

**NEVADA DEPARTMENT OF WILDLIFE
STATEWIDE SPORT FISHERIES MANAGEMENT**



FEDERAL AID JOB PROGRESS REPORT

**F-20-53
2017**

**RUBY MOUNTAIN & EAST HUMBOLDT
HIGH MOUNTAIN LAKES**



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

Table of Contents

<u>Contents</u>	<u>Page</u>
SUMMARY	1
BACKGROUND	1
OBJECTIVES and APPROACHES	2
PROCEDURES	2
FINDINGS	3
RECOMMENDATIONS	5

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

State: *Nevada*
Project Title: *Statewide Fisheries Program*
Job Title: *Ruby Mountain and East Humboldt High Mountain Lakes*
Period Covered: *January 1, 2017 through December 31, 2017*

SUMMARY

During 2017, 51 volunteer angler surveys were collected from the Lamoille and Soldier creeks drop-boxes, with no additional anglers being contacted. Reported catch rates ranged from 2.3 to 14.0 fish per hour. Ratings for angler satisfaction were highest for total fishing experience and lowest for size of fish. The Island Lake and Lamoille Lake fisheries were also assessed in 2017, with numerous brook trout caught during the survey. No lakes were stocked, as no eggs were available.

BACKGROUND

Currently, the Eastern Region of the Nevada Department of Wildlife manages 19 of the 25 named lakes in the Ruby Mountains and East Humboldt Range as high mountain lake fisheries. The lakes generally lie between 8,550 and 10,000 ft in elevation and range from less than two acres to 29 acres. Eleven lakes have established, self-sustaining fish populations, while another eight lakes have established populations that need periodic augmentation. The self-sustaining fisheries are generally brook trout populations, which are managed under a Wild Fisheries Management Concept. The augmented populations are generally hatchery-reared stock of Lahontan cutthroat trout and are managed under a “unique or quality” concept.

Stocking of these mountain lakes can be dated back to 1895, when horseback stocking was used, to the present when releases are completed with the use of helicopter. Species planted in the past have included brook trout, golden trout, rainbow trout, tiger trout, Arctic grayling, and lake trout. Stocking rates have been variable and dependent upon survey results. Stocking cycles generally have been maintained at three-year intervals. Baseline biological surveys of the lakes were completed during the period from the 1930s to the 1950s and resulted in baseline water quality, species presence, substrate types, and crude mapping attempts. Since that time, biological monitoring has focused on growth rates, angling pressure, water quality, reproduction, and overwinter survival. Past management activities have included mysid shrimp introductions in the 1950s and 1970s, eradication and re-introduction of golden trout (1963), outlet dam construction projects, and the introduction of different predators (Lahontan cutthroat trout, rainbow trout, or lake trout) to control brook trout populations.

In general, the fisheries are limited by overwinter survival, low productivity (low pH, short growing season), and limited natural reproduction. Issues related to the mountain lakes include limited angler access (through private lands to Forest Service

lands), native trout recovery waters downstream, and endemic aquatic species. These lakes have demonstrated their potential in providing recreation to the angler through the years and the Department has determined a need to collect periodic data to manage these high mountain lakes properly. Fish population status, potential of natural reproduction, stocking level requirements, and chemical analysis are some of the identified factors associated with the management of the high mountain lakes.

OBJECTIVES and APPROACHES

Ruby Mountain and East Humboldt High Lakes

Objective: General Sport Fisheries Management

Approaches:

- Conduct a general fisheries assessment through opportunistic angler contacts and angler drop boxes.
- Evaluate the fisheries health and water quality/quantity of Hidden, Steele, Goat, Echo, and Island lakes.
- Stock cutthroat trout fry in Greys Lake (1000), Smith Lake (1000), Griswold Lake (1000), and Verdi Lake (1000).
- Stock sterile tiger trout in Island (1000) or Lamoille lakes (1000).

PROCEDURES

Fishery Assessments

Angler questionnaires from the Soldier Creek and Lamoille Creek trail drop-boxes were collected throughout the summer and fall. Angler satisfaction in 2017 was rated on a scale of zero to four, with zero being unsatisfied and four representing satisfaction.

High Lake Fisheries Health and Water Quality

A hook-and-line survey was conducted on Island Lake and Lamoille Lake using various methods of fishing (fly- and spin fishing). The total length of all captured fish was measured and recorded before being released back into the lake. The total amount of time spent conducting the survey and the number of individuals fishing was recorded in an effort to calculate the catch rate (fish/hr). The pH and water temperature of the lake was determined using a Hach Kit and a standard bulb thermometer.

Stocking

No lakes were stocked, as eggs were not available.

FINDINGS

Fishery Assessments

Favre Lake

Three volunteer angler surveys from the Lamoille Creek drop-box were received for Favre Lake in 2017. These anglers reported fishing for 4.5 hours and caught 62 fish. Resulting catch rates were 21 fish per angler and 14 fish per hour. Reported fish lengths consisted of 85% of fish being less than 10.9 inches and 15% of the captured fish being 11 - 12.9 inches. Average ratings were 3.7 for total angling experience, 3.0 for size of fish, and 2.7 for number of fish caught.

Hidden Lake

Fifteen volunteer angler surveys from the Soldier Creek drop-box were received for Hidden Lake in 2017. During the months when surveys were received, 15 anglers had fished for 39 hrs and caught 88 fish. Resulting catch rates (cutthroat trout) were 6.9 fish per angler and 2.3 fish per hour. Reported fish lengths consisted of 11.36% of fish being less than 10.9 inches, 32.95% of the fish being 11.0 - 12.9 inches, 26.14% of the fish being 13.0 - 14.9 inches, 29.55% of the fish being 15.0 - 16.9 inches, and 0% of the catch being 17 - 18.9 inches. Average ratings were 3.2 for total angling experience, 3.5 for size of fish, and 3.2 for number of fish caught.

Island Lake

Three volunteer angler surveys from the Lamoille Creek drop-box were received for Island Lake in 2017. During the months when surveys were received, three anglers had fished for 7.5 hours and caught 31 fish. Resulting catch rates were 10.33 fish per angler and 4.13 fish per hour. Reported fish lengths consisted of 100% of fish being less than 10.9 inches. Average ratings were 3.7 for total angling experience, 3.0 for size of fish, and 3.9 for number of fish caught.

Lamoille Lake

Nineteen volunteer angler surveys from the Lamoille Creek drop-box were received for Lamoille Lake in 2017. During the months when surveys were received, 19 anglers had fished for 44 hrs and caught 171 fish. Resulting catch rates were 9.0 fish per angler and 3.9 fish per hour. Reported fish lengths consisted of 67.3% of fish being less than 10.9 inches, 27.5% of the fish being 11.0 - 12.9 inches, 2.3% of the fish being 13.0 - 14.9, 2.3% of the captured fish being 17.0 - 18.9 inches, and 0.6% of the captured fish being 19.0 inches or larger. Average ratings were 3.7 for total angling experience, 3.0 for size of fish, and 3.4 for number of fish caught.

Liberty Lake

Six volunteer angler surveys from the Lamoille Creek drop-box were received for Liberty Lake in 2017. These anglers fished for 14.5 hrs and caught 45 fish. Resulting catch rates were 7.5 fish per angler and 3.1 fish per hour. Reported fish lengths consisted of 53.3% of fish being less than 10.9 inches, 37.8% of the fish being 11.0 - 12.9 inches, 6.7% of the fish being 13 - 14.9 inches, and 2.2% of the catch being larger than 19 inches. Average ratings were 3.8 for total fishing experience, 2.8 for size of fish, and 3.3 for number of fish caught.

Verdi Lake

One volunteer angler survey from the Lamoille drop-box was received for Verdi Lake in 2017. This angler fished for 3.0 hrs and caught nine fish. Resulting catch rates were 9.0 fish per angler and 3.0 fish per hour. Reported fish lengths consisted of 22.2% of fish being less than 10.9 inches, 66.7% of the fish being 11.0-12.9 inches, and 11.1% of the fish being 17-18.9 inches. Ratings were 4.0 for total fishing experience, 4.0 for size of fish, and 4.0 for number of fish caught.

Cold Lake

Four volunteer angler surveys from the Soldier Creek drop-box were received for Cold Lake in 2017. These anglers fished for 3.0 hrs and caught 39 fish. Resulting catch rates were 9.8 fish per angler and 13.0 fish per hour. Reported fish lengths consisted of 23.1% of fish being less than 10.9 inches, 51.3% of the fish being 11.0 - 12.9 inches, and 25.6% of the fish being 13 - 14.9 inches. Average ratings were 4.0 for total fishing experience, 4.0 for size of fish, and 4.0 for number of fish caught.

High Lake Fisheries Health and Water Quality

Island Lake

Island Lake was at full pool, with a steady stream of water flowing in and out of the lake. Weather conditions were clear and sunny, with an air temperature of 56°F. The pH at the outlet of the lake was 9.3, with a water temperature of 60°F. The lake inlet had a pH of 8.7, with a water temperature of 60°F. There was a significant amount of vegetation in the lake. This is concerning as it may be possible that the decaying vegetation combined with the ice cover is causing anoxic conditions and poor trout survival.

The combined 15 hours of angling during the hook-and-line survey produced 32 captured brook trout. Extrapolating this data produces 2.13 fish/hr. The captured brook trout averaged 24.0 cm (9.5 inches) with a range of 17.2 - 34.0 cm (6.8 - 14.4 inches). Only one Lahontan cutthroat x rainbow trout hybrid was observed during the sampling effort.

Lamoille Lake

Lamoille Lake was at full pool, with a steady stream of water flowing out of the lake. The pH at the outlet of the lake was 9.1, with a water temperature of 58°F. The inlet of Lamoille Lake had a pH of 8.6 and a water temperature of 60°F.

Eight total hook-and-line survey hours produced 11 brook trout for an average of 1.4 fish/hr. The captured brook trout averaged 20.2 cm (8.0 inches), with a range of 11.0 - 22.5 cm (4.3 - 8.9 inches). No cutthroat trout were captured or observed during the survey.

Stocking

No lakes were stocked, as eggs were not available.

RECOMMENDATIONS

- A more concerted effort should be made to document angler use at the Ruby Mountain high lakes during the 2018 field season. It may be necessary to dedicate some seasonal creel clerk time for this task to collect enough data during the peak use periods.
- Continue to stock the alpine lakes depending on population sampling efforts and fishery analysis.
- Population assessment should occur on selected lakes yearly, preferably sampling a minimum of two lakes per year. Continue to monitor the body condition of the LCT during population sampling as well as water chemistry analysis and invertebrate observations.
- The drop-boxes should be checked periodically during the summer and fall.
- Evaluate the possibility of stocking other trout species into high mountain lakes that receive high angling pressure in an effort to keep up with the angler demand.

Prepared by: Michael Starr
Fisheries Biologist, Eastern Region

Date: February 2018