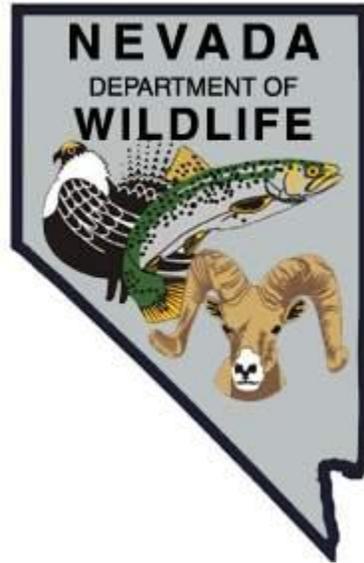


NEVADA DEPARTMENT OF WILDLIFE
STATEWIDE FISHERIES MANAGEMENT



FEDERAL AID JOB PROGRESS REPORTS

F-20-48
2012

LANDER COUNTY
SMALL LAKES AND RESERVOIRS
EASTERN 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: *Lander County Small Lakes and Reservoirs*
Period Covered: *January 1, 2012 through December 31, 2012*

SUMMARY

In 2012, Groves Lake was not stocked with rainbow trout, as low water conditions in May were not conducive to trout survival. Willow Creek Pond, on the other hand, received a total of 6,180 rainbow trout between spring and fall stockings. The final year of a four year study to examine trout population health after controlling introduced yellow perch through largemouth bass predation was completed at Willow Creek Pond, with an electroshocking survey being conducted in June. This survey produced 200 fish in 13.2 min of electroshocking effort.

Body condition of rainbow trout in Willow Creek Pond once again was low, with 53.8 % 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 decreasing. Future sampling efforts will be designed to allow a more complete understanding of the overall health of the fishery. A thermograph was also put in place in mid-April and showed that water temperatures were 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 from 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. 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 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.

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 single nighttime, electrofishing survey of three established transects during the early summer.

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 relative abundance, growth, size distribution, and trout carryover by electroshocking the established transect during a single night in summer or early fall.
- Examine the potential spawning season for largemouth bass by monitoring water temperature in spring and summer using an electronic recording thermograph.

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 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 Hz, pulse width of 5 ms, and an output of 5-6 amps. Captured fish were measured, weighed, and released. All fish were measured to total length.

FINDINGS

Groves Lake

Due to low water levels in the reservoir, no trout were stocked in Groves Lake in 2012. Between a below normal water year and a potential leak in the dam, water levels were at a critical low by the end of May.

Additionally, due to the low water levels, the electroshocking survey did not occur. If water conditions allow, this survey will be conducted to examine the survivorship after a drought year.

Willow Creek Pond

In May, there were 4,080 Eagle Lake strain rainbow trout stocked, with an additional 2,100 Jumper strain rainbow trout stocked in September. These numbers are consistent with the last several years.

In 2012, four visits were made to the reservoir for completing multiple work objectives, with three anglers being contacted. These anglers fished for 12 hrs to catch 18 fish, resulting in success rates of 6.0 fish per angler and 1.5 fish per hour. The angler drop-box, installed in 2011, received a total of 33 questionnaires, 30 of which were usable. Thirty-five anglers fished for 141 hrs to capture 270 fish, resulting in success rates of 7.7 fish per angler and 1.9 fish per hour. Species composition of caught fish was 204 trout (75.6%), 39 largemouth bass (14.4%), and 27 yellow perch (10.0%).

On June 20, under relatively clear and calm conditions, three transects were electroshocked, covering approximately 90% of the reservoir shoreline. A total of 200 fish were contacted in 13.2 min of electroshocking, resulting in a capture rate of 909.1

fish per hour. Yellow perch made up 10% of the catch, largemouth bass made up 45.5%, and rainbow trout and brown trout made up 23.5% and 21%, respectively. It is also important to note that only about 40-50% of the fish contacted were captured, with a variety of fish species and sizes going un-netted, although largemouth bass were the most numerous. A breakdown of all captured fish is shown in Table 1.

Table 1. Willow Creek Pond Captured Fish Summary.

	Percent Catch	Total Fish	Mean Length	Min Length	Max Length
Yellow Perch	10	20	201.4 mm	168 mm	225 mm
Largemouth Bass	45.5	91	169.5 mm	110 mm	234 mm
Brown Trout	21	42	256.4 mm	170 mm	326 mm
Rainbow Trout	23.5	47	239.2 mm	146 mm	298 mm

Yellow perch ranged in size from 6.6 to 8.9 in (168 to 225 mm). The first sampling that was done in 2007 produced a sample composed of 86% yellow perch. The 2009 survey produced a composition of 54% yellow perch, while 2010 produced 25.9%, 2011 produced 39.4%, and 2012 produced 10%, the lowest composition to date. Although there is some variation due to sampling, the overall trend shows a decrease in perch numbers. The average size for the 2009 and 2010 samples were virtually identical at 7.6 in (193.3 mm), with the 2011 average size increasing to 8.1 in (204.6 mm) and dropping again in 2012 to 7.9 in (201.4 mm). Future surveys will provide additional data to monitor average size and percent catch ratio of yellow perch. Additionally, the aging of perch, via otoliths, could provide age class structure data and growth rates, which would be very beneficial in better understanding this fishery.

The average size of the 91 largemouth bass caught was 6.7 in (169.5 mm) and ranged from 4.3 to 9.2 in (110 to 234 mm). With no bass over 10 in, only 10 were measured and weighed for body condition, resulting in 1 bass in poor condition (10%), 2 in fair condition (20%) and 7 in good condition (70%). Since 2007, when 400 bass, averaging 8.8 in, were stocked into the reservoir, the percent of catch has continually grown, with 2012 being the highest by almost four fold. By using Wilson Reservoir data as a reference for age structure (due to the lack of data from Willow Creek Pond), Willow Creek Pond bass shows 1 class I/II, 25 class III, 61 class IV, and 4 class V. Although Willow Creek Pond provides a unique fishery and growth rates and age classes are probably slightly different than Wilson Reservoir, we can speculate that cohorts from the 2008 and 2009 spawn are currently the most abundant. Future surveys will allow for narrowing down the age class structure so that cohorts and spawning success can be monitored yearly. This can be done through collection and aging of scales providing a better breakdown of length/age relationships.

The average size for rainbow trout was 9.4 in (239.2 mm), with a range of 5.7 to 11.7 in (146 to 298 mm). These fish were mainly comprised of recently stocked hatchery and carryover trout, and what appeared to be 13 wild trout. These fish were identified as wild based on their overall appearance, in particular, their lack of fin wear.

A total of 13 rainbow trout were measured and weighed for body condition. Seven fish were in poor condition (53.8%), 4 in fair condition (30.8%), 2 in good condition (15.4%), and none in excellent condition.

Table 2 compares percent of catch and body condition of rainbow trout over the last five surveys. The percent catch of rainbow trout was steadily increasing until this year, where it dropped by nearly a quarter. The body condition of trout has been relatively constant during the last three years for percent of contacted fish in Poor/Fair body condition. Although the sample size has been small, the high number of trout in relatively poor body condition seems to suggest that the health of the fishery may be exceeding its threshold. Willow Creek Pond was originally managed as a trout fishery; however, the current health of the trout population has been disconcerting since the illegal introduction of yellow perch, and consequent introduction of largemouth bass as a controlling factor. With so many fish in a small reservoir, a reduction of stocked rainbow trout may need to be considered.

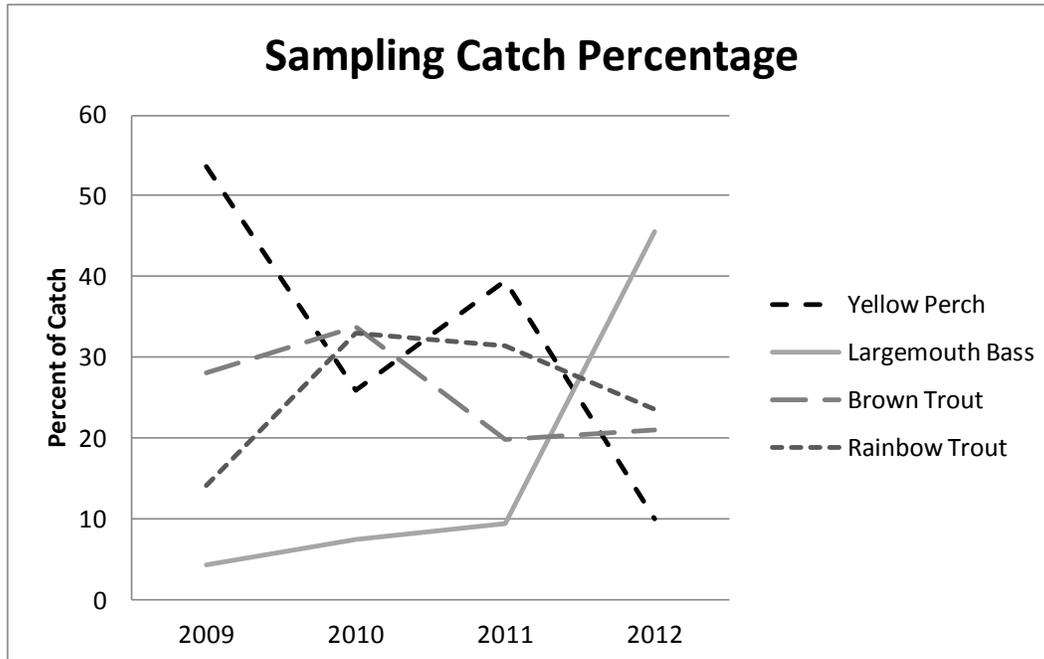
Table 2. Rainbow Trout Percent of Catch and Body Condition.

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

A total of 42 brown trout were captured, with 32 of these weighed and measured. The average size was 10.1 in (256.4 mm), with a range from 6.7 to 12.8 in (170 to 326 mm). Body condition ratings resulted in 1 fish in poor condition (3.1%), 5 in fair condition (15.6%), 12 in good condition (37.5%), and 14 in excellent condition (43.8%). The percent of catch for brown trout over the last four years has ranged from 3.8% to 33.7% of all fish caught, with annual body conditions averaging in the good range. Due to the predatorial 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.

The percent catch has changed from year to year; however, there were some patterns that have emerged (Figure 1). Rainbow and brown trout have been running relatively steady somewhere in the middle of the range. Hatchery stocked trout are planted twice a year, and the brown trout population is entirely dependent on reproduction from the inflow creek and appear to be successfully sustained in the reservoir. The composition of bass and perch, having a predator/prey relationship, appears to have been reversed since 2007, resulting in an increase in bass and a decrease in perch. These were expected management results for introducing a biological control for perch. It is also expected that this control will occur at a more consistent rate. Because there has been an evolution in community structure, following this change during the next several years will be crucial in understanding this fishery.

Figure 1. Willow Creek Pond Species Composition.



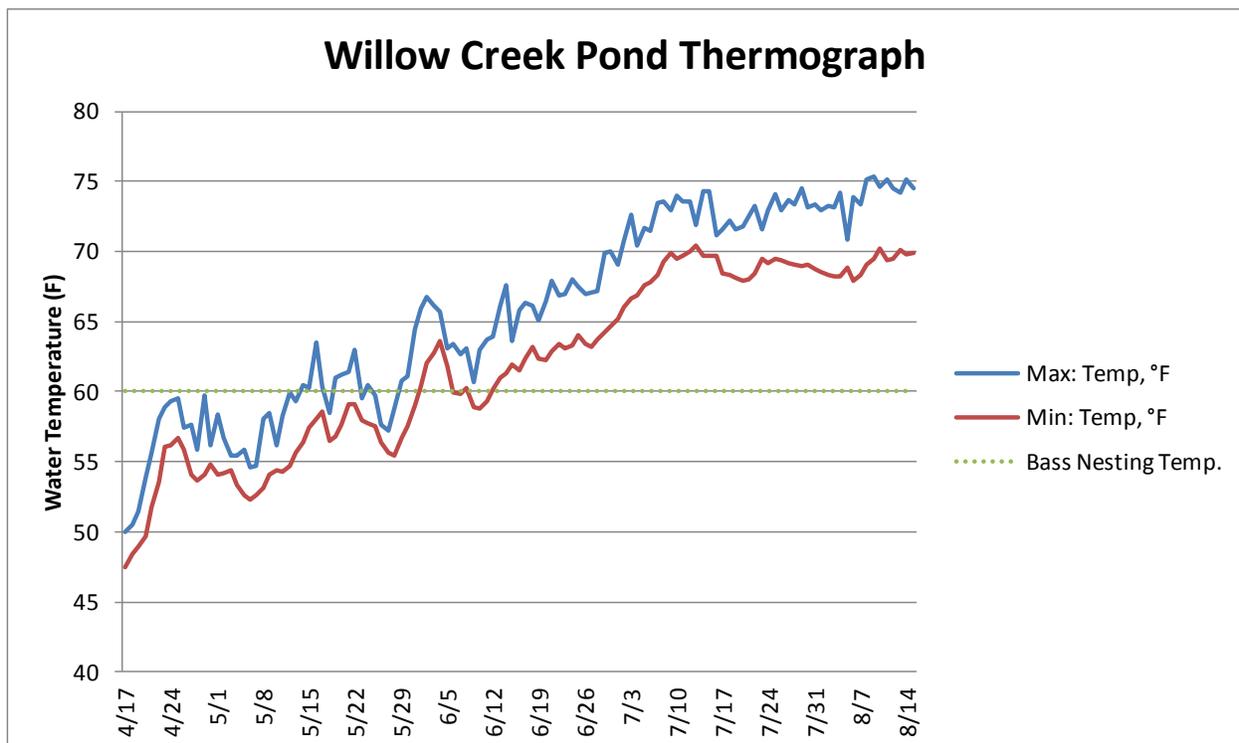
Overall, the fishery appears to be in relatively good condition, with the exception of the rainbow trout body condition. One way to monitor fishery health is to observe body condition of rainbow trout, which is the primary sport fish prior to the yellow perch introduction. The reservoir has been managed as a seasonal put-and-take fishery and there has been no fish sampling since the reservoir was created in 1989, which means no historic or pre-yellow perch information is available for comparison. As seen in Table 3, the body condition of rainbow trout from 2007 showed 77% of them to be in fair to good condition. In 2009 and 2010, the percent of trout in fair to good body condition dropped to 43% and 40%, respectively. The 2011 and 2012 surveys showed a slight increase to 48% and 46.2%, respectively, but still fall short of that in 2007. Although there is only one year for comparison, i.e., 2007, it appears that rainbow trout is suffering from competition with other species in the reservoir. If this trend continues, trout stocking adjustments must be considered since the other three species present are self-sustaining and are not controlled through stocking. Although this was the fourth and final year of the study, there are several questions that need to be answered or clarified; therefore, surveys should continue annually or even biennially to monitor the health of this fishery.

A HOBO Water Temp Pro thermograph collected water temperature in the reservoir beginning April 17 and was pulled on October 16 (Figure 2), which by this date was about 18 in out of the water. On May 29, the water temperature reached 60°F (15.5 °C), the critical spawning temperature for largemouth bass, nearly a month earlier than in 2011. Based on availability of quality spawning habitat at the water temperatures experienced, there should have been a successful spawn of largemouth bass in 2012.

Table 3. Willow Creek Pond Rainbow Trout Body Condition Summary.

Rainbow Trout Body Condition (Percent of Total)					
	2007	2009	2010	2011	2012
Poor	14	57	60	46.3	53.8
Fair	50	43	26.7	41.5	30.8
Good	27	0	13.3	7.3	15.4
Excellent	9	0	0	4.9	0
N=	22	7	15	41	13

Figure 2. Willow Creek Pond 2012 Thermograph.



MANAGEMENT REVIEW

The pre-stocking evaluation approach for Groves Lake was completed, which resulted in no fish being stocked in 2012. The electroshocking survey approach was not completed in 2012 due to low water conditions.

All approaches were completed for Willow Creek Pond in 2012. This year was the final year of a four-year study to monitor this fishery, with emphasis on evaluating the rainbow trout body condition and the success of largemouth bass as a biological control of yellow perch. Surveys showed that the body condition of rainbow trout was reduced over the last several years, with competition from yellow perch, largemouth bass, and brown trout most likely being the major influence. Species composition in the reservoir has fluctuated throughout this study and as this fishery continues to find

balance, adjustments to the rainbow trout stocking regime may need to be considered in order to provide a quality trout fishery. The most recent survey appears to show a shift towards a greater largemouth bass composition while there was a reduction in yellow perch, implying that the biological control is working to some degree. Although the study has reached its final year, additional surveys are needed to continue monitoring this fishery as it appears to further stabilize. Future surveys, done on a yearly or biennial basis, will provide data needed to evaluate the overall fisheries health and provide direction for future management decisions.

Monitoring spring/summer temperatures during the last four years has shown that Willow Creek Pond can provide optimal spawning conditions for largemouth bass. Optimal water conditions, combined with suitable spawning habitat, have contributed to multiple age classes that are now being observed in the reservoir.

RECOMMENDATIONS

Groves Lake

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

Willow Creek Pond

- Continue to assess water conditions prior to trout stocking in the spring and fall.
- Evaluate the fishery, particularly species composition by electroshocking.
- Assess angler use through opportunistic angler contacts and the angler drop-box.
- Collect otoliths from yellow perch and largemouth bass to determine length/age relationships.

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