

NEVADA DEPARTMENT OF WILDLIFE
STATEWIDE FISHERIES MANAGEMENT



FEDERAL AID JOB PROGRESS REPORTS

F-20-54
2018

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, 2018 through December 31, 2018*

SUMMARY

Anglers completed 24 volunteer drop-box surveys from fishing Boulder Reservoir in 2018. Fishing results for 35 anglers were reported each month (except January, August, November, and December); totaling 137.5 hrs and catching 440 rainbow trout. Resulting catch rates were 12.6 fish per angler and 0.4 fish per hour. Anglers reported releasing 382 (86.8%) fish.

The stocking of 3,010 catchable rainbow trout occurred in 2018. Strains of rainbow trout included Eagle Lake, Marlette Lake Triploid (pressure treated), and Trout Lodge Triploid.

When present at the reservoir, general habitat conditions were observed and documented. Habitat assessment was based on visual observations of lake level and clarity during a walk around the reservoir. The concept of installing a basic boat ramp was explored and discussed with the Bureau of Land Management but was deemed unnecessary.

Gill nets were set the night of September 10 and caught 33 rainbow trout for a catch rate of 1.03 fish per net-hr.

BACKGROUND

Boulder Reservoir is located 190 mi 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, has a maximum depth of 10 ft, and relies on snowmelt and a perennial spring located in the reservoir's southwest corner.

Boulder Reservoir was constructed for irrigation storage in 1950 and it has been owned and managed historically by the Harris, Groves, Cockrell, and Jaksick families. Problems at the reservoir have a long history, for example 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 and routine hatchery stocking.

In 2009, the 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 enacted and construction was completed during the summer/fall of 2014. Among others components of the project,

improvements 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 improves, it will be stocked with bowcutt trout as well. On occasion, low water levels coupled with siltation and abundance of aquatic vegetation have led to late summer/early fall fish kills. However, since the reservoir was improved by deepening, this may no longer be a concern. Boulder Reservoir is managed under a Coldwater Quality Fishery Management Concept, having an objective for angler success of 0.30 to 1.25 fish per hour and 2.0 to 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.
- Explore opportunity for enhancing put in/take out boat access at the reservoir.
- Conduct population assessment by setting 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 2018 to collect contact creel survey data among other things. No anglers were contacted during these visits.

Angler use and success was assessed through the volunteer angler drop-box and the Mail-in Angler Questionnaire Survey. Angler questionnaire data was derived from a survey 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.

Explore opportunity for enhancing put in/take out access at the reservoir. Due to angler concern, improvement of boating access (i.e., easy entry for anglers using float tubes or pontoon boats) at Boulder Reservoir was evaluated during 2018. Correspondence occurred through phone and emails with BLM to discuss a solution.

Conduct population assessment by setting gill nets for two net-nights in the fall. On September 10, two 150 ft x 6 ft experimental mesh gill nets were set at 0400 hrs and 0415 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 deep water, starting at the dam and extending toward

the middle of the reservoir, while the second net was set in the littoral zone of 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 in 2018, no anglers were contacted that were actively fishing. Several people were contacted who conveyed their satisfaction with the conditions of the reservoir and the developed camping area.

The volunteer angler drop-box collected 24 surveys in 2018 (excluding January, August, November, and December) and 35 anglers fished 137.5 hrs and caught 440 rainbow trout. Resulting catch rates were 12.6 fish per angler and 0.4 fish per hour, and 86.8 percent ($n=382$) of the fish caught were reported as released. Many of the fish caught (43.2%) were between 10.0 and 11.9 in. Those larger than 12.0 in comprised 50% of the fish caught, which was a large increase over 28.9% reported in 2017. This was the fourth consecutive year, since the reservoir was refurbished, that the percentage of larger fish increased. When comparing rainbow trout size distribution from 2015 to 2018, carryover from one year to the next is evident and capture of larger fish has become increasingly common (Figure 1).

Angler satisfaction ratings are based on a scale of -2 to +2 with -2 being unsatisfied and +2 being completely satisfied. Individual ratings reported at Boulder Reservoir were generally positive for angling experience, size of trout, and number of trout and averaged +1.73, +0.82, and +1.69, respectively. These are some of the highest average satisfaction ratings of any water body in Washoe County. Ratings were increased over the 2017 ratings, despite having lower catch rates.

The Mail-in Angler Questionnaire Survey estimated use at 329 anglers and 671 angler days in 2017, which were higher than the 36 year averages of 208 anglers and 546 angler days. In 2017, the catch was estimated at 9,808 fish with a success rate of 14.6 fish per angler day, which was more than triple the long-term average of 4.8 fish per angler day. The reservoir provides an excellent fishery for those willing to make the trip and it seems that more people are becoming aware of this remote, yet productive fishery.

Stocking Program

Stocking of 3,010 catchable rainbow trout occurred at Boulder Reservoir in 2018. Strains consisted of Eagle Lake, Marlette Lake Triploid, and Trout Lodge Triploid strains. Since 2014, annual stocking levels have remained relatively static and have appeared to be suitable for the available habitat and angler use in the reservoir.

Figure 1.

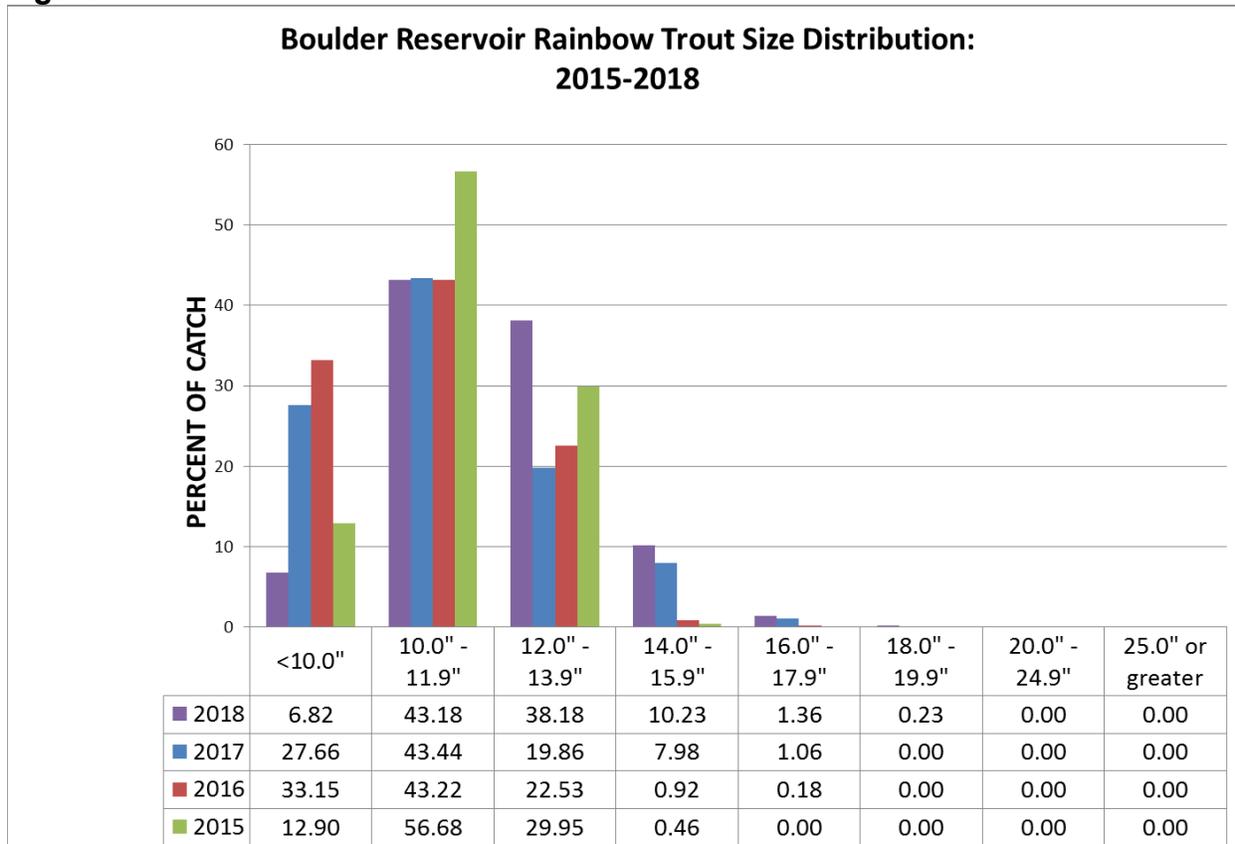


Table 1. Boulder Reservoir Stocking History, 2014 to 2018.

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	
4/23/2018	Rainbow	1,013	10	Eagle Lake
5/7/2018	Rainbow	998	9.6	Triploid
10/15/2018	Rainbow	999	9.8	Trout Lodge
2017 Total		3,010	9.6 - 10	
Total (All Fish)		16,825		

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, visual habitat assessments were made and the water level was near capacity on each trip, with very little fluctuation throughout the year.

Upland vegetation appeared to be doing well in the absence of ungulates. Aquatic vegetative growth was severe beginning in mid-summer and extending into early fall. The majority of the nearshore area was covered with floating and rooted vegetation. Angling from the shore during this time would be extremely difficult. The vegetation subsided in fall and enabled anglers to once again effectively fish from the shoreline.

Explore opportunity for enhancing put in/take out access at the reservoir. The idea to improve the access at Boulder Reservoir was evaluated through phone and email conversations with the BLM. Because of the reservoir’s small size, It was expressed that development of a ramp or “put in” area would congregate traffic and may have unintended negative effects on the fishery. After reviewing this, it was decided to leave the reservoir as it is.

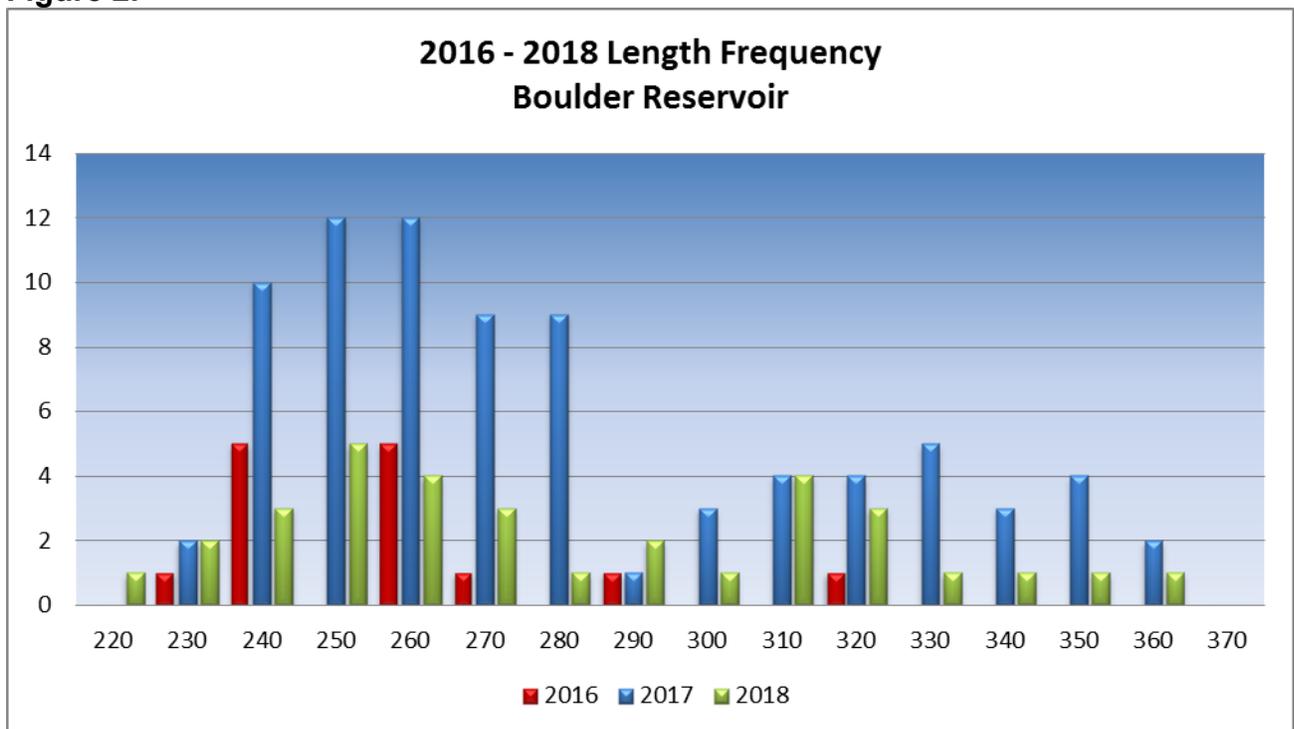
Conduct population assessment by setting gill nets for two net-nights in the fall. A gill net survey was conducted the night of September 10, catching 33 rainbow trout for a catch rate of 1.03 fish per net-hr. Rainbow trout ranged from 8.7 in (222 mm) to 14.5 in (368 mm), with an average 11.2 in (285 mm) FL. Weight averaged 0.6 lbs (271 g). The average K-value for rainbow trout was 1.1, suggesting a fair body condition. Results found in 2018 were consistent with fish health indices exhibited at Boulder Reservoir since annual monitoring began in 2016 (Table 2).

Table 2. Gill Net Rainbow Trout Data, 2016 – 2018.

Total Rainbow		2016 N=14	2017 N=80	2018 N=33
Length (mm)				
		2016	2017	2018
Average		262	284	285
Range	High	324	368	368
	Low	232	234	222
K Factor				
		2016	2017	2018
Average		1.13	1.17	1.12
Range	High	1.28	1.75	1.83
	Low	0.97	0.83	0.92
Weight (g)				
		2016	2017	2018
Average		206	278	271
Range	High	380	560	480
	Low	150	130	150

The size structure for rainbow trout population reveals an increasing proportion of larger fish every year since 2016 (Figure 2). At least three distinct size classes are visible in 2018, which loosely corresponds to stocking events over the past three years. Combining this data with data from the “Lake Tahoe Rainbow Trout Study” that includes tagged fish in Boulder Reservoir, will help to understand the life expectancy and growth rates of rainbow trout in the reservoir. This year was the second year to analyze the different strains of rainbow trout in Boulder Reservoir. Information is described in the “Lake Tahoe Rainbow Trout Study” that assesses the differences between two strains of rainbow trout in several waters across northwestern Nevada.

Figure 2.



MANAGEMENT REVIEW

Due to its remoteness, Boulder Reservoir does not receive a high level of use. However, it has a popular fishery for anglers willing to make the trip. The fishery produces incredible catch rates. Additionally, the area provides opportunities for dispersed camping, hunting, and wildlife viewing. Angler questionnaire and drop-box data suggest that the reservoir is currently far exceeding the requirements prescribed for a Coldwater Quality Fishery Management Concept and anglers are completely satisfied with their experience at the reservoir. The data compiled in 2018 once again reveals the size and health of fish is improving and, as the fish currently in the reservoir continue to age and grow, the quality and frequency of larger fish should increase.

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

fishery is near the top of northwestern Nevada waters.

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.
- Conduct a population assessment by setting gill nets for two net-nights in the fall.

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Date: January 3, 2018