

NEVADA DEPARTMENT OF WILDLIFE
STATEWIDE FISHERIES MANAGEMENT



FEDERAL AID JOB PROGRESS REPORTS

F-20-53
2017

BOULDER RESERVOIR
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: *Boulder Reservoir*
Period Covered: *January 1, 2017 through December 31, 2017*

SUMMARY

A total of 27 volunteer angler surveys were received from Boulder Reservoir in 2017 from the months of March through November. A total of 29 anglers reported to have fished for 136 hrs and caught 564 rainbow trout. Resulting catch rates were 19.4 fish per angler and 4.1 fish per hour.

A total of 3,319 catchable rainbow trout was stocked into Boulder Reservoir in 2017 consisting of three different strains. Eagle Lake, Incline, and Tahoe strain rainbow trout were all stocked into the reservoir in 2017.

General habitat conditions were observed and documented when present at the reservoir. Habitat assessment was based on visual observations of lake level and clarity during a walk around the reservoir.

A gill net survey was conducted the night of September 12. A total of 80 rainbow trout was captured for a total catch rate of 2.7 fish per net-hr.

BACKGROUND

Boulder Reservoir is located 190 miles north of Reno in Washoe County. It is situated at an elevation of 5,755 ft and is predominantly surrounded by sagebrush-steppe habitat. The reservoir covers approximately four acres with a maximum depth of 10 ft. The reservoir is fed by spring snowmelt runoff and a perennial spring located in the reservoir's southwest corner.

Boulder Reservoir was constructed as an irrigation storage reservoir in 1950. It has been owned and managed by the Harris, Groves, Cockrell, and Jaksick families in the past. The reservoir has had a long history with riser structures and spillways washing out during periods of high water. Throughout much of the past, verbal agreements between NDOW and landowners have allowed public access in exchange for routine hatchery stocking.

In 2009, Boulder Reservoir, surrounding acreage, and associated water rights were acquired by BLM through Southern Nevada Public Lands Management Act (SNPLMA) funding. A comprehensive recreation enhancement project was then enacted and construction was completed during the summer and fall of 2014. Among others, components of the project included dam repair, reservoir dredging, riparian

fencing, off site watering for livestock, as well as construction of picnic facilities and camping spots.

Boulder Reservoir supports a hatchery maintained population of rainbow trout and as the fishery rebuilds, it should support bowcutt trout as well. On occasion, low water coupled with siltation and an abundance of aquatic vegetation has led to late summer/early fall fish kills, but as a newly dredged and improved impoundment, this may no longer be an issue. Boulder Reservoir is managed under the Coldwater Quality Fishery Management Concept, having an objective for angler success rates of 0.30 - 1.25 fish per hour and 2.0 - 3.5 fish per angler day.

OBJECTIVES

- Conduct a general assessment of angler use, success, and harvest through opportunistic angler contacts and mail-in angler questionnaire data.
- Conduct a general habitat assessment through visual observations of water quantity (lake level), water quality (clarity), aquatic vegetation, and upland vegetation (cattle use) when on site.
- Set gill nets for two net-nights in the fall.

PROCEDURES

Conduct a general assessment of angler use, success, and harvest through opportunistic angler contacts and mail-in angler questionnaire data. Several opportunistic visits were made to Boulder Reservoir in 2017 to collect creel survey data among other things. No anglers were contacted during these visits.

Angler use and success at Boulder Reservoir was also assessed through a volunteer Angler Drop-Box Survey and the Department's Mail-in Angler Questionnaire Survey. Angler questionnaire data was derived from a survey that was mailed to 30,000 license purchasers from the previous year.

Conduct a general habitat assessment through visual observations of water quantity (lake level) and water quality (clarity), aquatic vegetation, and upland vegetation (cattle use) when on site. General habitat conditions were observed and documented when present at the reservoir. Habitat assessment was based on visual observations of lake level and clarity during each site visit.

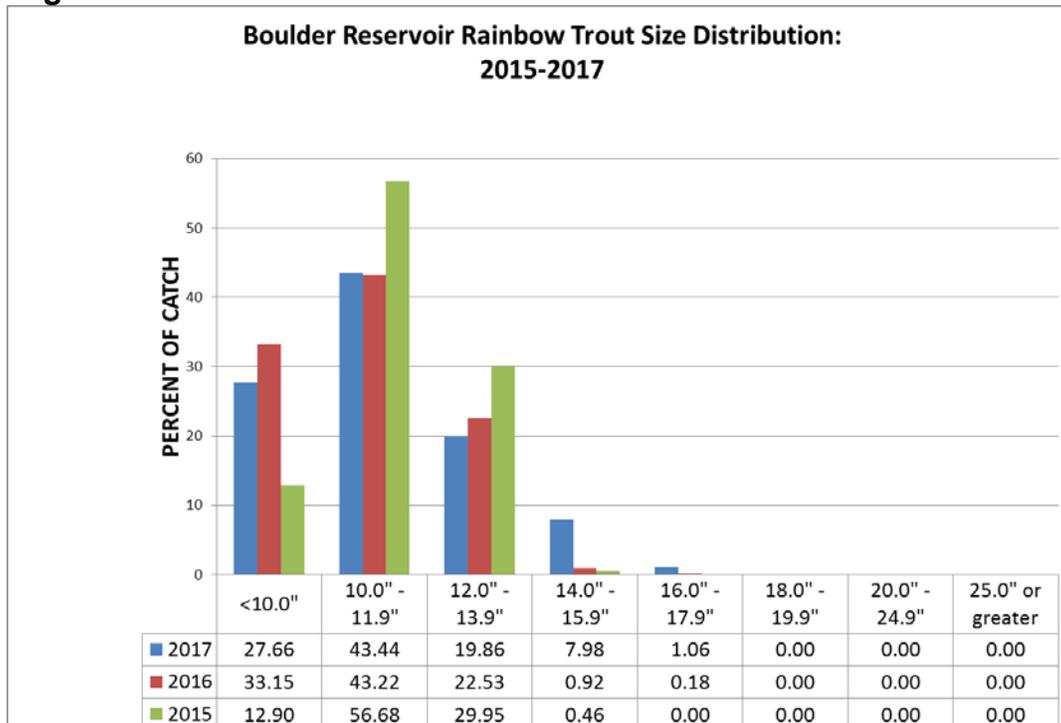
Set gill nets for two net nights in the fall. On September 12, two 150 ft x 6 ft experimental mesh gill nets were set at 0445 hrs and 0500 hrs in Boulder Reservoir. The nets consisted of 1/2, 3/4, 1, 1 1/2, and 2 in mesh panels. One of the nets was set in the pelagic zone starting on the dam and extending toward the middle of the reservoir while the second net was set in the littoral zone in the southern arm of the reservoir. All fish captured were identified, measured to fork length, and weighed with a certified battery powered scale. Live fish were returned to the reservoir after processing.

FINDINGS

Conduct a general assessment of angler use, success, and harvest through opportunistic angler contacts and mail-in angler questionnaire data. Despite several trips to Boulder Reservoir during 2017, no anglers were contacted that were actively fishing. Several people were contacted who conveyed their satisfaction with the conditions of the reservoir and the recent improvements.

A total of 27 volunteer angler surveys were received from Boulder Reservoir in 2017 from the months of March through November. A total of 29 anglers reported to have fished for 136 hrs and caught 564 rainbow trout. Resulting catch rates were 19.4 fish per angler and 4.1 fish per hour. Of the 564 rainbow trout, 88 percent (497) were reported as released. An analysis of the reported lengths of the rainbow trout harvested reveals that the majority (43.4 percent) of the fish caught were in the 10.0 to 11.9 in range. A fair number of fish were reported in the size brackets over 12 inches (28.9 percent), while the remainder of the catch was reported to be less than 10 inches. An increase in the upper size limit was once again seen in 2017, with the most fish being reported in the size brackets over 14 inches since the reservoir was improved in 2014. When comparing the size distribution from 2015 to 2017, it becomes apparent that fish are persisting in the reservoir and the frequency of larger fish is becoming more common (Figure 1). Angler satisfaction ratings are based on a scale of -2 to +2 with -2 being unsatisfied and +2 being completely satisfied. Ratings reported at Boulder Reservoir were generally positive, with angling experience, size of trout, and number of trout rating +1.67, +0.79, and +1.63, respectively. These are some of the highest average rating of any water in northwest Nevada.

Figure 1.



The Mail-in Angler Questionnaire Survey estimated use at 165 anglers and 280 angler days in 2016, both of which were lower than the 36 year average of 205 anglers and 542 angler days. Total catch was estimated at 3,104 fish with a success rate of 11.1 fish per angler day, which was more than double the long-term average of 4.5 fish per angler day. The reservoir appears to be receiving less angler use than it historically has, but for those willing to make the trip it is proving to be an excellent fishery.

Stocking Program

A total of 3,319 catchable rainbow trout consisting of three different strains was stocked into Boulder Reservoir in 2017. Eagle Lake, Incline, and Tahoe strain rainbow trout were all stocked into the reservoir in 2017.

Table 1. Boulder Reservoir Stocking History 2014 - 2017.

Date	Species	Number	Size (in.)	Strain
10/15/2014	Rainbow	3,070	9.3	Tahoe
2014 Total		3,070	9.3	
10/13/2015	Rainbow	1,176	9.5	Tahoe
4/10/2015	Rainbow	3,091	9.1	Triploid
2015 Total		4,267	9.1 - 9.5	
3/4/2016	Rainbow	1,958	9.5	Eagle Lake
9/27/2016	Rainbow	601	9.8	Incline
9/27/2016	Rainbow	600	10.1	Tahoe
2016 Total		3,159	9.5 - 10.1	
4/28/2017	Rainbow	2,078	9.7	Eagle Lake
10/6/2017	Rainbow	353	8.9	Incline
10/6/2017	Rainbow	888	9.5	Tahoe
2017 Total		3,319	8.9 - 9.7	
Total (All Fish)		13,815		

Conduct a general habitat assessment through visual observations of water quantity (lake level) and water quality (clarity), aquatic vegetation, and upland vegetation (cattle use) when on site. Several trips were made to the reservoir over the course of the year for numerous reasons. During each trip, the visual habitat assessments were made. The reservoir was noted to be near capacity on each trip and had very little fluctuation throughout the year.

Upland vegetation around the reservoir appears to be doing well in the absence of ungulate use. Aquatic vegetation was noted to be severe beginning in mid-summer and extending into the early fall. The majority of the near shore area was noted to be covered with floating and rooted vegetation. Angling from the shore during this time of the year would be extremely difficult. The vegetation persisted into the fall, but it subsided and enabled anglers to once again effectively fish from the shoreline.

Set gill nets for two net nights in the fall. A gill net survey was conducted the night of September 12. A total of 80 rainbow trout was captured for a total catch rate of 2.7 fish per net-hr.

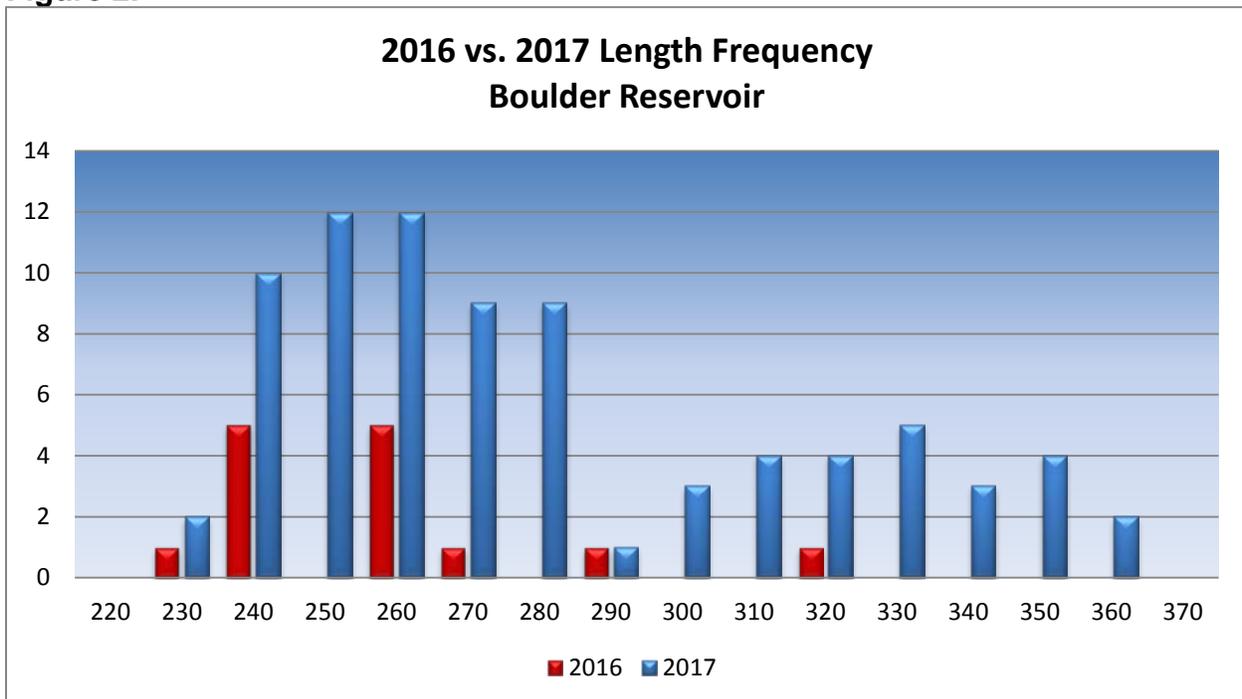
The rainbow trout ranged in length from 9.2 in (234 mm) to 14.5 in (368 mm) with an average fork length of 11.2 in (284 mm). Weight averaged 0.6 lbs (278 g). The average K-value for rainbow trout was 1.2, suggesting a fair to good body condition. All of these measurements are considered improvements in the fishery since the 2016 survey (Table 2).

Table 2. Gill Net Rainbow Trout Data, 2016 – 2017.

Total Rainbow		2016 - 14	2017 - 80				
		Length (mm)		K-Factor		Weight (g)	
		2016	2017	2016	2017	2016	2017
Average		262	284	1.13	1.17	206	278
Range	High	324	368	1.28	1.75	380	560
	Low	232	234	0.97	0.83	150	130.00

As with the angler drop-box data, a comparison of the length frequency for rainbow trout captured during gill netting in Boulder Reservoir in 2016 and 2017 reveals an increasing number of larger fish, which was expected as fish aged and persisted in the reservoir (Figure 2). At least two distinct size classes are visible in the 2017 gill netting sample, which loosely corresponds to stocking events over the past two years. Tracking these cohorts in the next few years may reveal longevity and the upper size limits of hatchery raised rainbow trout in Boulder Reservoir.

Figure 2.



In 2017, the first year of analysis on the different strains of rainbow trout in Boulder Reservoir was completed. This information can be found in the stand alone “Lake Tahoe Rainbow Trout Study” that was developed to assess the productivity of two different strains of rainbow trout being utilized in several waters across northwestern Nevada.

MANAGEMENT REVIEW

Due to its remote nature, Boulder Reservoir does not receive a high level of angler use. However, it is a popular fishery for those anglers willing to make the trip. This fishery is generally popular with anglers for producing incredible catch rates and an opportunity to fish in a semi-remote setting. Additionally, the area provides opportunities for dispersed camping, hunting, and wildlife viewing. The angler questionnaire and drop-box data suggest that the reservoir is currently far exceeding the requirements prescribed for the Coldwater Quality Fishery Management Concept and anglers are completely satisfied with their experience at the reservoir. The data compiled in 2017 reveals an improving fishery in the context of size and health of fish and, as the fish currently in the reservoir continue to age and grow, the quality of the fish will improve. The stocking of a different strain of rainbow trout (Incline strain) may also provide larger than average sized fish as they grow in the reservoir.

While access to the reservoir is simple, it may be prudent to look to improve the actual put in/take out at the reservoir, as currently there is not an actual location for this. Conversations with anglers who frequent the reservoir revealed this is need and will be followed up on.

The Boulder Reservoir Fisheries and Recreation Enhancement Project has proven to be a tremendous success and compliments to the project were noted on several angler drop-box forms.

RECOMMENDATIONS

- Conduct a general assessment of angler use, success, and harvest through opportunistic angler contacts and mail-in angler questionnaire data.
- Conduct a general habitat assessment through visual observations of water quantity (lake level), water quality (clarity), aquatic vegetation, and upland vegetation (cattle use) when on site.
- Explore opportunity for enhancing a put in/take out point at the reservoir.
- Conduct gill net surveys for two net-nights in the fall.

Prepared By: Travis Hawks
Biologist III
Western Region

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