NEVADA DEPARTMENT OF WILDLIFE
STATEWIDE SPORT FISHERIES MANAGEMENT

FEDERAL AID JOB PROGRESS REPORT

F-20-54
2018

RUBY MOUNTAIN & EAST HUMBOLDT
HIGH MOUNTAIN LAKES
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SUMMARY

During 2018, forty-two volunteer angler surveys were collected from drop-boxes located at Lamoille Creek and Soldier Creek trailheads. No opportunistic angler contacts were made this year. Reported catch rates from all waters ranged from 1.4 to 6.0 fish per hour. Ratings for angler satisfaction were highest for total fishing experience and lowest for size of fish. Fishery health and water quality were investigated at Island Lake, Goat Lake, Steele Lake, and Lamoille Lake fisheries in 2018. No lakes were stocked with cutthroat trout or tiger trout since none were available. Echo Lake was not surveyed in 2018, but the fishery is scheduled to be assessed next year.

BACKGROUND

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

Stocking of mountain lakes can be dated back to 1895, when stocking by horseback was used, to the present when releases are completed by helicopter. Species planted in the past have included brook trout, golden trout, rainbow trout, tiger trout, Arctic grayling, and lake trout. Allocations and rates have been variable and dependent upon survey results. Stocking cycles generally have been maintained at three-year intervals. Baseline surveys were completed from the 1930s to the 1950s for collecting water quality, species presence, substrate types, and crude mapping. Since that time, monitoring has focused on growth rates, angling pressure, water quality, reproduction, and overwinter fish survival. Past management activities have included mysid shrimp introductions in the 1950s and 1970s, eradication and reintroduction of golden trout (1963), outlet dam construction projects, and introductions of different predators (Lahontan cutthroat trout, rainbow trout, and lake trout) to control brook trout populations.
In general, the fisheries are limited by overwinter survival, low productivity (high pH, short growing season), and limited natural reproduction. Other issues 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 angling recreation and, therefore, they have a need to be monitored for proper management of the fisheries. Fish population status, potential of natural reproduction, stocking requirements, and water quality are identified factors associated with helping manage high mountain lakes.

**OBJECTIVES and APPROACHES**

Objective: General Sport Fisheries Management

Approaches:

- Conduct a general fisheries assessment through opportunistic angler contacts and angler drop-boxes.
- Conduct an angling survey to evaluate the fisheries health and monitor water quality/quantity at Steele, Goat, and Echo lakes.
- Conduct an angling survey to evaluate growth and survival of stocked trout in Lamoille and Island Lakes.
- Stock cutthroat trout fry in Greys Lake (1,000), Smith Lake (1,000), Griswold Lake (1,000), and Verdi Lake (1,000).
- Stock sterile tiger trout in Island (1,000) or Lamoille lakes (1,000).

**PROCEDURES**

**Fisheries Assessments**

Angler questionnaires were collected from drop-boxes at Soldier Creek and Lamoille Creek trailheads throughout the summer and fall. Based on data collected, angler satisfaction was rated on a scale from zero to four, with zero representing unsatisfied and four representing satisfaction.

**Fisheries Health and Water Quality Assessment**

Hook-and-line surveys were conducted at Steele Lake, Goat Lake, Island Lake, and Lamoille Lake using various methods of fishing (fly- and spin fishing). The total length of all fish caught was measured and recorded before releasing them back into the lake. The amount of time spent and the number of anglers was recorded in an effort to calculate the catch rate (fish/hr). The pH and water temperature were measured using a Hach Kit and a standard bulb thermometer, respectively.

**Stocking**

No lakes were stocked since tiger trout and cutthroat trout were not available.
FINDINGS

Fishery Assessments

*Favre Lake*

Nine volunteer angler surveys from the Lamoille trail drop-box were received for Favre Lake in 2018. Anglers reported fishing 23 hrs and caught 139 fish. Resulting catch rates were 13.9 fish per angler and 6.0 fish per hour. Ninety percent of the reported fish caught were less than 10.9 in and ten percent ranged between 11 and 12.9 in. Anglers were very satisfied with the fishery, showing average ratings of 3.9 for total angling experience, 3.1 for size of fish, and 3.8 for number of fish caught.

*Hidden Lake*

The Soldier Creek trailhead drop-box showed four anglers fished Hidden Lake and caught 22 cutthroat trout in 11 hrs. Resulting catch rates were 5.5 fish per angler and 2.0 fish per hour. Reported lengths consisted of 36% less than 10.9 in, 18% between 11.0 and 12.9 in, 18% between 13.0 and 14.9 in, 14% between 15.0 and 16.9 in, and 14% between 17 and 18.9 in. Average satisfaction ratings were relatively high, showing 3.3 for total angling experience, 3.8 for size of fish, and 3.5 for number of fish caught.

*Island Lake*

Six volunteer angler surveys from the Lamoille Creek drop-box were received for Island Lake. Anglers fished 16 hours, caught 22 fish, and showed catch rates of 3.7 fish per angler and 1.4 fish per hour. Reported fish lengths consisted of 86% for fish being less than 10.9 inches, 9% for the fish being 11.0 to 12.9 inches, and 5% for fish being 13.0 to 14.9 inches. Average satisfaction ratings were 3.2 for total angling experience, 2.3 for size of fish, and 3.2 for number of fish caught.

*Lamoille Lake*

Seventeen volunteer angler surveys from the Lamoille Creek drop-box were received for Lamoille Lake in 2018. During the months when surveys were received, 17 anglers had fished for 42.5 hrs and caught 142 fish. Resulting catch rates were 8.4 fish per angler and 3.3 fish per hour. Reported fish lengths consisted of 94% of fish being less than 10.9 inches, and 6% of the fish being 11.0 - 12.9 inches. Average ratings were 3.4 for total angling experience, 2.1 for size of fish, and 3.6 for number of fish caught.

*Liberty Lake*

Lamoille Creek trailhead drop-box received five surveys for Liberty Lake. Anglers fished 8.0 hrs, caught 23 fish, and showed catch rates of 4.6 fish per angler and
2.9 fish per hour. Reported fish lengths consisted of 57% for fish being less than 10.9 inches, 30% of the fish being 11.0 to 12.9 inches, and 13% of fish being 13 to 14.9 inches. Average satisfaction ratings were 2.6 for total fishing experience, 1.6 for size of fish, and 2.0 for number of fish caught.

Echo Lake

An angler fishing Echo Lake returned a completed survey at the Lamoille Creek trailhead drop-box. The angler fished 2.0 hrs, caught four fish, and showed catch rates of 4.0 fish per angler and 2.0 fish per hour. All fish were less than 10.9 in and satisfaction ratings were 4.0 for total fishing experience, 2.0 for size of fish, and 2.0 for number of fish caught.

High Lake Fisheries Health and Water Quality

Steele Lake

On September 15, Steele Lake was visited and was approximately five feet below the maximum water elevation and had a water temperature of 53°F (11.7°C). The pH near the outlet was 8.7, which was higher than previously observed in 1988 at 7.4.

During windy conditions, two surveyors spent approximately two hours angling and caught 24 brook trout. Success was 12 fish per hour and 12.0 fish per angler. From 16 fish measured, they ranged from 10.2 to 12.8 in (258 mm to 325 mm) TL and averaged 11.9 in (302.1 mm). They were in very good body condition and showed pre-spawn color and behavior.

Goat Lake

Goat Lake was at full pool, with minimal outflow and no noticeable inflow. The outlet of the lake had a pH of 9.4 and temperature of 58°F, while the inlet had a pH of 9.0 and a temperature of 57°F. Nine brook trout were captured during a combined 18 hours of hook-and-line surveying for a catch rate of 0.5 fish per hour. Brook trout averaged 9.2 in (23.3 cm) and ranged from 7.8 to 9.8 in (19.8 to 25.0 cm).

The brook trout population appears healthy and stable. Goat Lake should continue to be monitored and an opportunistic creel survey should be conducted to examine angler catch rates and use patterns. The pH will need to be monitored in the future as it was significantly higher (9.0 and 9.4) than the 1993 survey (7.7).

Island Lake

Island Lake was at full pool, with a steady in- and outflow from the lake. Weather was clear and sunny and water temperature was 55°F at the outlet and 49°F at the inlet. A hook-and-line totaled 8.0 hrs and 24 brook trout and 2 cuttbow trout were caught for a
catch rate of 3.25 fish per hour. Brook trout averaged 9.2 in (23.4 cm) and range from 6.2 to 10.8 inches (15.8 to 27.5 cm), and cuttbow trout averaged 9.6 in (24.5 cm) and ranged from 9.5 to 9.8 inches (24.2 to 24.8 cm).

Some cuttbow trout have survived in the lake since being stocked in 2015 and surveys should continue to evaluate their survival and growth. It may be beneficial to begin annual stocking of larger trout at a higher density to provide consistent opportunity for anglers. Additionally, it would be beneficial to monitor oxygen levels during the winter to determine if this influences trout survival. Angler drop-box data will continue to help assess angler catch rates and use patterns of Island Lake.

Lamoille Lake

Lamoille Lake was at full pool and had a steady stream of water flowing out of the lake. During the survey, the water temperature was 58°F. No fish were caught during the hook-and-line survey totaling 4.0 hrs. No fish were observed along the shoreline and no fish rises were documented.

It appears that Lahontan cutthroat trout stocked in October of 2016 most likely did not survive or are at a very low density. Future efforts should stock larger fish at higher densities and more frequently since it is one of the most visited lakes in the Ruby Mountains. Lamoille Lake should be surveyed in 2019 to continue evaluating the survival of trout stocked in 2016 and their growth rate. Angler drop-box data will continue to help assess angler catch rates and use patterns at Lamoille Lake.

RECOMMENDATIONS

- A more concerted effort should be made to document angler use at the Ruby Mountain high lakes during the 2019 field season. It may be necessary to dedicate seasonal creel clerk time to collect data during the peak-use period.
- Continue to stock the alpine lakes depending on population sampling efforts and fishery analysis.
- Population assessments should occur yearly on selected lakes, preferably sampling a minimum of two lakes per year. Continue monitoring body condition of trout as well as testing water chemistry and making invertebrate observations.
- Drop-boxes should be checked periodically during the summer and fall.
- Evaluate the possibility of stocking other trout species into those lakes receiving high fishing pressure in an effort to keep up with angler demand.

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