

NEVADA DEPARTMENT OF WILDLIFE
STATEWIDE FISHERIES MANAGEMENT



FEDERAL AID JOB PROGRESS REPORTS

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2018

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, 2018 through December 31, 2018*

SUMMARY

This was a near average year for snowpack, precipitation, and subsequent river flow in the Walker Basin. During 2018, 83% of average snow-water equivalent was recorded at SNOTEL sites in the Walker Basin of the Sierra-Nevada. Average monthly storage for Topaz Lake during 2018 was 179% (44,184 acre-ft) of the 20 average (24,747 acre-ft). This was the second consecutive year since 2012 that an above normal storage level was observed.

Mail-in, angler questionnaire data for 2017 estimated 1,620 anglers fished 6,299 days to catch 14,069 fish, which represented an increase in anglers use and number of fish caught from results in 2016. Since Topaz Lake straddles the Nevada and California state line, anglers may possess either state's fishing license, but the data reported here represents only anglers buying a Nevada fishing license. The average catch rate increased to 2.23 fish per angler-day. Coldwater and Warmwater management objectives were successfully met this year based on the mail-in survey as well as angler contact and drop-box results.

During 2018, adult smallmouth bass abundance was at an all-time high. In addition, juvenile numbers found during snorkel surveys increased from 2016 through 2018. A study aimed at assessing the effectiveness of artificial habitat structures on recruitment and survival of black bass was continued during 2018. An additional 10 Mossback habitat structures were installed, now totaling 60 since the project started in 2015. Monitoring for aquatic invasive species (i.e., quagga mussels) continued in 2018 and no veligers or adult mussels were found.

A study aimed at assessing the rainbow trout fishery was initiated during 2010. Growth and catch rates of four trout strains (bowcutt trout and Eagle Lake, Bel Air, and Tahoe strains of rainbow trout) indicated that bowcutt trout performed better than other strains. Creel survey results continue to indicate that bowcutt trout are by far the most likely to carryover from one year to the next. On the other hand, stocking has been inconsistent over the last two years (in timing and numbers of fish) and its significance is unclear on angler catch rates or size of fish.

BACKGROUND

The Nevada/California border almost 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 include brown trout (*Salmo trutta*), kokanee salmon (*O. nerka*), Lahontan cutthroat trout (*O. clarkii henshawi*), bowcutt trout (a hybrid between cutthroat and rainbow trout), tiger trout (a hybrid between brown 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, largemouth bass, and occasionally brown trout encompass a minor fishery. Even though smallmouth bass were known to occur in the West Walker River and anecdotal reports from anglers suggested they were in the lake earlier, they were first confirmed by NDOW in 2008. Smallmouth bass are now established and they comprise a significant component of the sport fishery, particularly during the summer when trout fishing becomes slow. The native fish community is comprised of mountain whitefish (*Prosopium williamsoni*), Tahoe sucker (*Catostomus tahoensis*), Lahontan tui chub (*Siphateles bicolor obesus*), Lahontan reddsides (*Richardsonius egregious*), and speckled dace (*Rhinichthys osculus*).

Topaz Lake fishing season is open from January 1 to September 30. Regulations state "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 charges a fee to launch boats. The Douglas County boat ramp is large enough for multiple launchings and can be used at all but extremely low water levels. In addition to a fish cleaning station, there are camping sites and restrooms. An angler drop-box near the Douglas County boat launch was installed in 2010 to collect basic information including hours spent fishing, number of fish caught, general size of fish, and species caught. 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, and 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, 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 adult 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.

Black Bass Study Specific Objectives

- Increase habitat complexity and provide additional juvenile habitat cover with additional artificial habitat structures.
- Monitor habitat structures and spawning activity utilizing snorkel surveys and acoustic techniques during summer.

PROCEDURES

General Management

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 were 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 30,000 anglers purchasing a Nevada fishing license. Information returned was entered into a database and summarized for use in assessment of individual fisheries. Since Topaz Lake straddles the Nevada and California state line, anglers can possess either state's fishing license, but the data reported here represents only those anglers buying a Nevada fishing license. Opportunistic angler contacts were made during January (4 days), May (4 day), June (2 days), July (1 day) and August (1 days).

Monitor lake level and clarity when on site. Lake volume was measured by a USGS gage in acre-ft near the dam and measurements were recorded at the beginning of each month. Water clarity was measured using a Secchi disk and measurements were taken on January 18, June 18, and August 10 near mid-lake.

Monitor for the presence of adult quagga mussels by conducting tactile surveys around boat docks and reservoir substrates at least three times per year. Monitoring of buoys, submerged rocks, exposed rocks, moored boats, and boat docks was conducted during January (4 days), May (4 day), June (2 days), July (1 day) and August (1 days). Tactile surveys included snorkeling around boat docks and buoys or visually inspecting surfaces that 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 Douglas County boat ramp, the second near mid-lake, and the third near 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- μ m mesh plankton net. Samples were only collected on June 18, preserved in 75% ethanol, and analyzed by Pisces Molecular in Colorado and Eco Analysts in Idaho.

Black Bass Study

Increase habitat complexity and provide additional juvenile habitat cover with additional artificial habitat structures. Habitat structures, purchased from Mossback Fish Habitat, are made of nontoxic “scuffed” PVC trunks with composite limbs to simulate sunken trees or root structures that would be found in a natural environment. Three different types of structures were utilized consisting of Safe Havens (Figure 1), Root Wad 3 Posts, and Trophy Tree Kits. Product dimensions and specifications are presented in Table 1.

Figure 1. Safe Haven Fish Habitat Structure.



Table 1. Mossback Habitat Specifications.

	Dimensions	Limbs	Number of Anchors
Safe Haven	50" x 50"	24	1
Root Wad 3 Post	25" x 50"	12	1
Trophy Tree Kit	50" x 50"-100"	36	2

Habitat structures were constructed in Fallon and transported to the lake on a small flatbed trailer. They were transported and installed at lake locations using an 18 ft aluminum Delta Angler boat. Suitable locations were determined based on bathymetric maps and depth was then verified using a fish finder. All structures were placed in at least 6.0 ft of water, but not more than 15.0 ft in order to target areas where all species were suspected to be most vulnerable to predation. These locations and depths also function as suitable spawning habitat for warm water species, which produce offspring that can utilize the structures as well. Structures were submerged and anchored using

six-feet of nylon coated aircraft cable and either one or two cinder blocks per structure. GPS locations were recorded for each structure for future monitoring.

Monitor habitat structures and spawning activity utilizing snorkel surveys and acoustic techniques during summer. Snorkel surveys were conducted on May 18, June 18, and July 11, 2018. A single snorkeler swam from a boat and monitored fish use near each habitat structure. Fish species, approximate size, and their location to the structure were recorded.

FINDINGS

General Management

Conduct a general fisheries assessment through opportunistic angler contacts, angler drop-drop box surveys, and mail-in, angler questionnaire data. During 2018, 52 shore anglers targeting trout, 22 boating anglers targeting trout, and 20 targeting black bass were contacted at Topaz Lake. Shore anglers targeting trout showed a catch rate of 0.73 fish per hour and 2.10 fish per day, while boaters had a catch rate of 0.65 fish per hour and 3.32 fish per day. The catch rate when combining all trout anglers was 0.69 fish per hour, down slightly from the past couple of years (Table 2). Anglers targeting black bass had a catch rate of 3.31 fish per hour and 7.95 fish per day. Only smallmouth bass were reported and no largemouth bass have been reported since 2014.

Several anglers that frequently target trout and several that frequently target black bass kept detailed written logs of their fishing activity throughout 2018. This information was included in angler contact results. Ninety-four trout caught from shore averaged 14.05 in and 29 caught from a boat averaged 13.31 in and sizes ranged from 11 to 23 in. Measurements from 137 smallmouth bass averaged 10.25 in and they ranged from 6.0 to 24.0 in. The largest was about 5.0 lbs.

Table 2. Angler Contact Catch Rate History.

Trout Anglers	Fish/hour	Average size
2018	0.69	13.87
2017	0.88	16.02
2016	0.76	15.8
Bass Anglers	Fish/hour	Average size
2018	3.31	10.25
2017	0.6	18.5
2016	-	

Historical mail-in, angler questionnaire data is presented in Table 3. In 2017 (the latest data), results were slightly below average for angler use (days fished). However, the catch rate (fish per angler day) and number of fish caught were above average. Mail-in data does not distinguish between species caught, but trout have historically dominated the creel (based on contact and drop-box survey data). However, in 2018, black bass were reported more in the drop-box survey than trout for the first time (Table 4).

Table 3. Mail-in Angler Questionnaire History.

Year	No. of Anglers	Days Fished	Fish Caught	Fish/Angler Day
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
2013	1,502	6,453	6,457	1.00
2014	1,094	7,670	7,147	0.93
2015	1,084	4,224	6,880	1.63
2016	1,412	7,236	11,794	1.63
2017	1,620	6,299	14,069	2.23
10 Year Average	2,048	9,909	14,509	1.47

Table 4. Angler Drop-Box Survey, 2010 – 2018.

	2010	2011	2012	2013	2014	2015	2016	2017	2018	AVE
No. Anglers	4	32	29	25	0	18	23	15	30	20
Hrs Fished	24	167	122	144.5		95	141.5	120	159.5	122
Bass	0	22	4	45		8	6	5	153	30
Tiger	1	1	7	1		0	0	0	0	1
Rainbow	6	108	132	50		31	112	124	128	86
Fish/Hour	0.29	0.78	1.17	0.66		0.41	0.83	1.08	1.76	0.87
Fish/Day	1.75	4.09	4.93	3.84		2.17	5.13	8.6	9.37	4.99

The drop-box in 2018 collected 30 completed surveys, while only 15 were collected in 2017 and 23 in 2016 (Table 4). Anglers showed average catch rates (all fish combined) of 1.76 fish per hour and 9.37 fish per day, which were the highest observed in the past nine years. The Douglas County boat ramp was open for most of 2016 through 2018, however, it was closed throughout most of the year in 2014 and 2015 due to drought, and data was limited since the drop-box was located at the boat ramp. This survey also does not distinguish between black bass species; however, based on contacts surveys, 100% of the black bass caught during the past several years have been smallmouth bass. Therefore, it is likely that most, if not all, black bass reported on drop-box surveys have been smallmouth. Largemouth bass do occur in the lake, but their numbers are low. The catch of black bass had declined since 2015 (21% of fish caught), however, during 2018, black bass made up 54% of all fish reported.

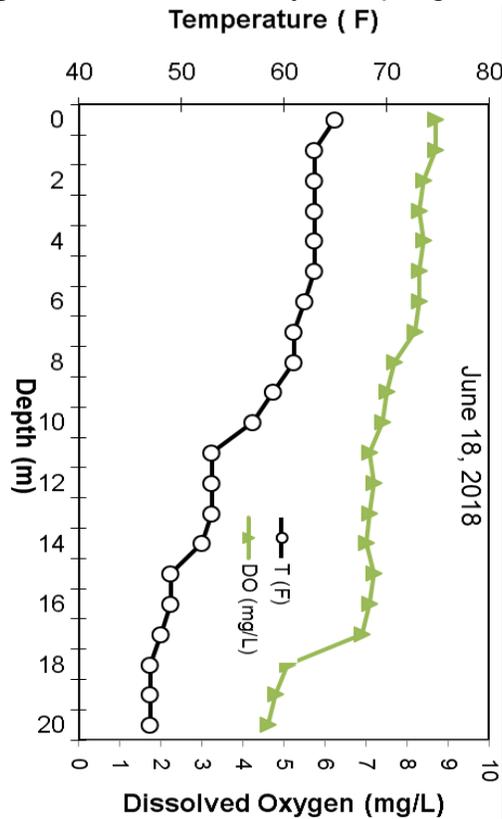
Topaz Lake is managed as a “two tiered fishery” under guidelines of Coldwater and Warmwater General Fishery Management Concepts. The coldwater concept states “angler success rates should range between 0.25 and 0.75 fish per angler hour and 1.0 and 2.0 fish per day.” The warmwater concept states “angler catch rates should range between 0.25 and 0.75 fish per hour and 1.0 and 2.0 fish per day. Largemouth bass should average 10 in.” The size of fish reported from the angler drop-box survey showed most black bass were larger than 10 in and 48% of trout caught were larger than 11 in (Table 5). These results indicate that Topaz Lake is meeting the angling objectives.

Monitor lake level and clarity when on site. The surface temperature ranged from a high of 72°F during August to a low of 42°F during January (Table 8) and appeared not to create issues for trout to survival. A water quality profile was taken on June 18, 2018 (Figure 2), and a strong thermocline typically develops in summer with suitable trout habitat occurring only within few vertical meters near the bottom in September. However, there was no evidence of a strong thermocline during 2018. This was most likely due to a heavy inflow during summer that allowed for above average mixing of the lake.

Table 8. Surface Water Quality Sampling, 2018.

Date	Air Temp (°F)	Water Temp (°F)	Secchi Depth (Ft)
1/18/18	35	42	10.1
6/18/18	75	65	5.3
8/10/18	90	72	4.2

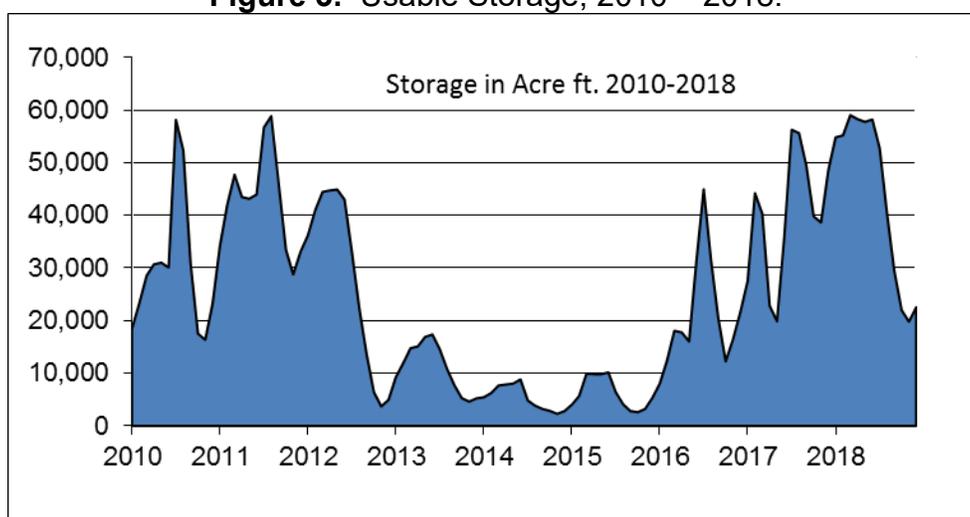
Figure 2. Water Quality Sampling, 2018.



By mid-summer, a large algae bloom occurred on the California side of the reservoir, which sparked a warning. Although an algae bloom occurred in Nevada, toxicity levels were too low to generate a warning or hazard by Nevada Department of Environmental Protection. Additionally, no large-scale mortality events were observed possibly because spring runoff continued well into July, creating lower surface temperatures and high dissolved oxygen concentrations. The lake level remained higher for longer period than during the past several years due to near average snowpack and a longer runoff period.

Secchi depth was measured three times, clarity being clearest in winter and diminishing throughout the summer due to phytoplankton and macrophyte growth (Table 8), ranging from 33 ft in January to 13.8 ft by mid-August (Table 8). Water storage reported in Figure 3 was taken from USGS gage number 10297000. Only usable storage was measured at this gauge, which did not include the 65,000 acre-ft of minimum pool. While historical lows were observed during 2014 and 2015, levels rebounded to average levels during 2016 (88% of the historical average storage level) and 2017 (163% of the historical average storage level). In 2018, the lowest storage level occurred on October 30, at 19,690 acre-ft of usable water. As a comparison, October 26, 2014 showed a storage of 2,220 acre-ft and September 19, 2015 at 2,560 acre-feet. Typically, the lowest annual storage is observed in January since the irrigation season is closed. In 2018, the reservoir peaked on March 23 at 59,450 acre-ft.

Figure 3. Usable Storage, 2010 – 2018.



Monitor for the presence of adult quagga mussels by conducting tactile surveys around boat docks and reservoir substrates at least three times per year. Several methods were used for monitoring the presence of quagga mussels and included tactile and visual surveys of boat docks, buoys, and submerged and exposed rocks. No physical detection of adult quagga mussels occurred in 2018.

Conduct quagga mussel veliger sampling through plankton tows at established transects at least three times per year. Samples collected in 2018 were negative for detecting the presence of quagga mussel veligers.

Study Specific, Black Bass

Increase habitat complexity and provide additional juvenile habitat cover with additional artificial habitat structures. Installation of artificial habitat structures was completed throughout the course of several months in 2018. Each new structure (Table 10, Figure 4) was placed as near as possible to 2016/17 locations. The water level has remained consistently high since 2017 and no movement of shallow structures has been necessary. Generally, as structures attract a forage base of younger non-game and

game species, they also attract larger black bass. While conducting work on Topaz Lake, anglers in boats were observed fishing near these structures, suggesting structures are attract adult black bass.

Table 10. Mossback GPS locations.

Label	Water Body	Easting	Northing	Zone
S-25	Topaz lake	279841.0	4282887	11
S-26	Topaz lake	279847.4	4282847	11
S-27	Topaz lake	279828.6	4283824	11
S-28	Topaz lake	279968.6	4283989	11
S-29	Topaz lake	280173.1	4284158	11
S-30	Topaz lake	280387.3	4284268	11
S-31	Topaz lake	280428.7	4284380	11
S-32	Topaz lake	280422.5	4284361	11
S-33	Topaz lake	280406.6	4284293	11
S-34	Topaz lake	280339.2	4284220	11

Figure 4. Artificial Habitat Structures Placement.



Monitor habitat structures and spawning activity utilizing snorkel surveys and acoustic techniques during summer. Snorkeling surveys were conducted during May, June, and July. Visibility during the spring snorkeling effort was much higher (up to 10 ft), allowing in greater confidence in identifying fish than during previous surveys occurring later in the year (Table 11). The 2018 survey documented 53 juvenile smallmouth bass that ranged between three and five inches. Approximately 95 unidentifiable fish were observed near structures and another 195 were identified as nongame fish, mostly juvenile tui chub (Table 11). Results from annual snorkeling surveys show more black bass continue to use the structures, however, only four adults were observed in 2014 and none after that (2015 to 2018).

Table 11. Snorkel Survey Results, 2018.

	2015	2016	2017	2018	AVERAGE
No. Bass	28	30	43	53	38.5
No. Trout	0	0	0	1	0.25
No. nongame	50	95	130	195	117.5
No. Unidentified	75	80	45	95	73.8
Hours Snorkeled	2.9	7.5	5.5	6	5.5
Bass/Hour	9.66	4	7.82	8.83	7.6

MANAGEMENT REVIEW

The 2017 Mail-in Angler Questionnaire Survey suggests that catch rates have recovered from the lowest recorded catch rates in 2013 and 2014. Results from the 2018 drop-box survey and angler contact survey suggest that the catch rate objectives were met in spite of drought conditions that persisted until 2016. High summertime temperatures and low dissolved oxygen levels typically lead to limited carryover of trout; however, results from angler surveys in 2018 suggest that some trout were able to survive the 2016 and 2017 summers. Only bowcutt trout have been observed to carry over during the past three years. Results were consistent with a rainbow trout study conducted from 2010 through 2014 suggesting that bowcutt trout survived longer and grew larger than several other strains in Topaz Lake. Trout stocking over the past couple of years has been inconsistent (i.e., timing and allocations), but angler success is expected to increase when following a management strategy based on the trout strain study results.

Results from the 2018 adult quagga mussel monitoring were negative. Sampling should continue to help the spread of aquatic invasive species to other Nevada and California waters in case Topaz Lake should become infected.

A black bass study was initiated in 2014 corresponding to the addition of artificial protective cover. The study will examine if artificial habitat results in an increase of angler success and/or abundance of bass. Even though bass angling was less successful during 2014 and 2015, it is likely a result of persistent drought and subsequent low reservoir levels and not due to the addition of the artificial habitat. Artificial habitat was placed in Topaz Lake since cover is limiting and juvenile black bass appear to be attracted to the structures.

The effects of very low water levels observed from 2013 to 2015 possibly resulted in higher adult smallmouth bass mortality or reduced recruitment into older age classes. This subsequently affected angler catch rates, but recent angler creel surveys suggest smallmouth bass numbers have increased and are stabilizing. This appears to have correspond with higher water levels experienced during the past several years. Angling for smallmouth bass has become very popular spring and summer, rivaling trout fishing during winter and spring.

RECOMMENDATIONS

General Management

- 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 least once during spring

Black Bass Study Specific

- Monitor habitat structures and spawning activity utilizing acoustic techniques during summer.
- Evaluate data collected and make management recommendations.

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