NEVADA DEPARTMENT OF WILDLIFE
STATEWIDE FISHERIES MANAGEMENT

FEDERAL AID JOB PROGRESS REPORTS

F-20-48
2012

RUBY LAKE NWR AND COLLECTION DITCH
EASTERN REGION

NEVADA DEPARTMENT OF WILDLIFE, FISHERIES DIVISION
ANNUAL JOB PROGRESS REPORT

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NEVADA DEPARTMENT OF WILDLIFE, FISHERIES DIVISION
ANNUAL JOB PROJECT REPORT

State: *Nevada*
Project Title: *Statewide Fisheries Program*
Job Title: *Ruby Lake NWR and Collection Ditch*
Period Covered: *January 1, 2012 through December 31, 2012*

SUMMARY

There were 28,345 trout stocked at Ruby Lake NWR in 2012. This included three different rainbow trout strains, tiger trout, and brown trout.

Between June and August, seven creel survey visits were made to Ruby Lake, with an additional 12 voluntary, angler drop-box questionnaires being received. Creel survey efforts contacted 133 anglers who put forth 603.5 hrs of angling effort to catch 1,269 fish, resulting in catch rates of 2.1 fish per hour and 9.4 fish per angler, which was nearly identical to 2011. There were 9 usable drop-box questionnaires, resulting in 10 anglers catching 190 fish in 54.5 hrs of fishing effort. Catch rates were 19.0 fish per angler and 3.5 fish per hour, almost twice that in 2011.

Two thermographs were utilized in the spring of 2012, one in South Lake and one in Unit 20. Based on recovered data, it appears that an initial spawn could have been interrupted by a drop in water temperature lasting several days. Any attempt at a second spawn would have been successful based on water temperature. The bass fry survey produced far lower numbers than the previous year.

Due to time constraints and weedy conditions, only two transects were competed for the South Lake electroshocking survey. These two transects produced 202 largemouth bass and 2 trout in 2,055 electroshocking seconds, resulting in a capture rate of 357.4 fish per electroshocking hour. Average body condition was calculated from 63 bass at 4.65 for a rating of fair.

The 2010-11 fish population winterkill was considered low in South Lake and all areas of the North Dike complex. December to February dissolved oxygen levels taken at the main boat landing and dike units found adequate levels for fish survival.

The Collection Ditch was surveyed in April and July to evaluate trout carryover and distribution during times of varying water temperatures. The April survey produced 115 fish, while the July survey produced only 47. Both surveys found high percentages of rainbow and bowcutt trout relative to other fish in the community, with many fish being captured at spring heads.

BACKGROUND

Ruby Lake (Ruby Lake National Wildlife Refuge) is a major warmwater fishery in northeastern Nevada, while also providing an excellent coldwater fishery during the cooler months of the year. It lies at an elevation of 6,000 ft and contains over 9,000 acres of lakes, ponds, and waterways that are intermixed with islands, bulrush stands and manmade dikes. The slow growth rate of the largemouth bass is due to the short growing season and a limited food source, combined with fluctuating water conditions, requiring close monitoring of the fishery. Yearly fluctuation in water levels, reproductive successes of fish, fish health, and angler use requires a thorough understanding of the fishery to facilitate making adequate management decisions. Cooperative management with the federal refuge is also essential for reducing impacts to sport fish populations as well as consideration for anglers.

Historic surveys of the Collection Ditch have been limited to electroshocking a portion of the northern most end and no habitat evaluations have ever been conducted. Additionally, there has been little effort on contacting anglers. Limited information on angler success, sport fish populations, and habitat at the Collection Ditch has created a need to understand this fishery better for making management decisions.

In January of 2007, quagga mussels might have been transported to Ruby Lake via stocked fish from Lake Mead Hatchery. Quagga mussel monitoring, which includes sampling artificial substrates, conducting veliger plankton tows, and performing tactile surveys on natural substrates was started in summer of 2007 and will continue at varying levels of intensity.

OBJECTIVES and APPROACHES

Objective: General Sport Fisheries Management

Approaches:

- Conduct a pre-stocking evaluation of 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.
- Conduct a single nighttime electroshocking survey at three established transects during summer.
- Conduct two nighttime, electroshocking surveys of the Collection Ditch, north of Bressman's Cabin, one in April and one in July.
- Prioritize dredging areas along the Collection Ditch and coordinate a potential dredging project with the Ruby Lake NWR.
- Monitor water temperature during early spring and late fall with two thermographs within the Dike Units and South Lake to assess sport fish spawning activity.

- Visually assess overwinter fish mortality after spring ice breakup.
- Monitor dissolved oxygen levels once a month throughout the ice period.
- Salvage largemouth bass from closed or drained ponds/areas as needed and stock in suitable waters of the Ruby Lake NWR.
- Conduct visual bass ball surveys in early summer in the North Dike Unit 20.
- Revise the Ruby Lake NWR Fisheries Management Prescription.

PROCEDURES

Angler assessment at Ruby Lake was scheduled at periodic intervals to include weekdays, three weekend days, and boat openers in an effort to sample anglers uniformly throughout the largemouth bass fishing season. Anglers contacted were questioned as to their residence, number of anglers in their party, hours fished, target species, total fish harvested, and fish released. Harvested fish were recorded by species, weighed, and measured to total length unless otherwise noted. Clipped fins or tags were noted.

Recording thermographs were placed at predetermined locations in Unit 20 and the South Lake shortly after spring ice breakup and pulled prior to winter ice-up. This timeframe was expanded from previous surveys to incorporate monitoring through the quagga mussel spawning season.

The electroshocking survey was accomplished at two predetermined transects in South Lake. The electroshocking barge had fixed probes as the anode and the barge as the cathode. All fish were netted and held in the live well until the completion of the transect. The fish were then measured, weighed, and released.

Collection of habitat measurements included dissolved oxygen (DO), temperature, ice thickness, snow depth on ice, current weather conditions, and water flow. North Dike units were checked at water control structures along the dike system and South Lake was checked near the main boat landing. These sites were sampled at regular intervals throughout the ice-up period.

The South Lake winterkill survey was accomplished while boating by one or two-surveyors. Preferred sampling conditions included calm and clear weather, which provided for maximum visibility within the water. Areas that have experienced winterkill in the past were checked closely, as well as a shoreline survey throughout a extended portion of the South Lake complex. North Dikes were periodically checked by traveling along the roadway borrow ditch. In units that revealed low DO and/or low water levels during the ice-up period, an in-depth search was done from a canoe.

Black bass fry surveys were conducted by johnboat in Unit 20 using a two-man crew. The transect started at the weed line just south of the S-turn on Long Dike and continued north to the culvert leading to Unit 14. Observations of both shorelines along the borrow area were made from the johnboat, powered by an electric motor.

Largemouth bass fry balls were identified and categorized based on their size: small (50 – 250 fish), medium (250 – 500 fish), and large (over 500 fish).

FINDINGS

Stocking

There were 28,345 trout stocked at Ruby Lake NWR in 2012. This included three different rainbow trout strains, tiger trout, and brown trout. A summary of trout stocking can be seen in Table 1.

Table 1. Ruby Lake NWR Trout Stocking Summary.

	RB	TT	BN	
South Lake	12,830		1,310	
Collection Ditch	7,070	1700		
South Springs	1,460	1,000		
Unit 21	703	1,014		
Unit 10	518	740		
	22,581	4,454	1,310	**28,345**

Angler Contacts

Between June and August, Ruby Lake was visited seven times to conduct creel surveys, resulting in the contact of 133 anglers putting forth 603.5 hrs of angling effort to catch 1,269 fish. This effort produced angler success rates of 2.1 fish per hour and 9.5 fish per angler. A total of 118 largemouth bass anglers (86.8%) expended 539.5 hrs of effort to harvest 182 bass and release an additional 1,059 bass, resulting in total catch rates of 10.5 bass per angler and 2.3 bass per hour. The average length of largemouth bass harvested from South Lake was 11.1 in (283.1 mm), which was the management target length. Eighteen trout anglers (13.2%) put forth 72 hrs of angling effort to harvest two rainbow trout, and release an additional 35 trout. Success rates were 2.1 trout per angler and 0.5 trout per hour. Three trout were measured during creel contacts, with one being a tiger trout measuring 20.0 in (509 mm). The two rainbow trout measured were 14.8 and 19.4 in (375 and 492 mm).

Ruby Lake angler catch rate objectives for trout were established at 1.0 per angler and 0.45 per hour, and for largemouth bass 4.0 per angler and 1.5 per hour. Angler catch rates in 2012 fell above management objectives. The high catch rates for largemouth bass were due to anglers catching many bass below the 10 in minimum size limit. Numerous reports of fish in the 7 to 9 in range were received throughout the fishing season. With acceptable water levels, it is hoped that the numerous fish approaching 10 in will continue to reach harvestable size and again provide a quality fishing experience in 2013.

Supplemental angler information was received through an angler drop-box that was installed at the main boat ramp. A total of 12 angler questionnaire forms were

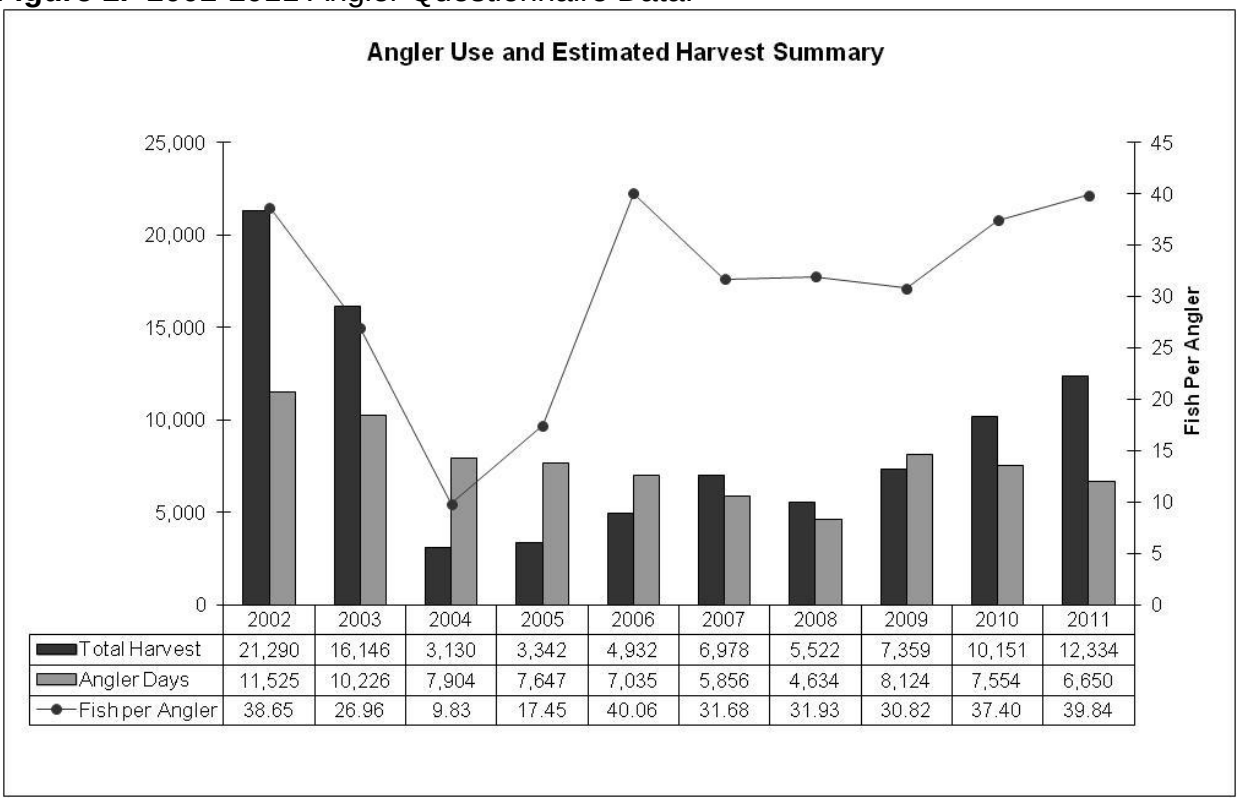
received, with 9 of these forms being used for analysis. These questionnaires showed 10 anglers caught 190 fish in 54.5 hrs of effort, producing catch rates of 19.0 fish per angler and 3.5 fish per hour. Largemouth bass angler catch rates were 20.9 per angler and 3.7 per hour, while trout angler catch rates were 2.0 per angler and 0.7 per hour. A comparison of rates between the contact creel survey and the angler drop-box survey can be seen below in Table 2. Catch rates for trout were relatively consistent, considering the possible fluctuations caused by a small sample size. Bass catch rates were noticeably higher for angler drop-box data, which can be attributed to a small sample size and an over-estimation of captured fish under 10 in. Numbers for bass anglers are nearly double that of the creel data numbers and is a trend that has been seen at this water for several years.

Table 2. Ruby Lake NWR Angler Catch Rates.

	T/A	T/H	B/A	B/H	F/A	F/H
Creel	2.1	0.5	10.5	2.3	9.4	2.1
Angler Box	2	0.7	20.9	3.7	19	3.5
Combined	2.1	0.5	11.3	2.4	10.1	2.2

The Nevada Department of Wildlife Mail-in, Angler Questionnaire Survey for the calendar year 2011 reported that 1,583 anglers fished 6,650 days and had a success rate of 39.84 fish per angler. Figure 1 shows a 10 yr trend using expanded data for harvest, angler days, and fish per angler.

Figure 1. 2002-2011 Angler Questionnaire Data.



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total Harvest	21,290	16,146	3,130	3,342	4,932	6,978	5,522	7,359	10,151	12,334
Angler Days	11,525	10,226	7,904	7,647	7,035	5,856	4,634	8,124	7,554	6,650
Fish per Angler	38.65	26.96	9.83	17.45	40.06	31.68	31.93	30.82	37.40	39.84

Angler use and harvest peaked in 2000 following several years of high water; however, as water levels dropped due to poor water years from 2001 to 2004, harvest, angler days, and angler catch rates followed a similar trend. Angler days have steadily dropped since 2000, and, until 2009, when the number of angler days almost doubled from 2008. Unfortunately, angler use in 2010 and 2011 has shown a declining trend again. It is important to note that this data should be used cautiously and primarily for observing trends. Based on this, angling days have been relatively consistent for the last eight years, falling between 8,500 and 4,500 days.

This initial decline in angler use was probably due to the low success rate for keeper-sized bass as water levels and number of bass dropped; however, as two dominate age classes grew to 10 in, the chance of anglers catching keeper-sized bass (10 in) increased, suggesting the increase in angler use in 2009. The increase in fish per angler and total fish harvested over the last five years was likely due in part to the two dominant cohorts reaching catchable size in 2008 and carrying-over into the next couple of years. The consecutive, annual spawning events that have occurred as the bass population increased from these two cohorts further provided recruitment and diverse age-class structure. Fishing success rates should continue to improve as long as water levels persist at elevations that promote healthy spawning and recruitment. Unfortunately, the 2011-12 winter snow pack was well below normal. Even with an average 2012-13 water year, the upcoming spring snowmelt will help with groundwater recharge, but will help little in the way maintaining the water level at the marsh.

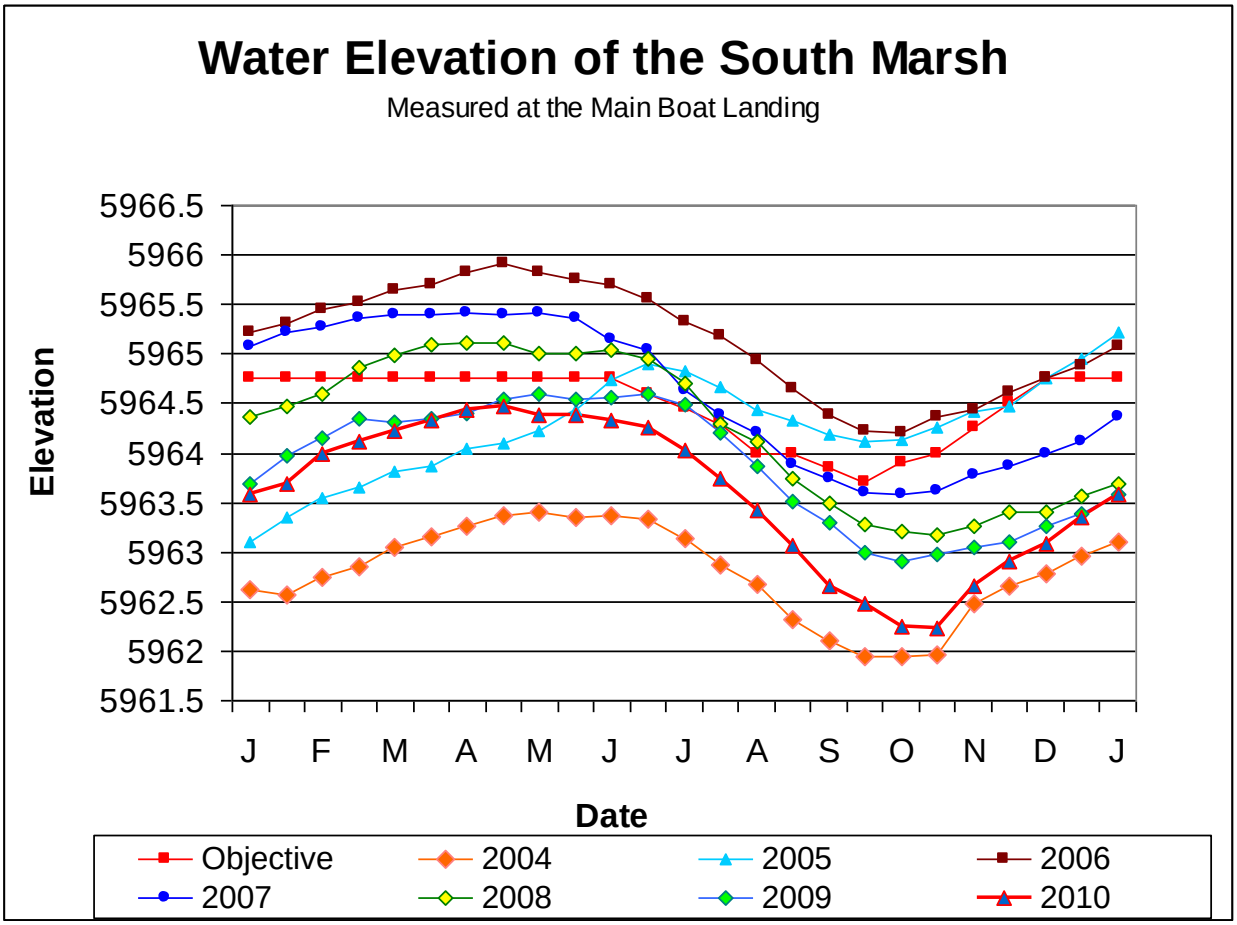
Water for the refuge has multiple uses and since 2005, the amount of water has not met many of the objectives, which has influenced the elevation at South Lake (Figure 2). No data is available for 2011 or 2012, as the refuge did not have data available. Since 2006, which was the most recent high water year, the South Lake water level dropped two feet by 2010. High water levels are critically important to provide spawning, rearing, and protective habitat for largemouth bass. Water levels will be watched closely in 2013 since the winter of 2012-13 saw below average snow pack. The impacts to the South Lake may last well into summer.

Creel surveys at the North Dike units were done secondary to South Lake creel surveys and no anglers were contacted. Angler use in most units was minimal during 2012, with reports of fair angling success for largemouth bass and poor for trout.

Thermographs

Springtime water temperatures at Ruby Lake have demonstrated wide fluctuations. The severity of these fluctuations hampers largemouth bass spawning success and, in severe cases, an entire year class can be weakened. Largemouth bass at Ruby Lake begin nesting activities when the water temperature approaches 60°F (15.5°C), with nest abandonment occurring mostly when the temperature drops below approximately 55°F (12.8°C). Water temperature fluctuations are typically less varied in the South Lake as compared to the North Dike units, mainly due to greater water depth.

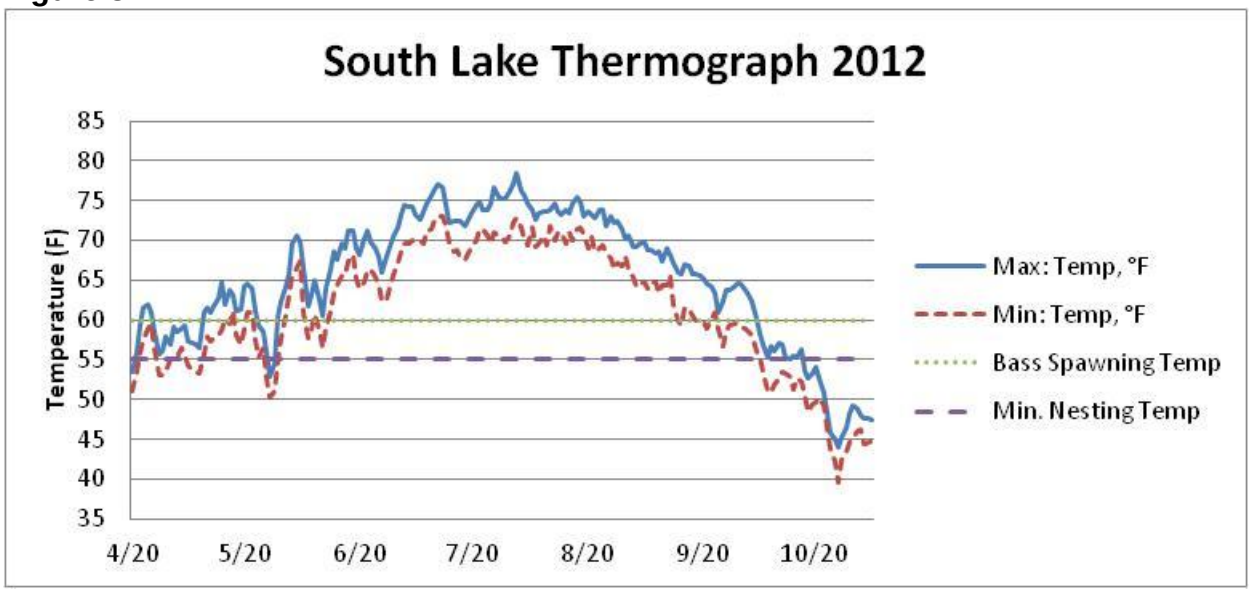
Figure 2. South Lake Water Elevation (Courtesy of Ruby Lake NWR).



A recording thermograph was installed in the west ponds of South Lake on April 19 (Figure 3). On May 9, the bass spawning temperature (generally above 60°F) was reached, but on May 25 the temperature dropped below nest abandonment temperature of 55°F. Finally on May 29, the daily water temperature again warmed for bass to begin spawning again. It stayed above the minimum temperature for the remainder of the spawn. This initial warming period of 16 days could have lead to a first spawn, but then likely resulted in nest abandonment during the cold snap. Any second nesting attempt should have been successful. The results of the summer bass ball survey were much lower than previous years, suggesting that the cold snap negatively influenced the first spawning attempt.

In conjunction with the bass ball survey, a thermograph was placed in Unit 20 on April 26 and was recovered at the end of July (Figure 4). There was a similar trend in temperature as what was found in the South Lake.

Figure 3.



Bass Ball Surveys

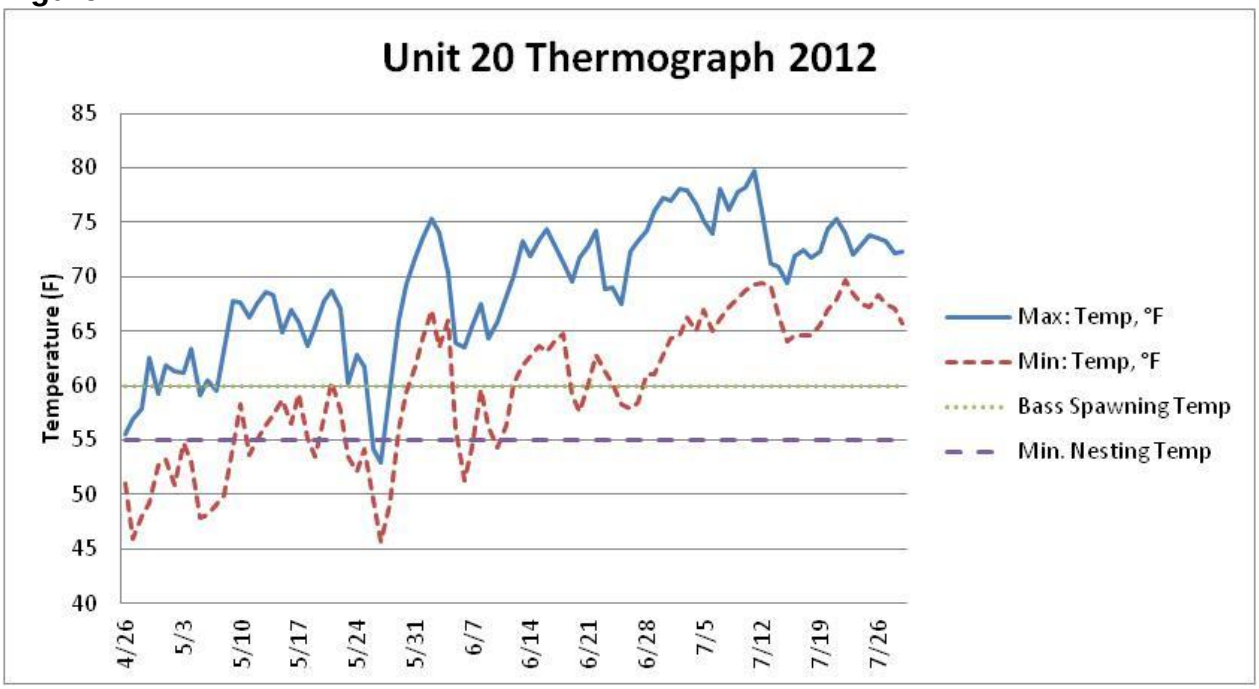
On July 30, Unit 20 was surveyed for the presence of largemouth bass fry balls. It took 40 minutes with paddle and canoe to cover the survey area, resulting in the observation of approximately 11 bass fry. Much of the survey area was covered in dense vegetation due to low water levels, making observing fry difficult. However, based on thermograph data showing a possible nest abandonment period, this was most likely a large factor in the low number of bass fry that were observed.

Additionally, the number of small bass recruited over the last three years was quite numerous. Age class I and II fish (3-7 inches) were the most numerous (several hundred), particularly along the weed beds. From 8 to 10 bass in the 10-inch range were also observed. Due to the time of day, most of the observed bass were holding tight to the patches of vegetation, suggesting many more bass were present within the vegetation and not observed. The high level of predation risks of fry from small bass would keep them tied to dense cover, making them difficult to observe during surveys. Therefore, a better grasp of spawning success and survival would come from upcoming electroshocking surveys. Largemouth bass success can be more readily tracked as they age, especially to Class II and III.

Largemouth Bass Population Monitoring

The electrofishing survey in South Lake was conducted under clear and calm weather conditions and a water temperature of 68 °F (20 °C). Transect I, located on the west shoreline north of “Otis Island,” was electrofished for 993 seconds and produced 85 fish resulting in a capture rate of 308.2 fish per electroshocking hour. These fish averaged 8.3 in (211.1 mm) and ranged in size from 3.4 to 12.3 in (86 to 312 mm). The capture rate was considered fair, with several smaller size classes of fish observed but not captured.

Figure 4.



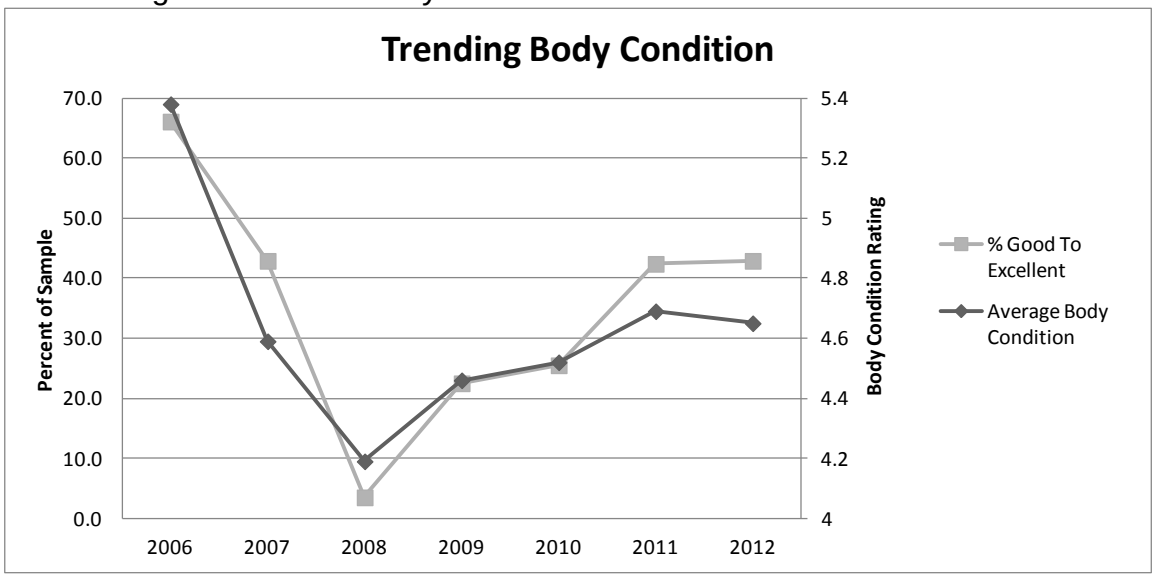
Transect II, located along the west shoreline of the "Water Ski Ponds," was electrofished for 1,062 seconds producing 119 fish and resulting in a capture rate of 403.4 fish per electroshocking hour. The 117 bass averaged 8.8 in (224.5 mm), and ranged in size from 2.2 to 12.2 in (55 to 310 mm). Two trout were also captured in this transect, each measuring 15.2 and 15.9 in (386 and 405 mm). The third transect at "Jason's Pond" was not completed due to time constraints and low water levels.

Overall, 2,055 electroshocking seconds were used to capture 202 largemouth bass and two rainbow trout, resulting in a capture rate of 357.4 fish per electroshocking hour. All fish were measured for total length to evaluate age class, and 63 were weighed to evaluate body condition. Largemouth bass averaged 8.6 in (218.8 mm) and based on body condition analysis, 6 fish were in poor condition (9.5 %), 32 fish in fair condition (47.6%), 27 fish in good condition (42.9%), and no fish in excellent condition. The average body condition was 4.65, a rating of fair. The two rainbow trout were also evaluated, with the smaller 15.2 in trout in poor condition and the larger 15.9 in one in good condition.

Beginning in 2006, the percentage of fish in good to excellent body condition had declined every year, bottoming out in 2008 with only 3.5% being in good to excellent condition. Body condition started an upwards trend in 2009 at 22.5% of the sample, and has continued to improve since. The 2012 survey showed 42.9% of the sample in fair condition. A similar trend is seen in the average body condition (Figure 5). This increase in body condition could be a product of an increase in larger food items, mainly yearling bass coming from increased spawning success. With two years of marginal spawning successes, it is expected there will be a slump in body condition ratings as juvenile bass diminish. Future surveys will produce additional data for better

understanding of this fluctuation in body condition and the potential connection to spawning success.

Figure 5. Largemouth Bass Body Condition.

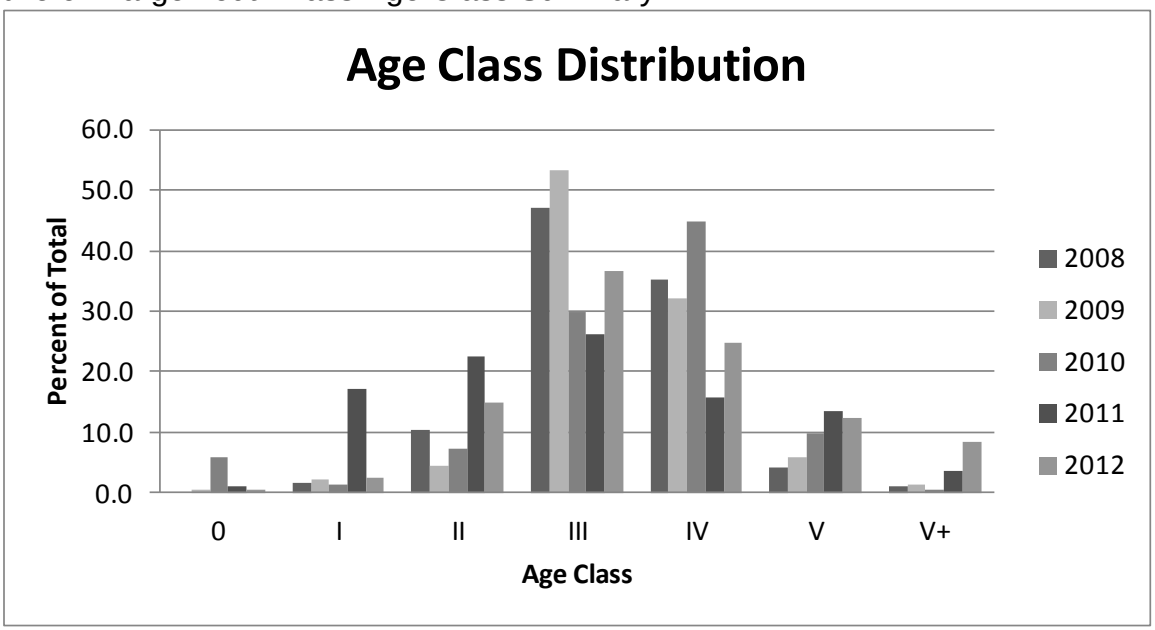


The 202 measured bass were separated into age classes to evaluate and follow the cohorts. Figure 6 shows the age class breakdown from 2008 to 2012. There were two dominate cohorts, starting in 2007 with Class II and III and continuing into 2008 with Class III and IV. As these fish exceeded 10 in (Class V), they were targeted by anglers and numbers dropped. However, as these fish reached maturity in 2009 and 2010, their reproductive success can be seen in Class I and II's in the 2011 survey. These two cohorts are clearly represented in the 2012 survey as well. The success of these two cohorts may also be contributing to the highest percentage of Class +V bass seen in the last seven years, as well as the lowest small (<10 in) to keeper bass (>10 in) ratio in the same time frame. It appears that annually in last six years, strong age classes were produced and are showing a more consistent age class distribution. Starting in 2009, there has been an increase in bass over 10 in. Historically, water has been a limiting factor that has drastic impacts on the Ruby Lake fishery. Refuge water management practices also play a critical role in the success of the largemouth bass fishery.

Winterkill Survey

The winterkill in 2011-2012 was considered very low for fish populations in South Lake and all areas of the North Dike complex. Dissolved oxygen levels at the main boat landing during January and February showed adequate levels for fish to survive. Ice thickness reached nine inches in January, with the entire refuge being relatively ice free by early March. Oxygen levels in the North Dike units also were adequate, with areas of open water persisting throughout much of the winter and flow occurring between the units.

Figure 6. Largemouth Bass Age Class Summary.



The South Lake winterkill survey began at 1100 hrs on April 19 and continued to 1400 hrs under cool, partly cloudy, and minimal wind conditions. Water temperatures ranged from 40 to 41.5°F. The focus area was from the east cut to the thermograph site and continued north of Otis Island. No fish mortality was observed during the three hour survey and very few live fish were seen.

The North Dike units were also surveyed on April 19 in an attempt to locate fish mortalities. No fish mortalities were observed and no other reports of mortalities were received.

Collection Ditch Electroshocking

In 2012, the Collection Ditch was electroshocked in April and July to assess temporal differences in fish distribution. On April 19, under clear and relatively calm weather, approximately 2.3 mi of the Collection Ditch was shocked. Water temperatures averaged 53.8°F (12.1 °C), with little fluctuation occurring even at the spring heads that were accessible. Water turbidity reduced visibility, but electroshocking and netting efficiency was considered good. An occasional fish escaped.

During the April sampling, after 30.6 min of electrofishing, 115 fish were contacted and resulted in a capture rate of 225.5 fish per electroshocking hour. Fish composition included 108 rainbow trout, two bowcutt trout, three tiger trout, one brown trout, and one largemouth bass. The rainbow and bowcutt trout ranged in size from 9.8 to 27.6 in (250 to 700 mm) and averaged 13.2 in (335.8 mm). Body condition was calculated for 34 rainbow and bowcutt trout, resulting in none in poor condition, 5 in fair condition (14.7%), 17 in good condition (50.0%), and 12 in excellent condition (35.3%). This data shows a higher percentage of fish in good to excellent condition, when

compared to the July 2011 survey. A large portion of fish that were contacted, approximately 87%, were carryover rainbows that were stocked in the fall of 2011. This was also documented in previous frame net surveys, with high number of fall fish carrying over to the spring, but disappearing by the next fall survey. It is presumed that most of these trout are lost to predation by cormorants and habitat limitations. One rainbow trout was observed having a fresh, open bird wound near its pectoral fin.

Three tiger trout were contacted and ranged in size from 20.7 to 22.8 in (526 to 578 mm), averaged 21.7 in (550.7 mm), and the largest fish weighed 6.4 lbs (2900 g). All three appeared to be in excellent body condition. The single brown trout contacted measured 17.4 in (442 mm), weighed 2.6 lbs (1200 g), and appeared to be in good to excellent body condition. The one largemouth bass contacted measured 18.5 in (470 mm), weighed 5.2 lbs (2,350 g), and was in excellent condition. There have been recent reports of anglers catching bass in the collection ditch, but this is the first time that they have been documented during an NDOW survey. Considering that water temperatures may extend into the low 70's along the northern portion of the ditch, it appears that bass may not only survive, but may do so quite successfully.

During the July 30 survey, the same section was electroshocked. Water temperatures were relatively constant throughout the ditch at around 70°F (21.1°C), but with fluctuations occurring in the spring heads. Two spring areas had water temperatures of 54° and 61°F, and trout were found here at a much higher density. Reduced visibility, due to turbidity and a light wave action did not allow for us to visually stalk fish. Electroshocking efficiency was considered fair, with missed fish numbering in the low forties. The most northern portion of the ditch, approximately 0.3 mi, was not sampled due to the pump on the live well not working. The lack of fresh water in the live well increased the water temperature and reduced oxygen levels to the point where fish stress was elevated, and it was felt that continuing would only increase the chance of fish loss.

After 28.6 min of electrofishing, a total of 47 fish were captured, resulting in a capture rate of 98.6 fish per electroshocking hour. Fish composition consisted of 46 rainbow trout and one tiger trout. The rainbow trout ranged in size from 7.0 to 22.0 in (179 to 560 mm), and averaged 16.2 in (411.7 m). Due to fish stressing in the live well, many fish were simply measured for length and released without weighing. A total of 22 rainbow trout were measured and weighed for body condition analysis. This resulted in no fish in poor condition, 4 fish in fair condition (18.2%), 15 fish in good condition (68.2%), and 3 fish in excellent condition (13.6%).

All trout contacted were seasonal carryover trout, with most fish initially stocked during spring or fall of 2011. No spring 2012 hatchery trout were contacted. The large number of carryover fish initially stocked in fall 2011was documented during the April survey, but not during July's. This pattern was seen in frame net surveys as well, and was presumably due to bird predation and limited thermal habitat. There were also a total of 10 wild trout contacted that ranged in size from 7 to 17.4 in (179 to 442 mm).

The only other trout species captured was a 22 in (560 mm), 4.4 pound (1,995 g) tiger trout. It appeared to be in excellent body condition.

With 75% of the captured fish closely occupying the two cold springs sampled, it appears that available habitat in the north Collection Ditch becomes limited in late summer due to temperatures increasing. Based on visual and frame net surveys in the spring and fall, trout utilize a larger percentage of the ditch during times when water temperatures allows. Table 3 shows a summary of surveys from the early 1990's and the last two years. Things to consider regarding the data are the time of year of the surveys, the change in trout species stocked (i.e., no longer stocking brook trout), and the uncertainty of the sites surveyed in the earlier studies. The time of year of the survey influences the water temperature, which in April was documented in the low to mid 50's and in July around 70° F.

Table 3. Collection Ditch Survey Summary.

	1990	1991	1992	1994	2011	2012	2012
% Rainbow/BC	27.1	78.0	55.2	10.8	75.0	95.6	97.9
% Tiger Trout	21.4	4.9	20.7	83.8	15.6	2.6	2.1
% Brown Trout	10.0	2.4	3.4	0.0	9.4	0.9	0
% Brook Trout	41.4	14.6	17.2	5.4	0.0	0	0
% Carryover	5.7	12.2	10.3	5.4	81.3	90.4	100
Total Fish	70.0	41.0	29.0	37.0	32.0	115	47
Minutes Shocked	52.9	19.7	36.4	39.7	8.4	30.6	28.6
	Mid April Surveys				Mid July	Mid April	Late July

Overall the survey was extremely productive and provided additional insight into the Collection Ditch fishery. Although historic survey data did not allow for many direct comparisons, it can still be useful as the fishery evaluation continues. This year's duel surveys have provided useful information regarding the importance of sample timing. Surveys of this stretch of the Collection Ditch are scheduled to continue on a two-year rotational basis to further monitor the health of the fishery. Additionally, coordination with the refuge on allowing access to additional portions of the collection ditch would provide a more thorough investigation and understanding of this productive fishery.

Dredging Project Proposal

The dredging project proposal for the Collection Ditch was completed and sent to the Refuge for comments. Because the Refuge is currently going through a Comprehensive Conservation Planning (CCP) process, the project was not approved. The Refuge feels that the CCP would have to include the Refuge goal/objective "to maintaining and improving a trophy trout fishery" before the project could move forward.

Largemouth Bass Salvage

Unit 13 was dewatered in 2012, which occurred in the spring rather than the typical fall dewatering. On March 29, the southern borrow area was electroshocked to

remove all bass. Four passes were made along the 530 m long channel, with a total of 146 bass being captured. The size of fish ranged from 2 to 14 in (50.8 to 355.6 mm), with a good variety of age classes being contacted. Water temperature was 46°F (7.8°C) and all captured fish were placed in unit 14, the adjacent unit to the south.

Fisheries Management Prescription

The development of a Fisheries Management Prescription was initiated in 2010, but has been put on hold until the completion of the Refuge Comprehensive Conservation Plan, which will be the driving force for all management aspects of the refuge.

MANAGEMENT REVIEW

All approaches were completed at Ruby Lake NWR. Although the management concept is being met at Ruby Lake, anglers continue to be concerned with the size of largemouth bass. Considering that the South Lake has seen a steady six-year drop in water level, the fishery is doing as well as can be expected. Slow growth and available habitat directly impact the success of this fishery and if the future provides adequate water levels, the fishery will continue to improve.

RECOMMENDATIONS

- Schedule an April/May electroshocking survey of the Collection Ditch in 2014 as the start of biannual trend surveys.

- Continue to assess angling pressure and angler success rates throughout the fishing season.

- Continue to monitor and utilize the angler drop-box and improve the visibility of the box, with the intent of increasing angler participation.

- Recording thermographs should continue to be placed in the South Lake and North Dike units to help predict timing and possible success of largemouth bass spawning.

- Periodic nest surveys and fry ball surveys should continue during spring to evaluate largemouth bass spawning success.

- An annual electroshocking survey in summer should be conducted to evaluate the status of this recovering largemouth bass fishery.

- Winter water chemistries and associated spring winterkill surveys should be continued to aid in the assessment of projected angler success and fish loss. This information also justifies the need for supplemental trout stocking.

- Continue to assess the angling pressure and angler harvest in the Collection Ditch as well as coordinate with the hatchery on trout stocking conditions and numbers.

- Salvage largemouth bass from closed or drained areas within the Ruby Lake NWR and stock in suitable waters.

- Work with Ruby Lake NWR, when applicable, on the completion of their Comprehensive Conservation Plan to ensure that quality fishing at the Refuge continues.

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