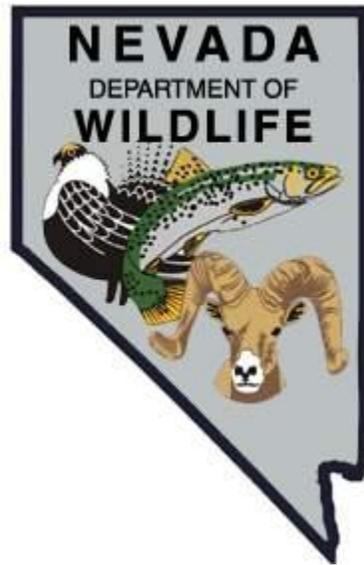


NEVADA DEPARTMENT OF WILDLIFE
STATEWIDE FISHERIES MANAGEMENT



FEDERAL AID JOB PROGRESS REPORTS

F-20-49
2013

LANDER COUNTY
SMALL LAKES AND RESERVOIRS
EASTERN REGION



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

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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: *Lander County Small Lakes and Reservoirs*
Period Covered: *January 1, 2013 through December 31, 2013*

SUMMARY

In 2013, Groves Lake received 2,037 rainbow trout in the spring, while Willow Creek Pond received 6,000 rainbow trout between the spring and fall stocking. The leak in Groves Lake is still having an impact on the fishery as only a small pool is maintained throughout the year. The final year of a five-year study was completed at Willow Creek Reservoir, with an electroshocking survey being conducted in June. This survey produced 177 fish in 9.2 minutes of electroshocking effort.

Body condition of rainbow trout once again was low, with 78.5% of the contacted fish being in poor condition. Species composition has changed substantially since initial sampling in 2007, with brown trout numbers increasing and yellow perch numbers decreasing. Future sampling efforts will allow a more complete understanding of the overall health of the fishery. A thermograph was also put in place in early May and showed that water temperatures were once again conducive for a successful largemouth bass spawn.

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, leaking 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 days averaging around 3,000. Beginning in 2012, the water level at Groves Lake have been very low, with this being attributed to a new leak in the dam structure, which has been further exasperated 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 a 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 the 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, the reservoir averages 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 inflow creek.

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 Concept.

Beginning in 2012, a recreation improvement project was initiated by Newmont Mining Company to improve the recreational facility around the reservoirs. Unfortunately, also beginning in 2012, below average water years have resulted in very low water levels at the main reservoir.

OBJECTIVES and APPROACHES

Groves Lake

Objective: General Sport Fisheries Management

Approaches:

- Conduct a pre-stocking evaluation of road conditions and water quality/quantity.

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 water levels and water temperatures 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 were 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 shocked due to the small size and the need to evaluate the entire reservoir. Electroshocking settings were as follows: 850 volts DC, pulse frequency of 60, pulse width of 5, and an output of 5-6 amps. Captured fish were measured, weighed, and released.

FINDINGS

Groves Lake

Engineering staff were given a tour of the reservoir in May to assess how to fix the leaky dam. Due to low water levels in the reservoir, only 2,037 Shasta strain rainbow trout were stocked in the reservoir, versus the regular 3,000 trout. With a below average water year and a leak in the reservoir, spring water levels never really increased, but it was still felt that the recreational use required the stocking of fish to allow for a very small put and take fishery in 2013.

Willow Creek Pond

There were 4,000 Shasta strain rainbow trout stocked in April, with an additional 2,000 Jumper strain rainbow trout stocked in September. These stocking numbers were consistent with the last several years.

In 2013, four visits were made to the reservoir for completing multiple work objectives, with no anglers being contacted. The angler drop-box, installed in 2011, received 33 questionnaires, of which 29 were usable. Twenty-nine anglers fished for 116 hrs to capture 284 fish, resulting in success rates of 9.8 fish per angler and 2.5 fish per hour. Species composition of fish caught was 259 trout (91.2%), 20 largemouth bass (7.0%), and 5 yellow perch (1.8%).

On June 19, under relatively clear and calm conditions, three transects were electroshocked, covering approximately 90% of the reservoir's shoreline. A total of 177 fish were contacted in 9.2 min of electroshocking, resulting in a capture rate of 1,150.2 fish per electroshocking hour. Yellow perch made up 3.9% of the catch, largemouth bass made up 32.8%, and rainbow trout and brown trout made up 50.3% and 13.0%,

respectively (Table 1). It is also important to note that shocking and netting efficiency was only 50-60%, with a variety of fish species and sizes going un-netted, although rainbow trout were the most numerous. A breakdown of all captured fish can be seen in Table 1.

Table 1. Willow Creek Pond Captured Fish Summary.

	Percent Catch	Total Fish	Mean Length	Min Length	Max Length
Yellow Perch	3.9	7	201 mm	178 mm	221 mm
Largemouth Bass	32.8	58	194 mm	109 mm	461 mm
Brown Trout	13	23	232.5 mm	144 mm	306 mm
Rainbow Trout	50.3	89	235.2 mm	184 mm	291 mm

Yellow perch ranged in size from 7.0 to 8.7 in (178 to 221 mm), which was very similar to the 2012 sample, while the percent of the catch was the lowest to date. A summary of the six 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 were being controlled by the largemouth bass, brown trout, and to a lesser extent, anglers. As seen in 2012, this survey showed a reduced number of yellow perch, reduced numbers of smaller age class perch, and larger fish in the eight-inch range.

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

	2007	2009	2010	2011	2012	2013
Percent of Catch	85.6	54	25.9	39.4	10	3.9
Mean Length	168	193.3	193.2	204.6	201.4	201

The average size of the measured 47 largemouth bass was 7.6 in (194 mm), TL, and ranged from 4.3 to 18.1 in (109 to 461 mm). A total of ten fish were measured for body condition, resulting in 4 fish in poor condition (40%), 3 fish in fair condition (30%), 1 fish in good condition (10%), and 2 fish in excellent condition (20%). Since 2007, when 400 bass averaging 8.8 in were stocked into the reservoir, the percent of catch has continually grown. The 2012 survey produced the highest percent catch at 45.5%, with a slight decrease in 2013 (Table 3). Using Wilson Reservoir age/length relationships to determine age classes does not work well with Willow Creek Pond data. Factors that may be contributing to this issue include a small sample size and inaccurate age class breakdown. The collection of scales and/or otoliths from a variety of sizes of bass in future surveys will provide a better understanding of their age/length relationship.

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

	2007	2009	2010	2011	2012	2013
Percent of Catch	NA	4.2	7.5	9.3	45.5	32.8
Mean Length	223	262.5	208.3	172.6	169.5	194

The average size for rainbow trout was 9.3 in (235.2 mm), TL, with a range of 7.2 to 11.5 in (184 to 291 mm). These fish were composed completely of recently stocked hatchery trout and carryover trout, with no wild trout being contacted. A total of 14 rainbow trout were measured and weighed for body condition. Eleven fish were found to be in poor condition (78.5%), 2 fish in fair condition (15.4%), one fish in good condition (7.1%), and no fish in excellent condition.

Table 4. Rainbow trout average length and percent of catch.

	2007	2009	2010	2011	2012	2013
Percent of Catch	11	14	32.9	31.4	23.5	50.3
% Poor/Fair	64	100	86.7	87.8	84.6	92.9
Number Sampled (N)	22	7	15	41	13	14

Table 4 shows the change in percent of catch and body condition of the rainbow trout over the last six surveys. The percent of catch of rainbow trout has an overall increasing trend, with the 2013 survey resulting in half of the contacted fish being rainbow trout. The body condition of trout has been relatively constant the last four years when looking at the percent 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 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 added to this small 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 average length and percent of catch.

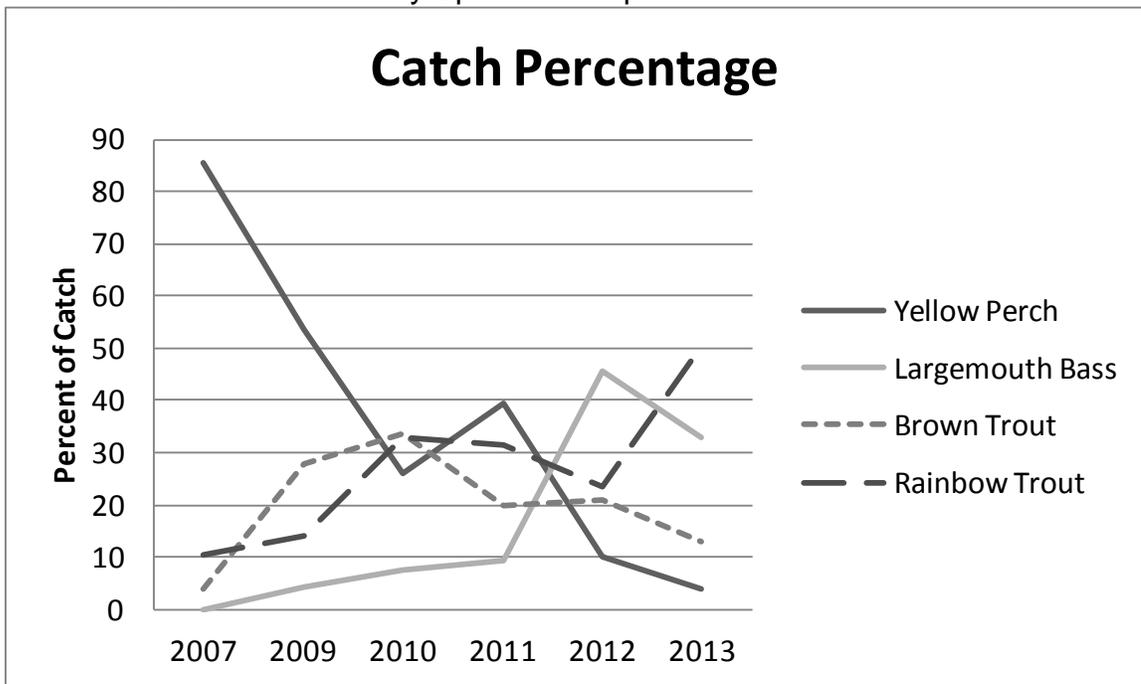
	2007	2009	2010	2011	2012	2013
Percent of Catch	11	14	32.9	31.4	23.5	50.3
% Poor/Fair	64	100	86.7	87.8	84.6	92.9
Number Sampled (N)	22	7	15	41	13	14

A total of 23 brown trout were captured, with 13 of these fish being weighed and measured for body condition, resulting in three fish in poor condition (23.1%), 1 fish in fair condition (7.7%), 7 fish in good condition (53.8%), and 2 fish in excellent condition (15.4%). The percent of catch for browns over the last six years has ranged from 3.8% in 2007 to 33.7% in 2010, with body conditions being in the good range. Due to the predaceous 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, and may be responsible for the increase of brown trout in the reservoir in 2010. As the fishery becomes more stable, and perch and bass fry are not as readily available, these numbers will probably decrease. The 2013 survey produced a 13% composition of brown trout and future surveys will be able to show if their numbers are stabilizing.

The species composition and percent catch has changed from year to year; however, there are some patterns that have emerged (Figure 1). The rainbow and

brown trout have been running relatively steady somewhere in the middle of the range. The hatchery stocked trout are planted twice a year, and the brown trout are entirely dependent on reproduction in the inflow creek, yet appear to successfully be sustained in the reservoir. The bass and the perch, with their predator/prey relationship, appear to have reversed since 2007, resulting in an increase in bass numbers and a decrease in perch numbers, as would be expected in a predator/pray relationship. The last survey shows largemouth bass and rainbow trout as the two most numerous species, which may be due to the stocking of rainbow trout and the reproductive success of the bass. Conversely, yellow perch and brown trout have the lowest percentages, possibly due to the brown trout's dependence on reproduction and the yellow perch being the primary prey source for the bass. This small fishery is still working out the niches for the various species that have been introduced over the last decade. Future surveys will continue to provide useful data on the functioning aspect of this developing fishery.

Figure 1. Willow Creek Pond Yearly Species Composition



Overall, the health of the fishery appears to be in relatively good condition, with the exception of the rainbow trout body condition. Because much of the angling effort is targeting rainbow trout, it is expected that many of the planted trout were caught and removed from the reservoir relatively quickly. However, we have found that those fish that do survive in the reservoir are not maintaining a healthy body condition. Making adjustments to the number of stocked rainbow trout could increase the overall health of the rainbow trout population, while still providing a quality fishing experience. The spring stocking numbers have been reduced by half, with the reservoir now receiving 2,000 rainbow trout in the spring and another 2,000 in the fall.

This small fishery has continually shown that there is some level of fluctuation year to year and it is still trying to find a balance with the recent addition of fish species.

The general fisheries survey is expected to occur in 2014 and then will go on a two-year rotation so that this small evolving fishery can be monitored.

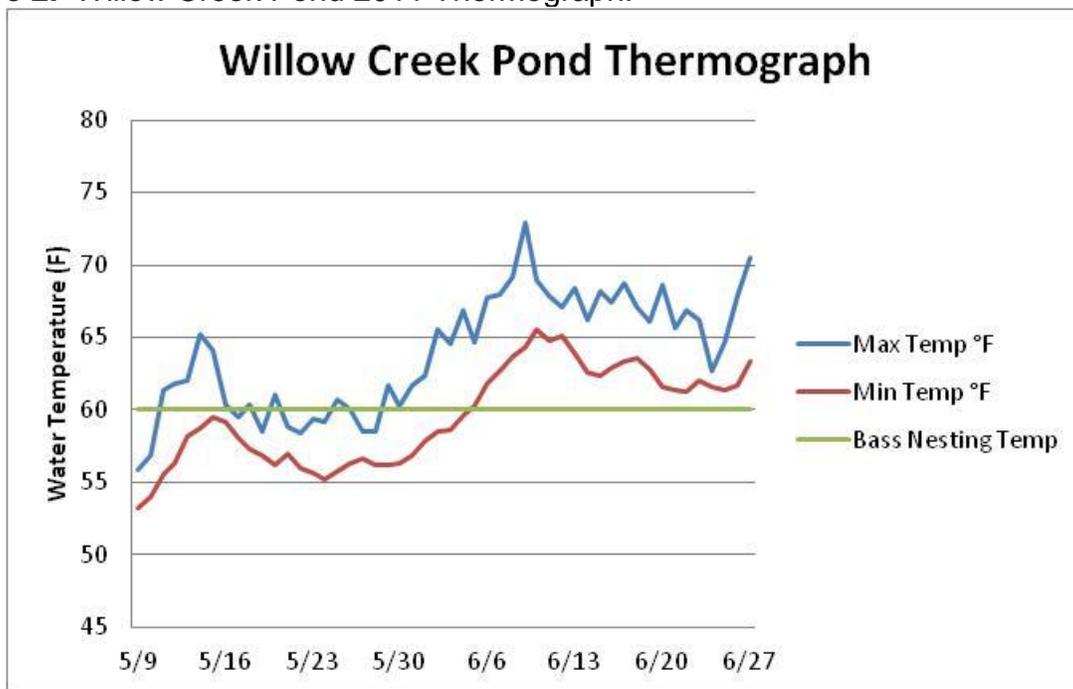
One HOBO Water Temp Pro thermograph was placed in the reservoir on May 9 and pulled in September, which, by this date, the thermograph was about 24 plus in out of the water (Figure 2). On June 5, the water temperature reached 60°F (15.5 °C), the critical spawning temperature for largemouth bass. Based on availability of quality spawning habitat and these water temperatures, there should have been a successful spawn of largemouth bass in 2013.

MANAGEMENT REVIEW

The pre-stocking evaluation Approach for Groves Lake was completed, which resulted in a reduced number of fish being stocked in 2013.

All Approaches were completed for Willow Creek Pond in 2013. This year was the final year of a five-year study to monitor this fishery, with emphasis on evaluating the rainbow trout health and the success of largemouth bass as a biological control on yellow perch. These surveys have shown that the body condition of the rainbow trout has been reduced over the last several years, with competition from other species being a major influence. Beginning in 2014, reductions in spring stocking numbers will be in effect and the impacts to the fishery will be monitored through bi-annual electrofishing surveys and angler creel.

Figure 2. Willow Creek Pond 2011 Thermograph.



The species composition in the reservoir has fluctuated over the length of this study, and may continue to do so until a balance between and among the fish species is

found. The most recent survey appears to show a shift in the composition of largemouth bass and yellow perch, implying that the biological control is working to some degree. Although the study has reached its final year, there is still a need to continue to monitor this small fishery.

The monitoring of largemouth bass spawning success, via a thermograph for the last five years, has shown that water conditions provide optimal spawning conditions for the bass. The optimal water conditions combined with suitable spawning habitat show that conditions are suitable for successful spawns, which has been documented by the multiple age classes that are now being found in the reservoir.

RECOMMENDATIONS

Groves Lake

- Continue to assess water conditions prior to trout stocking in the spring.
- Resample the fish population in the reservoir to evaluate survival and species composition following a drought year.

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 2014 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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