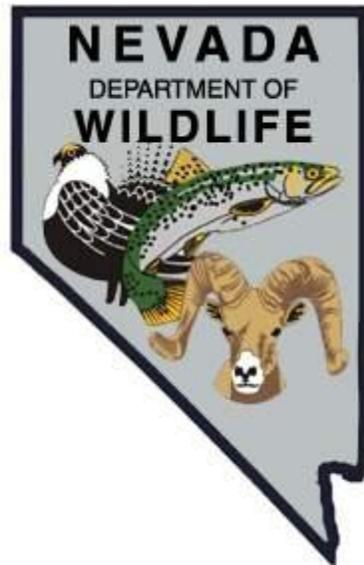


NEVADA DEPARTMENT OF WILDLIFE STATEWIDE FISHERIES MANAGEMENT



FEDERAL AID JOB PROGRESS REPORT

F-20-49
2013

TRUCKEE RIVER WESTERN 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: *Truckee River*
Period Covered: *January 1, 2013 through December 31, 2013*

SUMMARY

On April 1, 2013, the designated end for measuring snowpack, the Truckee River Basin snowpack stood at 60% of average. This follows a year where total snowpack was just 59% of average. A majority of upstream storage was exhausted in 2013 and another drought year could prove disastrous.

Nine fish population survey transects were completed across four river zones (2 through 5) on the Truckee River on October 8-10, 2013. A total 1,400 fish were captured during the survey consisting of 760 salmonids, 603 native non-game species, and 37 undesirable species. Excluding undesirable species, a game fish to non-game fish ratio of 56:44 was found.

Relative density of salmonids in the Truckee River across all transects and zones was 614.8 fish per mile. Salmonid estimates ranged from a low of 64.5 fish per mile at Painted Rock to a high of 2,812.6 fish per mile at Wingfield. Total species composition for all salmonids at all transects showed 64% rainbow trout, 27% brown trout, and 9% mountain whitefish.

Rainbow trout continue to do well in the Truckee River and consist of wild populations augmented with hatchery-reared fish to compensate for angling pressure and harvest. Of the 484 rainbow trout captured at all transects, 66.7% (323 fish) were found to be wild fish. Moreover, out of 250 wild rainbow trout captured, 74.4% (186 fish) were deemed as Class I or younger and were positive indicators of successful spawning in 2012 and 2013.

Brown trout populations also continued to thrive in the Truckee River. Data collected suggests their populations have not declined since the stocking program was eliminated eight years ago. Of the 208 wild brown trout analyzed, 62.5% (130 fish) were deemed to be Class I or younger and serve as a positive indicator of successful spawning in the past two years.

Of the 68 mountain whitefish analyzed, 57.4% (39 fish) were deemed to be Class I or younger fish. A total of 140 rainbow trout and 62 mountain whitefish fin samples were collected during the annual electroshocking survey and given to University of Nevada Genetics Lab for genetic analysis.

Opportunistic angler contacts were made on five days in 2013. There were 37 anglers that fished for 57 hrs and caught 224 fish, which were rainbow trout. Of these,

9 were harvested while the remaining 215 were released. Catch rates were 6.05 fish per angler and 3.93 fish per hour. Angler use showed all 37 anglers to be Washoe County residents.

A total of 65 volunteer angler surveys were received from the two drop-boxes on the Truckee River in 2013. Anglers fished for 194.5 hrs and caught 169 fish consisting of 150 rainbow trout and 19 brown trout. Resulting catch rates (all fish) were 2.60 fish per angler and 0.87 fish per hour. Species composition was 88.8% rainbow trout and 11.2% brown trout.

The Mail-in Angler Questionnaire Survey estimated Truckee River use at 9,220 anglers and 101,845 angler use days. There were an estimated 253,784 fish caught with a success rate of 2.49 fish per day. These estimates were substantially higher than the 6,451 anglers, 57,917 angler days, 112,574 fish, and 1.94 fish per day reported from 2011.

From early March through early October, the Truckee River was stocked with 76,845 triploid-strain rainbow trout on 19 separate occasions.

The Nevada Board of Wildlife Commissioners met in September to discuss and set fishing seasons and bag limits for 2014. At this meeting, the Washoe County Advisory Board to Manage Wildlife recommended regulation changes as presented in a petition by a private individual. As a result, the Nevada Board of Wildlife Commissioners enacted a three fish limit throughout the portion of the Truckee River in Nevada to become effective on March 1, 2014.

From Painted Rock upstream to the Nevada/California border, 26 transects were surveyed for the presence/absence of New Zealand mud snails (NZMS) on the Truckee River. A total of 679 NZMS were collected at the 13 transects where mud snails were documented. As a result of the survey, current NZMS distribution on the Truckee River spans from Mustang upstream to Mayberry Park, a distance of approximately 18 miles.

BACKGROUND

The Truckee River formerly supported tremendous spawning runs of cui-ui that lived in Pyramid Lake and lacustrine/ad-fluvial Lahontan cutthroat trout (LCT) that inhabited the Lake Tahoe and Truckee River basins. It is generally accepted there were two spawning runs (winter and spring) of LCT from Pyramid Lake that would ascend the Truckee River to reach spawning habitat in the main stem and tributaries. The cui-ui is believed to have had an upstream limit near East McCarran Boulevard while LCT is believed to have moved throughout the Lake Tahoe-Truckee River-Pyramid Lake watershed.

The influx of European settlers to the Truckee River basin brought with it a number of anthropogenic changes to the system including water diversions (fish passage barriers) for municipal and agricultural use (i.e., Derby Dam), over-harvest of fish, habitat alteration, reduced water quality and quantity, and introduction of non-

native salmonids. The Pyramid Lake LCT population began to dwindle in the early 1900s and they eventually became extirpated around 1940. Fortunately, the cui-ui was able to persist in limited numbers due to the longevity of the species.

LCT were successfully reintroduced into Pyramid Lake by the Nevada Department of Wildlife (NDOW) with stocks from a number of genetic strains including fish from Summit Lake and the Carson River Basin. The reintroduced LCT population currently provides a quality fishery. Pyramid Lake is within the boundaries of the Pyramid Lake Paiute Reservation and the Pyramid Lake Paiute Tribe (PLPT) manages the lake's LCT fishery, which is maintained by hatchery stocking.

Subsequent to the collapse of the LCT fishery in the Truckee River, non-native salmonids such as rainbow trout and brown trout were introduced for sport fishing purposes. These species soon established self-sustaining populations that persist today. In an effort to meet angler demand, wild trout in the Truckee River are annually augmented with hatchery-reared trout.

The majority of the Truckee River is managed under general regulations, which allow year-round angling and restricts daily harvest to five trout and ten mountain whitefish. In 1981, a "Trophy Section" was created in a 2 mi stretch of the upper Truckee River from Verdi Power Dam upstream to the California state line. This was changed to a 3 fish limit in 2013. However, the designation still requires the use of artificial lures/flyes. In 1988, the Trophy Section was extended one mile downstream to the Interstate-80 Bridge. In 1992, the artificial lure regulation was modified to read, "artificial lures with single barbless hooks."

NDOW and the PLPT signed a 5 yr Memorandum of Agreement (MOA) in 2002, which coordinates efforts to restore LCT in the Truckee River. The main objectives are to 1) Work toward the reestablishment of a natural LCT spawning run in the Truckee River and 2) To utilize LCT in the maintenance of recreational fishing in the Truckee River. Due to improved habitat conditions for salmonid spawning and rearing, both parties are optimistic that some degree of restoration is possible. In addition, through the work of the Fish Passage Team, some fish passage barriers are under evaluation in the hope that future modification would allow fish to move naturally throughout the system.

Annual population sampling has been conducted utilizing electrofishing techniques on the Truckee River since 1971.

In April of 2013, the Nevada Division of Environmental Protection (NDEP) informed the Department of Wildlife that a substrate sample collected in August of 2012 from the Truckee River had recently been analyzed and was confirmed to contain a single New Zealand mud snail (*Potamopyrgus antipodarum*) (NZMS). The single mud snail was reportedly collected near the East McCarran Bridge in Sparks, Nevada and it represents the first confirmed occurrence of the non-native invasive species in the Truckee River/Lake Tahoe Basin.

OBJECTIVES

General Management Objectives:

- Monitor water quantity (discharge) through USGS stream flow data.
- Monitor fish populations by conducting tote-barge electroshocking surveys at 11 traditional transects during three days in the fall.
- Coordinate and assist USFWS with raft electroshocking and shoreline electroshocking in the spring, summer, and fall as needed.
- Coordinate LCT recovery/restoration activities with the Truckee River Recovery Implementation Team.
- Collect fin samples from rainbow trout and LCT for genetic analysis during electroshocking surveys in cooperation with the University of Nevada Genetics Lab.
- Conduct a general assessment of angler use, success, and harvest through opportunistic angler contacts, return of angler drop box surveys, and mail-in angler questionnaire data.
- Maintain the angler information center and angler drop-boxes when on site.

PROCEDURES

Monitor water quantity (discharge) through USGS stream flow data. Natural Resource Conservation Service (NRCS) and US Geological Service (USGS) data were used to assess water quantity in the Truckee River throughout the year. Annual snowpack data was derived from NRCS Snowtel sites in the Truckee River Basin while instream flow data was obtained from USGS gages located at Reno and Derby Dam sites.

Monitor fish populations by conducting tote-barge electroshocking surveys at 11 traditional transects during three days in the fall. The Smith Root 5.0 GPP tote barge was used in a single pass fish survey at 11 transects along the Truckee River on October 8 through 10, 2013. Due to poor results in the past, the Eagle Picher transect was eliminated last year in favor of adding the new transect at the McCarran Ranch property. The Crystal Peak Park transect was also not completed in 2013. The tote barge-shocking unit was set up with the two probes as the anode and the hull of the aluminum barge, containing the shocking unit, as the cathode. Power was generated with a gasoline-powered generator also housed in the boat. Voltage was set in the high range (50 to 1,000 V DC) and 50 to 100% power, while pulse frequency was set at 120 Hz.

At each transect, the tote barge was pushed upstream while continuously shocking using both probes. Standard dip nets were used to capture stunned fish and then were temporarily placed in a live well on the tote barge until shocking activities were completed. All fish captured were identified to species, measured (fork length to the nearest millimeter), and returned to the river. Rainbow trout were also judged as either wild or hatchery. Caudal fin samples were collected from rainbow trout and

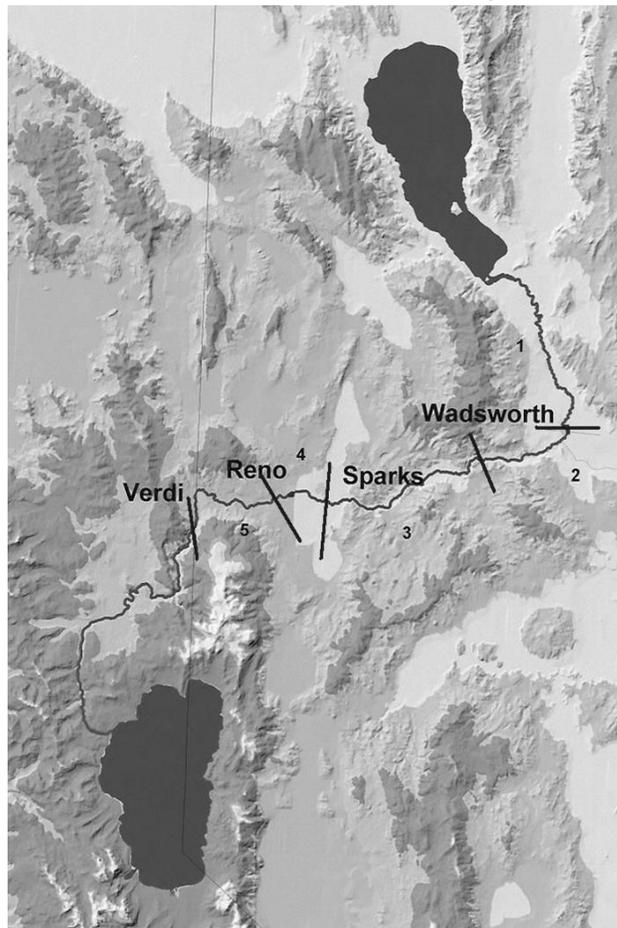
preserved in coin envelopes for future genetic analysis.

Data gathered were compiled and analyzed in Microsoft Excel. Species composition and age class distribution at each transect were assessed. Relative density (fish per mile) estimates were calculated based on the length of transect and number of fish captured. Attempts were not made to electroshock every fish nor every portion of river at each transect. This survey was not intended to provide a population census at each transect. It was intended instead to develop basic trends over time that can be compared to previous electroshocking efforts.

For ease of data analysis, the Nevada portion of the Truckee River was divided into five zones beginning at the mouth of Pyramid Lake and ending at the California state line (Figure 1). Beginning downstream and moving up, Zone 1 encompasses Pyramid Lake to the Wadsworth Bridge and is entirely within the Pyramid Lake Paiute Tribe (PLPT) Reservation. It is not sampled by NDOW. Zone 2 stretches from the Wadsworth Bridge upstream to Derby Dam, while Zone 3 covers Derby Dam to East McCarran Bridge. Most of the greater Reno/Sparks urban area is located within Zone 4, which runs from East McCarran Bridge to Mayberry Bridge. The portion of the river from Mayberry Bridge to the California state line is defined as Zone 5.

Figure 1.

Truckee River Zone Map



Coordinate and assist USFWS with raft electroshocking and shoreline electroshocking in the spring, summer, and fall as needed. Due to efforts spent researching and surveying for New Zealand mud snails in the Truckee River as well as assisting other Western Region biologists in various projects, no progress was completed on this approach in 2013.

Coordinate LCT recovery/restoration activities with the Truckee River Recovery Implementation Team. Actions pertaining to LCT restoration in the Truckee River basin are usually coordinated with the USFWS and other members of the Truckee River Recovery Implementation Team (RIT) during semi-annual meetings. The Truckee River RIT did not meet in 2013.

Collect fin samples from rainbow trout and LCT for genetic analysis during electroshocking surveys in cooperation with the University of Nevada Genetics Lab. A total of 140 rainbow trout and 62 mountain whitefish fin samples were collected during the annual electroshocking survey. Samples were air dried in envelopes and delivered to the genetics lab for analysis.

Conduct a general assessment of angler use, success, and harvest through opportunistic angler contacts, return of angler drop-box surveys, and mail-in angler questionnaire data. Scheduled and opportunistic visits were made to the Truckee River throughout the year for collecting creel survey data during an expected time to contact the greatest number of anglers as possible. Information on angler harvest, effort, and origin were recorded. Harvested fish were identified to species and measured to fork length in millimeters.

During the course of other duties throughout the year, two volunteer angler drop-boxes on the Truckee River were periodically maintained and restocked. At the end of the calendar year, data was tallied.

Angler use and success at the Truckee River was also assessed through the Department's Mail-in Angler Questionnaire Survey. Angler questionnaire data was derived from a survey that was mailed to about 10% of license purchasers from the previous calendar year.

As described in How to find a needle in a haystack: A qualitative sampling protocol for presence/absence of New Zealand mud snails (Draheim and Ryce), a modified zigzag technique was used to survey transects on the Truckee River for the presence/absence of New Zealand mud snails (NZMS) from July 9 to 17, 2013. Encompassing that portion of the Truckee River managed by the Department of Wildlife, the survey began at Rock Park, moved upstream to the Nevada/California border, returned to Rock Park, then moved downstream to Painted Rock near the Pyramid Lake Paiute Reservation boundary.

Two surveyors were utilized per transect. At each transect, a midpoint was first delineated. From here, a length of 100 ft was measured and marked both upstream and downstream. Beginning at the midpoint, each surveyor completed a “zig” by first walking perpendicular to the bank to a point judged to be halfway across the river. At the completion of every other step, two to three rocks or substrate material was picked up from the river bottom and thoroughly examined for the presence of snails. A corresponding “zag” was accomplished by walking at roughly a 45° angle back to the same bank and checking substrate accordingly at every other step.

Zigs and zags were completed by one surveyor moving upstream and the other downstream to each corresponding 100 ft marker. At most transects this equated to a total of four zigs and zags upstream and an additional four zigs and zags downstream. All gastropods found were collected and preserved in a plastic vials until the transect was complete. It must be noted that, in some cases, the halfway point of the river could not be safely reached in the zig procedure due to depth or high flow. In these instances, a returning zag was initiated from the furthest, safest location reached. In addition, some transects did not allow for a complete 100 ft transect upstream or downstream from the initial midpoint. In such cases, the longest attainable distance upstream and downstream was completed. Gastropods collected were preserved in ethyl alcohol. Detailed notes were taken regarding transect locations, river aspect, and any other pertinent information. Water temperature was taken with a standard bulb thermometer. Midpoint locations were recorded and given named waypoints using a Garmin handheld GPS. Subsequent to survey activities, all gastropods collected were reviewed by the Limnological Laboratory at the University of Nevada for proper species identification.

Maintain the angler information center and angler drop-boxes when on site.

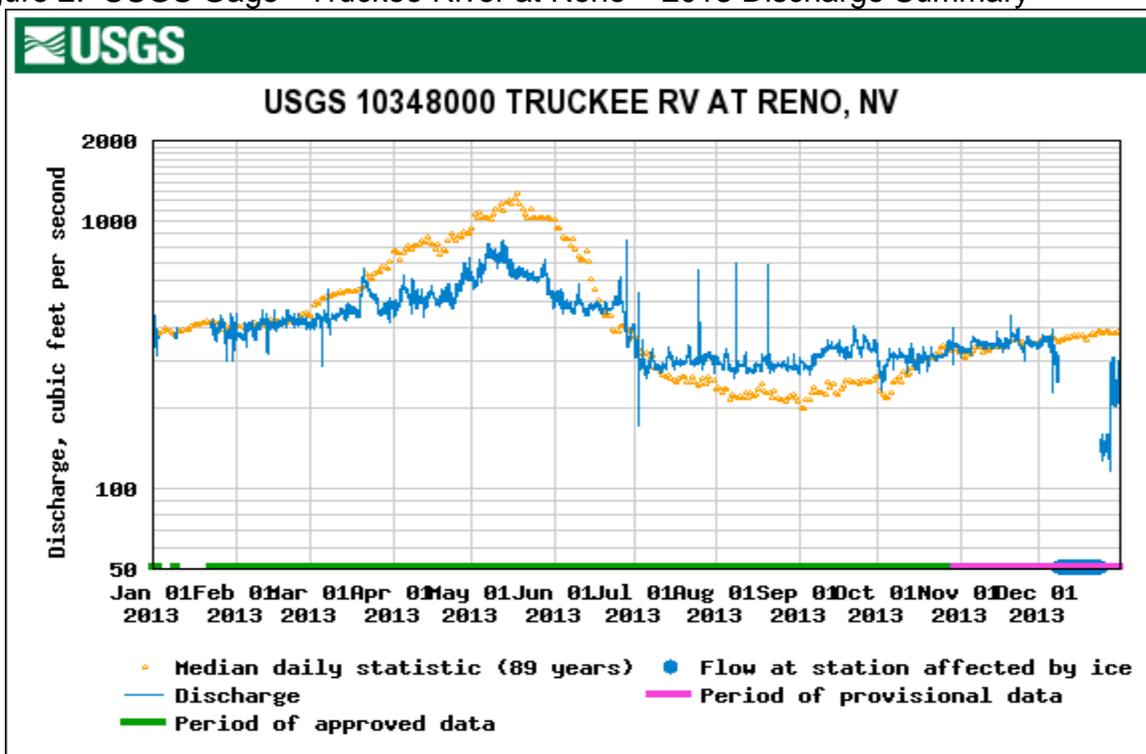
The angler information center and drop-boxes were visually inspected and restocked on a regular basis.

FINDINGS

General Management Objective

Monitor water quantity (discharge) through USGS Stream Flow data. On April 1, 2013, the designated end for measuring snowpack, the Truckee River Basin snow pack stood at 60% of average. This follows a year where total snowpack was just 59% of average. This is certainly a cause for concern for the Truckee River fishery. A single drought year can be mitigated fairly easily. A second consecutive year of precipitation well below average, such as was experienced this year, exhausts all upstream storage supplies. However, with upstream storage depleted, a third consecutive year of drought could prove disastrous for the Truckee River fishery. Due to upstream storage, flows were maintained in the Truckee River throughout 2013. Consequently, the USGS gauge at Reno showed flows well above the long-term average from August through October, the warmest part of the year (Figure 2). This gage gives a general representation of water conditions throughout the Truckee Meadows downstream to Derby Dam.

Figure 2. USGS Gage - Truckee River at Reno – 2013 Discharge Summary

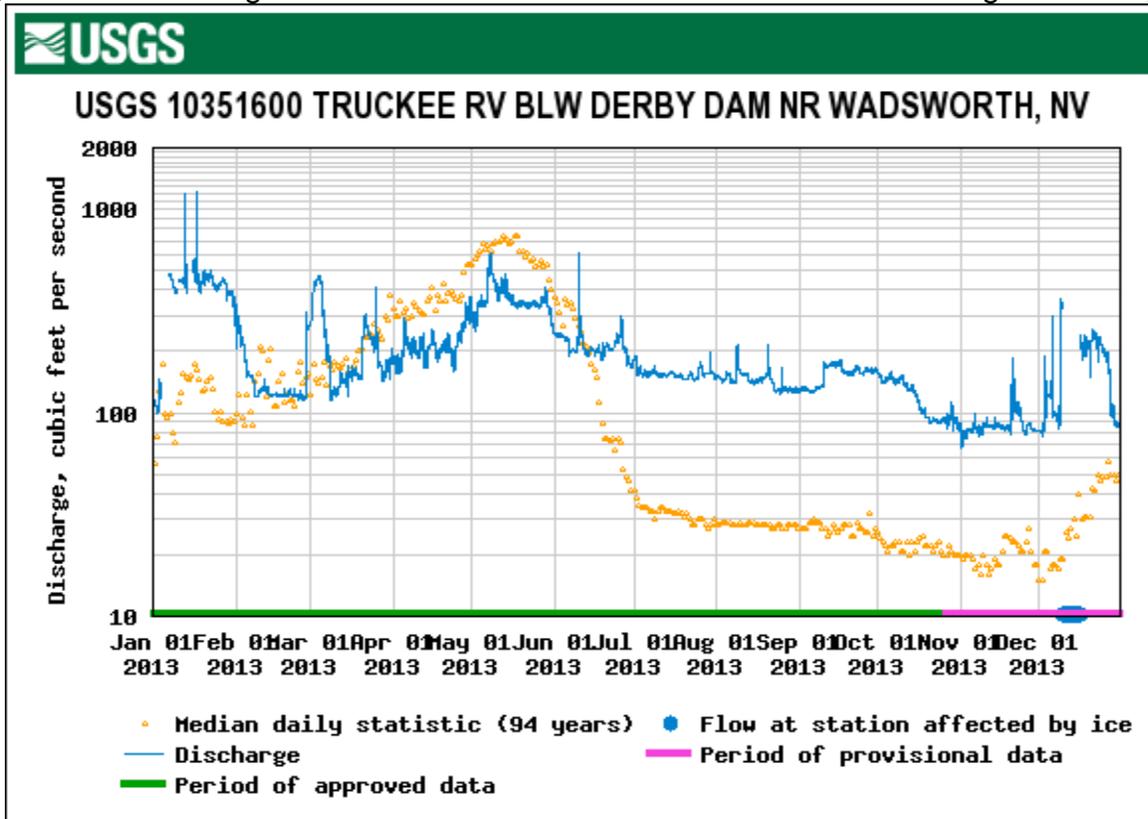


Similarly, the USGS gage near Wadsworth reported discharge higher than the long-term average throughout the latter half of the year (Figure 3). Based on observations made during the drought of 1987 to 1994, a minimum instream flow of 250 cfs in Zones 2 and 3 downstream of Sparks is necessary to sustain salmonid populations through July and August. Flows less than 250 cfs may allow water temperature to approach the upper threshold for trout survival. Average discharge from the USGS Reno gage showed flows above 250 cfs in the first half of the year and dropping below the 250 cfs for much of the last half of the year. Despite less than desirable flows for much of 2013, no fish mortalities were observed or reported. Although detrimental effects from a poor winter snowpack were not realized in 2013, it is feared that an additional winter with below average snowpack could prove devastating to the Truckee River fishery. With many of the upstream storage reservoirs now nearly dry, then adequate winter snowpack is crucial to maintain flow in the river throughout the upcoming year.

Monitor fish populations by conducting tote-barge electroshocking surveys at 11 traditional transects during three days in the fall. Eleven fish population survey transects were completed across four river zones (2 through 5) on the Truckee River on October 8 through 10, 2013. A total 1,400 fish were captured during the survey consisting of 760 salmonids, 603 native non-game fishes, and 37 of undesirable species. Salmonids were comprised of rainbow and brown trout, both of which are non-native, as well as the native mountain whitefish. Although more than 15,000 LCT were stocked into the Truckee River in 2011, none were observed or captured during the survey. Native non-game species captured consisted of Paiute sculpin, Lahontan

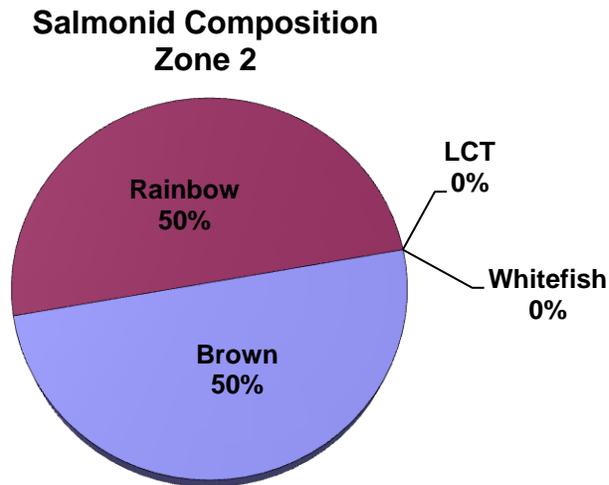
redside shiner, speckled dace, mountain sucker, Tahoe sucker, and tui chub. Twenty green sunfish, 14 largemouth bass, and 3 fathead minnows made up the 12 undesirable fishes. A few common carp were also observed during surveys yet none were captured. Undesirable species were a result of unintentional and/or illegal introductions in the river over time.

Figure 3. USGS Gage – Truckee River Near Wadsworth – 2013 Discharge Summary



Zone 2 population sampling transects were completed at Painted Rock and Derby Dam. A total of 156 non-game fish, 42 salmonids, and 29 undesirable fish were captured. Non-game fish captured included 124 Lahontan redside shiners, 15 mountain suckers, 15 Tahoe suckers, and 2 speckled dace. Undesirable fish consisted of 16 green sunfish and 13 largemouth bass. Salmonids were comprised of 21 brown trout and 21 rainbow trout (Figure 4) resulting in a relative density of 121.0 fish per mile. Fish collected and processed from the large pool at the foot of Derby Dam were included in length assessments, but not factored into the fish per mile estimate. Average length of brown trout was 10.5 in (266 mm) and ranged from 8.1 in (205 mm) to 18.8 in (478 mm). No juvenile brown trout (class I or smaller) were captured. Rainbow trout ranged from 3.9 in (99 mm) to 16.9 in (436 mm) and averaged 10.0 in (254 mm) overall. Approximately 19% of wild rainbow trout captured in Zone 2 were Class I or younger fish (<140 mm) suggesting fair to moderate recruitment. Of the 21 rainbow trout captured, 100% were identified as wild fish.

Figure 4.



A single population sampling transect was completed in Zone 3 at the McCarran Ranch. This transect was added last year to replace the Eagle Picher transect, which did not appear to be a good representation of this zone. The transect at McCarran Ranch should be able to capture changes in fish populations in the Truckee River resulting from a number of restoration projects in recent years. While restoration efforts have resulted in deeper habitats that appear to provide excellent fish habitat, they are not conducive to tote barge sampling techniques, so larger salmonids may be underrepresented as a result. A total of 247 non-game fish and 26 salmonids was captured in Zone 3. Non-game fish captured included 34 Lahontan reddsides, 29 mountain suckers, 1 speckled dace, and 183 Tahoe suckers. Salmonids were comprised of 7 brown trout and 19 rainbow trout (Figure 5) resulting in a relative density of 429 fish per mile. Average length of brown trout was 8.8 in (224 mm) and ranged from 6.6 in (168 mm) to 13.7 in (349 mm). No Class I or younger brown trout (<160 mm) were captured. Rainbow trout ranged from 3.5 in (89 mm) to 17.7 in (450 mm) and averaged 7.0 in (177 mm) overall. Approximately 42% of wild rainbow trout captured in Zone 3 were Class I or younger fish (<140 mm) suggesting a good recruitment year in 2012. All rainbow trout captured were identified as wild fish. Although time is needed to determine what effects the restoration projects on the lower Truckee River will have on fish populations, evidence of recruitment and the presence of large salmonids serve as positive early indicators.

Zone 4 population sampling transects were completed at Rock Park (two transects) and Wingfield. A total of 144 non-game fish, 367 salmonids, and 8 undesirable fish were captured. Non-game fish captured included 69 Lahontan reddsides, 12 speckled dace, 50 mountain suckers, and 13 Tahoe suckers, while undesirable fish consisted of 3 fathead minnows, 4 green sunfish, and 1 largemouth bass. Salmonids were comprised of 110 brown trout, 240 rainbow trout, and 17 mountain whitefish (Figure 6) resulting in a relative density of 969.8 fish per mile. Average length of brown trout was 4.8 in (122 mm) and ranged from 2.4 in (60 mm) to 17.5 in (445 mm). Approximately 86% of brown trout captured in 2013 were

represented by Class I or younger fish (<160 mm), which was evidence of excellent brown trout recruitment. Rainbow trout ranged from 2.0 in (52 mm) to 16.3 in (415 mm) and averaged 3.8 in (96 mm). Approximately 94% of wild rainbow trout captured in Zone 4 were Class I or younger fish (<140 mm), again showing excellent recruitment in 2013. All rainbow trout captured in Zone 4 were identified as wild fish. Average length of mountain whitefish was 11.0 in (281 mm) and ranged from 3.5 in (90 mm) to 15.9 in (405 mm). Approximately 6% of mountain whitefish were represented by Class I or younger fish (<200 mm), which was evidence of poor mountain whitefish recruitment in Zone 4 in 2012. Although final analysis is not yet available, however, preliminary findings for examining fish passage through the Rock Park Whitewater Park are positive from a study commissioned by the City of Sparks.

Figure 5.

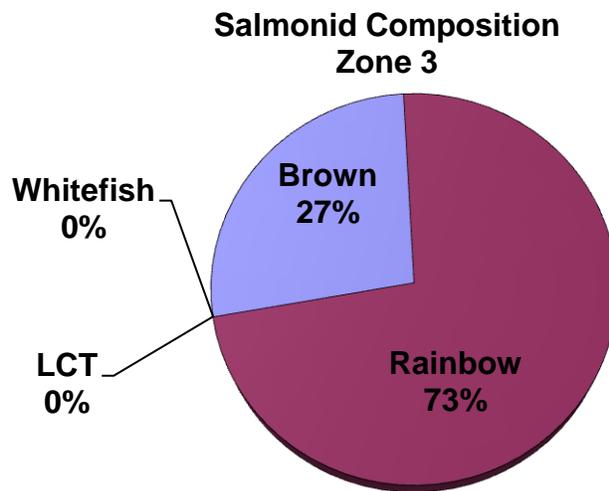
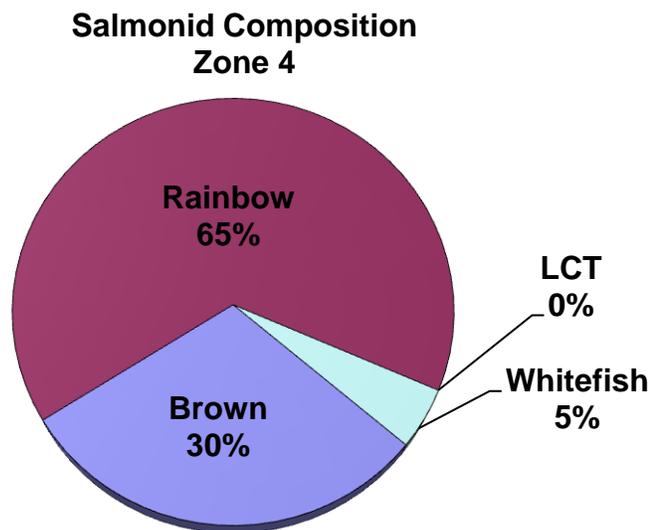


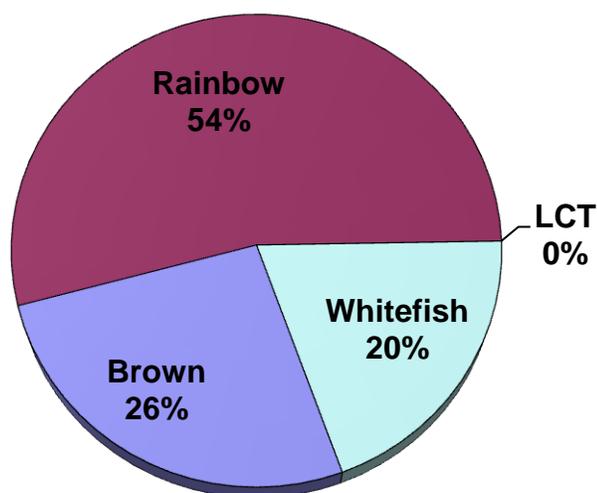
Figure 6.



Zone 5 population sampling transects were completed at Patagonia, River Bend Dam, River Bend Dam Pool, Verdi Power Dam, and Verdi Power Dam Pool. A total of 54 native non-game fish and 325 salmonids were captured. Non-game fish captured included 7 Paiute sculpin, 27, speckled dace, 10 mountain suckers, 9 Tahoe suckers, and 1 Lahontan redbreast shiner. Salmonids were comprised of 70 brown trout, 204 rainbow trout, and 51 mountain whitefish (Figure 7) resulting in a relative density of 767.9 fish per mile. Fish collected and processed from large pools at the foot of both River Bend Dam and Verdi Power Dam were included in fish length assessments, but not factored into fish per mile estimates. Average length of brown trout was 8.5 in (217 mm) and ranged from 3.3 in (84 mm) to 26.9 in (682 mm). Evidence of good brown trout recruitment in 2012 occurred, with approximately 50% of brown trout captured as Class I or younger fish (<160 mm). Rainbow trout ranged from 2.8 in (72 mm) to 14.6 in (370 mm) and averaged 9.0 in (230 mm) overall. Approximately 51% of wild rainbow trout captured in Zone 5 were Class I or younger fish (<140 mm), suggesting good recruitment in 2012. Of the 224 rainbow trout captured, just 10.8% (22 fish) were identified as wild fish. A relatively low percentage of wild rainbow trout was a direct result of sampling at both Patagonia and the Verdi Dam pool. During the month preceding the survey, the Truckee River had been stocked with over 12,000 rainbow trout, many of which are planted in these two areas. A vast majority of rainbow trout captured at these transects were undoubtedly from current stockings. Average length of mountain whitefish was 7.3 in (185 mm) and ranged from 2.0 in (52 mm) to 15.4 in (390 mm). Approximately 75% of mountain whitefish were represented by Class I or younger fish (<200 mm), which was evidence of good mountain whitefish recruitment in 2012.

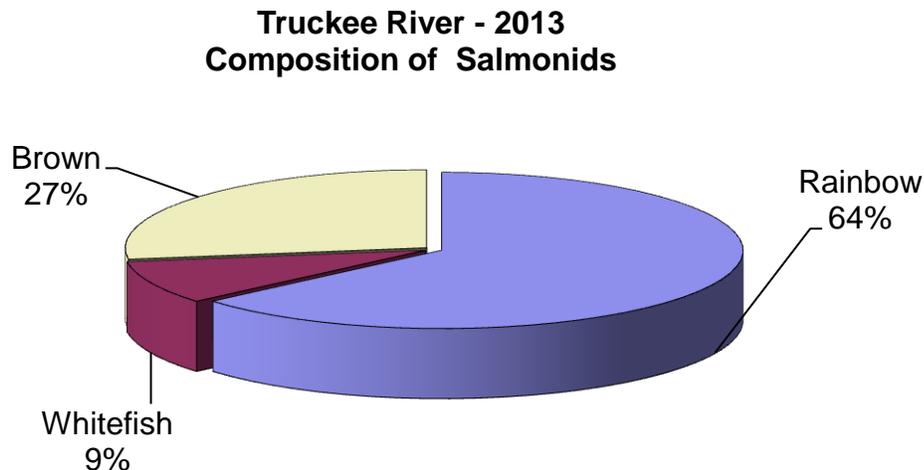
Figure 7.

Salmonid Composition Zone 5



Relative density of salmonids in the Truckee River across all transects and zones was 614.8 fish per mile which is quite a bit lower than the 1,008.4 fish per mile found in 2012. Fish estimates (salmonids) ranged from a low of 64.5 fish per mile at Painted Rock to a high of 2,812.6 fish per mile at Wingfield. Total species composition for all salmonids at all transects showed 64% rainbow trout, 27% brown trout, and 9% mountain whitefish (Figure 8). In comparison to the 2012 survey of the Truckee River, rainbow trout increased by 10%, while brown trout decreased by 8% and whitefish by 2%.

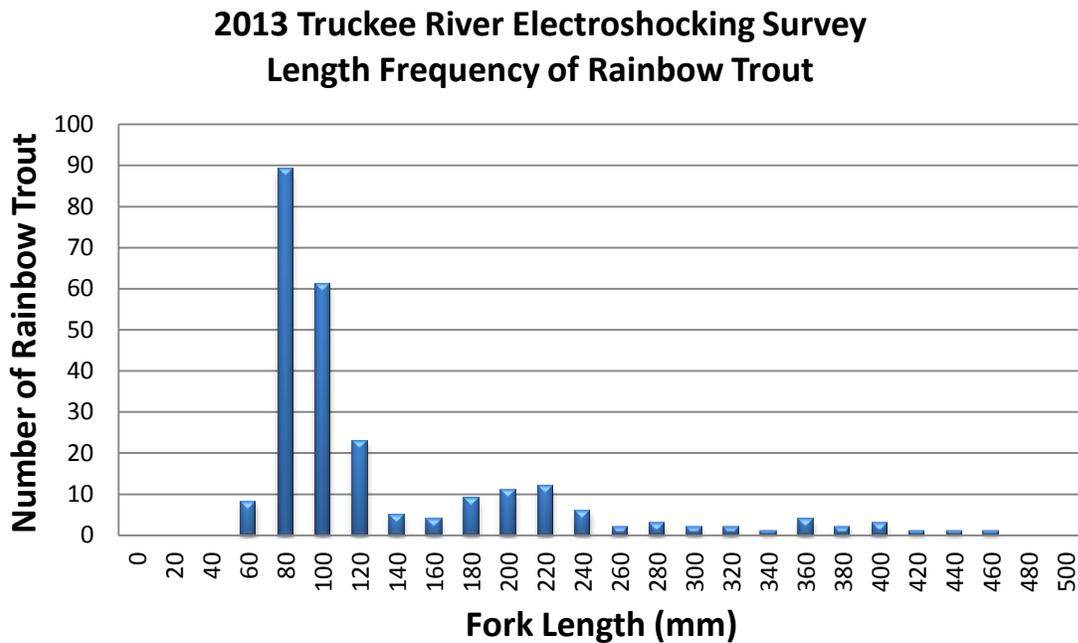
Figure 8.



A length frequency analysis of the wild rainbow trout captured reveals at least five age classes represented in the Truckee River survey effort (Figure 9). A breakpoint of 5.5 in (140 mm) was used to distinguish Class I and younger fish while breakpoints of 9.5 in (240 mm), 12.6 in (320 mm), and 15.7 in (400 mm) were used to separate older age classes. Due to rainbow trout of various sizes being stocked throughout the year, it is important to note that a length frequency analysis was completed only on rainbow trout that were identified as wild. Of the 250 wild rainbow trout analyzed, 74.4% (186 fish) were deemed as Class I or younger and were positive indicators of successful spawning in 2012 and 2013. Of particular note were extremely high numbers of Class I and younger fish sampled at the Rock Park and Wingfield transects. Of the 484 rainbow trout captured at all transects, 66.7% (323 fish) were deemed as wild.

Rainbow trout continue to do well in the Truckee River and consist of wild populations augmented with hatchery-reared fish to compensate for angling pressure and harvest. Historic survey data shows wild rainbow trout consistently outnumbered hatchery-reared trout since the late 1990's. However, a 10% reduction in wild rainbow trout was realized when compared to the 2012 survey. As previously discussed, this reduction was a direct result of the inordinate number of hatchery-reared rainbow trout caught at the Patagonia and Verdi Dam pool transects. A total of 153 hatchery-reared rainbow trout were found at the Patagonia and Verdi Dam pool transects, while only 8 hatchery rainbow trout were caught from all other transects combined.

Figure 9.



At least six distinct age classes are readily apparent from a length frequency analysis of brown trout captured in the survey (Figure 10). A length breakpoint of 6.3 in (160 mm) was used to distinguish Class I and younger fish while breakpoints of 12.6 in (320 mm), 15.0 in (380 mm), 19.7 in (500 mm), and 22.8 in (580 mm) were used to reveal older age classes found in the survey. Because they have not been stocked in the river since 2005, all brown trout captured were wild. Of the 208 wild brown trout analyzed, 62.5% (130 fish) were deemed to be Class I or younger and serve as a positive indicator of successful spawning in the past two years.

Brown trout populations continue to thrive in the Truckee River. Data suggests their populations have not declined since the brown trout stocking program was eliminated eight years ago. Of particular note was the presence of trophy-sized brown trout sampled at both the River Bend Dam and Verdi Power Dam transects. Although historically found during fall surveys of the river, large brown trout inexplicably disappeared from these transects from 2008 through 2010. However, this survey marks the third consecutive year in which large brown trout were found. Of note are four individual fish captured that were all greater than 22.7 in (550 mm), with the largest measuring 26.9 in (682 mm).

Length frequency analysis of mountain whitefish captured during the survey reveals at least four distinct age classes in the Truckee River (Figure 11). A length breakpoint of 7.9 in (200 mm) was used to distinguish Class I and younger fish while breakpoints of 11.0 in (280 mm), and 14.2 in (360 mm) were used to reveal older age classes. Mountain whitefish represent a native unstocked species in the Truckee River. Of the 68 mountain whitefish analyzed, 57.4% (39 fish) are deemed to be Class I or younger fish and are positive indicators of successful spawning in the river in 2012.

Predictably, mountain whitefish were only found in Zones 4 and 5 beginning at Rock Park and continuing at successive upstream transects. Mountain whitefish are generally only found in high numbers below the Reno/Sparks area in years following above average winters.

Figure 10.

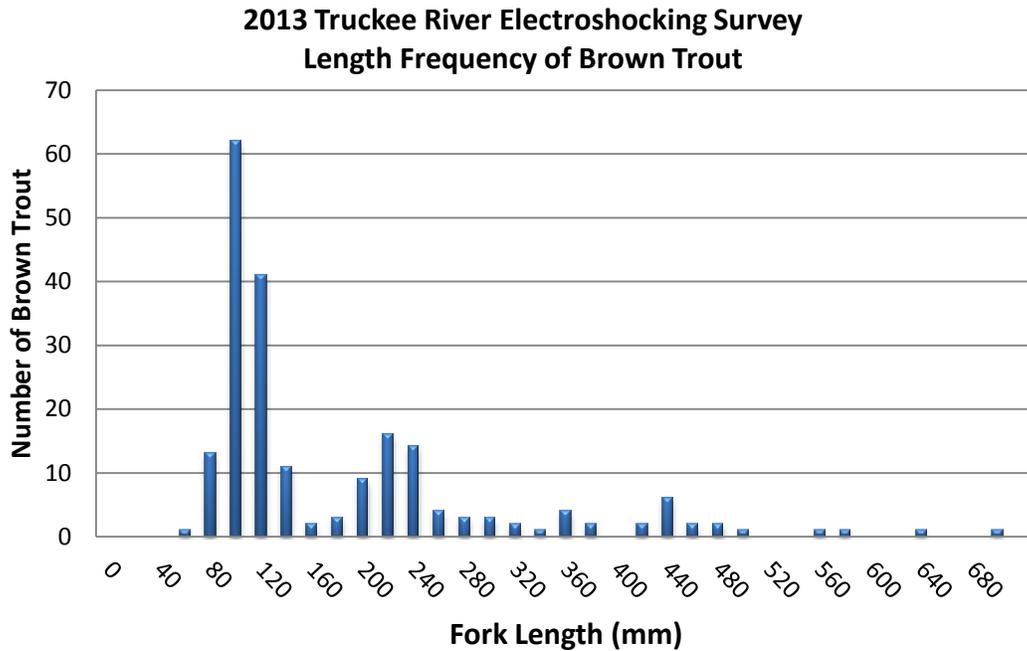
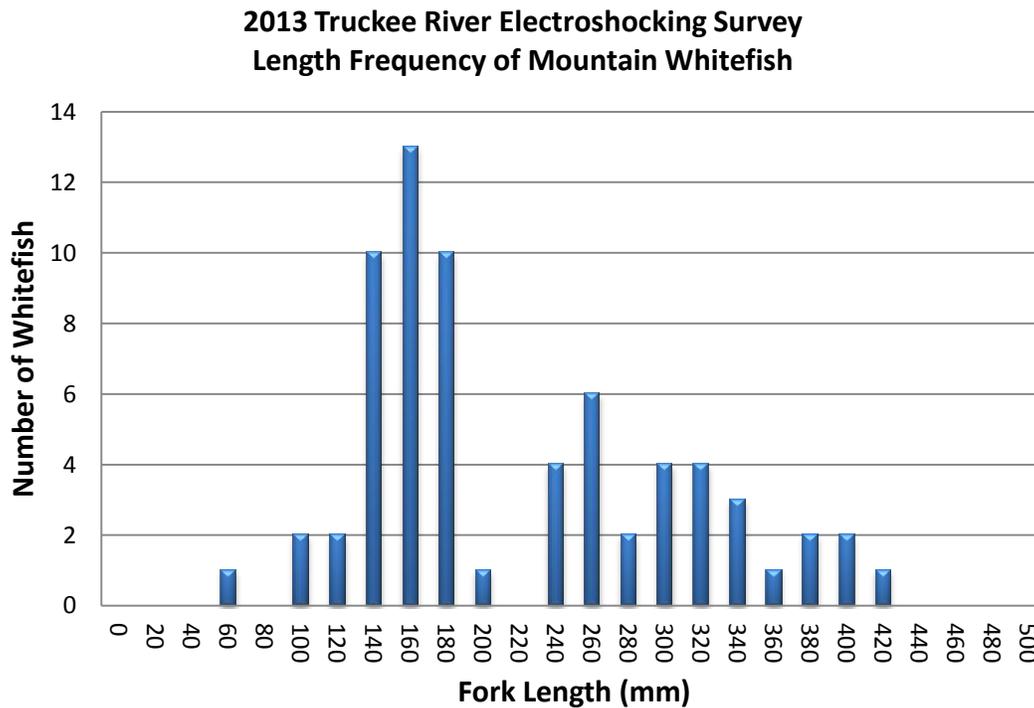


Figure 11.



Coordinate and assist USFWS with raft electroshocking and shoreline electroshocking in the spring, summer, and fall as needed. Due to efforts spent researching and surveying for New Zealand mud snails in the Truckee River as well as assisting other Western Region biologists in various projects, no progress was completed on this approach in 2013.

Coordinate LCT recovery activities with the Truckee River Recovery Implementation Team. Actions pertaining to LCT restoration in the Truckee River basin are usually coordinated with the U.S. Fish and Wildlife Service and other members of the Truckee River Recovery Implementation Team (RIT) through semi-annual meetings. The Truckee River RIT did not meet in 2013. NDOW personnel attended the annual LCT Interagency Meeting in Reno, Nevada.

Collect fin samples from rainbow trout and LCT for genetic analysis during electroshocking surveys in cooperation with University of Nevada Genetics Lab. A total of 140 rainbow trout and 62 mountain whitefish fin samples were collected during the annual electroshocking survey. Samples were air dried in envelopes and delivered to the genetics for analysis.

Conduct a general assessment of angler use, success, and harvest through opportunistic angler contacts, return of angler drop-box surveys, and mail-in angler questionnaire data. Opportunistic angler contacts were made on five days in 2013. There were 37 anglers fished for 57 hrs and caught 224 fish, all of which were rainbow trout. Of these, 9 were harvested while the remaining 215 were released. Catch rates were 6.05 fish per angler and 3.93 fish per hour. The average length of 12 rainbow trout measured was 10.9 in (278 mm) and ranged from 5.9 in (150 mm) to 18.0 in (457 mm). Observed angler use showed all 37 anglers to be Washoe County residents.

A total of 65 volunteer angler surveys were received from the two drop-boxes on the Truckee River in 2013. Anglers fished for 194.5 hrs and caught 169 fish consisting of 150 rainbow trout and 19 brown trout. Resulting catch rates (all fish) were 2.60 fish per angler and 0.87 fish per hour. Of the 169 fish reported, all but 8 rainbow trout and 1 brown trout were released. Species composition was 88.8% rainbow trout and 11.2% brown trout (Figure 12).

An examination of lengths reported by anglers from drop-box surveys showed representation by rainbow trout in all eight size brackets (Figure 13). With the frequency that the river is stocked, it comes as no surprise that 82% of rainbow trout reported occupied the smallest three size brackets (<10.0 in, 10.0 – 11.9 in, and 12.0 – 13.9 in), however, fish were reported in the four largest size brackets as well. Brown trout occurred in all size brackets except the 16.0 to 17.9 in bracket, with approximately 74% in the four smallest size brackets.

Figure 12.

2013 Truckee River - Angler Drop Boxes Species Composition

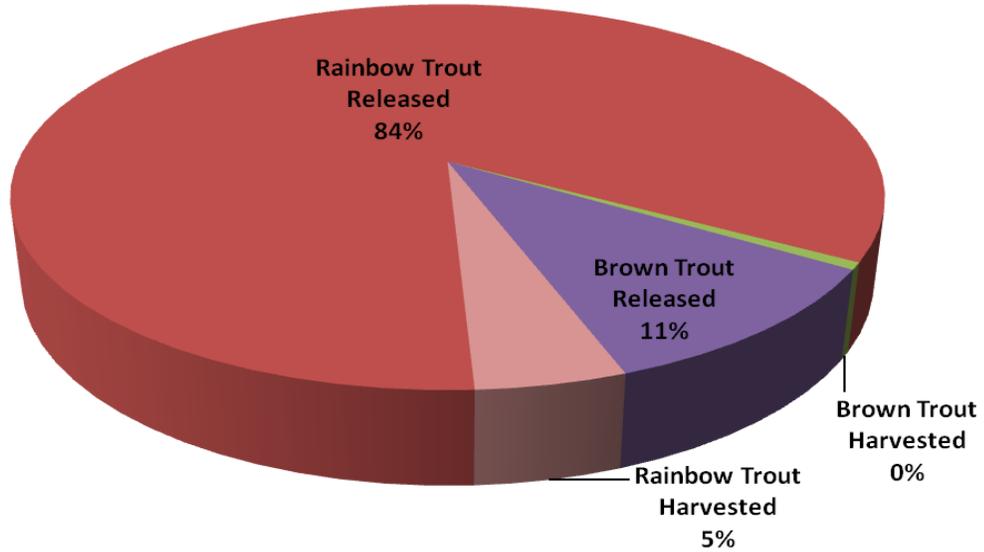
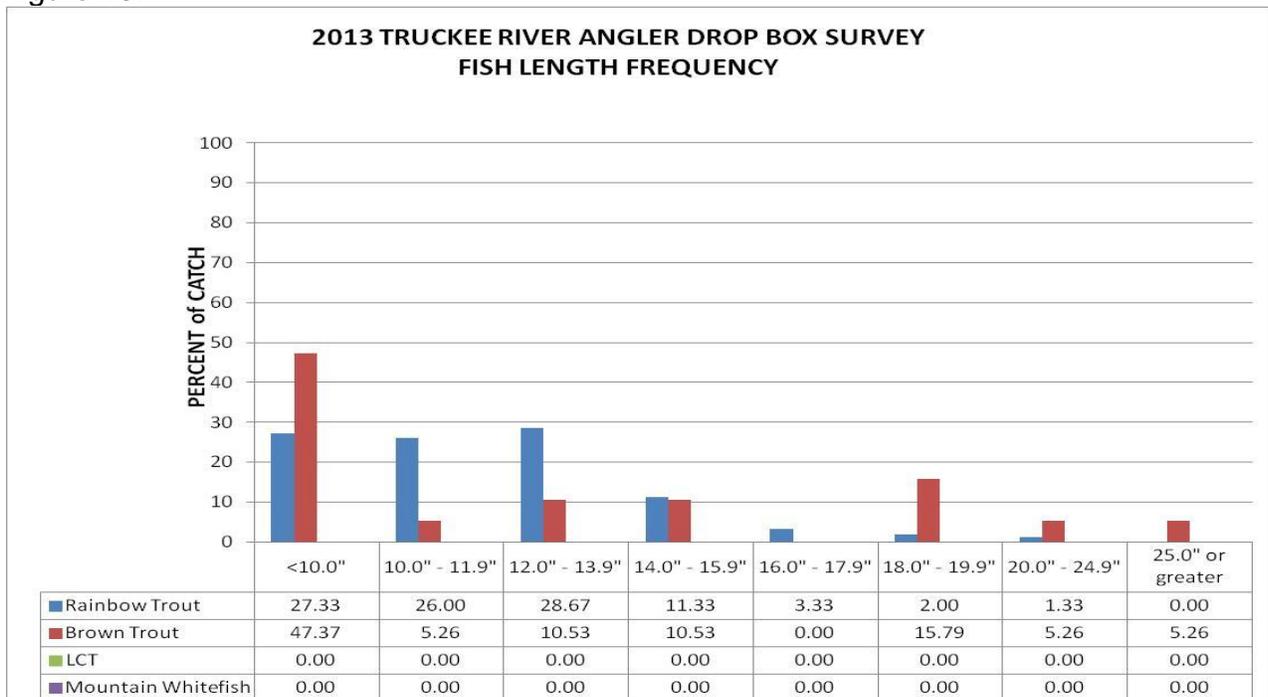
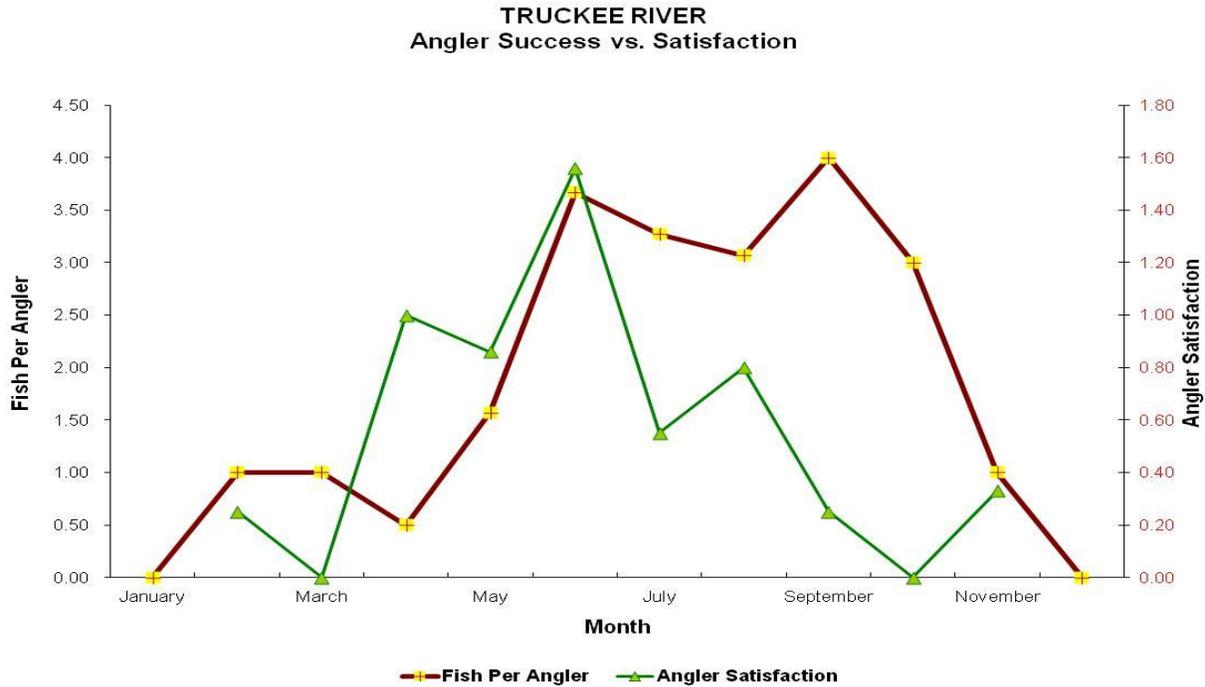


Figure 13.



Angler satisfaction fishing the Truckee River was rated on a scale of -2 to +2 with -2 being unsatisfied and +2 representing satisfaction. Average ratings were positive at 0.56 for total fishing experience, 0.35 for size of fish, and 0.16 for number of fish. A direct relationship was seen between angler success and satisfaction (Figure 14). This suggests an increase in angling success leads to increasing angler satisfaction.

Figure 14.



The Mail-in Angler Questionnaire Survey estimated Truckee River use at 9,220 anglers and 101,845 angler use days. There were an estimated 253,784 fish caught with a success rate of 2.49 fish per day. These estimates were substantially higher than the 6,451 anglers, 57,917 angler days, 112,574 fish, and 1.94 fish per day reported from 2011.

Stocking Program

From early March through early October, the Truckee River received 76,845 triploid strain rainbow trout on 19 separate occasions (Table 1). Because of collaborative efforts between NDOW, USFWS, and PLPT, efforts have been made in recent years to implement a stocking strategy that facilitates LCT recovery in the Truckee River, while simultaneously maintaining a quality sport fishery. As such, both LCT and triploid strain rainbow trout have been stocked in relatively equal numbers. However, due to poor spawning performance of LCT brood stock at Marlette Lake for the past three years, only triploid-strain rainbow trout were stocked in 2013. The river is scheduled for the same in 2014.

Table 1. Truckee River Stocking Summary – 2013

Date	Species	Number	Size (in.)	Strain
3/7/13	Rainbow	7,326	9.1	Triploid
3/19/13	Rainbow	4,405	9.8	Triploid
3/26/13	Rainbow	2,999	9.1	Triploid
4/9/13	Rainbow	4,531	9.7	Triploid
4/22/13	Rainbow	5,670	9.7	Triploid
5/7/13	Rainbow	4,428	10.3	Triploid
5/21/13	Rainbow	4,420	10.4	Triploid
6/3/13	Rainbow	4,740	10.2	Triploid
6/14/13	Rainbow	5,320	9.8	Triploid
7/10/13	Rainbow	4,998	10.0	Triploid
7/17/13	Rainbow	1,210	10.4	Triploid
7/17/13	Rainbow	3,090	10.7	Triploid
7/30/13	Rainbow	4,302	10.2	Triploid
8/13/13	Rainbow	5,200	9.9	Triploid
9/16/13	Rainbow	3,815	10.5	Triploid
9/18/13	Rainbow	2,398	10.5	Triploid
9/18/13	Rainbow	1,536	9.9	Triploid
9/26/13	Rainbow	4,290	10.4	Triploid
10/1/13	Rainbow	2,167	10.8	Triploid
Total (All Fish)		76,845		

Table 2. Truckee River Stocking History 2008 – 2012

Year	Species	Number	Size Range (in.)
2008	Rainbow	34,184	8.3 – 11.4
	Lahontan Cutthroat	21,376	7.5 – 8.8
2008 Total		55,560	
2009	Rainbow	39,999	8.5 – 10.8
	Lahontan Cutthroat	40,465	8.4 – 12.1
2009 Total		80,464	
2010	Rainbow	33,501	2.8 – 10.6
	Lahontan Cutthroat	55,115	6.4 – 9.5
2010 Total		88,616	
2011	Rainbow	24,586	9.7 – 10.8
	Lahontan Cutthroat	15,736	2.0 – 9.5
2011 Total		40,322	
2012	Rainbow	71,130	2.1 – 10.2
2012 Total		71,130	
Total		336,092	

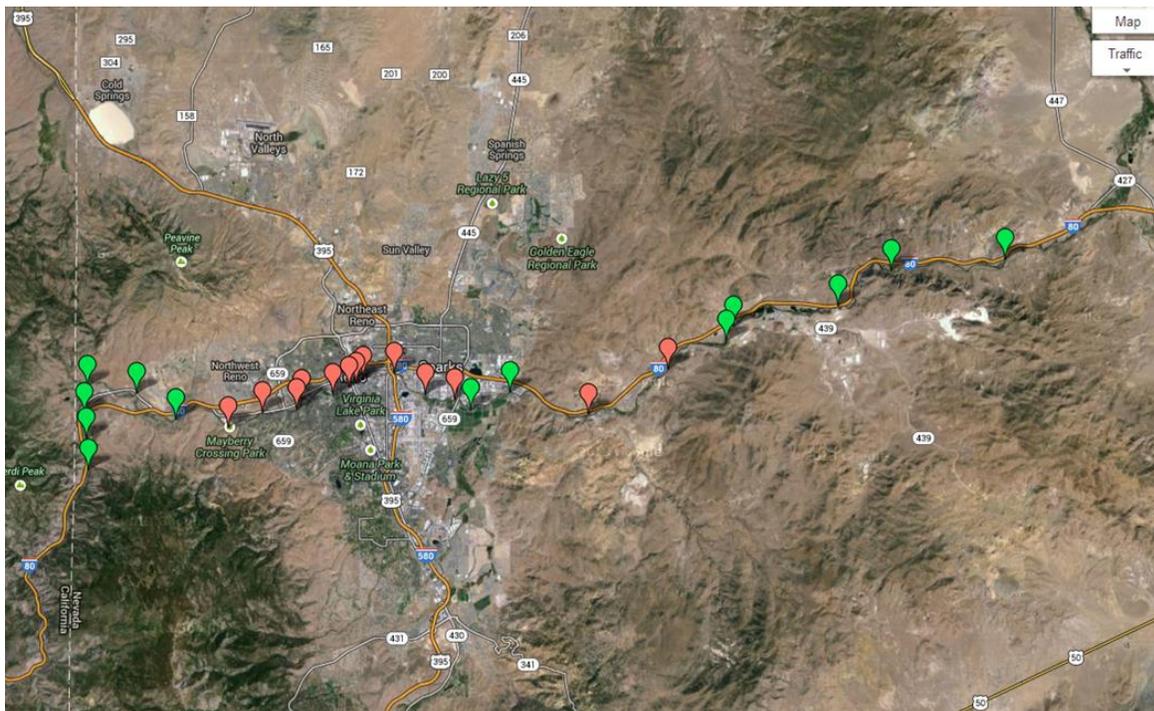
Aquatic Invasive Species Monitoring

From Painted Rock upstream to the Nevada/California border, 26 transects were surveyed for the presence/absence of New Zealand mud snails on the Truckee River. Of these, the presence New Zealand mud snails was confirmed at 13 separate transects (Table 3). A total of 679 NZMS was collected at the 13 transects where mud snails were documented. Where encountered, the number of NZMS collected per transect ranged from one at the Booth Street Bridge transect to a high of 350 at Crissy

Caughlin Park. It must be noted that full, 200 ft surveys were not completed at five transects. Depth and access issues prevented full surveys at the Sparks Treatment Plant, Mustang, McCarran Ranch, and Waltham Bridge transects while only one quarter of a complete survey (one zig and zag both upstream and downstream) was completed at Crissy Caughlin Park due to the sheer number and volume of NZMS encountered.

Survey results document current NZMS distribution on the Truckee River to span from Mustang upstream to Mayberry Park, a distance of approximately 18 mi (Figure 15). Although NZMS were not found at Cottonwood Park and Sparks Treatment Plant transects, it is assumed that they are likely present in these vicinities due to the fact that NZMS were found both upstream and downstream of these transects. A quantitative assessment of density was not completed, however, it was noted that roughly 94% of all NZMS collected were found at four transects that encompass a 3.5 mi section of river from the Oxbow Nature Area upstream to Mayberry Park.

Figure 15. Current Distribution of NZMS in the Truckee River



Some basic, non-quantitative observations related to preferred NZMS habitat were made during survey activities. As the survey progressed, it was noted that NZMS seemed to prefer certain habitat characteristics including very shallow water (<6 in) with a significant mud/silt substrate component. Abundances were also noted to be greater on the insides of curves. Mud snails were mostly observed on the undersides of cobble (6 to 12 in diameter). Moreover, NZMS were nearly always found in very stagnant water within 5 ft of the riverbank. These habitat types were abundant where NZMS relative densities were the highest and seemed to be absent in much of the lower river and upper river where NZMS were not found.

Table 3. 2013 NZMS Survey Results

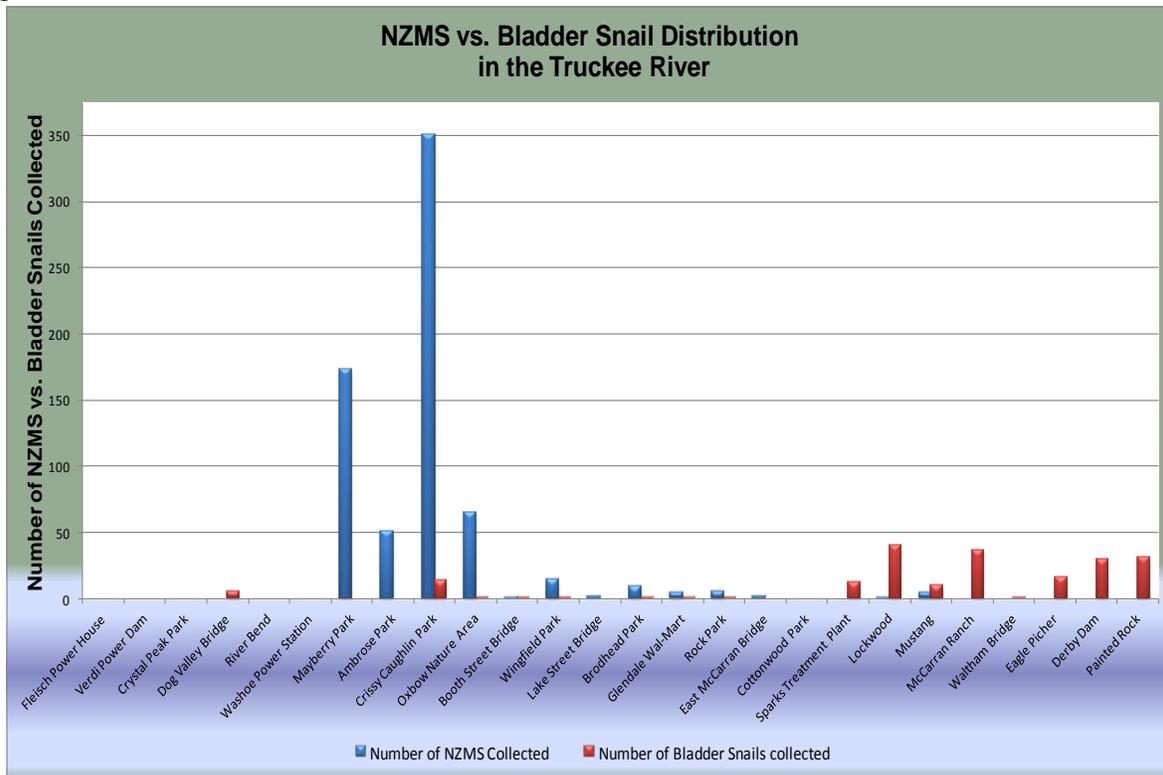
Date	Waypoint	Location	Bank Aspect (N/S)	Water Temp. (°F)	# NZMS Collected (Invasive)	# Bladder Snails Collected (Native)	# Lymnaeidae Collected (Native)	# Ram's Horn Collected (Native)
7/12/13	13TMS 16	Fleisch Power House	S (E)	64				
7/12/13	13TMS 15	Verdi Power Dam	S (E)	62				
7/12/13	13TMS 14	Crystal Peak Park	N (W)	62				
7/11/13	13TMS 13	Dog Valley Bridge	S	72		5	1	
7/11/13	13TMS 12	River Bend	S	68				
7/11/13	13TMS 11	Washoe Power Station	S	72				
7/11/13	13TMS 10	Mayberry Park	N	67	173			
7/11/13	13TMS 09	Ambrose Park	S	68	50			
7/10/13	13TMS 08	Crissy Caughlin Park †	N	70	350	13		
7/10/13	13TMS 07	Oxbow Nature Area	S	71	64	1		
7/10/13	13TMS 06	Booth Street Bridge	N	68	1	1		
7/10/13	13TMS 05	Wingfield Park	N & S	68	14	1		
7/9/13	13TMS 04	Lake Street Bridge	S	72	2			
7/9/13	13TMS 03	Brodhead Park	S	71	9	1		
7/9/13	13TMS 02	Glendale Wal-Mart	S	70	4	1		
7/9/13	13TMS 01	Rock Park	N	68	5	1		
7/15/13	13TMS 17	East McCarran Bridge	N	68	2			
7/15/13	13TMS 18	Cottonwood Park	N	69				
7/15/13	13TMS 19	Sparks Treatment Plant*	N	74		12		
7/15/13	13TMS 20	Lockwood	N	74	1	40		1
7/16/13	13TMS 21	Mustang*	S	72	4	10		
7/16/13	13TMS 22	McCarran Ranch*	N	76		36	43	
7/16/13	13TMS 23	Waltham Bridge*	S	76		1		
7/17/13	13TMS 24	Eagle Picher	S	70		16		
7/17/13	13TMS 25	Derby Dam	N	71		29		
7/17/13	13TMS 26	Painted Rock	N	75		31		
TOTALS	N/A	N/A	N/A	Avg. 69.9	679	199	44	1

† Represents ¼ effort due to very high densities

* Full survey not conducted due to depth or limited access

Three additional species of gastropods, all native to the Truckee River basin, were collected during survey activities. An unnamed species of native snail (*Lymnaeidae* sp.) was found in the upper river at Dog Valley Bridge (one individual) and in the lower river at McCarran Ranch (43 snails). Meanwhile, a single ram's horn snail (*Planorbidae* sp.) was found at the Lockwood transect. Bladder snails (*Physa* sp.) were collected at 16 of the 26 transects sampled and exhibited a distribution from Painted Rock upstream to Dog Valley Bridge. Because densities were not examined, a correlation between bladder snails and NZMS cannot be made. However, bladder snails were found in relative high densities in the lower river where NZMS were largely absent (Figure 16). Because NSMS have no known natural predators in North America and have the capability to reproduce at such prolific rates, it is feared that, at high densities, the species could outcompete native gastropods for food resources and space.

Figure 16.



Research suggests that the eradication of New Zealand mud snails from a river system similar to the Truckee River is impossible. At this juncture, a concerted effort should be put forth to inform the public of the dangers NZMS may pose and educate river users on how to prevent the species spread into other waters with decontamination protocols.

Maintain the angler information center and angler drop-boxes when on site.

The angler information center and drop-boxes were visually inspected and/or restocked on a regular basis.

MANAGEMENT REVIEW

General Management Objective

Although snowpack from the winter of 2012/2013 was far less than desirable, the river did not experience any noticeable ill effects in 2013. Upstream storage was utilized to maintain flows in the river throughout the year. It is now feared that a third winter of precipitation and snowpack that are well below average could leave the Truckee River fishery imperiled.

At this juncture, sport fish populations in the Truckee River appear to be stable. Coupled with the river's wild population of rainbow trout, the hatchery-reared fish stocked annually into the Truckee River appear to meet angler demand. Although not stocked since 2005, reductions in brown trout abundance have not been evident. Angler demand for brown trout is currently being met through natural reproduction and recruitment.

Angler success rates documented through angler contacts, angler drop-box surveys, and Mail-in Angler Questionnaire Surveys are on par with long-term averages and currently meet the guidelines prescribed in a coldwater General Fishery Management Concept.

A private individual presented a petition to the Nevada Board of Wildlife Commissioners this year recommending a three fish limit on the portion of the Truckee River in Nevada as well removing the tackle restrictions in the Trophy Section upstream of Crystal Peak Park. The Nevada Board of Wildlife Commissioners met in September to discuss and set fishing seasons and bag limits for 2014. At this meeting, the Washoe County Advisory Board to Manage Wildlife recommended the changes as presented in the petition. The Nevada Board of Wildlife Commissioners enacted the three fish limit throughout the portion of the river in Nevada but did not have authority to act upon the tackle restriction in the Trophy Section. Per the Department's recommendation, the tackle restriction was subsequently eliminated through the Nevada Legislative Counsel bureau in early 2014. The 3 fish limit will become effective on March 1, 2014.

LCT recovery on the Truckee River continues to prove challenging. Although it is recommended that approximately half of the trout stocked be comprised of LCT, poor spawning success from the LCT broodstock at Marlette Lake has prevented these plans from reaching fruition. It appears that LCT stocking in the Truckee River will be temporarily postponed until either a significant LCT spawn is achieved at Marlette Lake or an additional source of LCT is found.

RECOMMENDATIONS

- Monitor water quantity (discharge) through USGS Stream Flow data.
- Monitor fish populations by conducting tote-barge electroshocking surveys at 11 traditional transects during three days in the fall.
- Coordinate and assist USFWS with raft electroshocking and shoreline electroshocking in the spring, summer, and fall, as needed.

- Coordinate LCT recovery/restoration activities with the Truckee River Recovery Implementation Team.
- Collect fin samples from rainbow trout and LCT for genetic analysis during electroshocking surveys in cooperation with the University of Nevada Genetics Lab.
- Conduct a general assessment of angler use, success, and harvest through angler contacts, return on angler drop-box surveys, and mail-in angler questionnaire data.
- Maintain the angler information center and angler drop-boxes when on site.

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Date: February 15, 2014