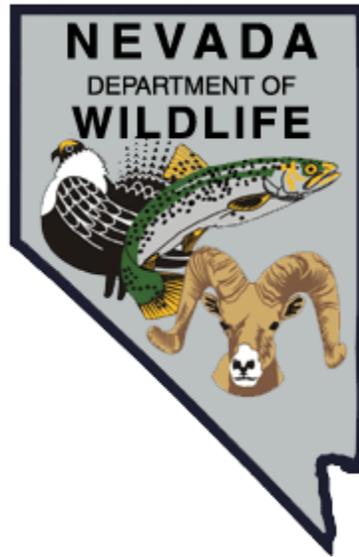


NEVADA DEPARTMENT OF WILDLIFE
STATEWIDE FISHERIES MANAGEMENT



FEDERAL AID JOB PROGRESS REPORTS

F-20-48
2012
TOPAZ LAKE
WESTERN REGION



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

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**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: Topaz Lake
Period Covered: January 1, 2012 through December 31, 2012

SUMMARY

Snow water equivalent in the Walker River Basin as of April 1, 2012 was 37% of average, but during the previous year, it was 157% of average.

Mail-in, angler questionnaire data for 2011 estimated 2,767 anglers fished 13,265 days to catch 22,652 fish (this represents data only collected from anglers buying a Nevada fishing license). The average catch rate was 1.71 fish caught per angler day. Based on this, the General Fisheries Management Concept was successfully met in 2012.

Monitoring for aquatic nuisance species (quagga mussels) continued in 2012 and, to date, no veligers or adult mussels have been found.

A largemouth bass habitat improvement project was completed during 2010 and surveys conducted during 2011 and 2012 verified an increasing population of smallmouth bass.

A study aimed at assessing the rainbow trout fishery was initiated during 2010. Growth and catch rates of four strains of fish (bowcutt trout and Eagle Lake strain, Bel Air strain, and Tahoe strain rainbow trout) are being evaluated. Preliminary results from the study indicate that anglers show better catch rates for bowcutt trout.

BACKGROUND

The Nevada/California border about equally divides Topaz Lake, but it is owned and operated by the Walker River Irrigation District (WRID). Nevada Department of Wildlife (NDOW) and California Department of Fish and Wildlife (CDFW), nonetheless, share fishery management responsibilities. Both agencies collectively have established a significant coldwater fishery in the reservoir. The earliest record of stocking by Nevada occurred in 1930 with black bass (*Micropterus* sp.), and since then, the lake has been stocked abundantly with rainbow trout (*Oncorhynchus mykiss*). Other stocked fishes have included brown trout (*Salmo trutta*), kokanee salmon (*O. nerka*), Lahontan cutthroat trout (*O. clarki henshawi*), bowcutts (a hybrid between cutthroat and rainbow trout), tiger trout (a hybrid between brown trout and eastern brook trout, *Salvelinus fontinalis*), and black bullheads (*Ictalurus melas*). Common carp (*Cyprinus carpio*) also exist. Today, however, rainbow trout and bowcutts make up the principal sport fishery; other fishes such as tiger trout, black bass, and occasionally brown trout encompass a minor fishery. The native fish community is comprised of mountain whitefish (*Prosopium williamsoni*), Tahoe sucker

(*Catostomus tahoensis*), Lahontan tui chub (*Gila bicolor obesus*), Lahontan redbside shiner (*Richardsonius egregius*), and Lahontan speckled dace (*Rhinichthys osculus robustus*).

Topaz Lake fishing season is open from January 1 to September 30. The fishing regulation states: Fishing is legal from 1 hour before sunrise to 2 hours after sunset, except for the area within the jetties of Topaz Marina, which is closed to fishing. Limit is 5 trout, 10 mountain whitefish, and 15 warmwater game fish of which not more than 5 may be black bass.

There are two major boat-launching facilities, Topaz Landing and Douglas County Park. Topaz Landing is privately owned with a fee for launching, while Douglas County Parks is public, it also charges a fee to launch boats. The Douglas County boat ramp is large enough for multiple launchings and can be used at any lake elevation. A fish cleaning station is available and sites have camping and restrooms. A drop-box near the Douglas County boat launch was installed in 2010 to collect basic angler information including hours spent fishing, number of fish caught, general size of fish and species. Douglas County Parks is open from January 1 to September 30.

Water storage typically declines during late summer, as water demands remain high. As the irrigation season ends in October, the water level increases throughout winter. Crop irrigation begins in mid-April and river runoff typically peaks shortly after, the reservoir then reaches maximum capacity for the year.

Maximum pool is 125,000 acre-ft, but usable storage, governed by the depth of the outlet, is about 59,500 acre-ft. At minimum stage (65,000 acre-ft), the reservoir reaches a depth of 59 ft. At full storage, maximum depth approaches 92 ft and the mean depth is 52 ft. It has 2,410 surface acres and sits at 5,005 ft above mean sea level when full.

OBJECTIVES

General Management Objectives:

- Conduct a general fisheries assessment through opportunistic angler contacts, angler drop-box surveys, and mail-in, angler questionnaire data.
- Monitor lake level and clarity when on site.
- Monitor for the presence of quagga mussels by conducting substrate sampling around boat docks and reservoir substrates when on site.
- Conduct quagga mussel veliger sampling through plankton tows at established transects at least three times per year.

Study Specific Objectives:

- Use data collected through opportunistic angler contacts and return of angler drop box surveys to observe differences in strains caught.
- Use data from population monitoring through gill netting 4 net-nights during spring at 4 established locations (north, south, east and west shores) to observe differences in strains caught.
- Use data from population monitoring through electrofishing one night during spring at 4 established locations (north, south, east and west shores) to observe differences in strains caught.

- Use data from population monitoring through beach seining during spring at 4 established locations along the north and east shores to observe differences in strains caught.

PROCEDURES

General Management Objectives:

Conduct a general fisheries assessment through opportunistic angler contacts, angler drop-box surveys, and mail-in, angler questionnaire data. Angler drop-box survey forms were collected from a single drop-box located next to the Douglas County boat ramp. Information obtained from the anglers included total time fishing and number, size, and species of fish caught. Location of angler, place of residence, and type of bait or lure used was also recorded. Angler questionnaires were sent to about 10% of anglers purchasing a Nevada fishing license. Information returned to the Department of Wildlife was entered into a database and analyzed for use in assessment of individual fisheries.

Monitor lake level and clarity when on site. Lake level was measured by the USGS gauge, in acre-ft, near the dam and water clarity was measured using a Secchi disk. Secchi disk measurements were taken at three locations throughout the lake, near the Douglas County boat launch, mid-lake, and near the Topaz Landing boat launch.

Monitor for the presence of quagga mussels by conducting substrate sampling around boat docks and reservoir substrates when on site. Artificial substrate samplers were placed near the Topaz Landing boat launch in 2006. The sample plates were monitored via visual surveys as well as touching the sampler plates and feeling for roughness, which could be an indication of attached mussels. The sampler plates since have been removed, however, monitoring continues on buoys, submerged rocks, exposed rocks, moored boats and boat docks.

Conduct quagga mussel veliger sampling through plankton tows at established transects at least three times per year. Three stations have been established to sample for quagga mussel veligers. The first station was near the Douglas County boat ramp, the second was near mid-lake, and the third was near the Topaz Landing boat launch. Vertical tows were made from the hypolimnion to the surface and a minimum of 1,000 liters of lake water was filtered through a 63- μ m mesh plankton net. Samples were taken on June 6, June 26, August 2, and August 21, 2012. The samples were preserved in 75% ethanol and were analyzed by Bureau of Reclamation and Eco Analysts.

Study Specific Objectives:

Use data collected through opportunistic angler contacts and return of angler drop box surveys to observe differences in strains caught. Same procedures were used as the general management objectives.

Conduct a general fisheries assessment through opportunistic angler contacts, angler drop-box surveys, and mail-in, angler questionnaire data. The same procedures were used for study specific objectives as general management objectives.

Use data from population monitoring through gill netting four net-nights during spring at four established locations (north, south, east, and west shores) to observe differences in strains caught. Locations were chosen based on many factors including public safety, creel information, historical locations, and reservoir levels (north shore near the western edge of the buoys, western shore on the south end in the major bay, on the eastern shore in the middle bay, and near the river inlet on the south end). Nets were set at a 90-degree angle to the shore and anchored to the bottom with 3 lb weights. Gill nets were 120 ft long by 6 ft deep, made of monofilament, with experimental-mesh sizes composed of five panels (bar mesh: 0.5, 1.0, 1.5, 2.0, and 2.5 in.) sewn together end-to-end from smallest to largest mesh. The top had a floating line and the bottom was lead-lined.

Use data from population monitoring through beach seining during spring at four established locations along the north and east shores to observe difference in strains caught. Beach seine surveys were conducted along the northern shore, the western shore, and near the southern shore where the canal enters the lake. The seine was 6 ft high and 50 ft wide with a 6 ft x 6 ft purse in the middle. The seine was pulled parallel the shore for 200 ft at each location.

FINDINGS

General Management Objectives:

Conduct a general fisheries assessment through opportunistic angler contacts, angler drop-drop box surveys, and mail-in, angler questionnaire data. A total of 121 anglers were contacted during 2012. Opportunistic angler contacts show anglers had a catch rate of 1.21 fish per hour. A total of 95 trout were measured; rainbow trout, comprising 56 percent of the catch, averaged 14.02 in and bowcutt trout, comprising 44 percent of the catch, averaged 14.73 in. Mail-in, angler questionnaire data in Table 1 shows data for the past 10 years. In 2011, a below average number of anglers fished at Topaz Lake; however, numbers have been increasing for all categories since 2008 with the exception of the number of anglers which has remained relatively stable.

Angler drop-box data for 2011 and 2012 is shown in Table 3. The construction of the angler drop-box and signage was completed during June 2010, after peak trout angling occurred; therefore, data was limited in 2010 and is not presented here. In 2012, 29 anglers averaged 1.71 fish per hour and 4.93 fish per angler day (Table 3), which is consistent with 1.21 fish per hour reported from opportunistic angler contacts. Only 4 black bass were reported from drop-box surveys. Angler satisfaction with fishing experience and size of fish was high (Table 2). The satisfaction survey is on a scale of -2 (being less satisfied) to +2 (being more satisfied).

Mail-in Angler Questionnaire History

Table 1

Year	No. of Anglers	Days Fished	Fish Caught	Fish/Angler Day
2002	3,628	18,671	31,221	1.67
2003	3,754	17,967	30,162	1.68
2004	3,408	19,056	28,817	1.51
2005	3,185	18,931	27,054	1.43
2006	2,945	14,704	23,098	1.57
2007	2,935	24,586	44,152	1.80
2008	2,482	10,474	12,443	1.19
2009	3,148	20,157	28,755	1.43
2010	2,793	14,895	22,395	1.50
2011	2,767	13,265	22,652	1.71
Average	3,105	17,271	27,075	1.55

Angler Drop-Box Satisfaction Survey

Table 2

	-2	-1	0	1	2	Total Ave.
Fishing exp.	1			13	10	1.29
Size of Fish	1	1	3	12	7	0.96
Number of fish	1			7	16	1.54

Angler Drop-Box Survey

Table 3

	2011	2012
No. Anglers	32	29
Hrs Fished	167	122
Bass	22	4
Tiger	1	7
Rainbow	108	132
Fish/Hour	0.78	1.17
Fish/Day	4.09	4.93

Topaz Lake is managed under the guidelines of the Coldwater, General Fishery Management Concept that states “angler success rates should range between 0.25 and 0.75 fish per angler hour and 1.00 and 2.00 fish per angler day.” Available data for angler catch rates suggests that Topaz Lake is meeting these management objectives.

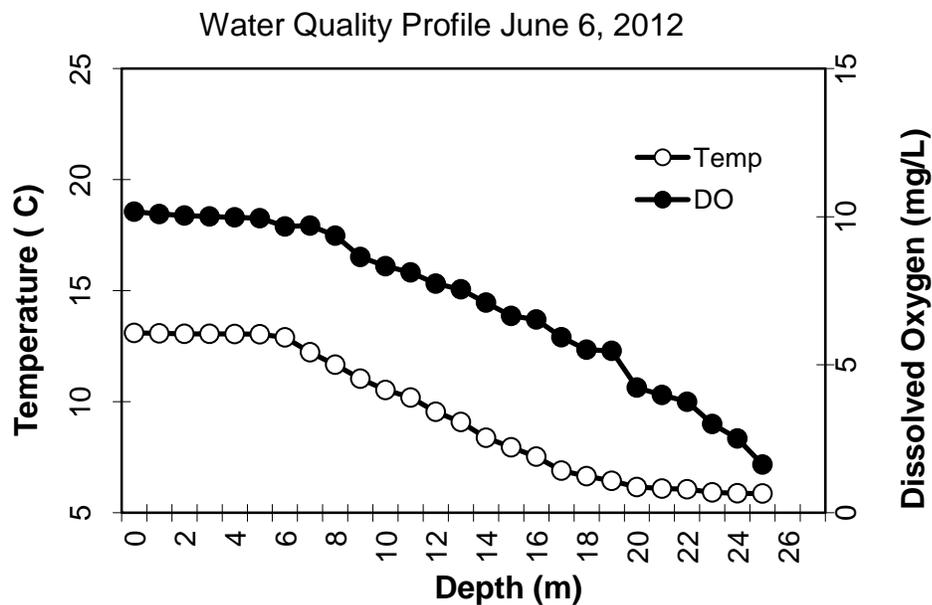
The Warmwater, General Fishery Concept states “angler catch rates should range between 0.25 and 0.75 fish per hour and 1.0 and 2.0 fish per angler day. Largemouth bass should average 10 inches.” The mail-in, angler questionnaire data does not distinguish between anglers targeting trout or bass so it is difficult to assess angler catch rates for warmwater species separately. Historically, trout have dominated the sport fish community as well as angler catch and there is no reason to assume this changed in 2012. However, during the summer of 2011 and 2012, smallmouth bass dominated the sport fish caught during gill netting. Steps were taken from 2008 to 2010 to improve the warmwater fishery with the intent of achieving Warmwater, General Fishery Concept standards.

These steps included a habitat enhancement project consisting of submerging fir trees in order to provide additional cover for juvenile bass and augmentation of the fishery by stocking adult and juvenile largemouth bass. During 2012, summertime creel and drop-box survey information suggested that the smallmouth bass fishery provided a warmwater fishery that met the management concept objectives.

Mail-in, angler questionnaire data for 2010 and 2011 suggest that low angler use reported during 2008 was temporary and that fishing effort and catch rates are returning to average. The number of anglers has not returned to the high numbers reported in 1997 when an estimated 7,400 anglers fished at Topaz Lake.

Monitor lake level and clarity when on site. Water quality profiles were taken at mid-lake on June 6, June 26, and again on August 21, 2012 (Figures 1, 2 and 3). Figures 2 and 3 show the thermocline observed.

Figure 1



On June 6, no thermocline was observed and oxygen as well as temperature levels throughout most of the water column remained within rainbow trout tolerances due to mixing with runoff and cool spring temperatures (Figure 1).

On June 26, the thermocline was observed and oxygen as well as temperature levels throughout the upper half (top 15 meters) of the water column remained within rainbow trout tolerances. The inflow during late spring was lower than average and the lack of mixing were likely to have contributed to this earlier than average thermocline development (Figure 2).

Figure 2

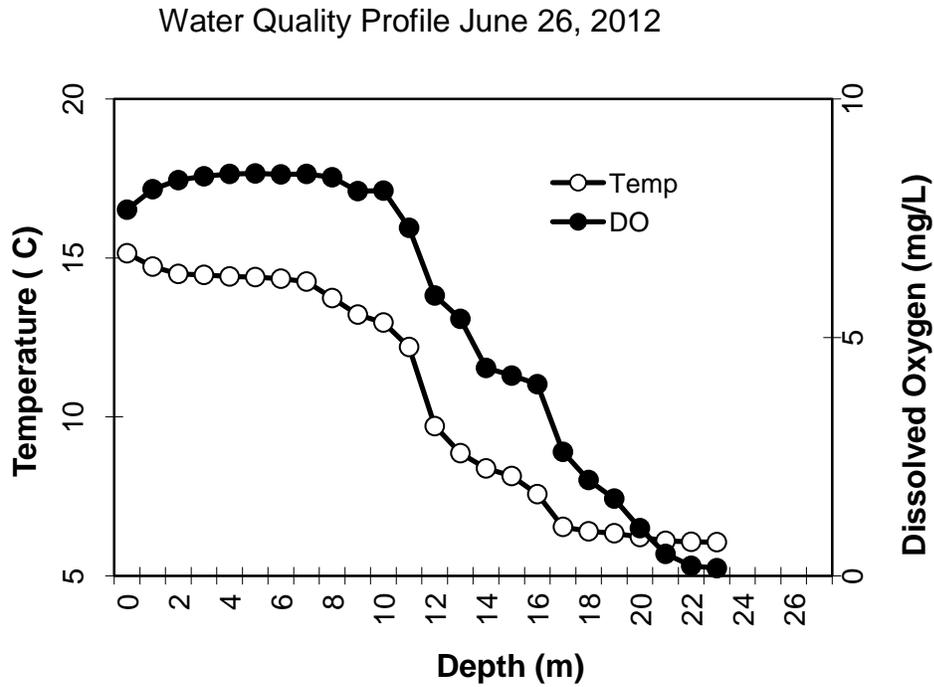
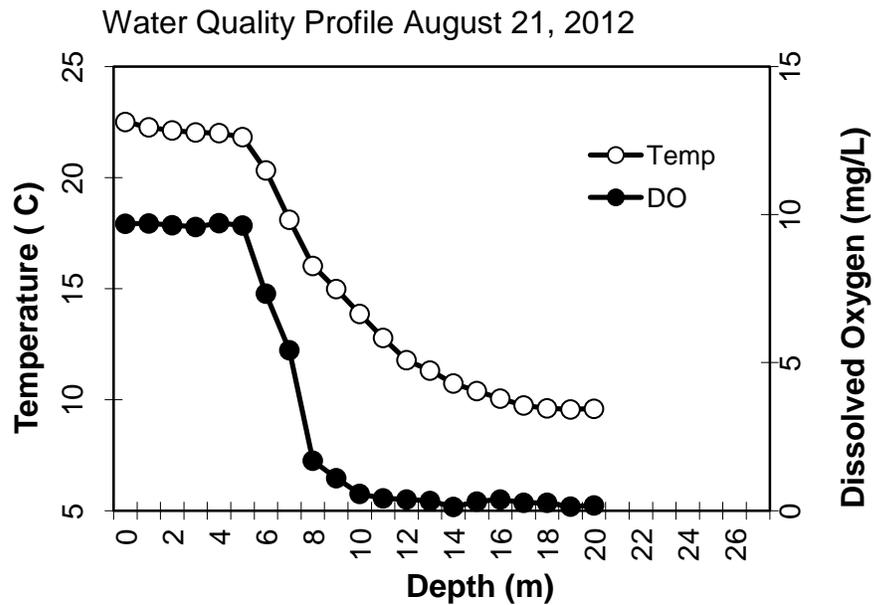


Figure 3



On August 21, the thermocline was very prevalent; oxygen as well as temperature levels throughout most of the water column were not within rainbow trout tolerances. The inflow during late spring was lower than average and the lack of mixing is likely to have contributed to these stratified conditions (Figure 3).

Preferred rainbow trout temperature and dissolved oxygen levels during August were restricted between 7 and 8 meters where temperatures were below 70°F and oxygen

levels were above 5 ppm (Figure 3). This range of depths within suitable trout tolerances is uncommon during August and is likely to have contributed to reduced carryover of trout during 2012.

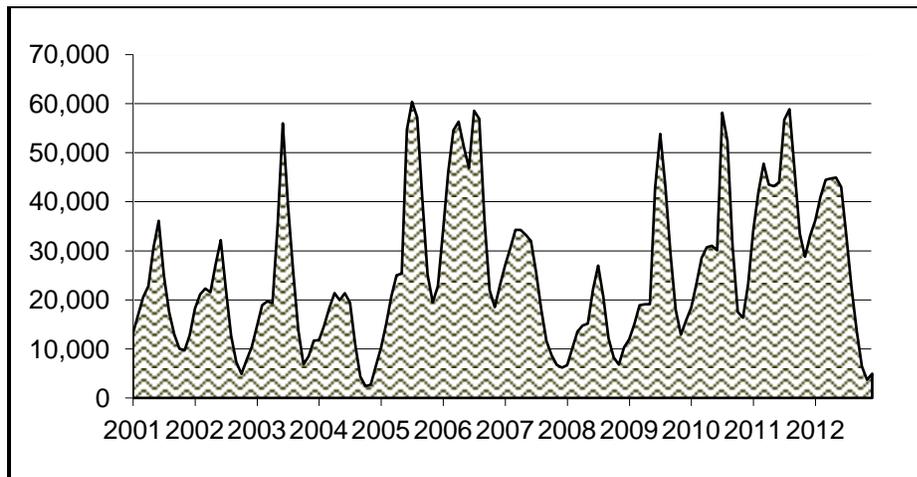
Secchi depth measurements were taken on each occasion when water quality data was recorded. The average depth of clarity 4.0 m, which is consistent with previous years' data.

Water clarity fluctuates throughout the year at Topaz Lake. During winter, algae and macrophytes are not abundant so water clarity typically remains high. During late summer and fall, water clarity diminishes and during moderate to heavy winds, visibility can be reduced to just a few feet. Secchi depth measurements taken in June averaged 4.0 m, Secchi measurements were not taken during August. These water quality measurements are consistent with previous data and there is no reason to believe that water quality in 2012 had any unexpected adverse effects on sport fish survival. Some of the expected adverse effects on sport fish survival would be related more closely to water quantity (i.e., lack of inundated vegetation for largemouth bass) and rising water temperatures combined with falling oxygen levels in summer due to low water volume and increased surface area, which could affect trout survival.

Water quantity measurements reported in Figure 4 were taken from USGS gauge number 10297000. Usable storage is measured from this gauge, which is in addition to the 65,000 acre-ft at minimum pool. Even though reservoir levels remained relatively high during most of 2012, storage at the end of December was near the recent historic low observed during 2004.

Figure 4

Usable Storage History in Acre-Feet, Topaz Lake



Monitor for the presence of quagga mussels by conducting substrate sampling around boat docks and reservoir substrates when on site. A potential quagga mussel (*Dreissena bugensis*) introduction occurred in 2006 when fish were planted into Topaz Lake from the Lake Mead Hatchery. Shortly after the fish were planted, quagga mussels were discovered in Lake Mead. All stocking from Lake Mead Hatchery was suspended and a monitoring program was initiated in waters that had received fish or water from the Lake Mead Hatchery.

Several survey methods for quagga mussels were used in Topaz Lake including veliger sampling using plankton nets and artificial substrate samplers to monitor for adults. Results have all been negative for adult quagga mussels.

Conduct quagga mussel veliger sampling through plankton tows at established transects at least three times per year. All samples have been negative for the presence of quagga mussel veligers.

If a quagga introduction had occurred during the 2006 season, it is likely that either veligers or adult quagga mussels would have been detected during the extensive survey efforts conducted over the past five years. Therefore, if quagga mussels are confirmed at Topaz Lake it is likely that they did not originate from the Lake Mead Hatchery.

Study Specific Objectives:

Use data collected through opportunistic angler contacts and return of angler drop-box surveys to observe differences in strains caught. Table 4 shows the growth and catch rate returns of tagged fish as of December 31, 2012.

Table 4

Tagged fish returns as of December 31, 2012.

All measurement values in inches	Tahoe	Bel Air	Bowcutt	Eagle Lake
Number tagged returns	28	17	88	18
Average Size at Stocking	10.30	9.24	10.97	9.08
Average size of Return	13.31	11.49	13.90	12.64
Ave number of Growth Days	217	149	146	154
Max size	18	14	18	15.75
Average growth	3.00	2.25	2.93	3.56
Average growth per month	0.43	0.47	0.62	0.72

Bowcutt trout have dominated the catch during the first three years of the study. Due to the strong thermocline observed during late summer 2012, an additional year has been added to the study to determine if one strain has a higher tolerance for the low oxygen levels and high temperatures observed. This data will be fully analyzed during 2013.

Use data from population monitoring through gill netting four net nights during spring at four established locations (north, south, east and west shores) to observe differences in strains caught. Even though gill netting was successful in catching trout, it was unsuccessful in capturing tagged trout.

Use data from population monitoring through beach seining during spring at four established locations along the north and east shores to observe difference in strains caught. No trout were caught during beach seining.

MANAGEMENT REVIEW

All work program objectives were completed in 2012.

The addition of habitat structures to Topaz Lake is likely to have contributed to the improved fishing for black bass, primarily smallmouth. In addition to providing cover habitat for juvenile bass, it seems to be also providing protection for other forage species, which should result in more abundance of prey fish. Population monitoring of warmwater and coldwater species through beach seining and snorkel surveys should be used to determine if the management goals of providing and sustaining a successful two-tier fishery are maintained. Even though gill netting was successful in capturing bass, multiple nets were unusable afterwards due to the abundance of tui chub.

Monitoring for adult quagga mussels via tactile inspection of boat docks and buoys should continue annually. Monitoring for veligers should also continue. It is likely that no introduction into Topaz Lake occurred during 2006.

The rainbow trout study implemented during 2010 to determine the effectiveness (growth and catch rates) of using the Bel Air, Tahoe, Eagle Lake strains of rainbow trout and bowcutt trout was successful during 2012. The Bel Air strain has not been used previously in Nevada; however, adjacent states such as Oregon have been using it with success. Preliminary results from the study indicate that bowcutt trout may provide a harvest advantage to anglers. Maximum size between Tahoe strain and bowcutt trout may be equivalent. Growth rates may be greatest for Eagle Lake strain trout; however, they were stocked at a smaller size and further analysis is necessary. Various species of trout including rainbow trout, tiger trout, brown trout, and cuttbow trout should be stocked based on habitat, fish availability, and the results of the ongoing trout study.

RECOMMENDATIONS

General Management Objectives:

- Conduct a general fisheries assessment through opportunistic angler contacts, return of angler drop-box surveys, and mail-in, angler questionnaire data.
- Monitor lake level and clarity when onsite.
- Monitor for the presence of quagga mussels by conducting substrate sampling around boat docks and reservoir substrates when on-site.
- Conduct quagga mussel veliger sampling through plankton tows at established transects at three times per year.

Study Specific Objectives:

- Use data collected through opportunistic angler contacts, return of angler drop-box surveys, and tagged fish returns data to evaluate differences in strains caught.
- Analyze data and write a final Job Progress Report.

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Date: March 2013