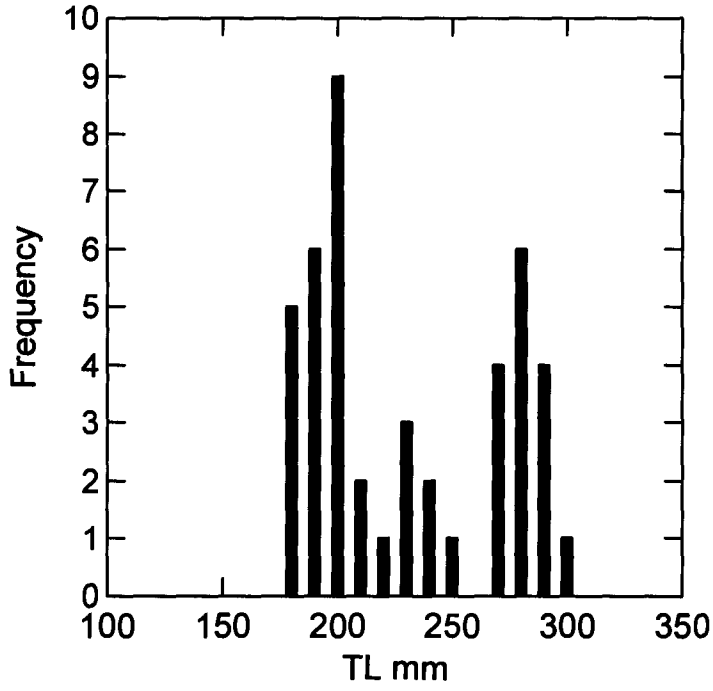

Figure 2. Total length (mm) of Arctic grayling captured on September 15, 2004 from Green Creek Lake.

2004 MAGIC VALLEY REGION FISHERY MANAGEMENT REPORT
LOWLAND LAKES AND RESERVOIR INVESTIGATIONS

ABSTRACT

Trap nets were set on August 2 - 4, 2004 to evaluate the effectiveness of increased stocking densities of channel catfish *Ictulurus punctatus* into Anderson Pond 3 on the Hagerman Wildlife Management Area (WMA). No catfish were sampled. Incidental catch included: 16 largemouth bass *Micropterus salmoides*, 55 bluegill sunfish *Lepomis macrochirus*, and 18 white sturgeon *Acipenser transmontanus*. The lack of catfish in the sample may indicate poor recruitment of stocked catfish into the fishery. Therefore catfish out-plants into Anderson Pond 3 have been discontinued. Channel catfish will instead be stocked into the adjacent Riley Creek Pond on the Hagerman WMA.

Kokanee *O. nerka* spawner counts were conducted on the South Fork of the Boise River from mid August through early October 2004 as part of standard population monitoring efforts associated with Anderson Ranch Reservoir. A total of 307 kokanee were counted which indicates a continued decline in numbers since the late 1990's. Due to the highly variable nature of the monitoring factors, it is recommended that alternative methods be investigated to help reduce data inconsistencies.

One night of electrofishing for largemouth bass was conducted on August 31, 2004 on Lower Salmon Falls Reservoir (Bell Rapids) in the Buckeye Bay area. Survey efforts were used to evaluate largemouth bass population structure and restrictive regulation impacts. Multiple age-classes of largemouth bass were not clearly defined in length frequency evaluation and it is believed that larger fish were under represented in the sample. It is recommended that sampling be conducted in pre-spawn and during the spawning period to better represent the larger fish. Along with an evaluation of the largemouth bass population, work needs to be conducted to reassess the special regulations slot limit currently in place.

A creel survey was conducted on Dierkes Lake from May to September, 2004. The creel survey was designed to evaluate angler harvest on largemouth bass and question anglers on desired management goals. Creel data was not evaluated due to software development difficulties and will be reported in 2005. Of anglers questioned, the majority preferred largemouth bass management change. It was recommended that management options be scoped in the upcoming rules cycle.

Dog Creek Reservoir was sampled on August 2 - 4, 2004 with six units of baited trap net effort. Trapping was conducted to determine channel catfish presence, to evaluate stocking densities, and to monitor the success of the stocking program. Eleven channel catfish were sampled ranging from 140 mm to 560 mm in length and are thought to represent several years of out-plant efforts. Catch rates are higher than previous survey results and believed to coincide with the increased stocking densities. It is recommended that higher stocking rates continue in order to provide a more productive catfish fishery.

Emerald Lake was sampled on May 17, 2004 to evaluate the relative abundance of game and non-game fishes. The population survey indicated that the fish community was dominated by non-game species. Fathead minnow *Pimephales promelas*, common carp *Cyprinus carpio*, and Utah sucker *Catostomus ardens* comprised 92.3% of the fish community. Emerald Lake was

renovated on October 20, 2004 with a piscicide application, and restocked with rainbow trout *O. mykiss* in December 2004. The lake will be managed as a put and take rainbow trout fishery.

A standard lowland lake survey was conducted in Lake Walcott in June and July of 2004. Sampling efforts were divided between the Magic Valley and Southeast regions. Survey results indicate the presence of good numbers of smallmouth bass *Micropterus dolomieu* and a reduction in the relative abundance of yellow perch *Perca flavescens*. A previous survey of the fishery prior to smallmouth introduction indicated yellow perch were the most dominant game fish. General observations from the survey suggested smallmouth bass population structure may differ between open and closed boating access areas of the reservoir and river section above the reservoir. It was recommended that differences in population structure be further investigated.

Investigations on Oakley Reservoir in 2004 included annual forage fish monitoring and an evaluation of walleye *Sander vitreus* recruitment from stocked and naturalized sources. On August 12, 2004, ten standard locations were sampled by electrofishing. Mottled sculpin *Cottus bairdi*, spottail shiner *Notropis hudsonius*, walleye and yellow perch made up the majority of the forage fish sample, with yellow perch comprising 56.23% of the total catch. This information suggests adequate forage is available for walleye. It is recommended that annual forage monitoring continues and that walleye forage preference be evaluated to help add value to the forage monitoring data. Walleye fry marked with oxytetracycline (OTC) were stocked into Oakley Reservoir on May 19, 2004. Fish less than 300 mm long believed to be age 0+ and age 1+ were collected and submitted for OTC analysis. Fifty six walleye fry were examined for OTC marks and the marked fish comprised 26.8% of the total sample. It is recommended that monitoring continue in future years to better assess walleye out-plant recruitment into the fishery. It was also recommended that OTC marked fry be examined in years with higher water levels and monitor corresponding recruitment of those fish into the population.

Forage fish monitoring for walleye was conducted on Salmon Falls Creek Reservoir on August 10, 2004. Ten standardized sites were electrofished. Data suggests that forage is available for walleye. Continuing forage species evaluation and monitoring is recommended using the standard electrofishing locations. It is also recommended that forage preference be examined to add value to forage fish monitoring data.

Conner Pond was renovated on October 19, 2004 with a piscicide application, and restocked with rainbow trout in December 2004. The lake will be managed as a put and take mixed fishery with largemouth bass and bluegill introductions scheduled for the spring of 2005.

A standard lowland lake survey was completed on Stone Reservoir on July 27 and 28, 2004. Black crappie *Pomoxis nigromaculatus*, white crappie *Pomoxis annularis*, largemouth bass, yellow perch, hatchery rainbow trout, and common carp were sampled. White crappie, rainbow trout and common carp comprised the majority of the total catch, and relative biomass was dominated by rainbow trout and common carp. Low resulting proportional stock density (PSD) values indicated the populations of white crappie, largemouth bass and yellow perch were mainly comprised of smaller fish. Slow growth of warm water fish in this reservoir is suspected. Age and growth data to support this theory was not collected, but length frequency histograms lend some support to this speculation. Temperature and dissolved oxygen profiles indicated suitable conditions for both warm and cold water fishes.

INTRODUCTION

Anderson Pond 3 (Hagerman WMA)

Anderson Pond 3 is located on the IDFG Hagerman Wildlife Management Area (WMA) approximately five kilometers south of Hagerman, Idaho. Anderson Pond 3 is one of a series of ponds located on the WMA managed for both fish and wildlife. The primary sources of water for Hagerman WMA ponds are Riley Creek and Tucker Springs. Anderson Pond 3 is managed as a warm water fishery primarily for largemouth bass and bluegill sunfish. Channel catfish were stocked in 2002 and 2003. However, no angler success on channel catfish was reported. In an effort to increase angler success, catfish stocking rates were increased in 2003.

The objective of sampling efforts conducted in 2004 was to evaluate the effect of increased stocking rates on channel catfish densities in Anderson Pond 3.

Trap nets were set to detect the presence of channel catfish in an effort to evaluate current stocking rates and subsequent catfish survival. Anderson Pond 3 was sampled with six units of trap net effort from August 2 - 4, 2004. Trap nets were positioned in areas considered to be catfish habitat. All trap nets were baited.

Anderson Ranch Reservoir

Anderson Ranch Reservoir is a U.S. Bureau of Reclamation impoundment on the South Fork Boise River in Elmore, County with a maximum storage capacity of 60,832 ha/m, of which 3,575 ha/m is considered dead storage (U.S.G.S. 1996). Anglers fishing Anderson Ranch Reservoir target primarily kokanee, rainbow trout, smallmouth bass and yellow perch. Bull trout *Salvelinus confluentus* and various other nongame fish species are also present. Kokanee are managed for a consumptive fishery with a daily bag limit of 25 fish and a possession limit of 50.

The South Fork Boise River upstream of Anderson Ranch Reservoir flows mostly through U.S. Forest Service lands in Elmore and Camas counties. Kokanee migrate upstream from Anderson Ranch Reservoir to spawn in the river from late August into early October. Annual kokanee spawner counts have been conducted in an effort to monitor kokanee recruitment in Anderson Ranch Reservoir since 1989. Recruitment estimates may be used to evaluate the need for supplementation or limitation of spawner escapement in an effort to balance numbers and growth.

Kokanee spawner counts were conducted in 2004 on the South Fork Boise River in an effort to continue annual monitoring of kokanee recruitment to Anderson Ranch Reservoir.

Kokanee spawning was monitored between August 19 and October 8, 2004 with counts of spawning adult fish at 13 sites on the South Fork Boise River and Trinity Creek. These are standard sites at which counts have been made since 1989 for spawner trend information except for the trap site just downstream of the Pine Bridge, which was added to the survey in 1990 (Partridge and Corsi 1993). Survey sites are accessed by way of a paved and gravel graded road that follows the river from Pine to the confluence of Big Smokey Creek. Site locations are listed in association with Table 1.

Lower Salmon Falls Reservoir (Bell Rapids)

Lower Salmon Falls Reservoir (Bell Rapids) was created by the construction of Lower Salmon Falls Dam on the Snake River upstream from Bliss in 1907 at the site of a natural falls. A new dam, constructed at the site in 1949, increased the reservoir volume impounding water upstream for a distance of 11 kilometers (km). The reservoir has a surface area of approximately 340 ha and a maximum depth of about 12 m. While dominated by non-game species such as carp

and suckers, the reservoir supports a fishery for largemouth bass, smallmouth bass, and stocked rainbow trout. Lower Salmon Falls Reservoir is currently managed as a quality bass fishery with restrictive regulations including seasonal catch and release and a slot limit of 305 to 406 mm.

The objective of 2004 electrofishing effort was to evaluate largemouth bass age structure and restrictive regulation effects.

One evening of electrofishing effort was conducted in the Buckeye Bay area of Lower Salmon Falls Reservoir on August 31, 2004. Total length of all largemouth bass was measured.

Dierkes Lake

Dierkes Lake in Twin Falls County is managed as an urban fishery for both warm and coldwater fish species. It is stocked in the spring and fall with catchable sized rainbow trout and supports a population of largemouth bass and bluegill. Dierkes Lake has also been stocked with channel catfish fingerlings for the last few years.

A restrictive largemouth bass regulation listed as a two-fish limit with none less than 508 mm was implemented in 1994. This regulation was implemented after surveys in 1991 and 1993 indicated that there was a dense population of stunted bluegill (Partridge et al. 1994, Partridge et al. 1995). The fishery has since been sampled in 1997 (Partridge et al. 2001) and 2003 (Warren et al., in print) to evaluate regulation effects on reducing bluegill numbers and increasing bluegill size. Results indicated the restrictive regulation was not effective. Regional recommendation was to reevaluate the continuation of the restrictive regulation given its lack of success.

A creel survey including an angler questionnaire was conducted in 2004. The objectives of the 2004 creel survey were to evaluate catch rates and harvest of largemouth bass and other sport fish in Dierkes Lake and to objectively determine how anglers would prefer largemouth bass are managed.

A stratified random creel survey as conducted on Dierkes Lake from May 1 to September 17, 2004. The designated time period was broken into four 35 day sample periods. Each period was stratified by day type (e.g. weekdays and weekends/holidays). Sample days and times were randomly assigned within each period. Sample times were limited to one-half hour prior to sunrise and one-half hour following sunset. Angler counts and interviews were conducted on four weekdays and four weekend/holiday days in each period. The lake was considered one section. Angler information collected included: residency, hours fished, fishing method, and fish caught (kept or released). In addition, a questionnaire was used to survey anglers on largemouth bass management options being considered for upcoming rules cycle changes. Interviewed anglers were asked if they preferred Dierkes Lake trophy bass regulations to remain the same, switch to general statewide bass regulations, or switch to a six bass daily limit – no size restrictions. Anglers were also provided a "no opinion" option.

Dog Creek Reservoir

Dog Creek Reservoir (Irving Reservoir) is a 38 ha impoundment located approximately 10 km northwest of Gooding, Idaho. Stored water is held for the benefit of fish and wildlife with the only fluctuations in levels resulting from the fall removal and spring replacement of dam boards for dam safety purposes. This usually results in a maximum annual fluctuation of one meter or less. The reservoir offers a diversity of fishing opportunities including: yellow perch, put-and-take rainbow trout, largemouth bass, bluegill, channel catfish, tiger muskellunge *Esox lucius x E. masquinongy* and brown bullhead *Ameiurus nebulosus*. An average of 3,000 channel catfish fingerlings have been stocked in Dog Creek Reservoir in intermittent years since 1991. The number of channel catfish stocked in Dog Creek Reservoir was increased in 2003 in response to perceived low angler

success. The fishery was sampled in 2004 in an effort to determine the success of the channel catfish stocking program.

Trap nets were set to detect the presence of channel catfish and evaluate channel catfish stocking rates. Dog Creek Reservoir was sampled with six units of trap net effort from August 2 - 4, 2004. Trap nets were set in areas considered to be ideal catfish habitat. All trap nets were baited.

Emerald Lake

Emerald Lake is a 12 ha gravel pit pond located along Interstate 84 northeast of Burley, Idaho. Maximum depth is approximately 2.9 m, with a mean depth of 2.0 m. Water for the pond is primarily from ground water with some additional input from irrigation canals. The pond area is managed as a park by Minidoka County. Emerald Lake is managed as a rainbow trout fishery providing urban fishing opportunities in the Burley area. The fishery is maintained by annual stocking.

Recent angler reports indicated poor growth and survival of present game fish. It was suspected that non-game fish were occupying the majority of the available biomass in the lake, restricting rainbow trout success.

The objective of this population survey was to determine the relative abundance of present game and non-game species. Collected information was used to determine the potential need for lake renovation.

A total of one unit electrofishing effort (boat) was completed on May 17, 2004. Both game and non-game fish were collected. Sampled fishes were used to estimate relative abundance of each collected species in the population.

Lake Walcott

Lake Walcott was formed in 1906 following completion of Minidoka Dam. Lake Walcott was constructed primarily for power production and irrigation. The reservoir covers an area of approximately 4,900 ha and lies at an elevation of 1,385 m. The Minidoka National Wildlife Refuge surrounds Lake Walcott, which is located about 19 km northeast of the town of Rupert, Idaho in Minidoka County. The reservoir is relatively shallow and composed of large marsh areas located along shoreline reaches. The system currently supports a substantial non-game fish community comprised primarily of Utah chub *Gila atraria*, carp, and various sucker species *Catostomous spp.* Game fish species present include: smallmouth bass, rainbow trout, and yellow perch. Largemouth bass were introduced into the reservoir in the 1970's, but were not successful (Grunder et al. 1988). Smallmouth bass were introduced in 1988 and 1990 and have expanded through natural recruitment.

Lake Walcott sampling efforts in 2004 were conducted as part of standardized population trend monitoring of regional waters.

A standard lowland lake survey was conducted on Lake Walcott in June and July of 2004. A total of five lowland lake units of effort were completed. Upper reservoir sites were sampled by IDFG Southeast Region fisheries personnel between June 15 and 17, 2004 and on June 29, 2004. Upper reservoir data is included in this report. Lower reservoir sites were sampled by IDFG Magic Valley Region fisheries personnel on June 7 and 8; and July 21 and 22. Sampling efforts were delayed until July by Magic Valley Region personnel in the main reservoir due to mechanical problems with electrofishing equipment. Sampling locations were arbitrarily chosen to represent the entire reservoir. Zooplankton samples and water quality measures were also collected at locations throughout the reservoir. Location coordinates are listed in Table 2 along with Lake Walcott zooplankton and water quality sample sites. Zooplankton samples were collected and analyzed

using criteria described by Teuscher 1999. Zooplankton Quality Index (ZQI) values were calculated for each site with the mean of all sites reported.

Oakley Reservoir

Oakley Reservoir is a 548 ha irrigation impoundment located in the lower reaches of the Goose Creek and Trapper Creek drainages. The fishery is managed for rainbow trout and walleye. Other species present include yellow perch, bluegill sunfish, and several sucker specie. Spottail shiners were introduced in 1989 to provide additional forage walleye.

Forage fish monitoring is conducted annually in Oakley Reservoir to evaluate walleye prey availability. In addition, walleye recruitment into the fishery from stocked and naturalized sources has been evaluated following out-plants since 2002. The objectives of Oakley Reservoir investigations conducted in 2004 were to continue forage monitoring and evaluate walleye recruitment into the fishery from stocked and naturalized sources.

Forage monitoring was conducted following standardized protocol for Oakley Reservoir on August 12, 2004. Protocol consist of electrofishing 10 standard locations. Location coordinates are listed in Table 3. Prior to 2004, forage samples were collected using a beach seine. Standard protocol was changed to account for poor seining conditions associated with variable water levels in the reservoir. Resulting data were used to define relative abundances of forage species.

A total of 500,000 walleye fry were stocked into Oakley Reservoir on May 19, 2004. The fry were shipped from Garrison National Fish Hatchery in a solution of 700 mg/l of OTC. The OTC mark was used to distinguish hatchery stock from naturalized recruitment. Young-of-the-year (YOY) walleye were subsequently sampled in coordination with forage monitoring efforts conducted on August 12, 2004. Walleye that appeared to be older than age 1+ were released. Walleye that appeared to be Age 0+ and age 1+ (less than 300 mm long) were frozen and sent to Ron Brooks at the Fisheries and Illinois Aquaculture Center and Department of Zoology at Southern Illinois University in Carbondale, Illinois for analysis. Otoliths were inspected for presence of OTC marks. Marked and unmarked fish were represented as a percentage of the total sample.

Salmon Falls Creek Reservoir

Salmon Falls Creek Reservoir is a 1,400 ha impoundment with a capacity for 28,944 ha of water at full pool. It is managed as an on demand irrigation impoundment. The irrigation outlet is over 30 m above the historic stream channel, leaving a significant volume of inactive storage water in the reservoir. The fishery is managed for walleye, rainbow trout, kokanee, yellow perch, and smallmouth bass. Additional species present include crappie, spottail shiner, and several sucker specie. Spottail shiners were introduced in 1987 to provide additional forage for walleye. Standardized forage fish monitoring is conducted annually in Salmon Falls Creek Reservoir to evaluate walleye prey availability.

The objective of Salmon Falls Creek Reservoir investigations conducted in 2004 was to continue standard forage fish monitoring.

Forage monitoring was conducted following standardized protocol for Salmon Falls Creek Reservoir. Protocol consist of electrofishing 10 minute units of effort at 10 standard locations. Location coordinates are listed in Table 4. Prior to 2004, forage samples were collected using a beach seine. Standard protocol was changed to account for poor seining conditions associated with variable water levels in the reservoir.

Stone Reservoir

Stone Reservoir is an irrigation storage reservoir located on Deep Creek in Oneida County, Idaho (Sec 35, T15S, R32E). Deep Creek is a tributary to Salt Lake in the Great Basin. The

reservoir is 11 km north of Snowville, Utah at an elevation of 1,400 m. The reservoir is owned by the Delmore Canal Company and provides irrigation water to lands both in Idaho and Utah. The reservoir encompasses approximately 123 ha. Stone Reservoir supports a mixed fishery consisting of black crappie, white crappie, largemouth bass, yellow perch, hatchery rainbow trout, and common carp.

A lowland lake survey was conducted on Stone Reservoir in 2004 to continue monitoring of population trends in regional waters.

A standard lowland lake survey was conducted on July 27 and 28, 2004. Two lowland lake units of effort were completed. Sampling efforts were conducted at standardized locations. Sample site coordinates are listed in Table 5.

OBJECTIVES

To obtain current information for fishery management decisions on lowland lakes and reservoirs, including angler use, success, harvest and opinions, fish population characteristics, stocking success, return-to-the-creel for hatchery trout, limnology and to develop appropriate management recommendations.

METHODS

Lowland lake surveys are conducted utilizing IDFG standardized protocol. One unit of effort under standard protocol consists of one trap net night, one sinking gill net night, one floating gill net night and one hour of night-time electrofishing. Sample locations are initially randomly determined and maintained for future surveys. A description of equipment used in lowland lake surveys is listed in Appendix 2.

Lowland lake surveys direct equal effort for collection of all species present. Two netters are used to collect fish in electrofishing efforts. All fish sampled during lowland lake surveys are identified and measured with a sub-sample weighed. Data is summarized by species for length, weight, relative abundance, relative biomass, and catch per unit of effort. Population indices such as PSD and relative weights (Wr) are calculated following methods described by Anderson and Newman (1996) when appropriate.

Water quality measures collected include: temperature, dissolved oxygen, specific and ambient conductivity, secchi depth, total alkalinity, and total hardness. Water quality measures are collected during day-time hours. Zooplankton samples are collected from three locations distributed throughout the lake or reservoir. ZQI is determined from collected samples as described by Teuscher (1999). ZQI is used to evaluate productivity in the given water body.

RESULTS AND DISCUSSION

Anderson Pond 3 (Hagerman WMA)

No channel catfish were collected in sampling efforts. Incidental trap net catch included largemouth bass, bluegill, and white sturgeon (Table 6). Incidental angler reports indicated no harvest of channel catfish. The absence of channel catfish in sampling efforts and lack of angler success on channel catfish suggested poor survival of 2003 out-plants. Consequently, channel catfish stocking efforts have been discontinued. It was reported that Anderson Pond 3 was flooded as a result of an irrigation canal problem. Flooding may have allowed fish to move into adjacent Riley Creek Pond although angler reports did not support this theory. In an effort to maintain a catfish fishery at the Hagerman WMA, catfish out-plants will be made in Riley Creek Pond also located on the Hagerman WMA. It is recommended that Riley Creek Pond catfish plants be evaluated to determine stocking success.

Anderson Ranch Reservoir

The total count of kokanee spawners among all sites combined across dates was 307 fish (Table 1). Kokanee spawner counts have been declining since a high in 1998 (Figure 3) and were well below the average of 6,200 fish reported for years 1989 to 2003 by Warren et al. 2003. Recent low reservoir water levels associated with drought conditions are suspected to negatively affect kokanee spawner access to the South Fork Boise River. Low reservoir water levels result in a braided channel making migration difficult. In addition, migrating adults are more vulnerable to predation in the shallow channel structure. Some effort has been made to investigate reservoir water level manipulations as a means of improving kokanee spawner access. To date no water level management plan has been formed.

Current spawner count methods require consistent river and stream channel form from year-to-year and consistent investigator accuracy for meaningful comparisons between years. These requirements are not met which creates highly variable data. Due to inconsistencies in current methods for counting spawning kokanee in the South Fork Boise River it is recommended that alternate techniques be investigated.

Lower Salmon Falls Reservoir (Bell Rapids)

Electrofishing efforts sampled 101 largemouth bass. Incidental catches of six bluegill and seven yellow perch were also made. Evaluation of largemouth bass length frequencies did not clearly define multiple age-classes (Figure 4). However, length frequency evaluation did suggest larger fish are misrepresented in the sample. A PSD of 25 supports the evaluation of length frequency data. Warren et al. 2001 report a largemouth bass PSD of 72 for electrofishing efforts conducted in July of 1997. Misrepresentation of larger older age-class fish may reflect sampling bias. Sampling bias may have resulted from temporal differences in samples between 1997 and 2004 and limited sampling effort in 2004. Effort in the prior investigation was spread throughout the reservoir. It is recommended that future sampling be conducted in early summer or fall to better sample all age-classes. In addition, a more in-depth evaluation of the largemouth bass population structure is warranted given sampled age structure in this limited effort.

Dierkes Lake

Analyses of Dierkes Lake creel efforts were not completed. New software designated for creel analysis is currently undergoing testing and evaluation. Creel survey results will be reported in the 2005 annual report.

Preliminary analysis indicated Dierkes Lake was a high-use fishery, rainbow trout made up the majority of fish caught and harvested by anglers, and reported catches of largemouth bass were insignificant. Survey questionnaire results indicated the majority of those surveyed preferred modification of the existing regulations (Table 7). Of those that indicated a change was preferred, the majority were interested in general statewide largemouth bass regulations. Given the preliminary results, it is recommended that proposed changes in largemouth bass regulations be scoped to the general public in the 2005 rules cycle.

Dog Creek Reservoir

A total of 11 channel catfish were sampled at a rate of 1.83 fish per unit effort. Catfish collected were between 140 and 560 mm and speculated to represent several years of out-plants. A standard lowland lake sample conducted in 2002 did not detect channel catfish in trap net samples (IDFG, unpublished data). However, channel catfish were captured by electrofishing and gillnetting efforts combined at a rate of 3 fish per unit effort. It is unclear whether trap nets used in 2002 were baited. Trap nets in 2004 were baited to maximize success. Although, previous trap netting details are unknown, the perceived increase in trap net catch rate was considered to be potentially related

to increases in stocking rate (Table 8). With an interest in providing catfish fisheries throughout the region, maintenance of higher stocking rates is recommended in Dog Creek Reservoir.

Emerald Lake

The Emerald Lake population survey indicated the fish community was primarily dominated by non-game fishes (92.3%) (Table 9). Non-game fish present included fathead minnow, common carp, and Utah sucker. Although present, game fish including hatchery rainbow trout, smallmouth bass and pumpkinseed sunfish *L. gibbosus* comprised only 7.7%. Sufficient data were not collected for evaluating relative biomass composition of each species. However, it was suspected that common carp and Utah sucker averaging 2.8 kg and 2.0 kg respectively, dominated the present biomass. Emerald Lake was renovated in October of 2004 by piscicide application. Out-plant of rainbow trout was reinitiated in December of 2004. Emerald Lake will be maintained as a put and take rainbow trout fishery.

Lake Walcott

Sampled fishes in order of greatest number caught included: Utah chub, smallmouth bass, common carp, Utah, sucker, large scale sucker *C. macrocheilus*, rainbow trout (identified hatchery and non hatchery origin), redside shiner *Richardsonius balteatus*, yellow perch, and sculpin species *Cottus spp.* (Table 10). Catch biomass was dominated by Utah chub, carp, and large scale sucker. Species specific population characteristics of sampled fished are listed in Table 10.

Survey results indicated a shift in species composition from 1987 sample efforts (Grunder et al. 1988). Previous records indicate yellow perch as the only game fish present. Samples now indicate the presence smallmouth and rainbow trout. Although, rainbow trout catches were not listed in previous reports they were stocked on an annual basis at that time (Grunder et al. 1987, Grunder et al. 1988). Grunder et al. 1987 reported rainbow trout were commonly entrained through Minidoka dam. Relatively recent changes in structure and operation in Minidoka dam have reportedly reduced entrainment.

Smallmouth bass introductions have been successful in many portions of the main Snake River. Given the available habitat in Lake Walcott, specifically rocky shoreline bluffs, it is not surprising they have done well in this location. Smallmouth introductions are likely responsible for a shift in yellow perch abundance. Historic reports indicated yellow perch comprised approximately 14% of gill net catches (Grunder et al. 1988) whereas their numbers were very low (>1%) in this sample.

Although not explored thoroughly it appears that differences in smallmouth population structures potentially occur between the upper and lower Lake Walcott system. High average Wr (117) and good PSD (29) values are indicators that smallmouth bass habitat is sufficient to maintain a good fishery (Table 11). Observations by survey crews seem to indicate a greater component of larger, older age-class fish in the upper portion of the system. However, average total length of smallmouth by sample site did not vary widely, ranging from 156 to 180 mm. If true differences in smallmouth population structure did exist they may reflect the time at which sampling occurred. Mature fish were collected in the upper reservoir and river sections in June and were in pre-spawn/spawn condition. Those fish collected in July were primarily immature. Larger older age-class fish may have moved from shallow water habitats effectively sampled with electrofishing gear by the time main reservoir sampling was completed. Sampling efficiency differences between crews may also be responsible for catch differences. Walcott Reservoir and the river above the reservoir are also divided into boating and non-boating access areas associated with the Minidoka National Wildlife Refuge. Limited access may influence population structure by reducing fishing mortality. Currently, angler support exists for providing greater access to non-boating areas. It would be of value to understand this fishery and the potential that exists in non- boating areas given the current

interest. It is recommended that population structure be evaluated in motorized and non-motorized areas. Evaluations should incorporate standard techniques to limit other influential factors previously listed.

Mean ZQI was 0.33 which indicated conditions are moderately productive and adequate for stocking fingerling rainbow trout at a density of 75 to 150 per acre (Teuscher 1999). Plankton sampling results are presented in (Table 12). Teuscher 1999 previously reported a mean ZQI value in Lake Walcott of less than 0.1. Differences in measures between years may reflect annual variation or discrepancies in sample effort. Measured total alkalinity and total hardness were 114 mg/L $CaCo_3$ and 176 mg/L $CaCo_3$, respectively.

Oakley Reservoir

Forage fish sampled included sculpin spp. (8.74%), spottail shiner (11.48%), walleye (21.86%) and yellow perch (56.28%) (Table 13). Bluegill sunfish and several sucker spp. made up the remaining 1.6% of the total catch. Although, total catch of both YOY yellow perch and 0+ walleye were greater than 2003 catches (IDFG, unpublished data), changes in collection methods prohibit direct comparison. Data suggested forage is available for walleye. Continued monitoring of forage species is recommended. Use of electrofishing techniques at standardized locations for sampling forage species should allow for more consistent annual samples and comparability between years in the future. In an effort to add value to forage trend monitoring it is recommended that walleye forage preferences be evaluated.

Fifty six 0+ age walleye were examined for OTC marks. Hatchery and wild walleye constituted 27% and 73% of sampled fish, respectively. Results indicated the majority of walleye currently in the 0+ age-class were from natural reproduction. Reservoir water levels may play a role in natural walleye recruitment and out-plant success. Oakley Reservoir water levels throughout 2004 were well below full pool with reservoir water level only reaching the Trapper Creek arm. Reservoir storage level was only slightly over 25% capacity. It is recommended that OTC marked out-plants be made in years with higher water levels to evaluate this potential influence. OTC marked out-plants under variable water conditions might create a better understanding of out-plant success in relation to water level fluctuation. Understanding out-plant-success in relation to reservoir condition might provide a more productive stocking criterion. It is also recommended that walleye out-plant success monitoring be continued into subsequent years to better evaluate the recruitment into the fishery.

Salmon Falls Creek Reservoir

Forage fish sampled include black crappie, bluegill sunfish, smallmouth bass, spottail shiner, sucker species, and yellow perch (Table 14). Total catch of YOY yellow perch was greater than 2003 (IDFG, unpublished data). Although, changes in collection methods inhibited direct comparison, data suggested forage is available for walleye. Continued monitoring of forage species is recommended. Use of electrofishing techniques at standardized locations for sampling forage species should allow for more consistent annual samples and comparability between years in the future. In an effort to add value to forage trend monitoring it is recommended that walleye forage preferences be evaluated.

Stone Reservoir

Species sampled during the Stone Reservoir survey included: black crappie, white crappie, largemouth bass, yellow perch, hatchery rainbow trout, and common carp. White crappie, rainbow trout and common carp dominated the catch across sample efforts. However, relative biomass was dominated primarily by rainbow trout and common carp. Fish data are summarized in Table 15. Crappie were not present in the previous lowland lake sampling efforts (Partridge and Warren 1994) despite the reported presence of black crappie in a previous 1986 survey (Grunder et al. 1987).

Black crappie were reportedly stocked in Stone Reservoir in 1993 following a period of low water conditions believed to have negatively influenced crappie numbers (Partridge and Warren 1995). No documentation exists indicating white crappie were introduced into the system legally. The potential for misidentification was not evaluated.

PSD and values for white crappie and yellow perch populations indicate a high mortality likely associated with either harvest or largemouth bass predation (Table 16). Largemouth bass PSD's have been shown to be inversely related to forage fish PSD such as yellow perch and bluegill (Guy and Willis 1991). Additionally, the catch composition and species specific mean lengths further support the theory that the fishery is unbalanced (Figures 5, 6, and 7). Relative weight values derived for largemouth bass indicated fish are foraging successfully; however it appears as though forage may be limited or becoming limited. Relative weight measures indicated white crappie and yellow perch may also be forage limited. Low water conditions can concentrate forage fish species and eliminate their cover resulting in increased competition for food. Concentrated forage fish would be vulnerable to largemouth bass resulting in high Wr and reasonable PSDs. This is likely the case in Stone Reservoir. No relative weight was calculated for preferred size yellow perch as none were captured.

Temperature and dissolved oxygen profiles (Figures 8 and 9) collected in the upper and lower reaches of the reservoir indicated that suitable summer conditions were present. Water chemistry measurements were collected mid-reservoir and were consistent with readings from other high desert reservoir systems in South Idaho (Table 17).

Table 1. Number of kokanee spawners observed at selected locations on the South Fork Boise River during spawner surveys from August 19 to October 8, 2004.

Location[a]	8/19	8/27	9/3	9/10	9/16	9/24	10/1	10/8
1	1	4	1	7	0	0	0	0
2	2	12	0	3	8	0	0	0
3	0	4	0	10	2	2	0	0
4	3	16	16	27	8	4	3	2
5	0	0	0	0	0	0	0	0
6	0	13	14	45	10	17	5	4
7	0	2	4	2	0	0	0	0
8	0	0	0	7	0	0	0	0
9	2	2	1	4	0	0	0	0
10	0	0	3	1	0	0	0	0
11	0	0	12	13	10	1	0	0
12	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0
Total:	8	53	51	119	38	24	8	6

[a] Site descriptions:

1 - Trap site: NW1/4, NE1/4, Sec 30, T2N, R10E

2 - Prospect hole: NW1/4, NE1/4, Sec 18, T2N, R10E

3 - Johnson hole: SW1/4, NE1/4, Sec 5, T2N, R10E

4 - Paradise hole: SW1/4, NW1/4, Sec 33, T3N, R10E

5 - Trinity Creek: SE1/4, SW1/4, Sec 9, T3N, R10E

6 - Section 10 hole: SE1/4, NE1/4, Sec 10, T3N, R10E

7 - Chaparral campground: NE1/4, NE1/4, Sec 12, T3N, R10E

8 - Ranger station hole: NE1/4, NE1/4, Sec 8, T3N, R11E

9 - Virginia Gulch Bridge: SE1/4, SE1/4, Sec 9, T3N, R11E

10 - Baumgartner campground hole: SE1/4, SE1/4, Sec 7, T3N, R12E

11 - Deadwood confluence: NE1/4, NE1/4, Sec 22, T3N, R12E

12 - Big hole: SE1/4, SW1/4, Sec 18, T3N, R13E

13 - Smoky Creek confluence: SE1/4, SW1/4, Sec 9, T3N, R13E

Table 2. Lake Walcott zooplankton and water quality sample sites by relative reservoir location.

Date	Sample	Site	UTM – NAD27
8/4/2005	ZQI	Lower	298,713 m E : 4,727,062 m N Z12
8/4/2005	ZQI	Middle	304,064 m E : 4,726,892 m N Z12
8/4/2005	ZQI	Upper	308,856 m E : 4,724,637 m N Z12

Table 3. Sample locations by UTM for standard Oakley Reservoir forage survey (UTM NAD 27).

Site	Location
1	752,710 m E, 4,674,526 m N, Z11
2	752,911 m E, 4,673,532 m N, Z11
3	752,880 m E, 4,672,086 m N, Z11
4	752,912 m E, 4,671,197 m N, Z11
5	753,034 m E, 4,670,090 m N, Z11
6	753,219 m E, 4,669,541 m N, Z11
7	753,309 m E, 4,671,656 m N, Z11
8	754,478 m E, 4,675,924 m N, Z11
9	754,082 m E, 4,675,465 m N, Z11
10	753,685 m E, 4,675,006 m N, Z11

Table 4. Sample locations by UTM (NAD 27) for standard Salmon Falls Creek Reservoir forage monitoring.

Site	Location
1	687,266 m E, 4,675,487 m N, Z11
2	686,020 m E, 4,673,058 m N, Z11
3	685,993 m E, 4,670,505 m N, Z11
4	687,168 m E, 4,669,654 m N, Z11
5	687,514 m E, 4,668,195 m N, Z11
6	687,767 m E, 4,666,582 m N, Z11
7	686,059 m E, 4,665,200 m N, Z11
8	685,679 m E, 4,663,581 m N, Z11
9	686,130 m E, 4,663,138 m N, Z11
10	684,796 m E, 4,660,530 m N, Z11

Table 5. Stone Reservoir lowland lakes survey sample locations. Data represent site, general location, gear used, and UTM coordinates. Electrofishing (ELEC), sinking gill net (SGN), floating gill net (FGN), trap net (TPN).

Site	Location	Gear	UTM
1	DAM	ELEC	359,903 m E, 4,658,595 m N, Z 12
2	DAM	SGN	358,834 m E, 4,659,178 m N, Z 12
3	DAM	FGN	358,815 m E, 4,659,454 m N, Z 12
4	DAM	TPN	360,550 m E, 4,660,596 m N, Z 12
5	INLET	ELEC	360,466 m E, 4,660,670 m N, Z 12
6	INLET	SGN	360,424 m E, 4,660,492 m N, Z 12
7	INLET	FGN	360,466 m E, 4,660,677 m N, Z 12
8	INLET	TPN	359,815 m E, 4,659,298 m N, Z 12

Table 6. Anderson Pond #3 2004 trap net catch summary. Summarized results by species include: total catch (N), catch per net night (CPUE), and percent of total catch (% CATCH).

	N	CPUE	% CATCH
Bluegill	51	8.50	60
Largemouth Bass	16	2.67	19
White Sturgeon	18	3.00	21

Table 7. Results from the 2004 Dierkes Lake angler survey questionnaire regarding largemouth bass management. Angler responses (N) are listed by survey question.

SURVEY QUESTION	N
Remain the same; 2 bass daily bag limit with none less than 20 inches long	25
Be switched to the general statewide rule; 6 bass daily bag limit, none less than 12 in	19
Be switched to a six bass daily bag limit with no size restrictions	5
I have no opinion on this	13
Total number of anglers surveyed	**62**

Table 8. Dog Cr. Reservoir 2004 trap net results. Results listed by number caught (N), minimum and maximum total length (TL), average total length (TL), catch per unit effort (CPUE), and percent of total catch by species (% CATCH). Average total length of yellow perch determined from n=3.

Species	N	Avg. TL	TL S.D.	CPUE	% Catch
Bluegill	3	--	--	0.50	3
Channel Catfish	11	311	141.6	1.83	11
Common Carp	23	--	--	3.83	24
Green Sunfish	6	--	--	1.00	6
Hatchery Rainbow Trout	9	--	--	1.50	9
Largemouth Bass	1	--	--	0.17	1
Largescale Sucker	29	--	--	4.83	30
Yellow Perch	14	163	15.3	2.33	15

Table 9. Summary of 2004 Emerald Lake electrofishing survey. Summarized catch data by species includes total catch (N), percent of total catch (% CATCH), and average total length (TL).

Species	N	% CATCH	AVG TL (mm)
Fathead Minnow	785	85.3	63
Common Carp	32	3.5	594
Utah Sucker	31	3.4	553
Bull Head	1	0.1	100
Pumpkinseed	68	7.4	94
Rainbow Trout	2	0.2	275
Smallmouth Bass	1	0.1	410

Table 10. Lake Walcott 2004 catch by species for all locations and gears. Summarized data include: total catch (N), total units of effort (EFFORT), catch per standard lowland lake unit of effort (CPUE), percent of total catch (% CATCH), and percent of total biomass caught (% BIOMASS).

Gear	Species	N	Effort	CPUE	Catch %	Biomass %
ALL	Carp	250	5	50	13.7	23.7
ALL	Hatchery Rainbow Trout	4	5	1	0.2	0.2
ALL	Largescale Sucker	77	5	15	4.2	19.6
ALL	Rainbow Trout	15	5	3	0.8	1.3
ALL	Redside Shiner	19	5	4	1.0	0.0
ALL	Sculpin spp	3	5	1	0.2	0.0
ALL	Smallmouth Bass	461	5	92	25.3	7.6
ALL	Utah Chub	885	5	177	48.5	42.4
ALL	Utah Sucker	95	5	19	5.2	5.1
ALL	Yellow Perch	15	5	3	0.8	0.0

Table 11 . Lake Walcott 2004 population characteristics by species. Summarized data include: average total length (AVG TL), minimum total length (MIN TL), maximum total length (MAX TL), preferred stock density (PSD), and relative weight (Wr). PSD and Wr measures were only calculated for smallmouth bass due to limited captures of other game fish.

Species	Avg. TL	Min TL	Max TL	PSD	Wr
Carp	227	30	800	--	--
Hatchery Rainbow Trout	294	265	325	--	--
Large Scale Sucker	497	210	630	--	--
Rainbow Trout	352	275	590	--	--
Redside Shiner	79	70	100	--	--
Sculpin spp	93	84	100	--	--
Smallmouth Bass	160	30	460	29	117
Utah Chub	260	40	420	--	--
Utah Sucker	188	60	670	--	--
Yellow Perch	111	91	190	--	--

Table 12. Zooplankton ratio (ZPR) and zooplankton quality index (ZQI) by site for samples collected from Walcott Reservoir 2004.

Date	Site	ZPR	ZQI
8/10/2004	Upper	1.00	0.04
8/10/2004	Middle	1.10	0.38
8/10/2004	Lower	0.85	0.57
		Mean ZQI	0.33

Table 13. Oakley Reservoir forage evaluation 2004 summary. Results listed by total catch (N), relative catch composition, and CPUE (fish < 150 mm/hr).

Species	N	%	CPUE
Bridge lip sucker	1	0.3	1
Sculpin spp.	32	8.9	19
Spottail shiner	42	11.6	25
Walleye	80	22.2	47
Yellow perch	206	57.1	121
TOTAL	361	100.1	213

Table 14. Salmon Falls Creek Reservoir 2004 forage evaluation summary. Results listed by total catch (N), percent composition by catch (%), and catch per hour (CPUE) for fish ≤ 150 mm.

Species	N	%	CPUE
Black crappie	16	15.0	12
Northern pike minnow	0	0.0	0
Sculpin spp.	0	0.0	0
Smallmouth bass	66	61.7	51
Spottail shiner	1	0.9	1
Sucker spp.	1	0.9	1
Walleye	0	0.0	0
Yellow perch	23	21.5	18
TOTAL	107	100.0	83

Table 15. Summary of Stone Reservoir lowland lake survey collections. Data represents total catch (N), percent of total catch (% CATCH), percent of total biomass (% BIOMASS), and catch per unit (CPUE).

Species	N	Catch (%)	Biomass (%)	CPUE
Black Crappie	4	0.7	0.2	2
Carp	149	26.8	38.7	75
Hatchery Rainbow Trout	221	39.7	46.9	111
Largemouth Bass	45	8.1	10.8	23
White Crappie	88	15.8	2.6	44
Yellow Perch	50	9.0	0.8	25
TOTAL	557	100.1	100.0	280

Table 16. Stone Reservoir lowland lake survey fish summary from 2004. Values represent average total length (AVG TL), min total length (MIN TL), maximum total length (MAX TL), preferred stock density (PSD), and relative weight of preferred size fish (Wr Pref).

Species	Avg. TL	Min TL	Max TL	PSD	Wr Pref
Black Crappie	140	100	220	--	--
Carp	328	100	450	--	--
Hatchery Rainbow Trout	277	200	350	--	--
Largemouth Bass	187	50	500	38.89	100.92
White Crappie	115	30	310	14.29	86.17
Yellow Perch	106	45	200	11.11	- na -

Table 17 . Stone Reservoir water quality measures evaluated on July 27, 2004.

Ambient conductivity (µs)	Specific conductivity (µs)	Salinity (‰)	Secchi depth (m)
775	794	0.4	1

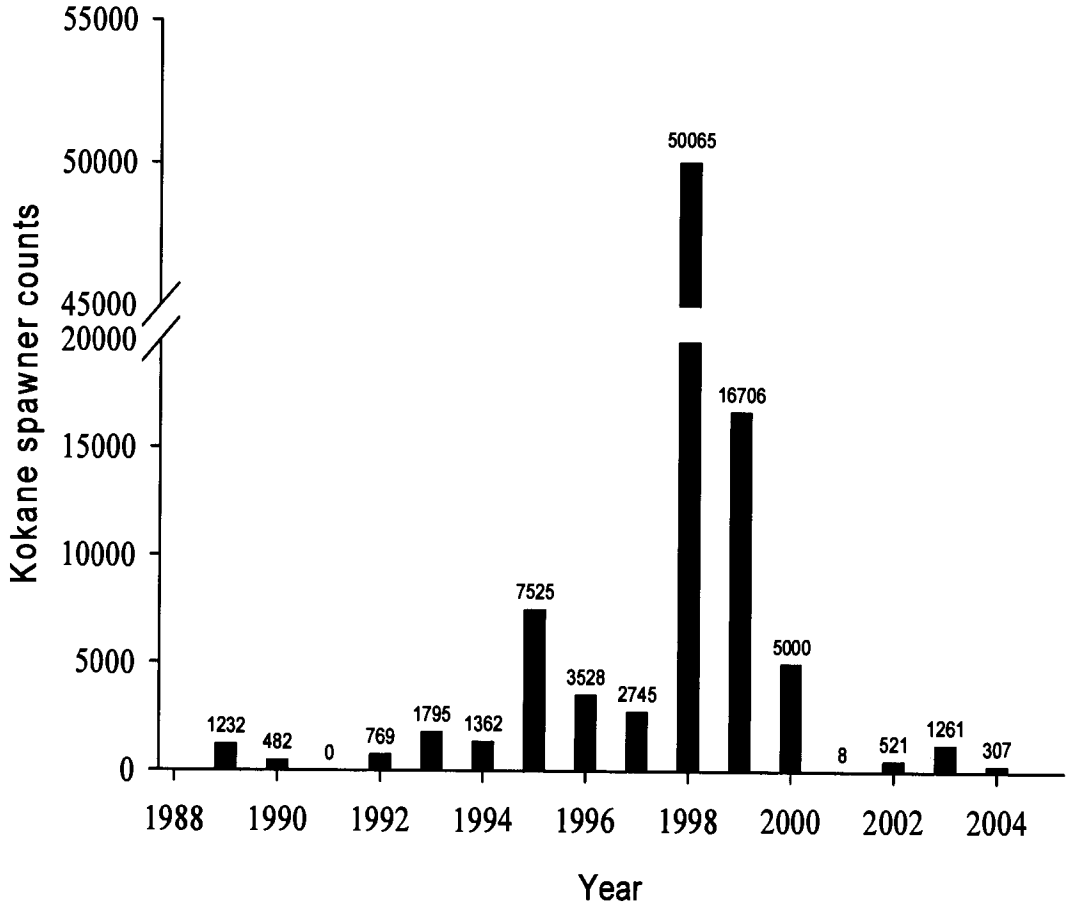

Figure 3. Total count of kokanee spawners in the South Fork Boise River upstream of Anderson Ranch Reservoir 1988 - 2004.

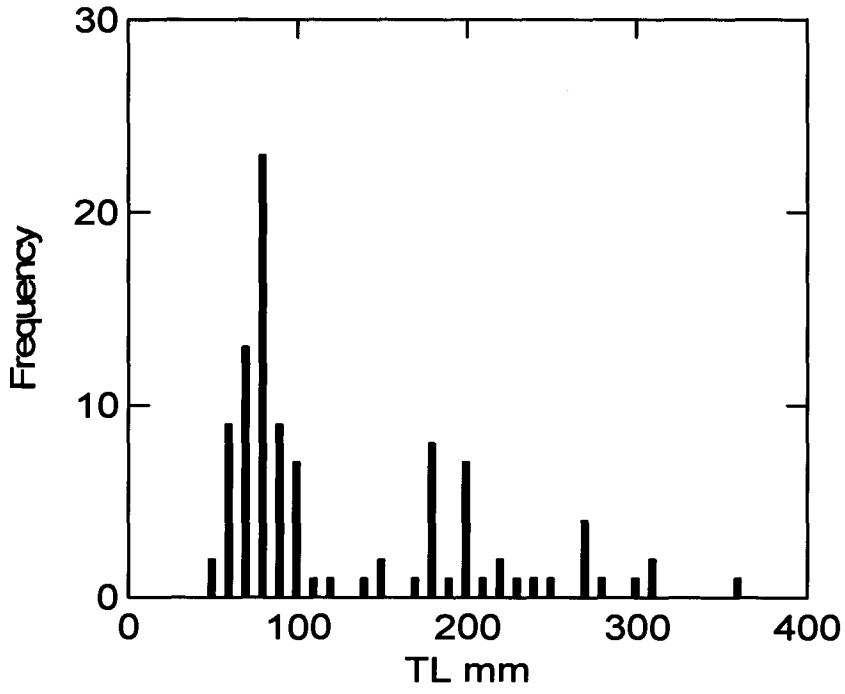

Figure 4. Length frequency of largemouth bass collected in Lower Salmon Falls Reservoir on August 31, 2004 by total length (TL).

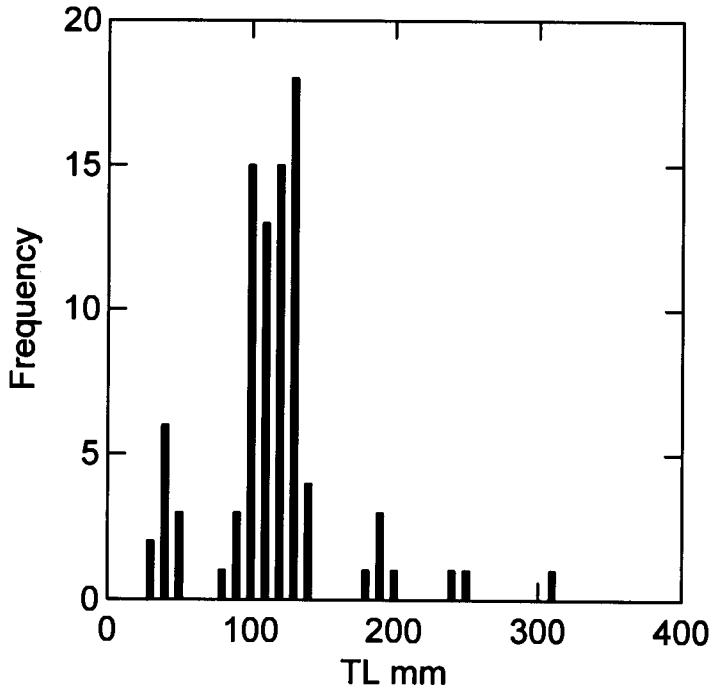

Figure 5. Length frequency of white crappie collected in Stone Reservoir July 27, 2004 by total length (TL).

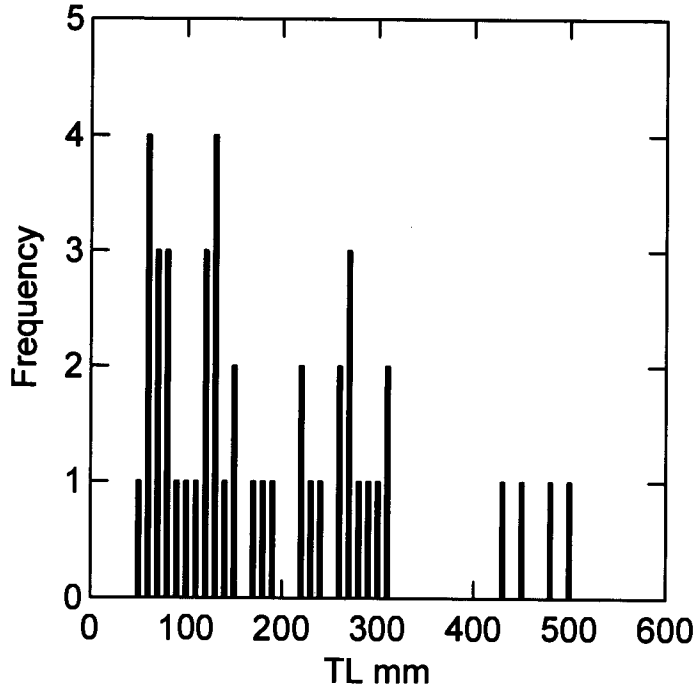

Figure 6. Length frequency largemouth bass collected in Stone Reservoir on July 27, 2004 by total length (TL).

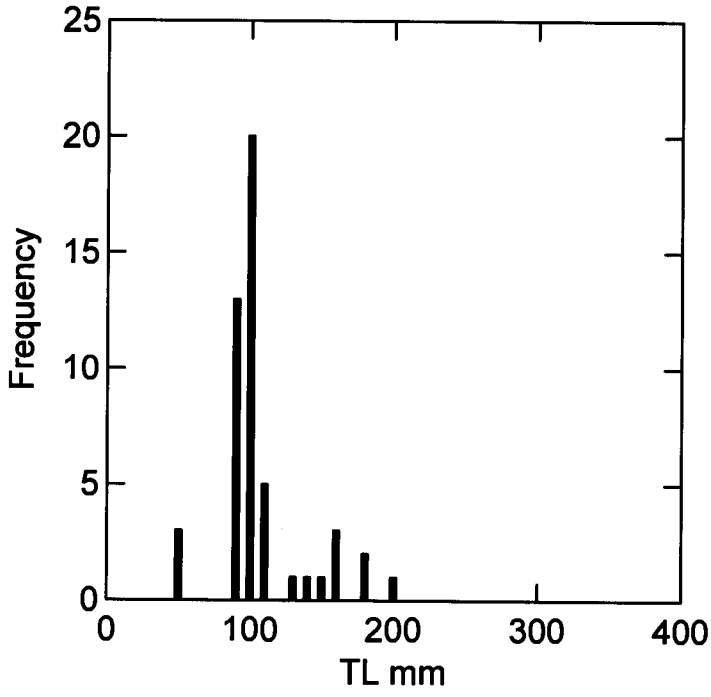

Figure 7. Length frequency of yellow perch collected from Stone Reservoir on July 27, 2004 by total length (TL).

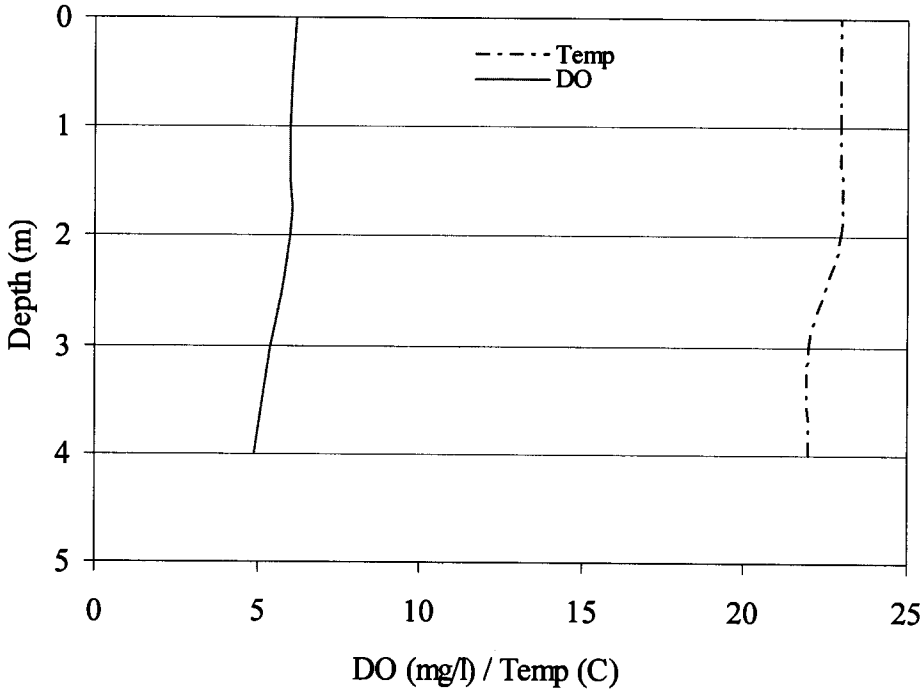

Figure 8. Stone Reservoir temperature (°C) and dissolved oxygen (mg/l) profile taken at UTM 359,962 M E; 4,658,618 M N; Z 12 on July 27, 2004.

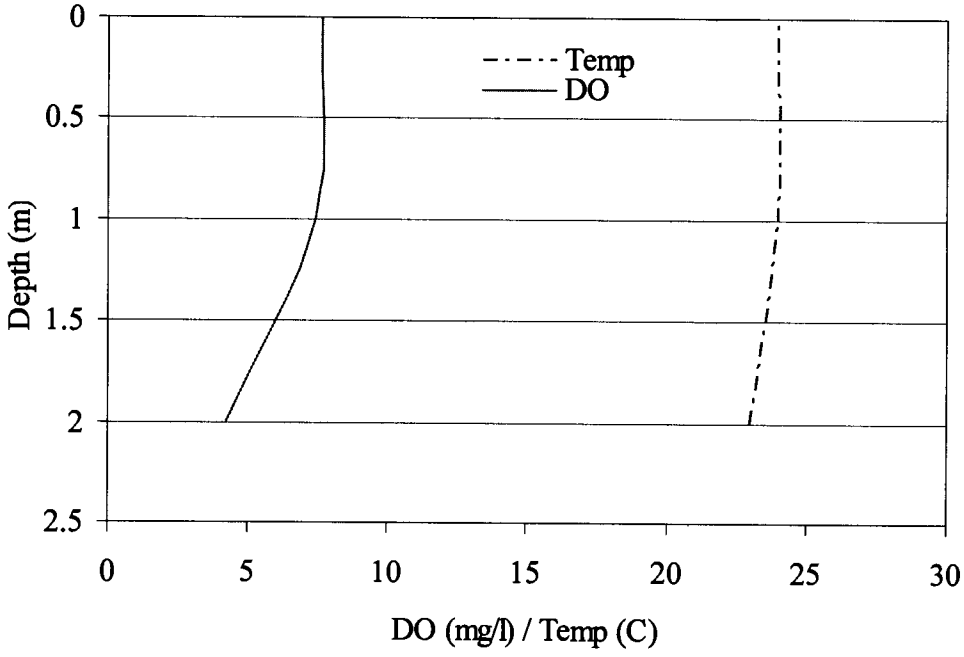

Figure 9. Stone Reservoir temperature (°C) and dissolved oxygen (mg/l) profile taken at UTM 360,168 M E; 4,659,121 M N; Z 12 on July 27, 2004.

2004 MAGIC VALLEY REGION FISHERY MANAGEMENT REPORT
LAKE RENOVATIONS

ABSTRACT

Connor Pond and Emerald lakes were renovated using liquid rotenone to remove non-game fish species and restore a sport fish fishery. A pre-treatment population survey indicated that the Emerald Lake fish community was dominated by non-game species. Angler information indicated non-game fish species were overly abundant in Connor Pond. Both lakes were renovated on October 20, 2004 with a liquid piscicide application, and Emerald Lake was restocked with rainbow trout in December 2004.

INTRODUCTION

Conner Pond

Connor pond (a.k.a. – Exit 208 Pond, Ponderosa Pond, or Burley Gravel Pit Pond) is a small gravel pit pond located northwest of the State Highway 27 – Interstate 84 interchange approximately 2.5 km north of Burley, ID. Connor pond encompasses approximately 10 ha and averages about two meters in depth. The pond receives irrigation return water and potentially ground water seepage. A formal easement is held by the IDFG for angler access to the pond.

Connor pond was previously managed for various warm water fishes. Recent reports indicated Connor Pond is dominated by non-game fishes (common carp, chub, shiners, dace *Rhinichthys spp.*) which have negatively influenced the fishery. Regional recommendation was to renovate Connor Pond and reinitiate a mixed or warm water fishery.

Renovation of Connor Pond was conducted on October 20, 2004. Synpren fish toxicant was used to treat 320,000 m^3. A total of 1,100 liters of chemical was applied at four mg/l. All chemical was applied with boats. One boat sprayed the water/shoreline zone and one boat applied chemical to the pelagic zone.

Emerald Lake

Emerald Lake is a gravel pit pond located along Interstate 84 northeast of Burley, Idaho. Emerald Lake encompasses approximately 16 ha with a mean depth of 2.0 m. Water for the pond is primarily from ground water with some additional input from irrigation canals. The pond area is managed as a park by Minidoka County. Emerald Lake is managed as a rainbow trout fishery, maintained by annual stocking.

A recent population survey and angler reports indicated poor growth and survival of present game fish. Common carp and chub were found to occupy the majority of the available biomass in the lake restricting rainbow trout success. Regional recommendation was to renovate Emerald Lake and reinitiate a rainbow trout fishery.

Renovation of Emerald Lake was conducted on 20 October, 2004. Synpren fish toxicant was used to treat 354,000 m^3 of lake and 0.5 km of stream. A total of 1440 liters (l) of chemical was applied at four mg/l to the standing water and 2.5 l to the inlet stream. Fish toxicant was applied through drip stations at the inlet and outlet and by boat to standing water. One boat sprayed the water/shoreline zone and one boat applied chemical to the pelagic zone.

OBJECTIVES

To remove the existing fish community from Emerald and Conner Ponds using approved piscicides and to restore game fish populations to provide fishing opportunities for the public.

RESULTS AND DISCUSSION

Conner Pond

Visual observations indicated a total removal of the existing fish population (common carp, chub, shiners, bluegill, largemouth bass, rainbow trout, and dace spp.. A mixed fishery will be re-established with rainbow trout and warm water species (bluegill and largemouth bass) being transplanted in the spring of 2005.

Emerald Lake

Effective treatment was confirmed. Confirmation consisted of the presence of dead fish (common carp, shiners, chub, bluegill, dace, smallmouth bass, rainbow trout) and visual observations. Hatchery rainbow trout were stocked into the lake in December 2004 and generated a popular ice fishery.

2004 MAGIC VALLEY REGION FISHERY MANAGEMENT REPORT
RIVERS AND STREAMS INVESTIGATIONS

ABSTRACT

A stratified random creel survey was conducted on Billingsley Creek from May to September, 2004. The creel survey was used to evaluate brown trout stocking success. Angler information collected included: residency, hours fished, fishing method, and fish caught. Creel survey results were highly variable and based on a small sample size. Few anglers were contacted throughout the duration of the creel suggesting angling pressure is limited. It was recommended that alternate methods be used to evaluate brown trout stocking success.

Multiple mark recapture population estimates were conducted at three locations on Stalker and Silver Creek in June and July, 2004. Surveys were initiated as standard monitoring sites. Density trends were not evaluated due to the inconsistent nature of sampling methods and locations in previous years; however, general trends in relative abundance from past to present suggest brown trout encroachment may be occurring. It was suspected that older age-class rainbow trout may be misrepresented in collected samples. An additional, nighttime effort in a different habitat type was recommended to evaluate potential sampling biases.

A creel survey was conducted at several Silver Creek access locations. Creel data was not evaluated due to software development difficulties and will be reported in 2005.

INTRODUCTION

Billingsley Creek

Billingsley Creek is a 13.6 km-long spring fed stream that flows into Lower Salmon Falls Reservoir, a Snake River impoundment near the town of Hagerman, Idaho. The stream is used extensively as a source for irrigation, commercial fish production, and hydroelectric production. Billingsley Creek is managed as a rainbow trout and brown trout *Salmo trutta* fishery. Brown trout stocking was discontinued in the mid 1990's but reinstituted in 2004 in an effort to enhance a mediocre rainbow trout fishery.

A creel survey was conducted in 2004 on Billingsley Creek in an effort to evaluate current use of the Billingsley creek fishery and evaluate brown trout stocking success.

A stratified random creel survey was conducted on Billingsley creek from May 29 to September 10, 2004. The designated time period was broken into four 40 day sample periods. Each period was stratified by day type. Strata included weekdays and weekends/holidays. Sample days and times were randomly assigned within each period. Sample times were limited to one half hour prior to sunrise and one half hour following sunset. Angler counts and interviews were conducted on four weekdays and four weekend/holiday days in each period. The creek was divided into three sections. Sections were delineated by available access points. Sections included the Bill Jones property access, the University of Idaho hatchery access, and the Billingsley Creek Wildlife Management Area (BCWMA) access (Table 18). Creel clerks interviewed anglers following each initial angler count. Angler information collected included: residency, hours fished, fishing method, and fish caught.

Stalker and Silver Creek

Silver Creek is a tributary to the Little Wood River in Blaine County, Idaho. Silver Creek originates from numerous springs. Stalker Creek, a main spring tributary originating on private land, flows eastward for approximately 7.5 km before merging with Grove Creek on The Nature Conservancy's Silver Creek Preserve. Silver Creek and its tributaries provide a popular destination fishery. Fishing rules provide restrictive gear angling in the upper portions of the stream. The fishery has been the focus of several studies over the past 10 years with research conducted on: telemetry monitored movements of brown trout and rainbow trout (Young et al. 1997), identification of aquatic community structure (Wilkison 1996), genetic analysis studies (Williams et al. 2000), and whirling disease (Spall et al. 1996).

In 2001 regional IDFG fishery personnel assisted the U.S. Geological Survey (USGS) with a biological survey that included a determination of fish species presence and a survey to estimate population densities of game fish on Silver Creek and Stalker Creek. Results will be reported by USGS.

The objective of 2004 survey efforts was to monitor relative abundance and density of game fish.

Fish were sampled by electrofishing in June and early July 2004 to monitor abundance of rainbow trout and brown trout (Table 19). Three segments of Silver Creek were sampled including: Stalker Creek, Silver Creek at the Cabin site (Cabin), and Silver Creek at Martin Bridge (Martin Bridge). Coordinates (UTM) designating sample boundaries are found in Table 20. Sample locations were selected as standard sample sites for continued monitoring in future years. Fish were collected using drift boat electrofishing techniques as described in the general methods. Netted fish were put into an oxygenated live well until they were identified to species, measured and weighed. Each site was sampled three times using multiple mark-recapture population estimate techniques.

Only fish ≥100 mm long were marked. The Schnable multiple mark recapture model was used for population estimation as described by Ricker (1975).

OBJECTIVES

To obtain current information for fishery management decisions on rivers and streams, including: angler use, success, harvest, fish population characteristics, spawning success, habitat characteristics, return-to-the-creel for hatchery trout, and social concerns pertaining to fish management or their overall fishing experience.

METHODS - STREAM SAMPLING

River and stream surveys are conducted using electrofishing equipment. Fish are typically sampled with pulsed direct current (DC). Four different electrofishing assemblies are commonly used to conduct surveys, depending on the size of river or stream sampled. Smaller wadeable streams are sampled with a backpack electrofishing unit. Sampling is conducted in an upstream movement with one or two netters. Larger wadeable streams and rivers are sampled with a canoe electrofishing assembly. Sampling is typically conducted in a downstream movement with multiple netters. Non-wadeable streams and rivers are sampled either with a drift boat mounted electrofishing assembly or a jet boat electrofishing assembly. Both methods consist of sampling in a downstream movement typically with two netters.

Quantitative stream surveys are completed using mark recapture, multiple mark recapture, or depletion estimate techniques. Mark recapture efforts are completed with one marking run and one recapture run separated by approximately one week. Fish are marked by a single fin punch. Multiple mark recapture efforts are completed with multiple (typically three) passes separated by approximately one week. Fish are marked on all passes except the final pass with fin punches. Depletion estimates utilize multiple passes with removal. The sampled reach is blocked with nets during depletion estimates. Removal passes in depletion estimates are discontinued when no fish are captured or the number of fish captured in a single run is less than 25% of the total number captured. Data analysis typically includes population estimation by age-class. Fish data are summarized by species for total length, weight, relative abundance, relative biomass, and catch per unit of effort. Length at age is determined loosely by analysis of length frequency or more definitively by otolith analysis of sampled ototliths from a representative collection of fish. A description of equipment used in river and stream surveys is listed in Appendix 3.

RESULTS AND DISCUSSION

Billingsley Creek

Creel clerks were not successful in contacting many anglers. Collected data was considered to be an inadequate sample. It is recommended that alternate methods be developed to evaluate brown trout stocking success. A population survey utilizing electrofishing gear is the most likely method.

The lack of angler contacts available to creel clerks is an indication that fishing pressure on Billingsley Creek is limited. However, Billingsley Creek is believed to have a core group of anglers that utilize its fishery. Regional fishery staff commonly receives inquires and recommendations from this core group regarding the fishery.

Stalker and Silver Creek

Population estimates were determined by age-class. Age-classes were combined for analysis if insufficient recaptures were collected. Five recaptures was considered sufficient. Length at age was loosely derived from length frequency histograms prepared by species for each location.

A stratified random creel survey was conducted on Silver Creek from July 3 through September 5, 2004. The designated time period was considered one interval. Week days and weekend days were assigned probabilities of 0.02 and 0.05, respectively. Surveys were randomly assigned to 20 week days and 10 weekend days. Sample times were limited to times between 0700 hours (hrs) and 1900 hrs. The creek was divided into five sections. Sections were designated by available access points and included the Nature Conservancy property, Martin Bridge, IDFG Point of Rocks access, Picabo Bridge, and the BLM access area on lower Silver Creek. Creel clerks interviewed anglers following each initial angler count. Angler information collected included: residency, hours fished, fishing method, and fish caught/kept.

Fish species sampled included brown trout, rainbow trout, bridgelip sucker *C. columbianus*, longnose dace *R. cataractae*, speckled dace *R. osculus*, redside shiner and Paiute sculpin *C. beldingi* (Table 21). Catch in all sample reaches was dominated by brown trout (range 25-40%) and rainbow trout (range 3-44%). Brown trout were the largest fish in the catch achieving lengths over 600 mm with rainbow trout rarely exceeding 450 mm (Figure 10, 11, and 12). Population estimates and densities were calculated for brown trout and rainbow trout (Table 22). Rainbow trout (>100 mm) were more abundant than brown trout in Lower Stalker and Cabin Reaches; whereas, brown trout dominated the fishery in the Martin Bridge reach. Insufficient recaptures limited population estimates by age-class in all sample reaches. No estimates were possible for rainbow trout in the Martin Bridge reach due to insufficient recaptures. Thirty-seven rainbow trout were marked, none were recaptured. No estimates were generated for brook trout *S. fontinalis* and mountain whitefish *Prosopium williamsoni* due to limited captures.

Population estimates indicated trout densities were highest on the Nature Conservancy property in the Cabin Site reach. In addition, results indicated brown trout dominated the lower most sample reach (Martin Bridge) and were nearly as common as rainbow trout in Stalker Creek and the upper Silver Creek sample reach. Due to inconsistencies with previous survey sample methods and timing, direct comparisons to historical data were not made.

Brown trout encroachment has been anecdotally reported by anglers for several years. Abundance of the brown trout from survey catches conducted on Silver Creek since 1977 also suggests this trend is occurring (Figure 13). As indicated, previous historical data collections were not standardized, making direct comparisons difficult. However, general trends in relative abundance were considered of value. Some anglers have expressed discontent regarding increased catches of brown trout and declining rainbow trout catches. However, it is unclear what the primary public preference is for this fishery. It is recommended that monitoring be continued in standard reaches to follow trends in species composition and fish density. It is also recommended that angler preferences regarding this fishery be evaluated.

Sampling results indicated catches of older age-class (3+) rainbow trout were limited or absent in all sample reaches. Although results suggest a population wide trend other factors may have influenced catch. Specifically, selected sample reaches may not represent ideal rainbow trout habitat and those rainbow trout occupying the sampled habitat may exhibit lower capture efficiency. Much of the habitat sampled was heavily vegetated and relatively shallow riffle-run type habitat. Rainbow trout in the system may prefer the more sparsely vegetated, deeper pool type habitat. In addition, larger, older-age-class rainbow trout captured seemed to occupy open channel areas of the stream. In contrast, many of the larger older-age-class brown trout were captured in and around heavy cover associated with vegetation and undercut banks. Rainbow trout occupying open water

habitats may have been in a position to more readily avoid sampling equipment. Day light hour sampling may also have influenced catch efficiencies. It is recommended that an additional sample reach that contains a greater proportion of more sparsely vegetated deeper pool type habitat be selected and sampled to confirm trends. In addition, a night time effort should be considered.

Current analyses of Silver Creek creel efforts were not completed. New software designated for creel analysis is currently undergoing testing and evaluation. Creel survey results will be reported in the 2005 annual report.

Table 18. Upper and lower bounds (UTM) of three strata for the 2004 Billingsley Creek Creel.

Strata	Boundary	Easting	Northing	Zone	Datum
Jones	Upper	674,681 m E	4,739,222 m N	Z11	NAD27
	Lower	674,601 m E	4,741,782 m N	Z11	NAD27
U of I	Upper	674,601 m E	4,741,782 m N	Z11	NAD27
	Lower	673,710 m E	4,743,282 m N	Z11	NAD27
BCWMA	Upper	673,710 m E	4,743,282 m N	Z11	NAD27
	Lower	672,496 m E	4,744,448 m N	Z11	NAD27

Table 19. Survey dates and times for Silver and Stalker Creek fish population estimates in June and July 2004.

Drainage	Sample site	Pass	Date	Start time (h)
Stalker Creek	Stalker Creek	1	June 14	0930
		2	June 18	0930
		3	June 22	0930
Silver Creek	Cabin	1	June 23	2030
		2	June 29	2030
		3	July 7	2030
	Martin Bridge	1	June 24	2030
		2	June 30	2030
		3	July 8	2030

Table 20. 2004 Silver and Stalker Creek standard sample sites by upper and lower boundaries.

Site	Upper boundary	Lower boundary
Stalker Creek	730,007 m E, 4,799,575 m N	730,224 m E, 4,799,882 m N, Z 11
Cabin Site	731,001 m E, 4,799,887 m N	731,305 m E, 4,799,708 m N, Z 11
Martin Bridge	734,534 m E, 4,800,807 m N	734,486 m E, 4,800,611 m N, Z 11

Table 21. Catch composition designated by sample reach. Survey results summarized by catch (N) and percent of total catch (% COMP) by species. Species abbreviated as: bridgelip sucker (BLS), brown trout (BRN), eastern brook trout (EBRK), longnose dace (LND), rainbow trout (RBT), redside shiner (RSS), sculpin (SCU), speckled dace (SPD), and Wood River sculpin (WRS).

	Stalker Creek		Cabin site		Martin Bridge	
Species	N	% Comp	N	% Comp	N	% Comp
BLS	338	16.18	60	9.27	260	19.16
BRN	521	24.94	259	40.03	457	33.68
EBRK	--	--	5	0.77	--	--
LND	285	13.64	16	2.47	47	3.46
RBT	626	29.97	283	43.74	40	2.95
RSS	191	9.14	11	1.70	397	29.26
SCU	32	1.53	2	0.31	--	--
SPD	96	4.60	7	1.08	156	11.50
SUC	--	--	4	0.62	--	--

Table 22. Brown (BRN) and rainbow trout (RBT) population estimates by sample reach. Results summarized by species, length range, age-class, total reach estimate, upper and lower 90% confidence intervals (90% C.I.), fish density (fish/m^2), and linear fish density (fish/km)

Specieds	Length (mm)	Age	Estimate	90% C. I. Lower	90% C. I. Upper	Fish/100m^2	Fish/km
Lower Stalker Creek							
BRN	100-350	1-2	548	332	979	6	48
BRN	>350	3+	58	38	93	1	541
RBT	100-250	1	650	462	955	6	456
RBT	>250	2+	117	59	275	1	97
Silver Creek at Cabin Site							
BRN	≥100	1+	1727	791	4,711	6	2156
RBT	100-250	1	3,089	2,098	4,766	11	3856
RBT	>250	2+	489	238	1,222	2	610
Silver Creek at Martin Bridge							
Brn Trt	100-200	1	262	142	556	2	296
Brn Trt	201-350	2	413	279	644	2	469
Brn Trt	>350	3+	200	143	291	1	227
Rbt			Insufficient Recaptures				

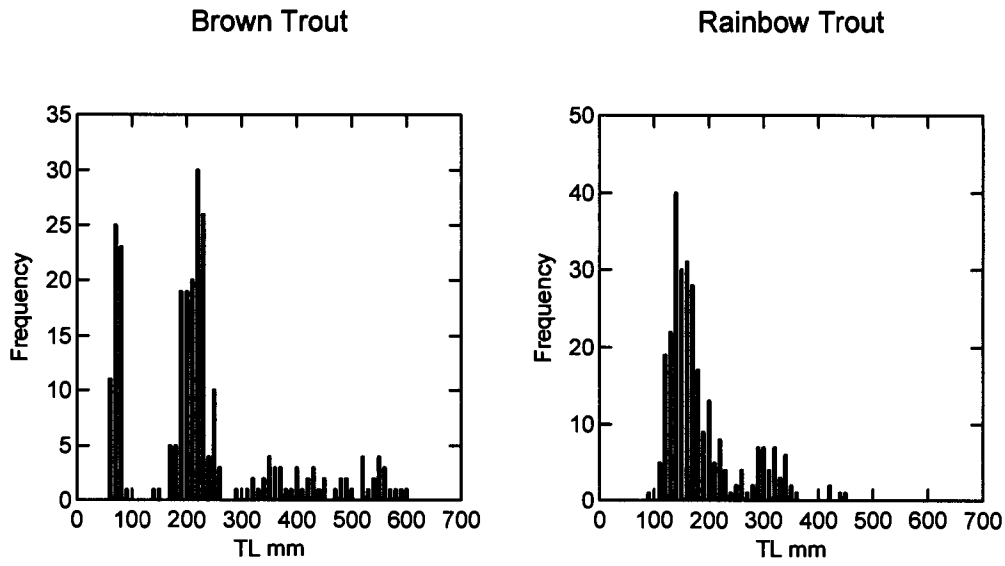

Figure 10. Length frequency histograms of brown and rainbow trout collected from lower Stalker Creek in the 2004 sampling effort by total length (TL).

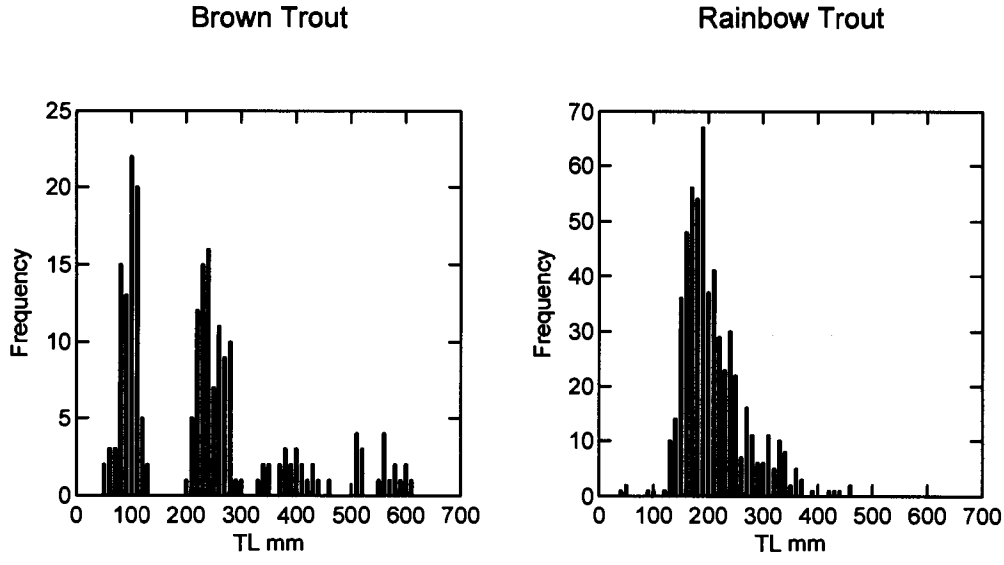

Figure 11. Length frequency histograms of brown and rainbow trout collected from Silver Creek (Cabin Site) in the 2004 sampling effort by total length (TL).

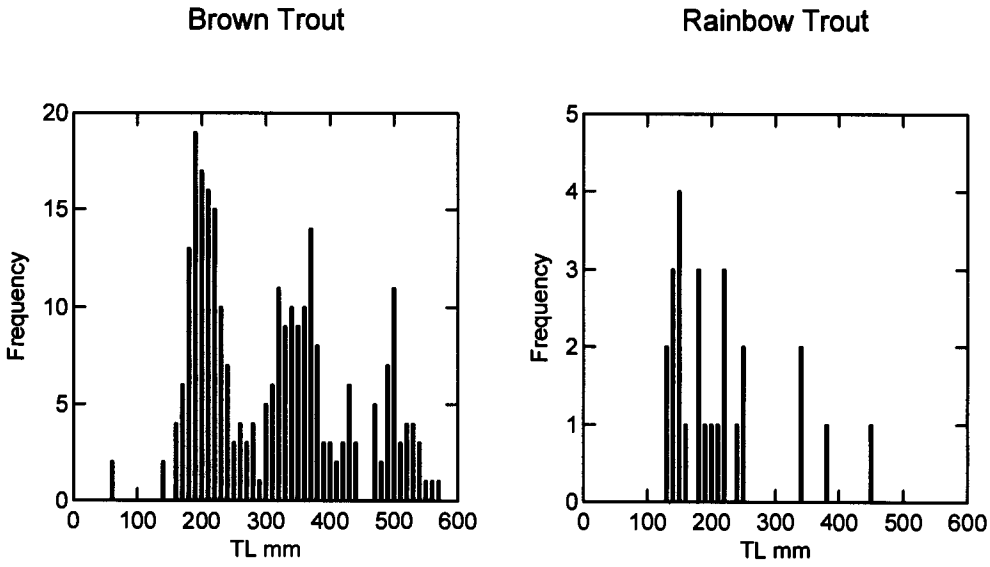

Figure 12. Length frequency histograms of brown and rainbow trout collected from Silver Creek (Martin Bridge Site) in the 2004 sampling effort by total length (TL).

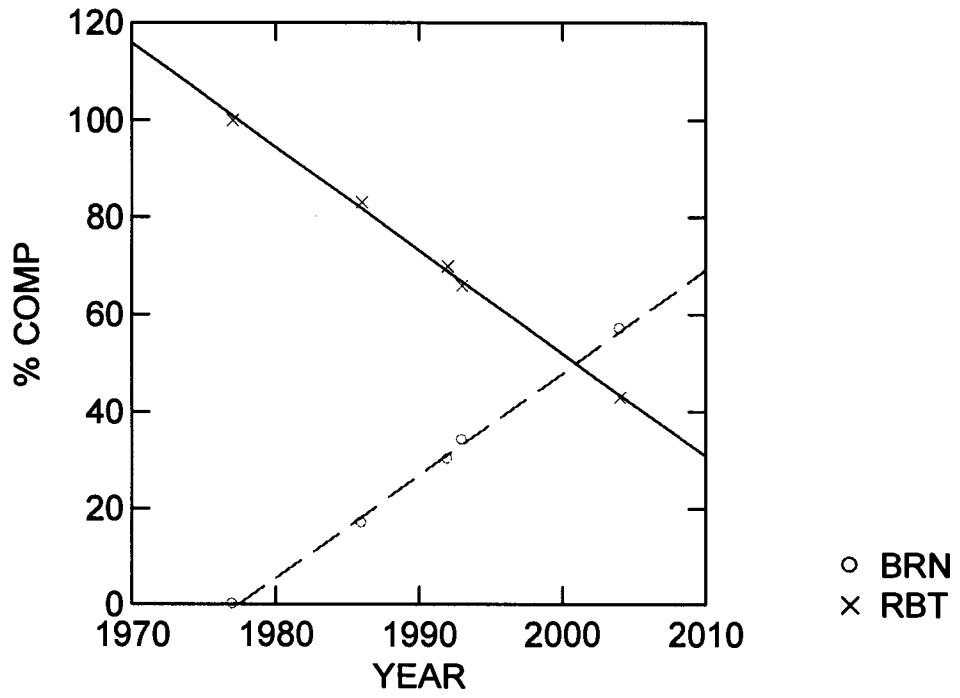

Figure 13. Percent abundance of rainbow (RBT) and brown trout (BRN) in Silver Creek surveys since 1977. Figure represents a data trend. Data may be influenced sources and collection methods. Catches at sites only from the Martin Bridge reach upstream. Surveys were not consistent in time of year, sampling method, or sampling agency. Captures of other fishes were not considered.

APPENDIX

Appendix 1. Standard mountain lake sampling gear.

GEAR	DESCRIPTION
Mountain lake gill net	Swedish made Lundgrens type-A lightweight multi filament sinking net (6x7.6 m panels (46, 38, 33, 30, 25, 19 mm), 1.5 m width)
Conductivity meter	Yellow Springs Instrument (YSI) model 30
Water chemistry kit	HACH kit - for alkalinity and total hardness measures
pH meter	Oakton hand held pH meter

Appendix 2. Standard lowland lake sampling gear.

GEAR	DESCRIPTION
Boat electrofisher	Smith-root model SR-18 w/ model 5.0 pulsator
Sinking gillnet	38 m x 1.8 m, 6 panels (19 mm - 64 mm mesh), monofilament
Floating gillnet	38 m x 1.8 m, 6 panels (19 mm - 64 mm mesh), monofilament
Trap net	1.8 x 0.9 m box, 5 - 76 cm hoops, 2 cm bar mesh
Conductivity meter	Yellow Springs Instrument (YSI) model 30
Temperature / D.O. meter	Yellow Springs Instruments (YSI) model 57
Water quality test kit	HACH kit

Appendix 3. Standard river and stream sampling gear.

Gear	Description
Canoe/Drift Boat electrofisher	Coffelt Model 15 VVP/Honda 5,000 watt generator
Boat electrofisher	Smith-root model SR-18 w/ model 5.0 pulsator
Backpack electrofisher	Smith-root model 15-D
Conductivity meter	Yellow Springs Instrument (YSI) model 30
Water quality test kit	HACH kit

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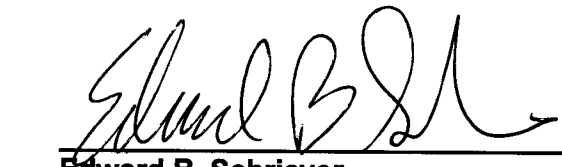

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