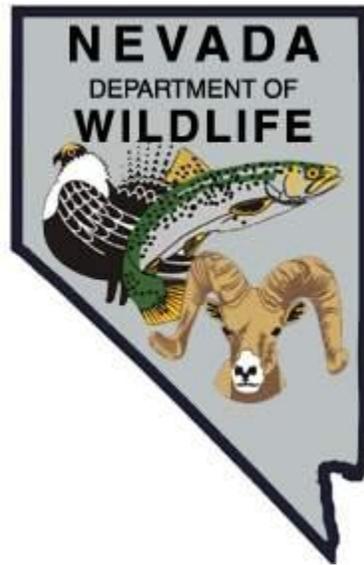


NEVADA DEPARTMENT OF WILDLIFE
STATEWIDE FISHERIES MANAGEMENT



FEDERAL AID JOB PROGRESS REPORTS

F-20-49
2013

WHITE PINE COUNTY
SMALL LAKES AND RESERVOIRS
EASTERN REGION



**NEVADA DEPARTMENT OF WILDLIFE, FISHERIES DIVISION
ANNUAL PROGRESS REPORT**

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ANNUAL PROGRESS REPORT**

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**NEVADA DEPARTMENT OF WILDLIFE, FISHERIES DIVISION
ANNUAL PROGRESS REPORT**

State: *Nevada*
Project Title: *Statewide Fisheries Program*
Job Title: *White Pine County Small Lakes and Reservoirs*
Period Covered: January 1, 2013 through December 31, 2013

SUMMARY

During four separate occasions, there were 20,034 hatchery-reared rainbow trout stocked into Cave Lake in 2013. In May of 2013, gill net surveys were conducted at Cave Lake to determine adequacy of trout stocking and whether the Department will need to adjust stocking recommendations. The gill net yielded 64 trout, consisting of 61 rainbow trout and 3 brown trout. Rainbow trout ranged from 3.8 in (96 mm) to 10.5 in (266 mm) and averaged 8.1 in (205.36 mm). In addition to gill net surveys, creel data was compiled from the Ely Rotary Club's Annual Ice Fishing Derby as well as opportunistic angler contacts while checking water conditions. Creel surveys resulted in 329 trout being measured, where rainbow trout comprised 98% and brown trout made up the remaining 2%. The 329 rainbow trout measured at Cave Lake ranged in length from 6.7 in (170 mm) to 13.8 in (351 mm), with an average fork length of 9.8 in (249 mm). The 6 brown trout ranged from 7.1 in (180 mm) to 14.5 in (369 mm), with an average total length of 11.0 in (279 mm). Cave Lake was sampled for quagga mussels in July of 2013. The samples were sent to two independent labs and the results showed negative for quagga mussels at Cave Lake.

A total of 3,625 hatchery-reared rainbow trout were stocked at Cold Creek Reservoir in 2013, which was on par with recommendations. As part of the Cold Creek Reservoir Study, gill net surveys as well as electroshocking surveys were conducted during 2013. In the spring of 2013, gill net surveys resulted in 222 fish captured, consisting of 59 rainbow trout, 9 bowcutt trout, and 154 tui chubs. Rainbow trout made up 26.5% of the catch, while bowcutt trout accounted for 4%, and tui chub made up the remaining 69.5%. In the fall, the electroshocking survey resulted in the capture of 179 fish. The composition of the fall survey was more promising with the efforts of largemouth bass controlling nuisance tui chub.

In March and October, Illipah Reservoir was stocked with 15,385 hatchery-reared rainbow trout, which was on par with stocking recommendations. During the months when angler questionnaire surveys were received, 76 anglers fished for 373.5 hrs and caught 680 fish, consisting of 1,002 rainbow trout and 44 brown trout. Resulting catch rates (all fish) were 8.6 fish per angler and 2.8 fish per hour.

Silver Creek Reservoir was stocked with 1,009 rainbow trout in April of 2013. However, due to Bonneville Cutthroat Trout restoration work that was being conducted in Silver Creek proper, the stream and the reservoir were both chemically treated to eradicate non-native trout.

BACKGROUND

Cave Lake

Cave Lake has been managed as a high use recreational fishery supporting some 20,000 angler-use days per year on 32 surface acres of water. It was purchased in 1971 by the Nevada Department of Fish and Game and is currently managed as a State Recreation Area under a cooperative agreement between the NDOW and the Nevada Division of State Parks (NDSP). The combination of a put-and-take rainbow trout fishery and quality visitor facility attracts year around use. Cave Lake also holds a self-sustaining population of brown trout, although not common in the creel. The state record brown trout was set in 1984 from Cave Lake at 27 lbs and 5 oz.

Cold Creek Reservoir

Cold Creek Reservoir is spring fed and located in Newark Valley in the northwest corner of White Pine County. It is made up of three distinct ponds, which contain self-propagating rainbow trout populations. The main pond is augmented annually with hatchery-reared trout. The uppermost spring pond and outflow are currently closed to fishing to protect spawning rainbow trout and the ranch's domestic water supply. The largest of the three, the lowermost pond (main pond), is located on private property and is routinely drawn down in summer by private landowner for irrigation. Cold Creek Reservoir was eradicated in 1972 and 1984 to remove tui chub that had reached nuisance levels in relation to the maintenance of the trout fishery. In 1990, a single chub was captured in a gillnet survey. Chub numbers have rapidly increased and again have reached nuisance levels in recent years.

Bassett Lake

Bassett Lake is situated in Steptoe Valley approximately five miles northwest of McGill, Nevada. Kennecott Copper Corporation constructed it in 1942 to serve as a final desilting reservoir for mill tailings from its McGill copper operation. At current operating capacity, Bassett Lake covers 77 surface acres and stores 385 acre-ft of water at an average depth of five feet. Although it receives flow from many springs and streams, its primary water source is Tailings Creek, which provides a constant source of water. In cooperation with Kennecott Minerals Company, NDOW has managed the reservoir as a public fishery since 1947. It was one of the top fisheries in White Pine County throughout much of the 1960s and 1970s. In recent years, however, nuisance populations of northern pike and carp, coupled with a change in water usage, have rendered the area undesirable to most anglers.

Illipah Reservoir

Illipah Reservoir is a privately owned irrigation reservoir managed as a public fishery under an agreement signed in 1981 between the NDOW and the owner, Robert E. Dickenson. As a result of this agreement, the State of Nevada built a new dam,

enlarging the reservoir's capacity and providing for a minimum pool of 160 acre-ft. At capacity, the reservoir is 72 surface acres with a storage capacity of 1,300 acre-ft. Due to irrigation needs by the adjacent Moorman Ranch, water level at Illipah Reservoir is highly dependent upon winter precipitation and fluctuates greatly.

Silver Creek Reservoir

Silver Creek Reservoir is a small, privately owned irrigation reservoir managed by NDOW as a put-and-take trout fishery. The reservoir was dredged in 1993, restoring some of its lost capacity and reestablishing a non-withdrawable minimum pool. It is managed as a public fishery under an informal agreement with the owner, Baker Ranches.

OBJECTIVES and APPROACHES

Cave Lake

Objective: General Sport Fisheries Management

Approaches:

- Conduct a general fisheries assessment through opportunistic angler contacts.
- Visually assess water quantity (lake level, inflow/outflow) and quality (clarity) for coordinating trout stocking.
- Set experimental gill nets for two net-nights in the spring.
- Sample for occurrence of quagga mussel veligers through plankton net tows conducted two to four times between June and September at up to three sites.

Cold Creek Reservoir

Objective: Evaluate the health of the fishery and determine the success of largemouth bass at controlling tui chub.

Approaches:

- Examine carryover of sport fish, body condition, size structure, and relative abundance by setting experimental mesh gill nets for two net-nights in the spring.
- Electroshock one established transect during one night in the fall to assess largemouth bass recruitment and tui chub abundance and size structure.

Objective: General Sport Fisheries Management

Approaches:

- Maintain and check return of volunteer angler drop-box surveys during the course of other duties.
- Visually assess water quantity (lake level, inflow/outflow) and quality (clarity) for coordinating trout stocking.

Bassett Lake

Objective: General Sport Fisheries Management

Approaches:

- Visually monitor seasonal water level fluctuations during the course of other duties.

Illipah Reservoir

Objective: General Sport Fisheries Management

Approaches:

- Conduct a general fisheries assessment through opportunistic angler contacts.
- Maintain and check return of volunteer angler drop-box surveys during the course of other duties.
- Visually assess water quantity (lake level, inflow/outflow) and quality (clarity) for coordinating trout stocking.
- Set experimental gill nets for two net nights in the spring(FY13)

Silver Creek Reservoir

Objective: General Sport Fisheries Management

Approaches:

- Conduct a general fisheries assessment through opportunistic angler contacts.
- Set experimental gill nets for two net-nights in the spring.
- Maintain and check return of volunteer angler drop-box surveys during the course of other duties.
- Visually assess water quantity (lake level, inflow/outflow) and quality (clarity) for coordinating trout stocking.

PROCEDURES

Visits were made throughout 2013 to Cave Lake and Illipah for the purpose of monitoring water quality and quantity. While present at each water body, department personnel collected creel survey data. Information on angler harvest, effort, and origin were recorded on standard forms. Harvested trout were measured to fork length in millimeters.

Prior to spring and fall stocking and during the course of other duties, trips were made to Cave Lake, Cold Creek Reservoir, Bassett Lake, Illipah Reservoir, and Silver Creek Reservoir to visually ascertain water levels and water temperatures for trout stocking.

At Cave Lake, Two 150 ft x 6 ft experimental gill nets were set at 1430 and 1500 hrs respectively on April 16, 2011 at Cave Lake. These nets consisted of five panels with 1/2, 3/4, 1, 1 1/2, and 2 inch mesh. The first net (deep set) was set at the north end of the reservoir approximately 30 m east of the overflow pipe at the east end of the dam in 28 ft (8.5 m) of water. The second net (shallow set) was set at the south end of the lake near the Cave Creek inflow along the west shoreline at a depth of 21 ft (6.4 m). The two nets were fished overnight and pulled at 1015 and 1110 hrs, respectively, the following morning. All trout captured were identified and measured to fork length. Live trout were returned to the reservoir.

Also at Cave Lake, two vertical plankton net tows were conducted on July 24, 2013. A 63 μ m mesh plankton was used to take the vertical samples at various depths. A target of 1000 L water sample was achieved at Cave Lake. The samples were preserved in ethanol and sent off for analysis.

At Cold Creek Reservoir, two 150 ft x 6 ft experimental gill nets were set at 1510 and 1520 hrs on May 7, 2013 at Cold Creek Reservoir. These nets consist of five panels having 1/2, 3/4, 1, 1 1/2, and 2 inch mesh. The first net (deep set) was set at the south end of the reservoir (lower pond) along the east shoreline at a depth of 8.0 ft. The second net (shallow set) was set at the north end of the reservoir along the west shoreline in 6.0 ft of water. The nets were pulled at 0815 and 0945 hrs, respectively, on May 8, 2013. The fork length of all trout captured was measured while a representative sample of chub was measured (total length). Live trout were returned to the reservoir and all chub were discarded.

The Eastern Region Coffelt electroshocking barge was used to sample one established transect at Cold Creek Reservoir on the evening of September 4, 2013. The shocking unit was set up with the booms forward as the anode and the hull of the boat as the cathode. Voltage was set at 510 (DC) with an output of 4.5 A. Pulse frequency was set at 60 Hz with a pulse width of 4 ms. Attempts were made to capture all fish stunned during survey activities. Excluding tui chub, all species of fish captured were measured (fork length) and weighed with a spring-type hand scale. Trout and

bass captured during survey activities were returned to the reservoir while tui chub were disposed of properly.

During the course of other duties throughout the year, volunteer angler survey boxes at Cold Creek Reservoir, Illipah Reservoir, and Silver Creek Reservoir were periodically maintained and restocked. At the end of the year, data was tallied using a standard computer spreadsheet.

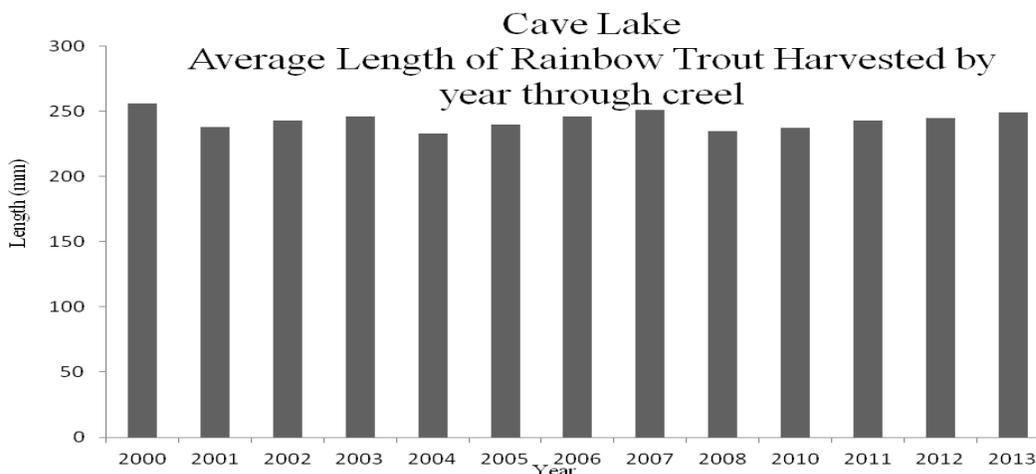
FINDINGS

Cave Lake

During the 2013 calendar year, department personnel attended only one of the annual derbies at Cave Lake to conduct a creel survey. However, between creel conducted at the Ely Rotary Club's Ice Fishing Derby and opportunistic angler contact, there was 335 trout measured. Rainbow trout comprised 98% of the trout measured, while brown trout made up the remaining 2%. The 229 rainbow trout measured at Cave Lake ranged in length from 6.7 in (170 mm) to 13.8 in (351 mm), with an averaged fork length of 9.8 in (249 mm). The 6 brown trout ranged from 7.1 in (180 mm) to 14.5 in (369 mm), with an average fork length of 11 in (279 mm).

Using creel data, length of rainbow trout harvested from Cave Lake has remained extremely consistent over the past 13 years. The standard deviation over a 13 year period (2002-2013) is 0.26 in (6.7 mm) (Figure 1). The 13-year average for rainbow trout is 9.6 in (243 mm).

Figure 1.

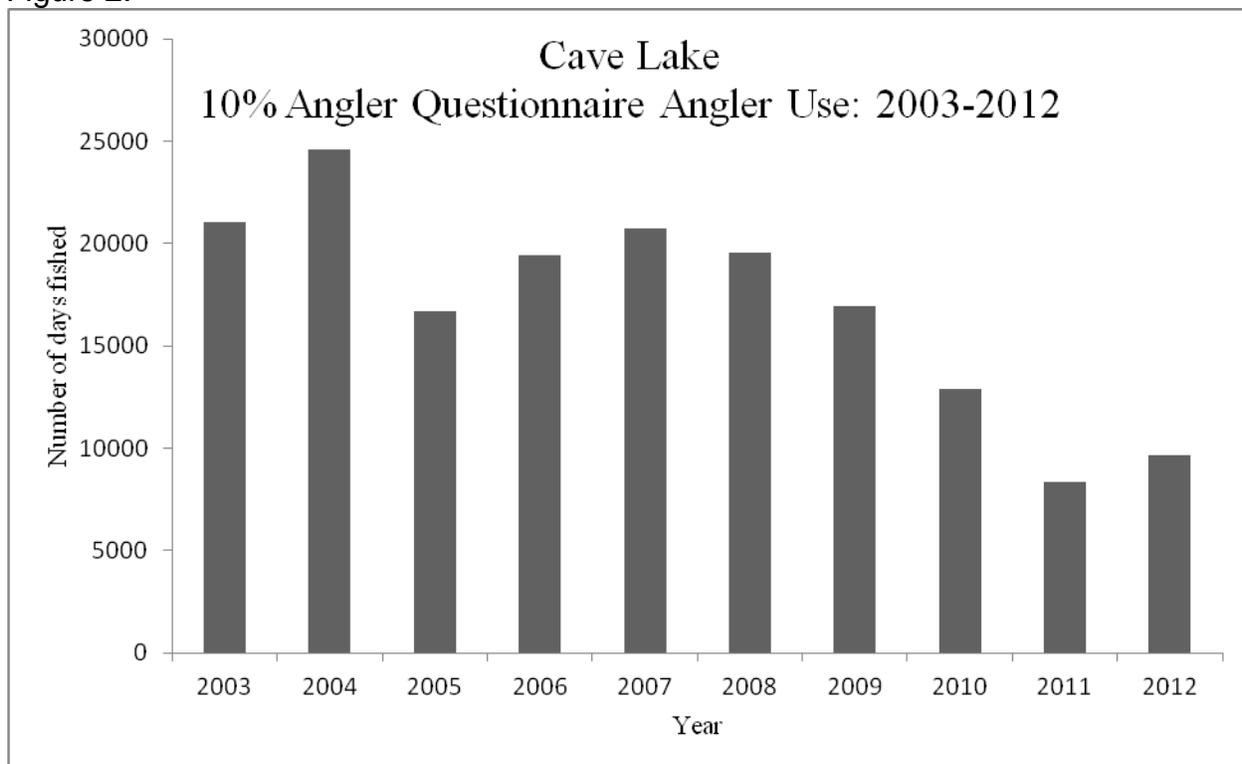


During four separate occasions, there was 20,034 hatchery-reared rainbow trout stocked into Cave Lake from April through October 2013.

Based on the Mail-in Angler Questionnaire Survey from 2012, there was a slight increase in number of angler days at Cave Lake; however, it was still a small jump from

the decadal low in 2011. In the past decade the amount of angler days spent at Cave Lake has slowly descended to the lowest amount of angler days that occurred in 2011 (Figure 2). Anglers spent nearly three times as many days in 2004 fishing at Cave Lake than in 2011 (8,351). These numbers are based on information gathered using the annual 10% Angler Questionnaire. Based on previous Mail-in Angler Questionnaire data, use of the fishery at Cave Lake from southern Nevada residents has followed a similar trend as the amount of angler days spent at Cave Lake.

Figure 2.



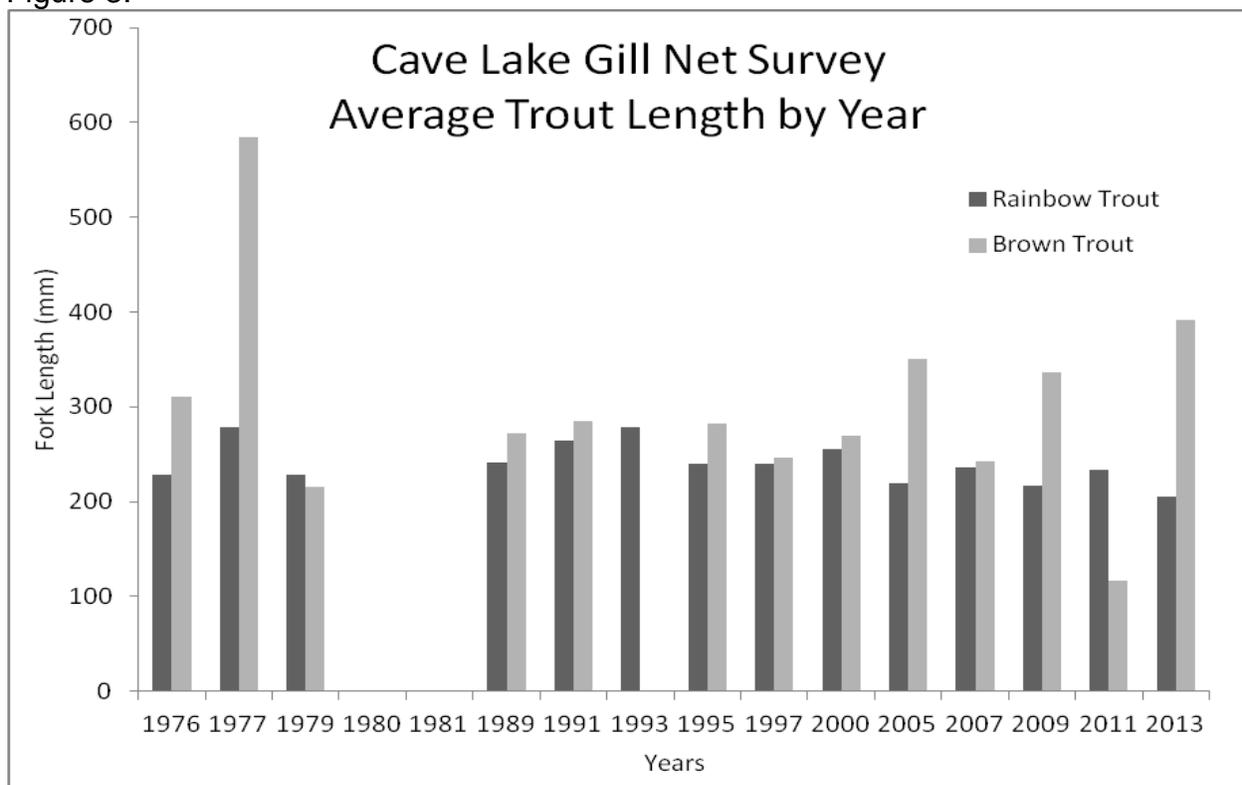
In April of 2013, department personnel set two gill nets in Cave Lake to determine the status of trout for making stocking recommendations to improve the fishery. When nets were pulled at the end of the survey, 64 fish were captured, consisting of 61 rainbow trout and 3 brown trout. Rainbow trout made up 95% of the catch while brown trout comprised 5%. Rainbow trout were captured at a rate of 1.5 fish per net hour and brown trout at a rate of 0.08 fish per net hour. Total catch rate for the gill netting effort was 1.6 fish per net hour. This is still lower than the long-term average of 1.8 fish per net hour, but substantially higher than the 2011 average of 0.65 fish per net hour.

The average fork length of all rainbow trout captured was 8.1 in (205.4 mm), ranging from 3.8 in (96 mm) to 10.5 (266 mm). This year's average length of rainbow trout is the shortest fork length in the last 37 years of conducting gill net surveys for rainbow trout at Cave Lake (Figure 3). Weights of these trout were not taken, but from general observation of dozens of trout, the body condition of most rainbow trout was poor. Relatively poor body condition can be contributed to lack of benthic and pelagic

invertebrates. An oligotrophic system such as Cave Lake does not provide the habitat required to generate macrophyte production, which in turn stimulates invertebrate production. This is supported by Persson et al. (1992), who demonstrated that primary production (macrophytes) is correlated to the number trophic levels within a lake. Therefore, the more productive a system is, the more biomass it can generally support.

In 2012, Cave Lake was stocked with an additional 4,725 hatchery reared rainbow trout. This could have been the reason that the 2013 gill net survey captured more than two times as many rainbow trout as the 2011 survey. However, total number of rainbow trout captured was expected to be even higher than what was captured for 2013.

Figure 3.



There are two variables that could have potentially caused this unexpected capture rate, first is that the additional trout stocked into Cave Lake were not caught by anglers and those trout were captured in the gill nets in the 2013. The second reason could be the result of an abrupt change in weather. In 2011, a storm system that moved in just after the gill nets were set was theorized to have caused trout to move to deeper water during the survey. A similar storm system in 2013 left Ely and its surrounding area with up to four inches of snow. Gill nets were set after the four inches of snow had fallen; still, there were persistent snow flurries and cold temperatures throughout the day and night leading up to the gill nets being pulled.

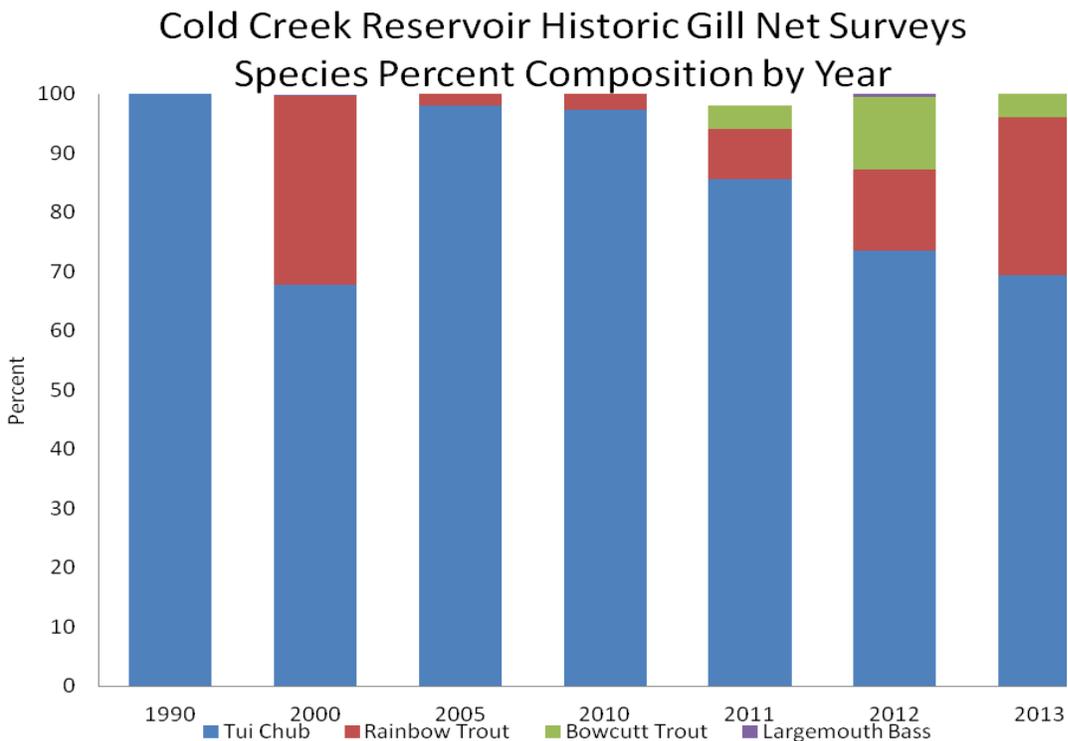
It is unclear if these factors actually influenced the number of captured trout during the survey, but they are factors that cannot be ignored. Regardless, catch rates and harvest rates have all remained consistent at the reservoir and fishing is forecasted to be good throughout the year.

The Cave Lake quagga mussel sampling results revealed to be negative by both independent labs. Sampling occurred visually for adult quagga mussels as well as for veligers. Veligers can be transported alive in water (bilge water on boats), so it is important that these surveys continue into the future.

Cold Creek Reservoir

In the spring of 2013, two gill nets were set and fished overnight as part of the ongoing Cold Creek Reservoir Study. A total of 222 fish were captured, consisting of 59 rainbow trout, 9 bowcutt trout, and 154 tui chubs. Rainbow trout made up 26.6% of the catch while bowcutt trout accounted for 4%. Tui chubs represented the remaining 69.4% of the catch. Combined, trout accounted for 30.6% of this year’s catch, which is higher than the 2012 gill net survey that was highest since 2000 (Figure 4). Rainbow trout were captured at a rate of 1.87 fish per net hour, bowcutt trout were captured at a rate of 0.29 fish per hour, and chubs were captured at a rate of 4.89 fish per net hour. Total catch rate for the gill netting effort was 7.05 fish per net hour. The number of chubs caught during the 2013 gill net survey was the fewest caught in more than 20 years.

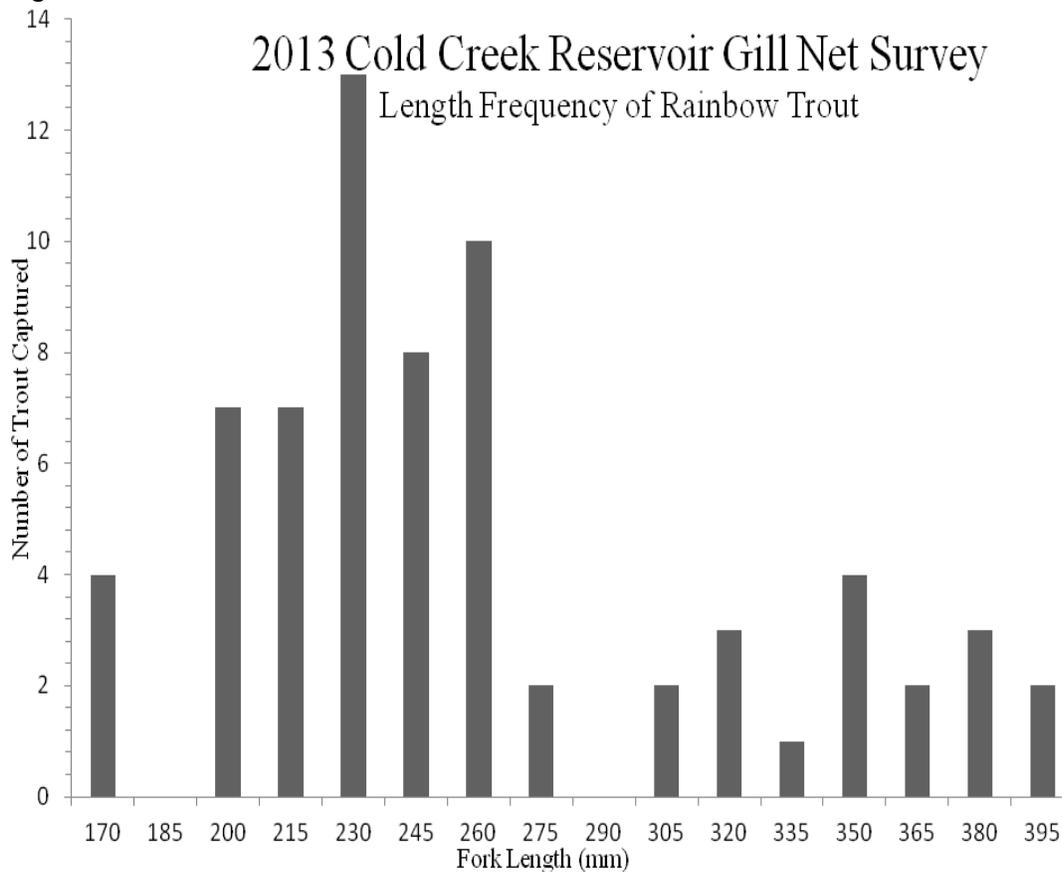
Figure 4.



The average fork length of the 59 rainbow trout captured was 9.6 in (244.6 mm), with a range from 6.6 in (167 mm) to 15 in (381 mm). The average length has been shorter the last two years when compared to previous surveys. The potential cause of this is that the reservoir was stocked with hatchery-reared rainbow trout one month prior to the survey. The average length of stocked rainbow trout was 8.5 in, which could have easily dropped the overall average of sampled rainbow trout. Length frequency analysis of the rainbow trout captured reveals at least four age classes currently inhabiting the reservoir (Figure 5). A length breakpoint of 185 mm separates wild-spawned fish from natural reproduction in 2012. Lengths between 200 mm and 275 mm separate fish stocked in the spring and fall of 2012, while a breakpoint of 290 mm separates fish stocked prior to 2012.

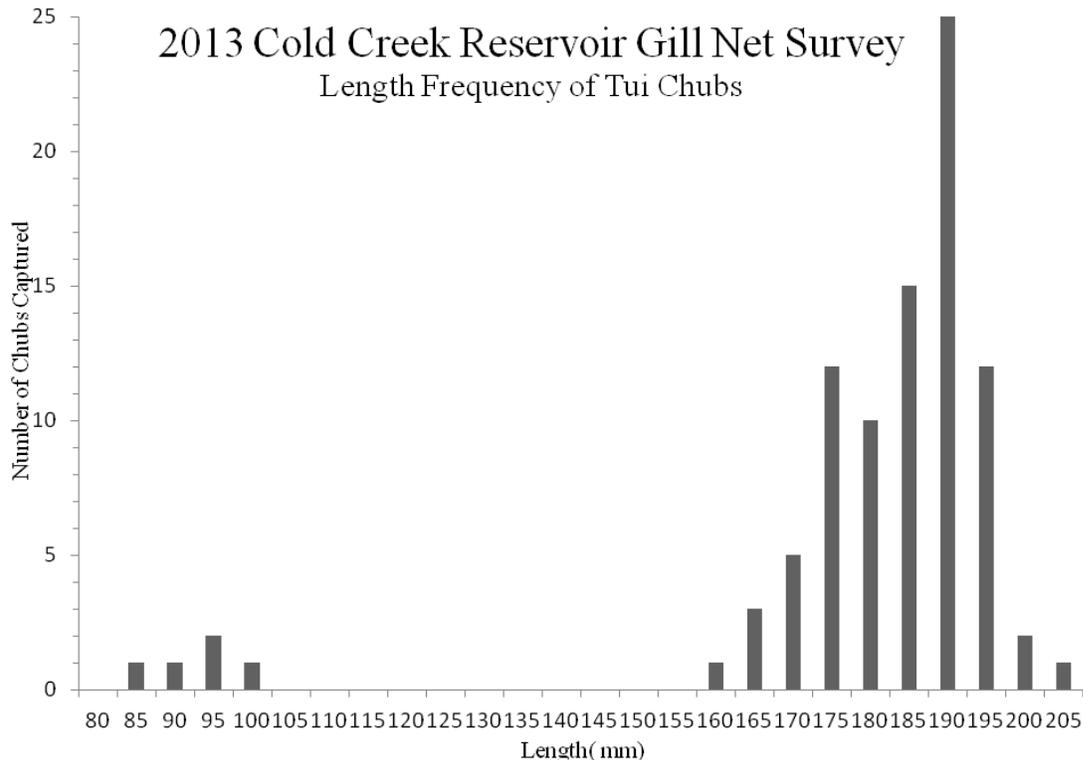
The average fork length of the 9 bowcutt trout captured was 12.1 in (307.8 mm), with a range from 10.0 in (254 mm) to 15.1 in (383 mm). Average length is just over an inch longer than the average (11.1 in) for bowcutt trout in 2012. Bowcutt trout have been stocked into Cold Creek Reservoir three times now; fall 2010, fall 2011, and most recently in the fall of 2012. Since there were few bowcutt trout captured, the length frequency analysis did not give an accurate split for the number of age classes present.

Figure 5.



A representative sample of 80 tui chubs was processed while the remaining 93 were discarded. Average length (total) was 7.4 in (188.9 mm), and ranged from 6.8 in (173 mm) to 8.1 in (206 mm). Average length of chub captured was a full 1.2 in (30.7 mm) longer than what was found in the 2011 gill net survey and represented the longest average length of tui chub found since 2000. In addition, both the shortest and longest chub measured in the survey were considerably longer than what was found in 2011. Length frequency analysis of the 80 chub measured reveals just one age class of larger adult chub currently inhabiting Cold Creek Reservoir (Figure 6). A mere 1.30 in separates the longest and shortest tui chub measured in the survey.

Figure 6.

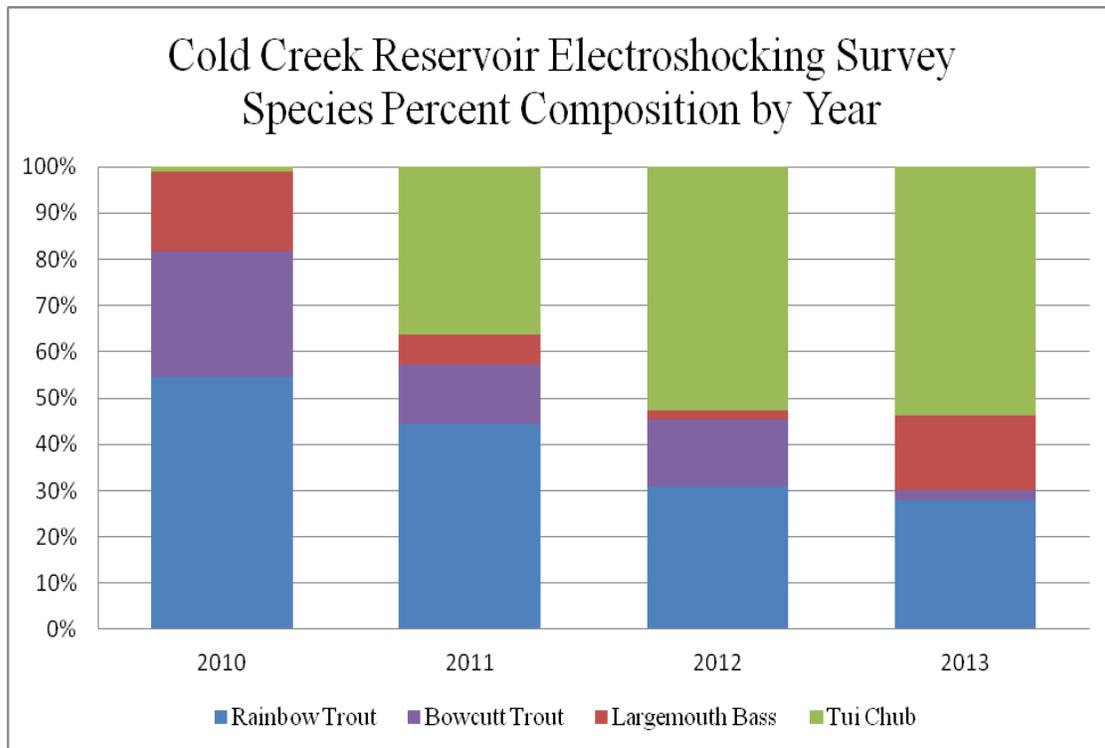


In the fall of 2013, an electroshocking survey was conducted along the one established transect in Cold Creek Reservoir. A total of 179 fish were captured during survey activities, consisting of 50 rainbow trout, 4 bowcutt trout, 29 largemouth bass, and 96 tui chub. Rainbow trout made up 28% of the catch, bowcutt trout accounted for 2.2%, and largemouth bass made up 16.2%. The remaining 53.6% of the catch was comprised of tui chub. Combined, trout accounted for 30.2% of this year’s catch, which is a slight drop compared to surveys from recent years (Figure 7).

The average total length of the 50 rainbow trout captured was 10.0 in (255 mm), with a range from 4.7 in (118 mm) to 13.7 in (348 mm). This fall’s average total length is similar to the average total length measured since 2009. Of the rainbow trout caught, only five were wild trout. Hatchery rainbow trout were easily discerned from wild rainbows by the excessive fin wear. Body condition of all trout captured during the

survey was rated as poor. This is the second consecutive fall in which trout body condition has been reported as poor.

Figure 7.



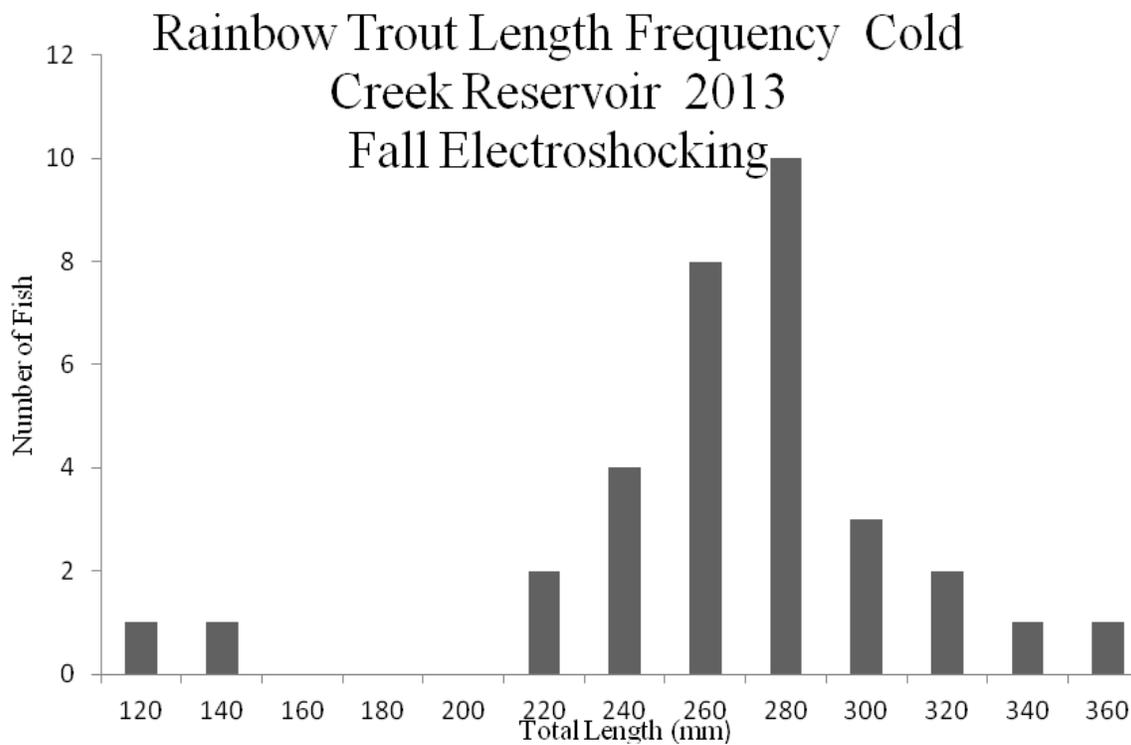
Abiotic and biotic factors such as habitat quality and competition can be attributed to additional stress causing poor body condition in trout. During the late spring and early summer of 2013, rapid water withdrawal was a major concern at Cold Creek Reservoir. Water levels have remained static since the middle of July, however, due to the lowering of the water there could be less thermal refuge present for trout to seek out. Increased water temperatures results in an increased maintenance metabolism in trout, therefore, they have a higher food requirement to subsist, which translates to limited growth or none at all. The reservoir also contains a large tui chub population, with YOY continually being recruited into it. This large tui chub population presents direct competition with trout for available food resources. The cumulative effects of poor water quality, resulting in a change in physiology of the trout, and competition for food resources could be enough to cause the poor body conditions.

The average fork length of the 17 rainbow trout captured was 9.2 in (233.4 mm), with a range from 3.8 in (92 mm) to 12.3 in (312 mm). This fall's average fork length was comparable to the average fork length found in 2009 and 2010, which was 9.9 and 9.2 in, respectively. Of the rainbow trout caught, 29% (5 fish) were wild trout. Body condition of the wild rainbow trout was considered good, whereas body condition of hatchery-reared rainbow trout was poor. Cold Creek Reservoir was last stocked with rainbow trout in April of 2013. This stocking date is five months prior to the electroshocking survey. Five months should be adequate time for hatchery trout to

establish themselves and gain both weight and some length, which is contrary to findings. It is believed that poor water quality due to increased water temperatures could cause additional stress to both hatchery reared bowcutt trout and rainbow trout. Increased water temperatures are a derivative of a below average water year that occurred throughout the state of Nevada.

Upon completion of the length frequency analysis for rainbow trout, at least four age classes currently inhabit the reservoir (Figure 8). Length breaks at 140 mm, 260 mm, 320 mm, and 360 mm reveal the four age classes in the reservoir. The trout captured in this survey measuring 4.7 in (120 mm) and 5.5 in (140 mm) indicates that there is some reproduction occurring in the stream feeding the reservoir.

Figure 8.



The average total length of the four bowcutt trout captured was 11.6 inches (295 mm), and ranged from 9.6 inches (245 mm) to 13.5 inches (343 mm). Once again, all stocked trout caught during this survey had a body condition factor that was poor. Based on the total length measurements recorded, it can be assumed that there was at least two age classes present in Cold Creek Reservoir. Each age class had two representatives; one class had trout measured at 272 mm and 273 mm, while trout measuring at 291 mm and 301 mm represented the second age class.

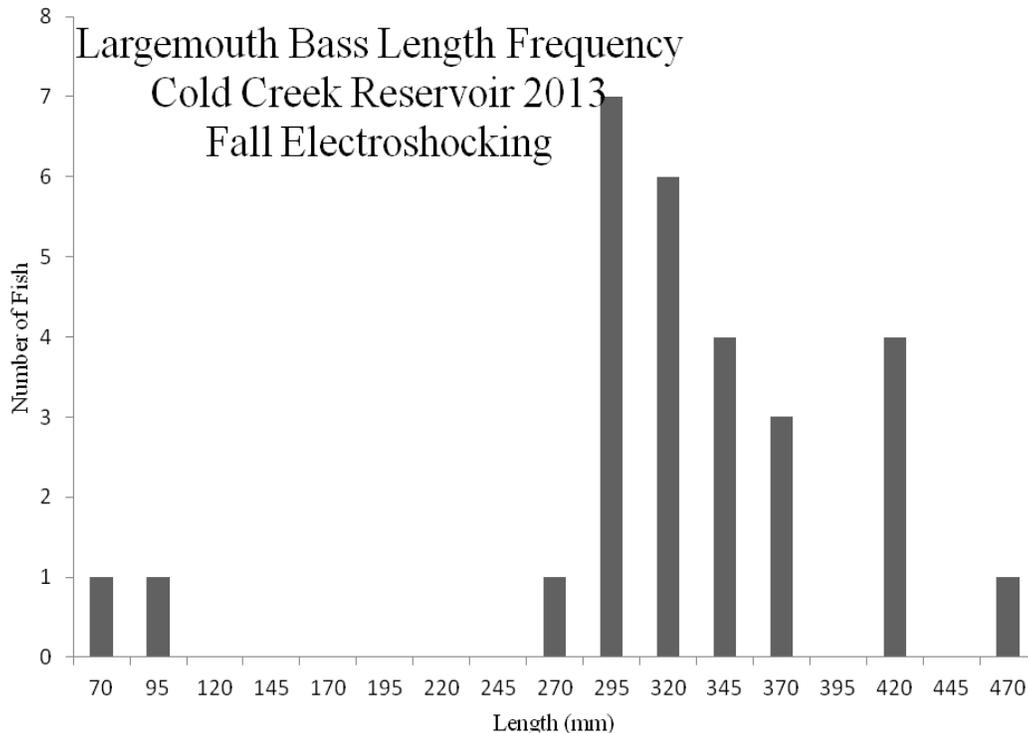
This year marks the most largemouth bass captured in an electroshocking survey since they were introduced in 2008. Largemouth bass averaged 12.3 in (312 mm) and ranged from 2.6 in (68 mm) to 17.7 in (450 mm). Largemouth bass averaged 1.6 lbs (731 g) and ranged from 0.7 lbs (320 g) to 5.5 lbs (2,500 g). Given the weights and

lengths, the K-factor rating for 28 of 29 largemouth bass was excellent. One largemouth bass was deemed to be in good body condition.

Length frequency analysis shows that there are four age classes of largemouth bass present in Cold Creek Reservoir. Using break points at 95 mm, 295 mm, 370 mm, and 470 mm, there are four age classes readily distinguishable (Figure 9). In order to create a viewer friendly graph length intervals had to be placed in 20 mm increments.

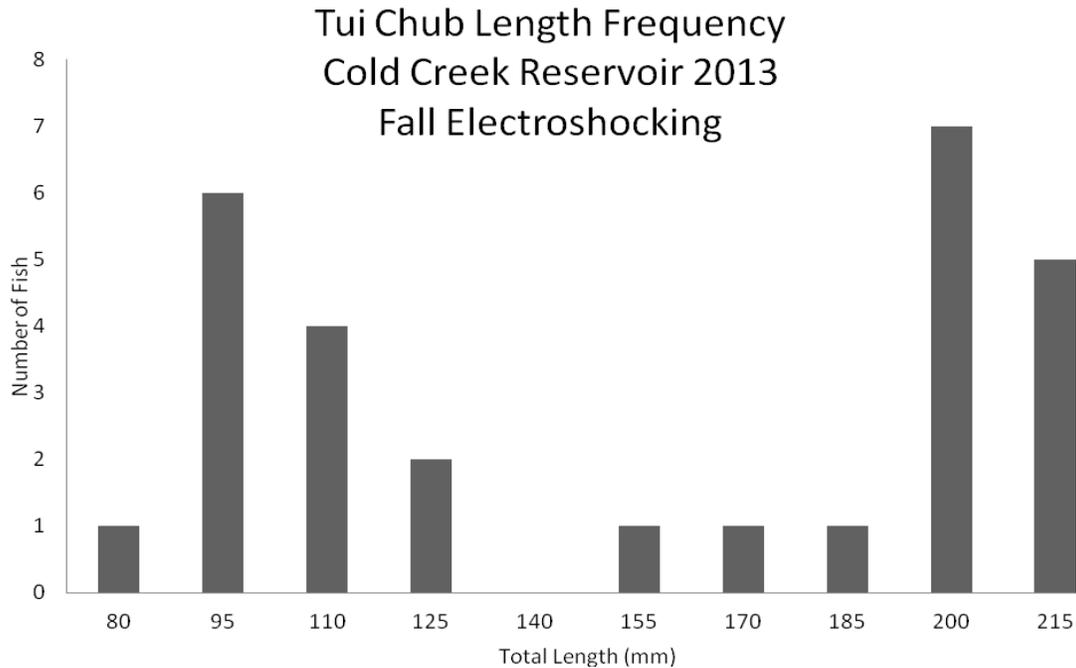
Largemouth bass are reproducing in Cold Creek Reservoir and that is apparent with the presence of two age class-I bass measuring 68 mm and 92 mm. Finding largemouth bass age class-I shows that there is quality habitat present in order for largemouth bass to successfully spawn. Poor water conditions was thought to have had adverse effects on largemouth bass populations in prior surveys, and since the fall 2013 survey, it can be shown that largemouth bass are healthy and should continue to be so in the future.

Figure 9.



A total of 96 tui chub were captured, however, only 33 were measured as a representative proportion of the population. Tui chub ranged from 3.1 in (80 mm) to 8.3 in (211 mm), with an average total length of 5.8 in (148 mm). Using length breaks at 95 mm, 125 mm, 185 mm, and 215 mm, four age classes are distinguishable (Figure 10). A large number of tui chub YOY were observed in the reservoir during the survey. However, due to a large mesh size on the dip nets used during the survey, none of them were captured. The observed tui chub YOY were approximately 30 mm to 50 mm in length.

Figure 10.



This fall's electroshocking survey revealed that tui chub continued to be the dominant species in the reservoir. They have continued to spawn successfully and recruit YOY into their population. This continued recruitment, along with competition for food resources is one of a number of issues affecting trout in the reservoir. Both rainbow trout and bowcutt trout are continuing to have poor body conditions due to biotic and abiotic factors at Cold Creek Reservoir. However, these factors have not affected them enough to keep them from reproducing, which is evident by finding smaller age class rainbow trout. These factors have affected trout enough to keep them from being an effective biological control on the nuisance tui chub present in the reservoir.

It is worth noting that in the 2013 spring gill net survey, bowcutt trout were observed to have small tui chub in their mouths when pulled from nets, showing that there is some predation on chubs. Largemouth bass were found in record numbers during the fall 2013 electroshocking survey. With nearly perfect body condition on all largemouth bass captured, and with the evidence of reproduction in the reservoir, it is promising that largemouth bass will eventually become a successful biological control on tui chub.

Six volunteer angler surveys from the drop-box were received from Cold Creek Reservoir in 2013. Of those six surveys, only one was discarded for lack of proper information. During the months when surveys were received, nine anglers had fished for 40 hrs and caught 125 trout. Resulting catch rates (all fish) were 13.9 fish per angler and 3.13 fish per hour. Of the 125 trout caught, 27 were kept and the remaining 98 were released. Eight of nine anglers fished from shore, with the only one using a float

tube. Angler satisfaction in 2013 was rated on a scale of 0 to 4 with 0 being unsatisfied and 4 representing satisfaction. Average ratings were 1.94 for total fishing experience, 1.56 for the number of fish caught, and 1.94 for the size of the fish caught. One thing to keep in mind is that these numbers are easily skewed due to low angler survey returns.

For trout, size reported was relatively well distributed among the less than 9 in bracket, 9 in to 10.9 in bracket, and 11 in to 12.9 in bracket. Together those three brackets comprised 93% of all trout caught. The 13 in to 14.9 in bracket retained 6% of the fish caught. The remaining 1% of trout caught ranged from 15 in and larger.

The sample of just nine angler surveys likely does not provide an adequate sample for properly assessing the fishery, although questionnaire returns this year are on par with long-term averages for the reservoir. From 2005 to 2011, the Cold Creek Reservoir drop-box shows an average of less than eight surveys received per year. Catch rates should not be compared to past years due to the fact that the survey form has undergone numerous changes. From 2005 through 2008, chub were included in angler surveys, while only trout and bass were reported on angler surveys since 2009. Additionally, satisfaction levels cannot be compared to previous years because the rating scale on the survey forms has changed a number of times. To add a minute bit of information, in three attempts at creel surveys, there were only two anglers checked at Cold Creek Reservoir. They fished for a total of 4 hrs and harvested the only two fish they caught, which were two rainbow trout measuring 14.1 in (360 mm) and 13.9 in (354 mm).

Illipah Reservoir

From April through September, Illipah Reservoir was stocked with 15,385 hatchery-reared rainbow trout on four separate occasions, which is 385 fish greater than the current recommendation of 15,000 rainbow trout per year. The additional fish stocked represent an excess number fish on hand at the rearing station that needed a home. Current recommendations are adequate to pace angler demand at the reservoir.

A total of 112 volunteer angler surveys from the drop-box were received from Illipah Reservoir this year, which was quite a bit higher than the seven-year average (2005 to 2011) of 83. Three were rejected for insufficient data. During the months when surveys were received, 122 anglers fished for 373.5 hrs and caught 1,046 fish consisting of 1,002 rainbow trout and 42 brown trout. Resulting catch rates (all fish) were 8.6 fish per angler and 2.8 fish per hour. Catch rates for 2013 were slightly higher than what was found in 2012, and continue to stay on par with the long-term average for the reservoir. Of the 1,002 rainbow trout caught, 311 were harvested and the remaining 691 released. In addition, 13 brown trout were harvested, while 31 were released. Harvest rates resulted in 2.66 fish per angler and 0.87 fish per hour. Shore anglers accounted for 89% (109 individuals) of all anglers, while 6% fished from boats (7 individuals) and the remaining 5% fished from float tubes (6 individuals).

Volunteer angler surveys reports were analyzed, and of the trout caught, 94% of them ranged from less than 9 in to 14.9 in (Table 1). The remaining 6% were larger fish that ranged from 15 in to greater than 19 in.

Table 1. Illipah Reservoir Angler Questionnaire.

	Rainbow Trout	Brown Trout
<9.0"	182 / 18	14 / 32
9.0" - 10.9"	258 / 26	0 / 0
11.0" - 12.9"	319 / 32	18 / 41
13.0" - 14.9"	174 / 17	8 / 18
15.0" - 16.9"	64 / 6.5	3 / 7
17.0" - 18.9"	5 / 0.50	1 / 2
>19.0"	0 / 0	0 / 0
Total	1002 / 100	44 / 100

Angler satisfaction in 2013 was rated on a scale of 0 to 4, with 0 being unsatisfied and 4 representing satisfaction. Total fishing experience averaged 3.50, while number of fish averaged 3.17, and size of fish averaged 3.45. All of the averages for angler satisfaction has increased over the past 2 years and should continue to increase. That being said, an average rating in all three categories above 3.4 is a positive indicator to angler satisfaction at Illipah Reservoir this year.

Silver Creek Reservoir

Silver Creek was stocked with 1,009 Shasta-strain rainbow trout in April of 2013. The reason that there were so few fish stocked into Silver Creek Reservoir was due to the pending chemical treatment of Silver Creek and its tributaries in 2013. The eradication project was completed as part of the *Conservation Agreement and Conservation Strategy for Bonneville Cutthroat Trout in the State of Nevada*. In order to ensure that there was no potential for diploid rainbow trout or any other non-native trout to survive, the chemical treatment was conducted from headwaters to Silver Creek Reservoir.

MANAGEMENT REVIEW

All approaches were completed at Cave Lake in 2013.

All four approaches were completed in 2013 at Cold Creek Reservoir. This year was the fifth year of a five-year study to evaluate the health of the trout fishery and determine the success of largemouth bass for controlling tui chub. However, due to inconclusive data, the study has been extended an additional year (through FY16). This

will provide another year of data to assist in determining the health of the trout fishery and largemouth bass at Cold Creek Reservoir.

The single approach for Bassett Lake was completed in 2013.

All four approaches for Illipah Reservoir were completed in 2013.

The single approach for Silver Creek Reservoir was completed in 2013.

RECOMMENDATIONS

Cave Lake

- Gill net surveys should be conducted in the future to assess population density and species composition of the Cave Lake trout fishery.
- Efforts should be expended to maximize the Cave Lake brown trout population.
- Current stocking levels at Cave Lake should be maintained in an effort to meet angler demand.
- Continue to monitor and sample for quagga mussels in Cave Lake.
- Implement goals and objectives outlined in the *Cave Lake Fisheries Management Prescription*.

Cold Creek Reservoir

- Electroshocking and gill netting surveys should be continued in an effort to determine the success of the largemouth bass and bowcutt trout augmentations at Cold Creek Reservoir.
- Augment additional largemouth bass or bowcutt trout in Cold Creek Reservoir if deemed necessary.
- Continue a general fisheries assessment through opportunistic angler contacts periodically in the future.
- Continue to maintain and check return of volunteer angler drop-box surveys.
- Continue to visually assess water quantity (lake level, inflow/outflow) and quality (clarity) for coordinating trout stocking.
- Conduct gastric lavage on all largemouth bass contacted during opportunistic angler surveys to determine utilization of food resources.

Bassett Lake

- Visually monitor seasonal water level fluctuations in the reservoir during the course of other duties.
- Conduct additional survey work in the Bassett Lake system to gain a proper understanding of flow patterns and identify possible problem spots prior to its treatment.

Illipah Reservoir

- Conduct a general fisheries assessment through opportunistic angler contacts in the 2014 calendar year.
- Continue to maintain and check return of volunteer angler drop-box surveys.
- Continue to visually assess water quantity (lake level, inflow/outflow) and quality (clarity) for coordinating trout stocking.

Silver Creek Reservoir

- Gill net surveys should be conducted periodically in the future to assess population density and species composition of the Silver Creek Reservoir trout fishery.
- Conduct a general fisheries assessment through opportunistic angler contacts in the 2014 calendar year.
- Continue to maintain and check return of volunteer angler drop-box surveys.
- Continue to visually assess water quantity (lake level, inflow/outflow) and quality (clarity) for coordinating trout stocking.

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