

NEVADA DEPARTMENT OF WILDLIFE  
STATEWIDE FISHERIES MANAGEMENT



FEDERAL AID JOB PROGRESS REPORTS  
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2014

WHITE PINE COUNTY  
Small Lakes and Reservoirs  
Eastern Region



**NEVADA DEPARTMENT OF WILDLIFE, FISHERIES DIVISION  
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, 2014 through December 31, 2014

**SUMMARY**

During 2014, Cave Lake was stocked with 27,168, 9.5-inch rainbow trout from April through October. On April 15th, 2014, Steve Gray, the Cave Lake State Park Manager, alerted NDOW he observed a fish present that was not a trout. He stated that it looked like a perch or crappie, however, it was difficult to verify because as soon as he realized it was not a trout it darted into cover. Illegal fish introductions such as crappie have occurred in Southern Region waters, specifically Spring Valley State Park in Lincoln County, within the last year.

In early fall of 2014, a mark-recapture sampling event took place at Cave Lake to examine the status of the crayfish population. Thirty crayfish traps were set for 682.5 hours and captured 101 crayfish. Crayfish were marked with a uropod clip and released. Traps were set again for 693.75 hours capturing 127 crayfish of which only 5 were recaptured. The Lincoln-Peterson model projected a population estimate of 2,176 crayfish. At a 95% confidence interval, the population ranged was  $648 \leq 2,176 \leq 3,702$ .

As part of the Cold Creek Reservoir Study, gill net and electroshocking surveys were conducted during 2014. In the spring, gill net surveys resulted in 211 fish captured that consisted of 46 rainbow trout, 6 bowcutt trout, and 159 tui chub. In the fall, a total of 40 minutes encompassing 851 of actual shocking seconds produced 209 fish. The composition of fish captured was 42 rainbow trout, 5 bowcutt trout, 35 largemouth bass, and 127 tui chub. The use of largemouth bass for controlling nuisance tui chub appeared promising this year.

A total of 2,142 hatchery-reared rainbow trout and 1,600 bowcutt trout were stocked at Cold Creek Reservoir in 2014. Additionally, 69 largemouth bass were augmented into the reservoir to aid in further controlling tui chub abundance.

During the 2014 electroshocking survey of Comins Lake, six northern pike were contacted, but not captured. The cause of this is likely due to high conductivity of the water. No largemouth bass were contacted or observed during the survey. In recent years, NDOW has documented the decline of northern pike and, in 2014, nothing changed in the population structure. Due to poor water quality, limited angling and the anticipation of chemical treatment meant no creel contacts were attempted at Comins Lake in 2014.

Bassett Lake was monitored quarterly for flow variations throughout the year. This also helped with identifying spring complexes and slack water areas that will be difficult to treat with rotenone during the proposed treatment in summer 2015.

Gill nets were set in Illipah Reservoir in the spring of 2014. A total of 69 trout were captured in two gill nets including 48 rainbow trout and 21 brown trout. Rainbow trout were captured at a rate of 2.7 per net hour, while brown trout were captured at 1.2 per hour.

Silver Creek was stocked with 2,370 tiger trout in June of 2014. The reason that so few fish were stocked into Silver Creek Reservoir was due to low water levels.

## **BACKGROUND**

### Cave Lake

Cave Lake resides in Cave Lake State Park located 15 miles southeast of Ely, Nevada. Water levels are maintained by the park ranger and the fishery is managed by NDOW as a put-and-take rainbow trout fishery. The fishery sees approximately 20,000 angler use days per year. Stocking occurs from April through October and the 32 surface-acre reservoir receives more than 20,000 hatchery-reared rainbow trout averaging approximately nine inches. Although uncommon in the angler's creel, a self-sustaining population of brown trout also occupies the lake.

Cave Lake State Park has long been a popular destination for many outdoor recreationists for fishing, hiking, camping, and a base camp for hunting. However, one of the complaints continually voiced is the small size of trout caught. Due to the lake's morphological makeup and relative lack of traditional lentic macroinvertebrates that trout depend upon, stocked fish currently do not realize substantial growth and carryover. Crayfish are present, but few stocked trout reach a size to be able to forage on them.

A crayfish population survey was conducted in August of 2009. Traps were set along the northwest shoreline and adjacent to the dam. It was estimated that Cave Lake had a population of 3,882 crayfish. Additionally another crayfish population survey was conducted at Cave Lake in September of 2010. The survey covered the same area as the 2009 survey and it revealed a population estimate of 8,583 crayfish.

### Cold Creek Reservoir

Cold Creek Reservoir is a small spring-fed water that is located approximately 100 miles northwest of Ely in Newark Valley, Nevada. At capacity, the reservoir covers 14 surface-acres and is situated on both private property and land administered by the Bureau of Land Management. It is managed under a General Fishery Management Concept and contains largemouth bass and a naturally reproducing population of rainbow trout that is augmented twice annually with approximately 4,000 hatchery-

reared rainbow trout averaging nine inches. The reservoir receives approximately 1,300 angler use days per year.

After being chemically treated in 1972 and again in 1984 to remove tui chub, chub abundance rapidly increased and is at nuisance levels once again. Tui chub compete with rainbow trout for food resources and, because rainbow trout do not do as well, angler visitation and satisfaction has suffered. In an effort to establish biological control, a total of 247 largemouth bass were augmented in 2008 and 2009. Bowcutt trout are known to be more piscivorous than rainbow trout, and in the fall 2010, 1,610 Marlette-strain bowcutt trout were stocked. An additional 1,560 bowcutt trout were stocked in the fall of 2012. It is anticipated that bowcutt trout and largemouth bass will create a multi-tiered fishery, increase angling opportunity, and provide a means to control tui chub.

### Bassett Lake

Bassett Lake is situated in Steptoe Valley approximately five miles northwest of McGill, Nevada. It was created by Kennecott Copper Corporation in 1942 to serve as a desilting reservoir for mill tailings from its McGill copper operation. At the current maximum 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 and constant water source is Tailings Creek. 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, 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, the water level at Illipah Reservoir fluctuates greatly and is highly dependent upon winter precipitation.

### Silver Creek Reservoir

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

## 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 at least 10 crayfish traps overnight, two times each summer or fall.
- Set two thermographs to monitor the littoral water temperature pattern.
- Visually survey shoreline and littoral habitat once in summer.
- 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.
- If necessary, augment the largemouth bass population with various sizes from nearby waters (Ruby Lake NWR).

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.

- Conduct general fisheries assessment through opportunistic angler contacts

### Comins Lake

Objective: General Sport Fisheries Management.

Approaches:

- Visually monitor seasonal water level fluctuations during the course of other duties.
- Conduct a general fisheries assessment through opportunistic angler contacts.
- Electroshock four established transects during one night in the fall.

### Bassett Lake

Objective: General Sport Fisheries Management.

Approaches:

- Visually monitor seasonal water level fluctuations during the course of other duties.
- Begin identifying spring complexes and slack water areas in preparation for a chemical treatment.

### 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.

### Silver Creek Reservoir

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.

## PROCEDURES

Visits were made throughout 2013 to Cave Lake and Illipah Reservoir for monitoring water quality and quantity. While present at each water body, personnel collected creel survey data. Information on harvest, effort, and angler origin were recorded. Harvested trout were measured to fork length (FL) in millimeters (mm).

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 measure water temperatures for trout stocking.

During the course of other duties throughout the year, volunteer angler drop-boxes at Cold Creek Reservoir, Illipah Reservoir, and Silver Creek Reservoir were periodically maintained and restocked with questionnaires. At the end of the year, data was summarized.

On April 15th, 2014, Steve Gray, the Cave Lake State Park Manager, alerted NDOW he observed a fish present in Cave Lake that was not a trout. He stated that it looked like a perch or crappie, however, it was difficult to verify because as soon as he realized it was not a trout it darted into cover. Therefore, a Coffelt electroshocking boat was used to sample Cave Lake and target illegally introduced fish on the evening of May 15, 2014. A single transect began at the boat launch and continued counter-clockwise following the shoreline until the boat launch was reached again. 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 480 (DC) with an output of 4.5 amps. Pulse frequency was set at 60 Hz with a pulse width of 4 milliseconds. Attempts were made to capture all stunned fish.

Sampling for quagga mussel veligers were conducted on August 25, 2014 at Cave Lake. A 63 $\mu$ m mesh plankton net was used to collect two vertical samples at various depths. A target of 1000 liter water sample was achieved. Samples were preserved in ethanol and were sent to two independent labs for analysis. Visual and tactile surveys were completed at the boat ramp to monitor for presence of adult quagga mussels.

The Coffelt electroshocking barge was used to sample four established transects at Comins Lake on the night of October 7, 2014. The shocking unit was set up with the forward booms as the anode and the hull of the boat as the cathode. Voltage was set at

850 (DC) with an output of 3 amps. Pulse frequency was set at 60 Hz with a pulse width of 2 milliseconds. Attempts were made to capture all fish stunned during the survey.

A crayfish population estimate was completed using a mark-recapture survey that was completed on consecutive days at two locations at Cave Lake. At each site, 15 standard crayfish traps were baited with hotdogs, fished at 3.3 – 9.8 feet (1.0 – 3.0 m) of water near shore, and tethered by rope to a surface float. Traps were fished overnight and pulled in early afternoon. All captured crayfish were marked with a right or left uropod clip and immediately released in the vicinity of capture. Specifics of each marking set included:

Set 1 – September 28-29, 2014. Fifteen traps were set along the western 1/3 of the dam face and along the west shoreline at the northwest end of the reservoir. Traps were set for 23.5 hours.

Set 2 – September 29-30, 2014. Fifteen traps were set along the eastern 2/3 of the dam face and around the east end of the dam into the cove at the north end of the reservoir. Traps were set for 22 hours.

After giving marked crayfish nearly a week to disperse and intermingle with unmarked crayfish, the trapping effort was essentially duplicated. On two consecutive days, the same number of traps was again set in the same two locations as the previous week. Upon capture, crayfish were examined for uropod clips and subsequently released. Specifics of each recapture set included:

Set 1 – October 5-6, 2014. Fifteen traps were set for 23 hours.

Set 2 – October 6-7, 2014. Fifteen traps were set for 23.25 hours.

Once again at Cold Creek Reservoir, two 150 feet x 6 feet experimental gill nets were set at 1510 and 1520 hours on March 24, 2014. Nets consist of five panels of  $\frac{1}{2}$ ,  $\frac{3}{4}$ , 1,  $1\frac{1}{2}$ , and 2 inch mesh. The first net was set deep at the south end of the reservoir (lower pond) along the east shoreline at a depth of eight feet. The second net was set shallow at the north end of the reservoir along the west shoreline in six feet of water. Nets were pulled at 0815 and 0945 hours on March 25, 2014. Fork length of all trout captured was measured while a representative sample of chubs was measured (total length). Live trout were returned to the reservoir and all chubs were discarded.

The Coffelt electroshocking barge was used to sample one established transect at Cold Creek Reservoir on the evening of September 4, 2014. 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 680 (DC) with an output of 4.5 amps. Pulse frequency was set at 60 Hz with a pulse width of 5 milliseconds. Attempts were made to capture all fish stunned. 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.

Two 150 feet x 6 feet experimental gill nets were set at 1457 and 1510 hours on April 10, 2014 at Illipah Reservoir. Nets consist of five panels of  $\frac{1}{2}$ ,  $\frac{3}{4}$ , 1,  $1\frac{1}{2}$ , and 2 inch mesh. One net (deep set) was set along the east shore roughly halfway between the old dam and the new dam in 30 feet (9.1 meters) of water. The other net (shallow set) was set farther south along the east shore of the south lake, approximately two thirds of the way between the old dam and current inflow in 13 feet (4 meters) of water. Nets were pulled at 0857 and 0910 hours on April 12, 2014. All fish captured were identified and total length measurements recorded. Live fish were returned to the reservoir while crayfish captured were discarded.

## **FINDINGS**

### Cave Lake

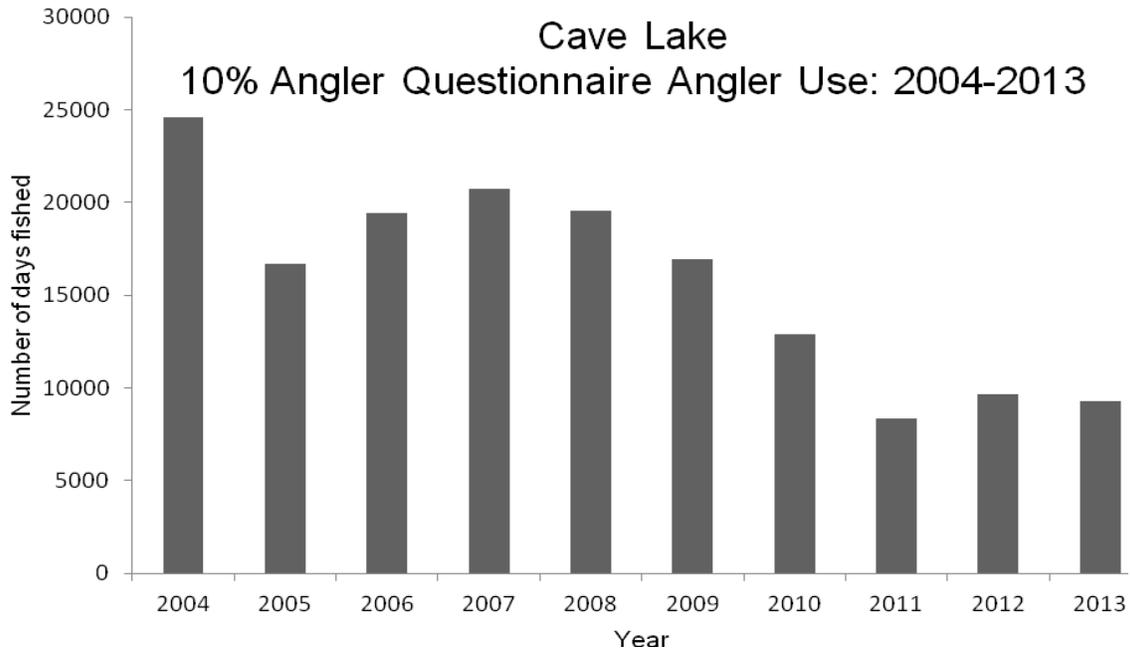
Both annual fishing derbies at Cave Lake were attended to conduct creel surveys in 2014. A total of 121 trout were measured, rainbow trout comprised 98% (119) of the trout caught, while brown trout made up the remaining 2% (2). The rainbow trout measured from 7.1 inches (180mm) to 14.7 inches (372mm) with an averaged fork length 10.6 inches (270mm). Brown trout were 9.5 inches (242mm) and 12.2 (310mm).

The current mail-in angler questionnaire information for Cave Lake from 2013 shows there was a small drop in the number of angler days from 2012. During the past decade, the number of angler days has slowly descended, with the lowest in 2011 (Figure 1). Anglers spent nearly three times as many days in 2004 (nearly 25,000) fishing Cave Lake than in 2011 (about 8,400). Based on previous Mail-in Angler Questionnaire Surveys, use of this fishery by southern Nevada residents followed a similar trend, suggesting they greatly influence angling pressure.

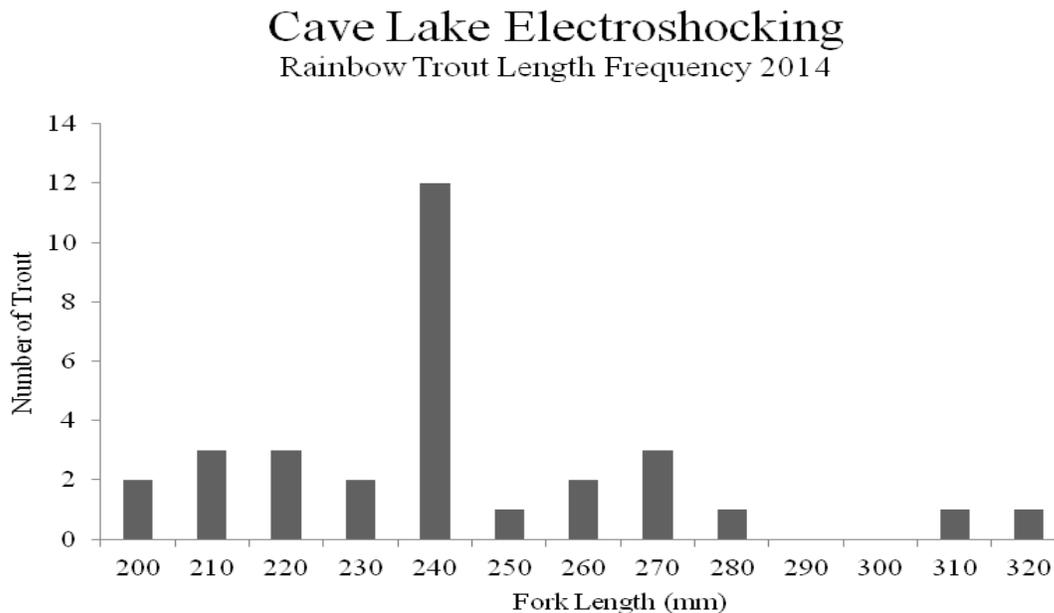
The electroshocking survey began at 2035 hrs and ended at 2120 hrs, encompassing 1,017 seconds (17 minutes) of actual shocking. The only species captured were brown and rainbow trout. No illegally introduced fishes were found during the survey. There were 54 brown trout caught during the survey. The number of brown trout captured during shocking activities is nearly twice as many brown trout than what has been captured during gill net surveys (29) over the past ten years.

A representative sample of 30 rainbow trout was selected at random to measure fork length. Rainbow trout ranged between 7.8 inches (199 mm) and 12.6 inches (320 mm), with an average of 9.4 inches (240 mm). There were at least three age classes of hatchery rainbow trout present in Cave Lake in 2014 (Figure 2). The average fork length of 9.4 inches from rainbow trout caught represents the average size of rainbow trout stocked into Cave Lake in spring by Spring Creek Rearing Station.

**Figure 1.**



**Figure 2.**

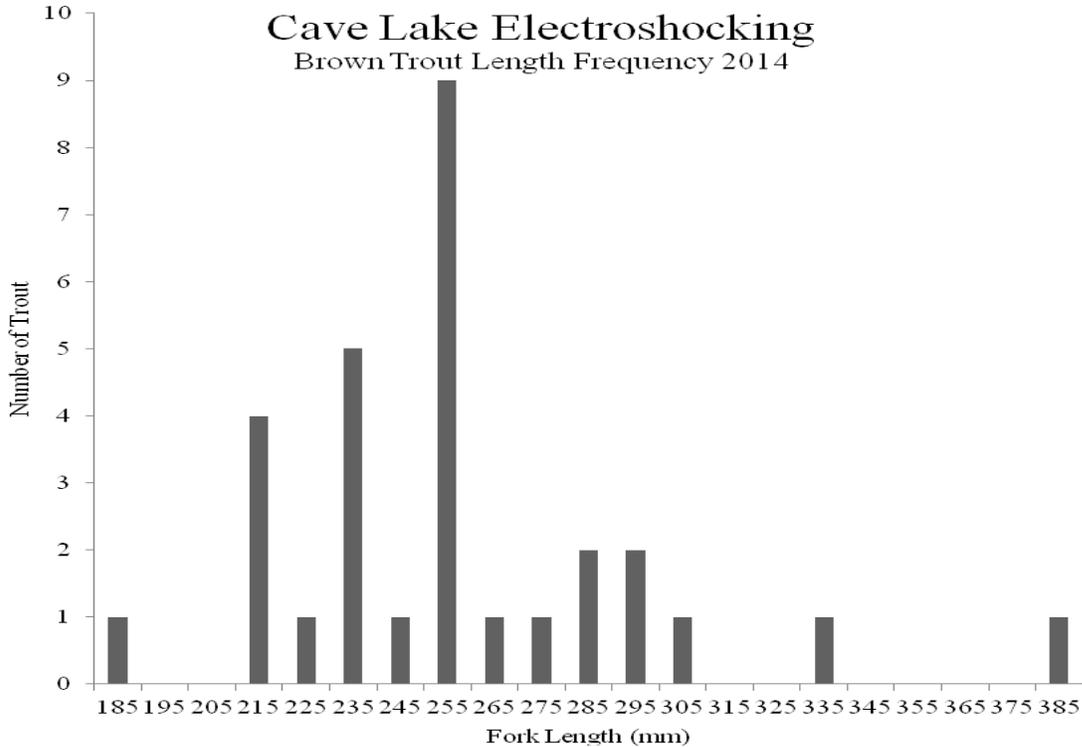


A representative sample of 30 brown trout was measured to fork length that ranged between 7.2 inches (183 mm) and 15.0 inches (381 mm) and averaged 9.9 inches (253 mm). There was at least three age classes present (Figure 3) suggesting there is spawning in Cave Creek and recruitment of an adfluvial brown trout population.

Even though the investigation was not successful in locating illegally introduced fish, the investigation yielded much needed information on the status of the brown trout

population in Cave Lake. The brown trout status in Cave Lake has been relatively unknown and electroshocking verses gill netting allows for better monitoring of their population.

**Figure 3.**



The Cave Lake quagga mussel veliger sampling results were found negative by both independent labs and visual adult mussel surveys also were negative. Veligers can be transported alive in water (bilge water of trailered boats), so it is important that these surveys continue into the future.

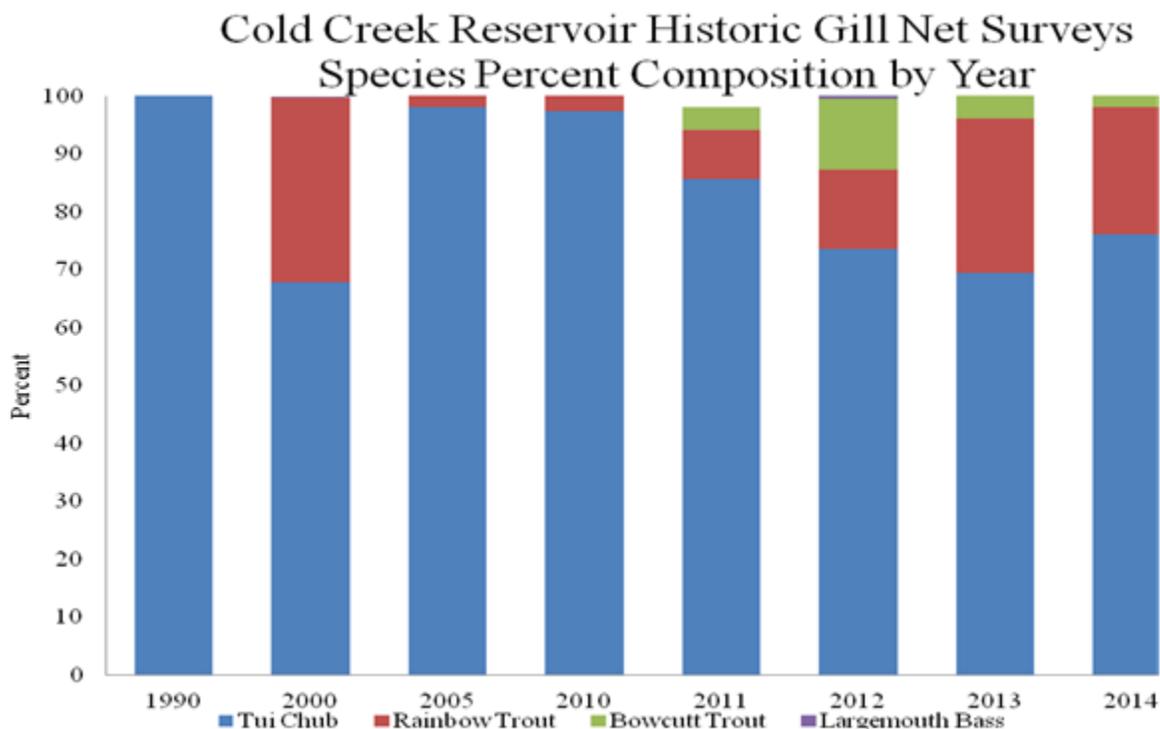
In early fall of 2014, a mark-recapture sampling event took place at Cave Lake to examine the status of the crayfish population. Thirty crayfish traps were set for 682.5 hours and captured 101 crayfish. Crayfish were marked with a uropod clip and released. Traps were set again for 693.75 hours capturing 127 crayfish of which only 5 were recaptured. The Lincoln-Peterson model projected a population estimate of 2,176 crayfish. At a 95% confidence interval, the population ranged was  $648 \leq 2,176 \leq 3,702$ .

### Cold Creek Reservoir

At the time of the gill net survey, the middle pond at Cold Creek Reservoir was dry and the lower pond was approximately 40% of capacity. A total of 211 fish were captured consisting of 46 rainbow trout (22%), 6 bowcutt trout (2%), and 159 tui chub (76%). There was a decrease in trout composition by nearly 6% and an increase in tui chub of 7% from that caught last year (Figure 4). Rainbow trout were captured at a rate of 1.8 fish/hour, bowcutt trout at a rate of 0.2 fish/hour, and chub at a rate of 6.1

fish/hour. Total catch rate for the gill netting was 8.0 fish/hour. The number of chub caught was the second lowest in more than 24 years.

**Figure 4.**



The average fork length of 46 rainbow trout was 9.4 inches (239.3 mm), with a range from 6.3 to 13.8 inches (161-350 mm). Length frequency analysis revealed at least three age classes of rainbow trout inhabited the reservoir (Figure 5). There were four rainbow trout that were noted as being wild spawned. Age classes were occurred at 220 mm, 280 mm, and 360 mm.

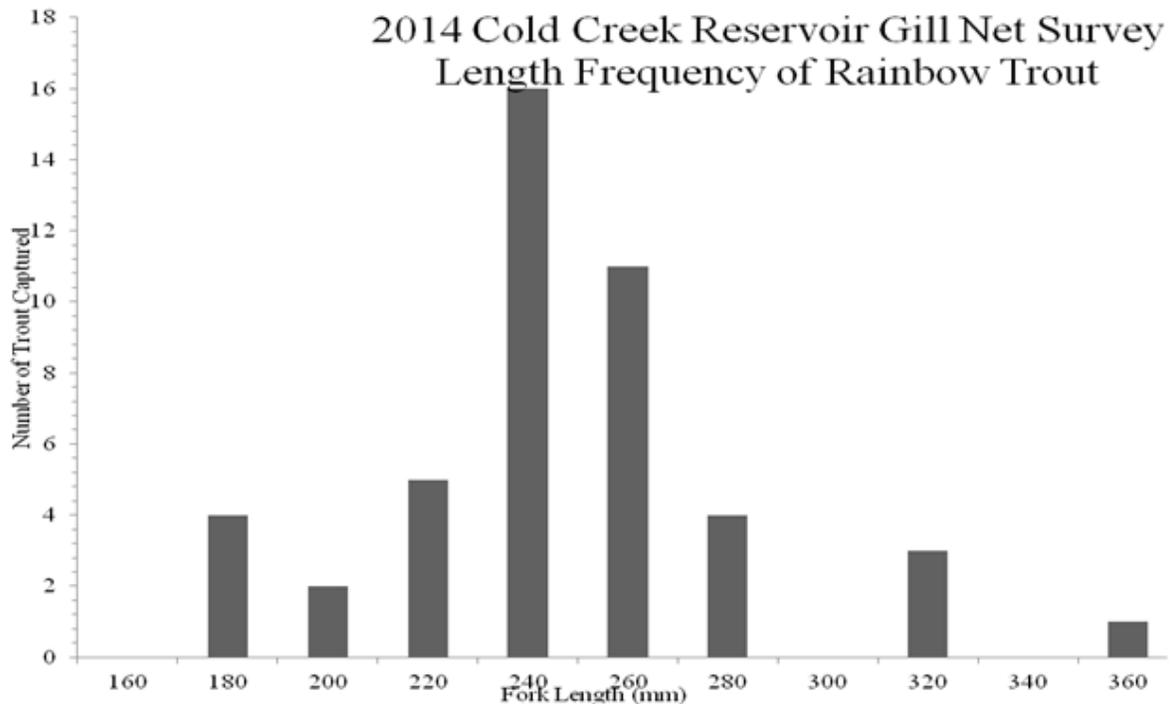
The average fork length of 4 bowcutt trout captured was 11.2 inches (283.3 mm), with a range of 9.3 inches (236 mm) to 12.8 inches (326 mm). Bowcutt trout have been stocked into Cold Creek Reservoir three times, in the fall 2010, fall 2011, and most recently in the fall of 2012. Sizes suggest at least two age classes were present.

A representative sample of 62 tui chubs was processed, while the remaining 97 were discarded. Average total length was 6.2 inches (156 mm) and ranged from three inches (76 mm) to 8.1 inches (205 mm). Length frequency analysis revealed three age classes at 105 mm, 175 mm, and 205 mm (Figure 6).

Tui chub catch in 2014 was the second lowest in 24 years of surveying. However, with observed reproduction and recruitment, it seemed that biological controls (largemouth bass and trout) were not as effective as thought. There was a record number of largemouth bass caught in fall 2013, but numbers appear too low to reduce the abundance of nuisance tui chub. Large bowcutt trout and rainbow trout will consume tui chub young-of-year, but they have not shown a significant effect on reducing tui chub abundance. Since tui chub remain very abundant relative to sport fishes, efforts should

be expanded to ensure that largemouth bass and bowcutt trout increase in order to have the desired effect of controlling tui chub.

**Figure 5.**



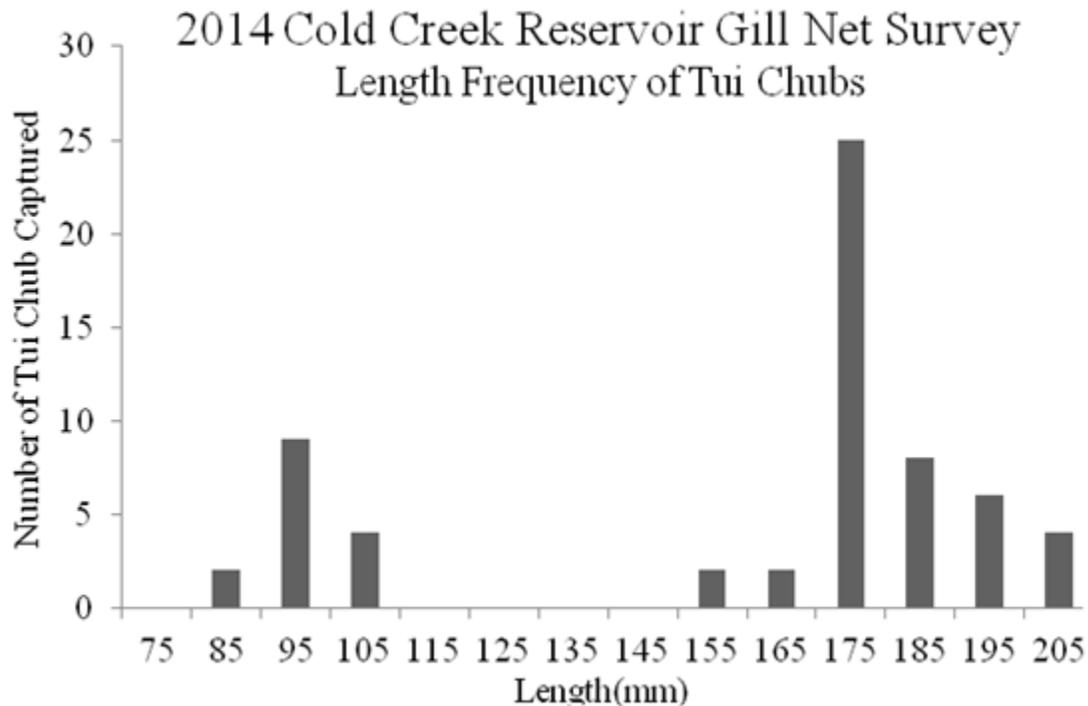
The electroshocking survey began at 1925 hours and concluded at 2005 hours, with 851 seconds of actual shocking. Survey activities commenced at the north end of the lower pond, continued counter-clockwise around, and concluded back at the south end of the reservoir. At the time of the survey, the reservoir was approximately one-third of capacity. The air temperature was 70°F, with an 8 to 10 mph wind out of the north-northwest. The wind created some difficulties maneuvering the boat, but shocking efficiency was good. Water temperature at the end of the survey was 64°F to 66°F.

A total of 209 fish were captured, consisting of 42 rainbow trout (20%), 5 bowcutt trout (2%), 35 largemouth bass (18%), and 127 tui chub (60%) (Figure 7). Even though trout have declined in the last two surveys, total trout captured has remained fairly consistent over the past four years. The number of largemouth bass caught has been steady at 29 and 35 in 2013 and 2014, respectively. The biggest increase over the previous four years has been tui chub, with an increase of nearly four times as many in the 2014 compared to 2011.

The average fork length of rainbow trout captured was 9.6 inches (255 mm), with a range of 4.7 to 12.7 inches (119 to 322 mm). The average length of rainbow trout captured this year was 0.3 inches longer than trout stocked earlier in March. Recruitment of wild rainbow trout increased from five in 2013 to 11 in 2014. This is an indication that the body condition of rainbow trout is good enough in early spring to successfully reproduce. Stocked rainbow trout were easily distinguished from

naturalized rainbow trout by their excessive fin wear from being raised in concrete hatchery raceways. Body condition of all trout captured during the survey was rated as poor. This is the third consecutive year that trout had poor body conditions during the time of this survey.

**Figure 6.**



Abiotic and biotic factors such as habitat quality and competition can attribute to additional stress that causes poor body condition in fish. During late spring and early summer of 2014, rapid water withdrawal from Cold Creek Reservoir was again a major concern. The water level remained consistent since the middle of July, with the water being lowered about 18 inches within two weeks prior to electroshocking. Increased water temperatures increase maintenance metabolism in trout, therefore, they require more food to subsist. This translates to limited growth or none at all. The reservoir also contains a large tui chub population, with young-of-the-year (YOY) continually being recruited. This presents direct competition with trout for available food resources. The accumulative effects of poor water quality, resulting in a change in physiology of the trout, and competition for food could be enough to cause poor body condition in trout.

The length frequency analysis for rainbow trout showed three age classes currently inhabiting the reservoir with length breaks at 150 mm, 210 mm to 285 mm, and 300 mm to 330 mm (Figure 8). Trout measuring between 4.7 inches (120 mm) and 5.9 inches (150 mm) indicates there was some reproduction occurring in the stream feeding the reservoir. There were a number of YOY rainbow trout missed during the survey due to their size being smaller than the net mesh size.

**Figure 7.**

### Cold Creek Reservoir Electroshocking Survey Species Percent Composition by Year



The average fork length of the five bowcutt trout captured was 14.8 inches (375 mm), which ranged from 10.1 inches (257 mm) to 18.5 inches (470 mm). Four trout were weighed to examine body condition and two were found to be in fair, one in good, and one in poor body condition.

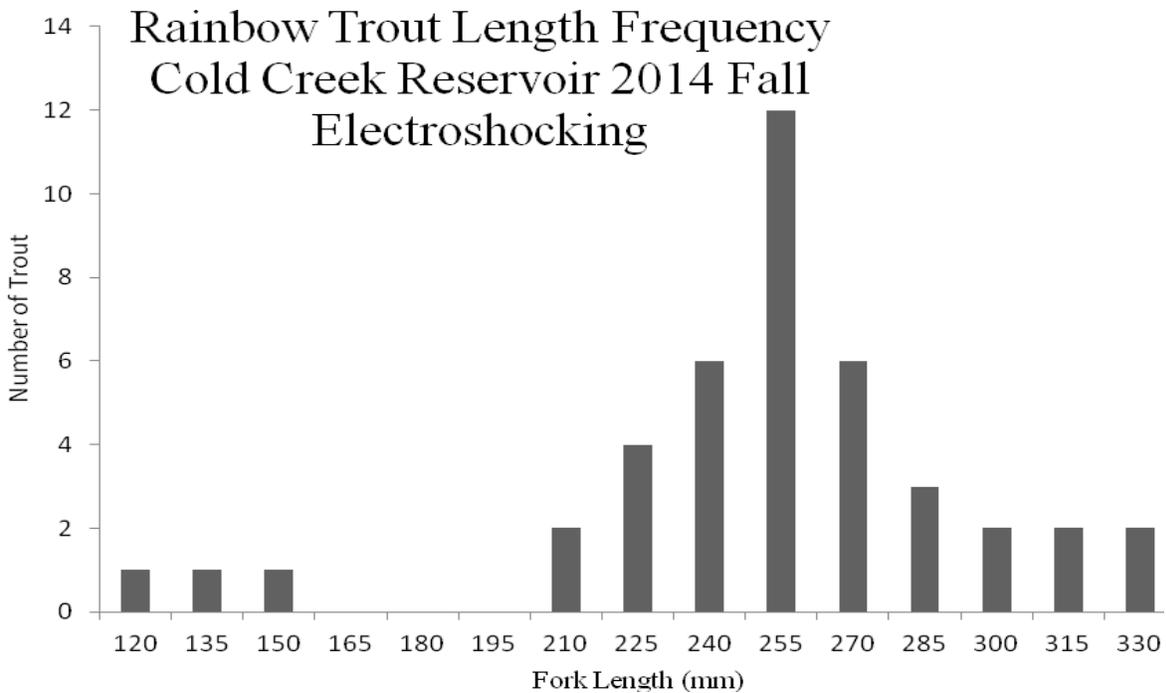
There has been a steady decline in the number of bowcutt trout captured in fall electroshocking surveys since 2010 (Figure 7). Based on fork lengths, it appears there was at least three age classes present, with the youngest containing one trout at 257 mm and the other age class containing three trout measuring at 371 mm, 380 mm, and 398 mm. The oldest age class contained one trout at 470 mm.

This year showed the most largemouth bass captured in an electroshocking survey since they were introduced in 2008. Largemouth bass averaged 6.3 inches (160 mm) and ranged from 3.5 inches (90 mm) to 13.9 inches (353 mm). Largemouth bass averaged 1.1 pounds (514 grams) and ranged from 0.18 pounds (80 grams) to 2.3 pounds (1,040 grams). Of the 35 largemouth bass captured, only seven were weighed in order to determine body condition. Six of the seven largemouth bass had excellent body condition. The remaining largemouth bass was rated as good. Length frequency analysis shows that there were four distinguishable age classes of largemouth bass at break points of 130 mm, 190 mm, 260 mm, and 360 mm (Figure 9).

The results of the 2014 electroshocking survey illustrates that largemouth bass have been spawning since their introduction. There was some evidence of reproduction in the 2013. The 2014 survey shows a strong spawning effort and recruitment that

occurred from previous years. This kind of recruitment reassures the future of largemouth bass at Cold Creek Reservoir. Even though there were fewer large largemouth bass in this year's survey compared to 2013, they could have been in deeper areas of the reservoir where shocking efficiency was poor. Compared to previous years, largemouth bass were more evenly distributed throughout the reservoir in 2014. Being evenly distributed throughout the reservoir could be the result of more active predation on tui chub by largemouth bass.

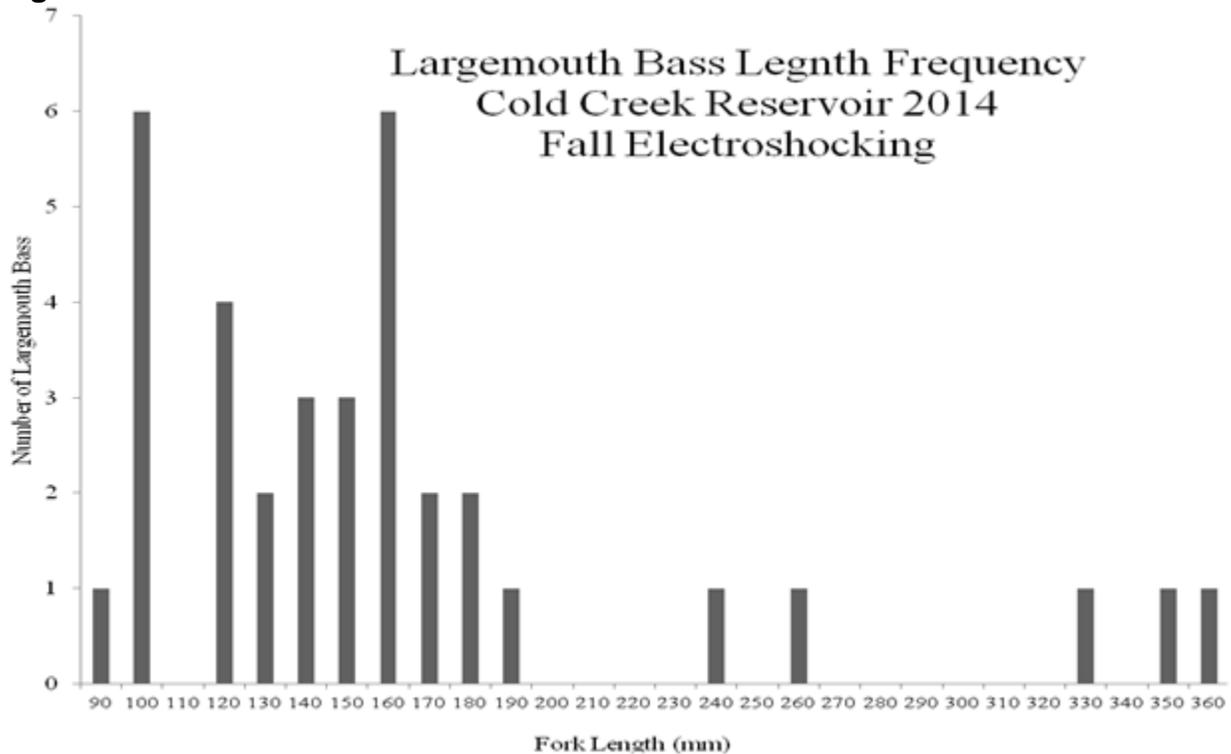
**Figure 8.**



A total of 127 tui chub were captured, however, only 25 were measured as a representative proportion of the population. Tui chub ranged from 2.1 inches (54 mm) to 7.9 inches (200 mm), with an average fork length of 4.4 inches (111 mm). Using length breaks at 125 mm, 175 mm, and 205 mm, three age classes are distinguishable (Figure 9).

Once again, the fall electroshocking survey showed successful recruitment into the tui chub population. Continuous annual 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 show poor body conditions due to biotic and abiotic influences. So far, these factors have not affected trout enough to keep them from reproducing, which is evident with smaller age class rainbow trout. Even though trout have been able to successfully reproduce, the accumulative effect of biotic and abiotic factors could be enough to keep trout from being an effective biological control on the nuisance tui chub population.

**Figure 9.**



### Comins Lake

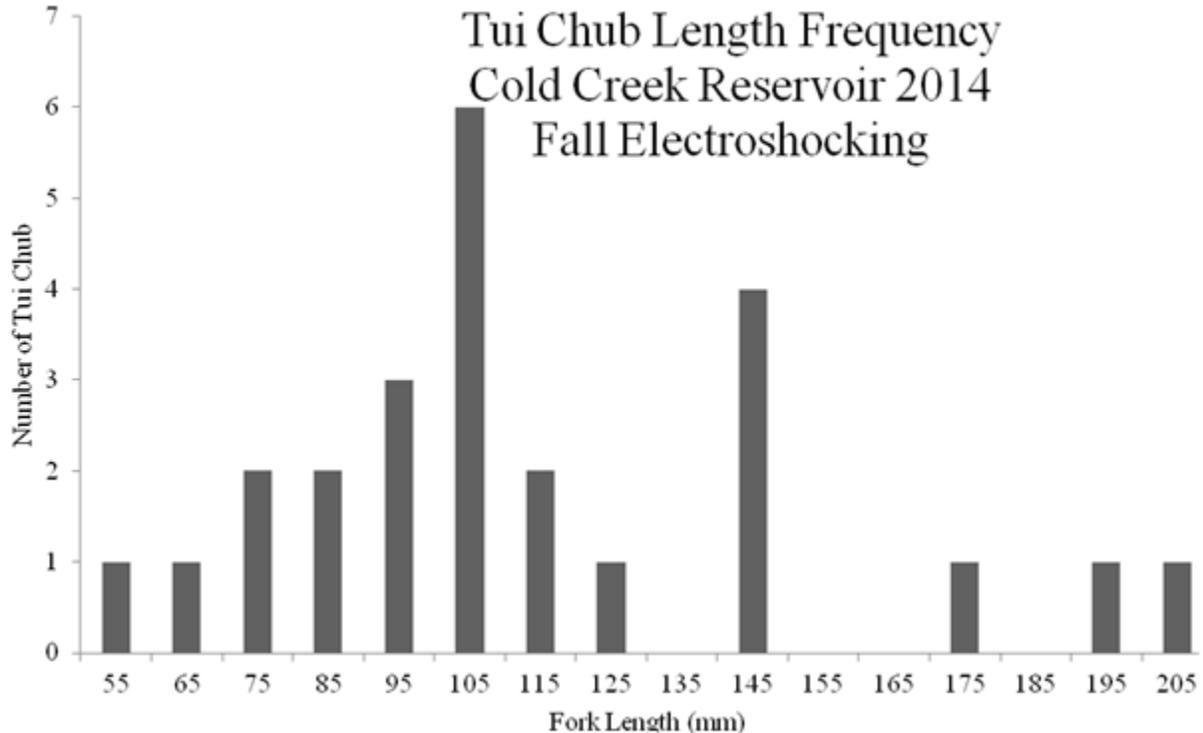
Shocking activities began at 1933 hours and concluded at 2038 hours. In that time, there was a total of 920 shocking seconds. Water temperature was 50°F and air temperature was 52°F. Survey activities commenced at the boat launch, moved to the west side of “the narrows,” and continued down the west shoreline of the south lake toward the float tube launch area. At this point, the water level was too shallow to effectively shock where northern pike inhabit, so this transect was shortened and the survey resumed on the opposite shoreline near the Argus Mill Site. Once again, due to low water conditions, the shocking boat could not get close enough to the shoreline habitat and had to leave the transect to avoid being stuck on sand bars. The survey ended up moving back into the northern portion of the lake, along the eastern shoreline and the face of the dam. Shocking continued in a counterclockwise fashion and concluded back at the boat launch.

Once in the northern portion of Comins Lake, the deeper water level provided more suitable habitat for electroshocking northern pike. However, high conductivity caused poor shocking efficiency resulting in the inability to catch northern pike. At least five northern pike were hit in the electrical field; however, they easily swam out of the field and avoided being captured.

The latter end of 2013 and throughout 2014, angling for northern pike declined significantly. This was likely due to their population collapse that has been documented for the last five years. This survey comes on the heels of a plan to conduct a rotenone

treatment of Comins Lake and Bassett Lake in 2015. This being the case, no further biological data for northern pike in Comins Lake was collected.

**Figure 10.**



### Bassett Lake

During three trips to Bassett Lake, personnel walked and drove around the lake looking for areas that will provide obvious problems during the rotenone treatment project. These areas were identified on maps that are kept on file at the Ely Field Office.

### Illipah Reservoir

A total of 93 volunteer angler surveys from the drop-box were received from Illipah Reservoir in 2014, which was less than what was received in 2013 (112 angler surveys). Only two angler surveys were rejected for insufficient data. During months when surveys were received, 93 anglers fished for 254 hours and caught 929 fish consisting of 846 rainbow trout and 83 brown trout. Resulting catch rates (all fish) were 10 fish per angler and 3.7 fish per hour. Catch rates for 2014 were considerably higher than what was found in 2013. There were only 117 fewer trout caught in 2014 than there was in 2013 (1,046). However, in 2013, anglers spent more time fishing (373.5 hours) compared to 254 hours in 2014. Of the 846 rainbow trout caught, 152 were harvested and the remaining 694 released. In addition, 22 brown trout were harvested, while the other 61 were released. Harvest rates resulted in 1.87 fish per angler and 0.69 fish per hour. Shore anglers accounted for 87% (109 individuals) of all anglers,

three percent fished from boats (9 individuals) and the remaining one percent fished from float tubes (three individuals).

Volunteer angler surveys were analyzed and from rainbow trout caught, 95% ranged from less than nine inches to 14.9 inches (Table 1). The remaining five percent were larger fish that ranged from 15.0 inches to greater than 19.0 inches. Length measurements for brown trout were more evenly distributed.

**Table 1.**

	Rainbow Trout	Brown Trout
<9.0"	159 / 19 %	13 / 16
9.0" - 10.9"	289 / 34 %	16 / 19
11.0" - 12.9"	230 / 27 %	11 / 13
13.0" - 14.9"	134 / 16 %	20 / 24
15.0" - 16.9"	36 / 3.5 %	19 / 23
17.0" - 18.9"	4 / 0.5 %	4 / 5
>19.0"	0 / 0	0 / 0
Total	852 / 100	83 / 100

Angler satisfaction was rated on a scale of 0 to 4, with 0 being unsatisfied and 4 representing satisfaction. For 2014, total fishing experience averaged 3.18, while number of fish averaged 2.95, and size of fish averaged 2.96. Overall angler satisfaction decreased this year even though there was an increase in catch rates and more fish reported of larger size classes. One variable that likely attributed to poor ratings for Illipah Reservoir was the drawdown of the reservoir by the water right holders. From April 15, 2014 to May 15, 2014, the water level drop eight vertical feet. It remained that low or slightly lower throughout the entire summer.

### Silver Creek Reservoir

Silver Creek Reservoir was stocked with 2,370 tiger trout in June of 2014. The reason that so few fish were stocked was due to low water levels.

## **MANAGEMENT REVIEW**

All approaches were completed for Cave Lake in 2014.

All four approaches were completed in 2014 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 at controlling tui chub. However, due to inconclusive data, the study has been extended an additional year. This will provide

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

Both approaches for Bassett Lake were completed in 2014.

All four approaches for Illipah Reservoir were completed in 2014.

Both approaches for Silver Creek Reservoir were completed in 2014.

Two of the three objectives were completed for 2014. Objectives included monitoring water level fluctuations and electroshocking four established transects during one night in the fall.

## **RECOMMENDATIONS**

### Cave Lake

- Place placards around Cave Lake citing NRS 503.597 (Introduction of aquatic life) to discourage the illegal movement of fish species.
- That crayfish surveys be conducted to accumulate data and determine if crayfish is a viable food source for smallmouth bass.

### Cold Creek Reservoir

- Electroshocking and gill net 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.
- Conduct gastric lavage on all largemouth bass contacted during opportunistic angler surveys to determine utilization of food resources.

### Comins Lake

- Conduct a chemical treatment to eradicate northern pike.
- If a chemical treatment is deemed unfeasible, boat electroshocking four established transects.
- That the public awareness campaign continues in an effort to inform the public of future management plans for the reservoir.

### 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.
- 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.
- That gill net surveys be conducted to document the status and trend of the trout fishery.

### Silver Creek Reservoir

- 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.

Prepared by: Heath Korell  
Biologist II, Eastern Region

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