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SUMMARY

In 2016, Groves Lake received 2,560 rainbow trout in the spring, while Willow Creek Pond received 3,529 rainbow trout between spring and fall stockings. The leak in Groves Lake is still having an impact on the fishery as only a small pool is maintained by late summer. The electroshocking survey at Willow Creek Pond was conducted in August and documented rainbow trout, brown trout, largemouth bass, and yellow perch. Body condition of the rainbow trout was once again in the poor range. A survey in 2018 will continue the monitoring of the stocking reduction that began in 2014.

BACKGROUND

Groves Lake

Groves Lake is located on the east side of the Toiyabe Mountain Range, three miles west of the town of Kingston. At maximum capacity, the lake covers 16 surface acres, with a maximum depth of 22 feet. Although the dam was resealed in 2000, a leaky bottom has hampered the water level from reaching its maximum capacity. As one of the few lakes in the area, it is heavily fished by locals, with annual angler use averaging around 3,000 days. Beginning in 2012, the water level at Groves Lake has been very low, with this being attributed to a new leak in the dam structure. Water levels have been further exacerbated by the below normal water years. Until the completion of a Fisheries Management Plan, the reservoir will be managed under a General Fishery Management Concept.

Willow Creek Pond

Willow Creek Pond is located 13 miles southwest of Battle Mountain and includes the reservoir and a lower pond. The lower pond was built in 1960. It covers one surface acre, with a maximum depth of about eight feet. The larger reservoir was built in 1988-89 by Battle Mountain Gold Corporation to supply water for local mining operations. It has a maximum surface area of 11 acres, with a maximum dam height of 47 feet. Even with the small size of both ponds, they average just over 2,000 angler days per year. The ponds are managed as seasonal put-and-take fisheries with limited carryover of stocked rainbow trout, while brown trout drift down from the inflowing creek. As rainbow trout body condition ratings continue to be poor, a 2,000 fish reduction in spring stocking numbers was made starting in 2014.
In 2003, yellow perch were illegally stocked in Willow Creek Pond and the population quickly expanded to levels where management action was needed. Largemouth bass were stocked in September of 2007 in an attempt to control the yellow perch population, and both of these warmwater species will be managed under the Warmwater Panfish Fishery Management Concept.

OBJECTIVES and APPROACHES

Groves Lake

Objective: General Sport Fisheries Management

Approaches:
- Conduct a pre-stocking evaluation of road conditions and water quality/quantity.
- Conduct a dye test to evaluate the leak in the dam structure.

Willow Creek Pond

Objective: Evaluate the health of the trout fishery and examine the success of largemouth bass on controlling yellow perch.

Approaches:
- Conduct a pre-stocking evaluation of road conditions and water quality/quantity.
- Conduct a general fisheries assessment through opportunistic angler contacts.
- Maintain and check for returns of volunteer, angler drop-box surveys during the course of other duties.
- Examine sport fish and non-desirable fish (perch) relative abundance, growth, size distribution, and trout carryover by electroshocking two established transects during a single night in summer or early fall.

PROCEDURES

Coordinating trout stocking with the hatcheries required checking the reservoir and evaluating the water level and water temperature prior to stocking.

Angler creel was collected by means of personal contact or using angler drop-boxes. Information gathered included number of anglers fishing, number of hours fished, fish caught, fish released, and fishing method used.

Electroshocking surveys are conducted using an electroshocking barge with the fixed probes used as the anode and the barge serving as the cathode. A majority of the shoreline, approximately 90%, was electroshocked due to its small size and the need to completely evaluate the fishery. Captured fish were measured, weighed, and released.
FINDINGS

Groves Lake

A total of 2,560 Shasta strain rainbow trout were stocked in Groves Lake on May 18. Even though a leak in the reservoir persists, the good snow pack was expected to fill the reservoir to levels that had not been seen in several years.

A dye test was not completed in 2016, due to busy and conflicting scheduling with engineering staff. The leak is still a priority for repair and it is expected that testing will be completed in 2017.

Willow Creek Pond

Even with a year of good snow pack, the stocking numbers remained at the reduced rate that was initially dropped by 2,000 fish in the spring. There were 2,000 Eagle Lake strain rainbow trout stocked in May, with an additional 1,529 Eagle Lake strain rainbow trout stocked in October.

In 2016, several visits were made to the reservoir for completing multiple work objectives, with no anglers being contacted. The angler drop-box, installed in 2011, received 13 questionnaires, all of which were usable. These thirteen anglers fished for 40.5 hrs to capture 115 fish, resulting in success rates of 8.6 fish per angler and 5.8 fish per hour. Species composition of fish caught was 105 trout (91.3%), nine largemouth bass (7.8%), and one yellow perch (0.9%).

On August 23, after four years of drought, the reservoir was in good condition, with water levels being a couple of feet from spilling and a small amount of water still flowing in from the inlet stream. The water temperature was 65°F and the survey was conducted under clear skies with a light wind. The entire shoreline was electroshocked and, to increase the number of contacted trout, a second transect was done around the north and west shorelines.

A total of 104 fish were captured in 21.9 minutes of electroshocking, which resulted in a capture rate of 284.3 fish per electroshocking hour. Yellow perch made up 1.0% of the catch, largemouth bass made up 76.0%, and rainbow and brown trout made up 18.3% and 4.7%, respectively (Table 1). It is also important to note that electroshocking efficiency was only 50-60%, with a variety of fish species and sizes going un-netted, although rainbow trout and bass were the most numerous.

Only one yellow perch was netted on this survey, with approximately five other perch being observed. Since 2007, the average length has increased and the percent of catch has continued to decrease. A summary of the seven years of sampling can be seen in Table 2. Based on the 2007 survey, when the perch were going relatively unchecked, it does appear that perch are being controlled by the largemouth bass, brown trout, and to a lesser extent, anglers.
Table 1. Willow Creek Pond Species Composition

<table>
<thead>
<tr>
<th></th>
<th>Percent Catch</th>
<th>Total Fish</th>
<th>Mean Length</th>
<th>Min Length</th>
<th>Max Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow Perch</td>
<td>1</td>
<td>1</td>
<td>214 mm</td>
<td>214 mm</td>
<td>214 mm</td>
</tr>
<tr>
<td>Largemouth Bass</td>
<td>76</td>
<td>79</td>
<td>206.3 mm</td>
<td>134 mm</td>
<td>246 mm</td>
</tr>
<tr>
<td>Brown Trout</td>
<td>4.7</td>
<td>5</td>
<td>273 mm</td>
<td>248 mm</td>
<td>296 mm</td>
</tr>
<tr>
<td>Rainbow Trout</td>
<td>18.3</td>
<td>19</td>
<td>283.4 mm</td>
<td>262 mm</td>
<td>312 mm</td>
</tr>
</tbody>
</table>

Table 2. Yellow Perch average length and percent of catch.

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</tr>
</thead>
<tbody>
<tr>
<td>Percent of Catch</td>
<td>85.6</td>
<td>54</td>
<td>25.9</td>
<td>39.4</td>
<td>10</td>
<td>3.9</td>
<td>13.3</td>
<td>1</td>
</tr>
<tr>
<td>Mean Length</td>
<td>168</td>
<td>193.3</td>
<td>193.2</td>
<td>204.6</td>
<td>201.4</td>
<td>201</td>
<td>200.1</td>
<td>214</td>
</tr>
</tbody>
</table>

The average size of the 79 measured largemouth bass was 8.1 inches (206.2 mm) TL and ranged from 5.3 to 9.7 inches (134 to 246 mm). A total of 31 fish were measured and weighed for body condition. One fish was found to be in poor condition (3.2%), three fish in fair condition (9.7%), 26 fish in good condition (83.9%), and one fish in excellent condition (3.2%). Since 2007, when 400 bass averaging 8.8 inches were stocked into the reservoir, the percentage of catch has continually grown. The 2016 survey produced the largest percentage of catch, and one of the largest average lengths compared to past surveys (Table 3). The high average length during the first three years of surveys was due to one or two large fish being captured, with the last four or five surveys being a more accurate average (Table 3). Based on the developed Wilson Reservoir age class/length relationship, it appears that there are three age classes of largemouth bass, age class III, IV, and V. There were several smaller fish presumed bass in the one to two inch range that were observed, but eluded capture.

Table 3. Largemouth Bass average length and percent of catch.

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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of Catch</td>
<td>NA</td>
<td>4.2</td>
<td>7.5</td>
<td>9.3</td>
<td>45.5</td>
<td>32.8</td>
<td>50.5</td>
<td>76</td>
</tr>
<tr>
<td>Mean Length</td>
<td>223</td>
<td>262.5</td>
<td>208.3</td>
<td>172.6</td>
<td>169.5</td>
<td>194</td>
<td>193.8</td>
<td>206.2</td>
</tr>
</tbody>
</table>

The average size for rainbow trout was 11.2 inches (283.4 mm) TL, with a range of 10.3 to 12.3 inches (262 to 312 mm). Three of the captured fish appeared to be wild, with the remaining 16 fish being of hatchery origin. A total of 19 rainbow trout were measured, with 15 of these being weighed for body condition. Six fish were found to be in poor condition (40.0%), eight fish in fair condition (53.3%), one fish in good condition (6.7%), and no fish in excellent condition.

Table 4 shows the change in percentage of catch and body condition of the rainbow trout over the last eight surveys. The initial percentage of catch for rainbow trout shows an increasing trend through 2010, and then appears to level out with some year-to-year fluctuations. The body condition of rainbow trout has been relatively constant the last five years based on the percentage of contacted fish in Poor/Fair body condition. Although the sample sizes have been small, this high number of trout in relatively poor body condition seems to show that the carrying capacity for trout of the reservoir is being exceeded. Considering that, Willow Creek Pond is managed primarily
as a trout fishery; the health of the trout population was a primary concern when yellow perch, and consequently largemouth bass, were introduced to this small bodied reservoir. With so many fish in this reservoir, a reduction in the number of stocked rainbow trout needs to be considered.

Table 4. Rainbow trout body condition and percent of catch.

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</tr>
</thead>
<tbody>
<tr>
<td>Percent of Catch</td>
<td>11</td>
<td>14</td>
<td>32.9</td>
<td>31.4</td>
<td>23.5</td>
<td>50.3</td>
<td>25.7</td>
<td>18.3</td>
</tr>
<tr>
<td>% Poor/Fair</td>
<td>64</td>
<td>100</td>
<td>86.7</td>
<td>87.8</td>
<td>84.6</td>
<td>92.9</td>
<td>84.3</td>
<td>93.3</td>
</tr>
<tr>
<td>Number Sampled (N)</td>
<td>22</td>
<td>7</td>
<td>15</td>
<td>41</td>
<td>13</td>
<td>14</td>
<td>19</td>
<td>19</td>
</tr>
</tbody>
</table>

Five brown trout were captured, with all of these fish being weighed and measured for body condition. This resulted in no fish in poor or fair condition, one fish in good condition (20.0%), and four fish in excellent condition (80.0%). The percent of catch for brown trout over the last eight years has ranged from 3.8% in 2007 to 33.7% in 2010, with body conditions being in the good range. Due to the predatory nature of brown trout, yellow perch and largemouth bass fry may be an adequate food source to support a larger brown trout fishery in the reservoir. This may be responsible for the increase in observation in the reservoir in 2010. Since 2010, the drought may have had an impact on the brown trout’s ability to move between the stream and the reservoir due to intermittent connectivity.

Overall, the health of the fishery in 2016 appears to be fair at best, as fish numbers appear to be slightly down and the average rainbow trout body condition continues to be poor. Poor body conditions are at least partly due to the four previous years of drought that has led to the reservoir water level being well below average. If water conditions are near average in 2017, and the health of the fishery does not improve, the stocking program will be evaluated.

The original study was concluded in 2013, but due to a continuing need to monitor the reservoir fishery, particularly during and after drought conditions, surveys have continued. This survey is expected to occur again in 2018, at which time the fishery can be thoroughly evaluated and monitoring could be scheduled on a two to three year basis to evaluate the developing fishery and potentially assess any changes in stocking.

MANAGEMENT REVIEW

The pre-stocking evaluation Approach for Groves Lake was completed, which resulted in near normal number of fish being stocked in 2016. The dye test was not completed, but the test is expected to occur in 2017.

All four approaches were completed for Willow Creek Pond in 2016. Beginning in 2014, spring stocking numbers were reduced by 2,000 trout and the impacts to the fishery will be monitored through bi-annual electroshocking surveys and angler creel surveys.
RECOMMENDATIONS

Groves Lake

• Continue to assess water conditions prior to trout stocking in the spring.
• Conduct a dye test to evaluate the leak in the reservoir/dam.
• Resample the fish population in the reservoir to evaluate survival and species composition following drought years.

Willow Creek Pond

• Continue to assess water conditions prior to trout stocking in the spring and fall.
• Evaluate the fish population and species composition in 2018 through electroshocking.
• Assess angler use through opportunistic angler contacts and the angler drop-box.
• Collect otolith and scales of yellow perch and largemouth bass to be aged for length/age relationships.

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