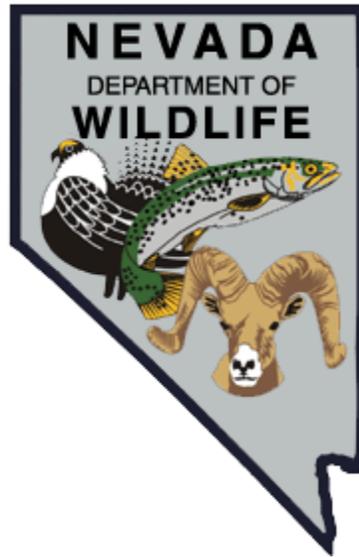


NEVADA DEPARTMENT OF WILDLIFE  
STATEWIDE FISHERIES MANAGEMENT



FEDERAL AID JOB PROGRESS REPORTS

F-20-49

2013

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**

**State:** Nevada  
**Project Title:** Statewide Fisheries Program  
**Job Title:** Topaz Lake  
**Period Covered:** January 1, 2013 through December 31, 2013

**SUMMARY**

Average monthly storage for Topaz Lake during 2013 was 43% of average (11,106 acre-ft during 2013, the 16 year historical average is 26,086 acre-ft). This was the second year of drought in the Walker basin.

Mail-in, angler questionnaire data for 2012 estimated 2,574 anglers fished 8,414 days to catch 12,497 fish (this represents data only collected from anglers buying a Nevada fishing license). The average catch rate was 1.49 fish caught per angler day. Coldwater and Warmwater General Fisheries Management Concepts were successfully met in 2013 based the mail-in survey as well as angler contacts and drop-box data.

Monitoring for aquatic nuisance species (quagga mussels) continued in 2013 and, to date, no veligers or adult mussels have been found.

Surveys conducted during 2013 verified an increasing population of smallmouth bass. A study aimed at assessing the effectiveness of additional artificial habitat structures on bass recruitment and survival should be initiated during 2014.

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, Bel Air, and Tahoe strains of 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*), bowcutt trout (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 and bowcutt trout 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 reidsides (*Richardsonius egregious*), 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 hr before sunrise to 2 hrs 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 and 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 SA 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, return of angler drop-box surveys, and tagged fish returns to evaluate differences in strains.

## PROCEDURES

### General Management Objectives:

**Conduct a general fisheries assessment through opportunistic angler contacts, angler drop-box surveys, and mail-in, angler questionnaire data.** Information obtained from angler contacts included total time fished 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 drop-box survey forms were collected from a single drop-box located next to the Douglas County boat ramp. 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 a USGS gage, in acre-ft, near the dam and water clarity was measured using a Secchi disk. Secchi disk measurements were taken on two occasions (July 9 and September 9 2013) 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.** Monitoring of buoys, submerged rocks, exposed rocks, moored boats, and boat docks was conducted once per month from May through September. Tactile surveys included snorkeling around boat docks and buoys as well as visual inspection of surfaces, which became exposed as the reservoir level dropped throughout the summer.

**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 near mid-lake, and the third near the Topaz Landing boat launch. Vertical tows were made from the hypolimnion to the surface and a minimum of 1,000 L of lake water was filtered through a 63- $\mu$ m mesh plankton net. Samples were taken on July 9 and September 10, 2013. The samples were preserved in 75% ethanol and analyzed by Pisces Molecular in Colorado and Eco Analysts in Idaho.

### Study Specific Objectives:

**Use data collected through opportunistic angler contacts, return of angler drop-box surveys, and tagged fish returns to evaluate differences in strains.** 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 through both the drop-box survey and angler contacts included total time fishing and number, size, and species of fish caught as well as any tagged fish information including Floy tag color, number, and fish length to the nearest tenth of an inch.

## 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 148 anglers were contacted at Topaz Lake during 2013. Anglers showed a catch rate of 0.34 fish per hour. A total of 83 trout were measured; rainbow trout, comprising 93% of the catch, averaged 13.9 in and bowcutt trout, comprising 7%, averaged 15.9 in. These numbers represent a decline in both catch rate (1.21 fish per hour during 2012) and observed number of trout per angler (2013 angler contacts resulted in 0.58 trout per angler and during 2012, angler contacts yielded 0.78 trout per angler). Only four contacts were made with anglers targeting bass and even though data is limited, those four anglers caught 20 bass, which averaged 15.3 in and reported a catch rate of 3.33 fish per hour.

Historical mail-in, angler questionnaire data is shown in Table 1. In 2012, a below average number of anglers fished at Topaz Lake; days fished and numbers of fish caught were below the 10 year average (52% and 50% of average, respectively), however, fish per angler day was near the 10 year average.

**Table 1**

**Mail-in Angler Questionnaire History**

Year	No. of Anglers	Days Fished	Fish Caught	Fish/Angler Day
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
2012	2,574	8,414	12,497	1.49
Average	2,999	16,245	25,203	1.53

The mail-in, angler questionnaire data does not distinguish between anglers targeting trout or bass so it is not possible to assess angler catch rates for warmwater species separately based on this information only. Historically, trout have dominated the sport fish community as well as angler catch; however, creel contacts and angler drop-box surveys suggest bass numbers and numbers of anglers targeting bass are increasing.

The angler drop box survey does not distinguish between black bass species, however, angler creel contacts reported 100% of the bass caught were smallmouth bass, therefore, it is assumed that most, if not all, bass reported on the drop-box survey were smallmouth. Largemouth bass are present in the lake, but numbers are low. Angler drop-box data for 2011 to 2013 is shown in Table 2. The installation of the angler drop-box and signage was completed during June 2010, after peak trout angling occurred; therefore,

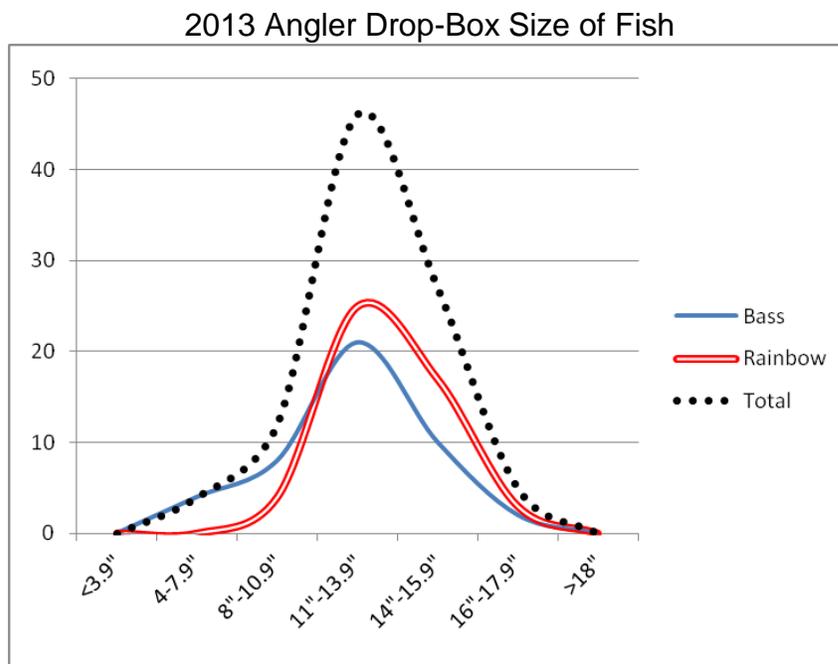
data was limited in 2010 and not necessary to present here. In 2013, 25 anglers averaged 0.66 fish per hour and 3.84 fish per angler day (Table 2). An increase in bass was reported from the drop-box survey, with 4 caught during 2012 and up to 45 during 2013. Conversely, there was a decline in rainbow reported in 2012 of 132 and 2013 of 50.

**Table 2**

Angler Drop-Box Survey			
	2011	2012	2013
No. Anglers	32	29	25
Hrs Fished	167	122	144.5
Bass	22	4	45
Tiger	1	7	1
Rainbow	108	132	50
Fish/Hour	0.78	1.17	0.66
Fish/Day	4.09	4.93	3.84

Topaz Lake is managed as a “two tier fishery” under the guidelines of the Coldwater and Warmwater, General Fishery Management Concept. The coldwater concept states “angler success rates should range between 0.25 and 0.75 fish per angler hour and 1.0 and 2.0 fish per angler day.” The warmwater 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 size of fish reported on angler drop box surveys is shown in Figure 1; 73% of bass caught were larger than 11 inches, 92% of trout caught were larger than 11 inches. Available data for angler catch rates and size of fish suggests that Topaz Lake is meeting these management objectives.

**Figure 1**



Angler satisfaction during 2013 with fishing experience and size of fish was high (Table 3). The satisfaction survey is on a scale of -2 (being less satisfied) to +2 (being more satisfied).

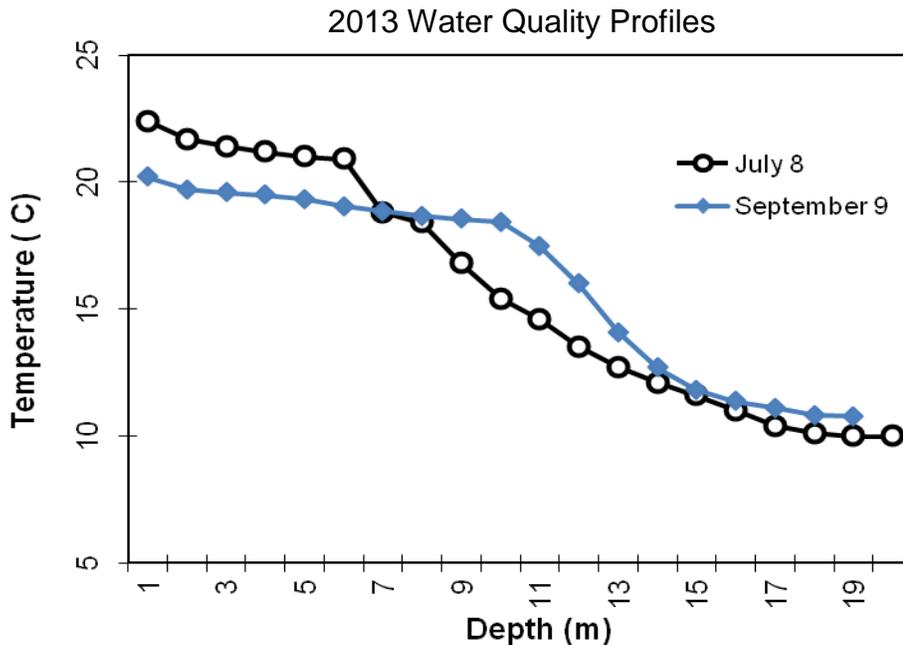
**Table 3**

**2013 Angler Drop-Box Satisfaction Survey**

	-2	-1	0	1	2	Total Ave.
Fishing exp.	5		2	8	10	0.72
Size of Fish	2	1	3	7	7	0.80
Number of fish	2		4	6	11	1.04

**Monitor lake level and clarity when on site.** Water quality profiles were taken at mid-lake on July 8 and September 9, Figure 2 shows the temperature profiles observed. Dissolved oxygen was recorded, however, the range of values was outside normal limits, and it was suspected that calibration of the Hydrolab unit was incorrect; therefore, the data was discounted.

**Figure 2**

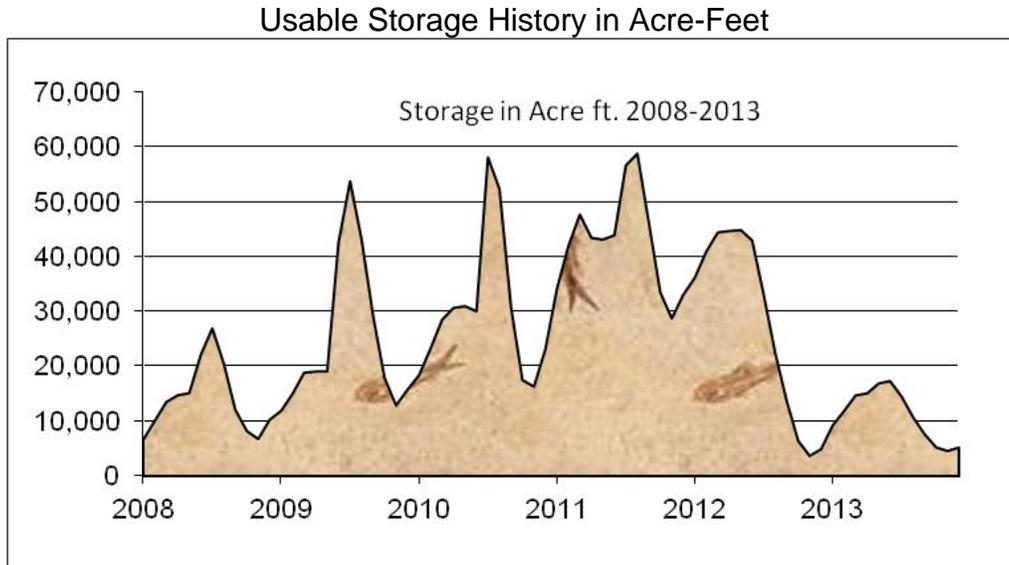


Secchi depth measurements were taken on each occasion when water quality data was recorded. The average depth of clarity was 13 ft (4.0 m), which is consistent with previous years' data.

Water quantity measurements reported in Figure 3 were taken from USGS gage number 10297000. Usable storage was measured from this gage, which was in addition to

the 65,000 acre-ft at minimum pool. Reservoir levels remained low during 2013; storage at the end of November was near the recent historic low observed during 2004. Average monthly storage during 2013 was the lowest in the past 16 years.

**Figure 3**



Water clarity fluctuates throughout the year at Topaz Lake. During winter, algae and macrophytes are reduced creating high water clarity. During late summer and fall, water clarity diminishes and during moderate to heavy winds, visibility reduces to just a few feet. Adverse effects on sport fish survival and recruitment could be attributed to water level (e.g., lack of inundated vegetation for juvenile black bass). Additionally, rising water temperatures combined with falling oxygen levels in summer due to a low water volume and increased surface area could affect trout survival.

**Monitor for the presence of quagga mussels by conducting substrate sampling around boat docks and reservoir substrates when on site.** Several substrate sampling methods for quagga mussels were used including tactile and visual surveys of boat docks, buoys, submerged, and exposed rocks. 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.

Study Specific Objectives:

**Use data collected through opportunistic angler contacts and return of angler drop-box surveys and tagged fish returns to evaluate differences in strains.** Table 4 shows the growth and catch rate returns of tagged fish as of December 31, 2013. Bowcutt trout has dominated the catch during the first four years of the study. Highlighted cells in Table 4 represent the highest performing strain for that particular category.

**Table 4**

Tagged fish returns as of December 31, 2013.

<b>All values in inches</b>	Tahoe	Bel Air	Bowcutt	Eagle Lake
Number tagged returns	28	17	96	18
Average Size at Stocking	10.30	9.24	11.05	9.08
Average size of Return	13.31	11.49	14.34	12.64
Ave number of Growth Days	217	149	175	154
Max size	18	14	20	15.75
Average growth	3.00	2.25	3.29	3.56
Average growth per month	0.43	0.47	0.58	0.72
Percentage of tagged returns	1.4	0.85	4.8	0.9
Number of fish carried over, next season	5	0	8	0
Average size of fish carried over	15.8	NA	17.4	NA

One additional year has been added to the study to ensure all tagged fish returns are included in the final analysis. The entire study will be analyzed at the conclusion of the 2014 season.

### **MANAGEMENT REVIEW**

The 2012 Mail-in Angler Questionnaire Survey suggests that numbers of fish caught and days spent angling were approximately half what was reported during previous years. However, catch rates reported on the 2012 mail-in survey, 2013 drop-box, and 2013 creel survey suggest that management objectives are being met. Extremely low water levels during 2013, combined with an increasing predator population (smallmouth bass), could be contributing to lower than average number of trout being reported through angler contacts and drop-box data.

Monitoring for adult quagga mussels through tactile and visual inspection of boat docks, buoys, and substrates should continue annually. Monitoring for veligers should also continue.

The rainbow trout study initiated in 2010 to determine the effectiveness (growth and catch rates) of stocking Bel Air, Tahoe, Eagle Lake strains of rainbow trout and bowcutt trout continued during 2013 and preliminary results suggest that bowcutt trout are out-performing the other strains. The Bel Air strain has not been used previously in Nevada; however, adjacent states such as Oregon have been using it with success. An in-depth analysis of strain performance will be conducted at the conclusion of the 2014-fishing season. 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.

A study should be initiated to determine if addition of protective cover for juvenile bass would result in an increase in catch rate, maximum size, or relative abundance. Artificial habitat should be placed where cover is limited and be monitored during the

summer. In addition to providing cover for juvenile bass, artificial habitat will also provide protection for other forage species inhabiting Topaz Lake.

## **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 tactile surveys around boat docks and reservoir substrates at least three times per year.
- Conduct quagga mussel veliger sampling through plankton tows at established transects at least three times per year.

### Study Specific Objectives, Black Bass:

- Install 20 artificial habitat structures that will provide additional habitat for juvenile black bass.
- Conduct beach seining surveys at least three times during spring and early summer near artificial habitat structures.
- Monitor habitat structures and spawning activity through snorkeling surveys during summer.

### Study Specific Objectives, Rainbow Trout:

- Analyze biological data (i.e., growth rate, life span, body condition) and angler information (i.e., catch rates and satisfaction) collected on various strains of trout during the four-year study and write a final report.

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