

NEVADA DEPARTMENT OF WILDLIFE STATEWIDE FISHERIES MANAGEMENT



FEDERAL AID JOB PROGRESS REPORT F-20-50 2014

Lahontan Reservoir WESTERN REGION



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

Table of Contents

<u>Contents</u>	<u>Page</u>
SUMMARY	1
BACKGROUND	2
OBJECTIVES	2
PROCEDURES	3
FINDINGS	4
MANAGEMENT REVIEW	8
RECOMMENDATIONS	9

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

State: *Nevada*
Project Title: *Statewide Fisheries Program*
Job Title: *Lahontan Reservoir*
Period Covered: *January 1, 2014 through December 31, 2014*

SUMMARY

This year was a below average water year in the Carson Basin, precipitation was 25% of average for 2013 and, through the first ten months of 2014, it was at 33% of average as reported by the Natural Resources Conservation Services SNOTEL sites. The reservoir elevation dropped from April through October and the Nevada Division of State Parks closed all boat launches when the reservoir level was unsafe for launching. Boat launching from shore is allowed and signs are posted that boating is “at your own risk.”

Bureau of Reclamation (BOR) had a positive contact for quagga mussel veligers during routine monthly plankton monitoring in April 2011. Subsequent monitoring by Nevada Department of Wildlife (NDOW) and BOR have been negative for quagga mussels. A boat inspection program began in spring 2013, with two decontamination stations, operated through the summer of 2014, located at the Sportsman’s Marina and near the State Parks entrance on the Churchill County side of reservoir.

Commercial fishing operators at Lahontan Reservoir have traditionally hauled live Sacramento blackfish to markets outside of Nevada. However, upon a suspected positive result for quagga mussel by BOR in 2011, permitted operators were required to kill all fish prior to hauling them and ship them on ice with no water from the reservoir. This permit revision was implemented in order to prevent the unintentional spread of quagga mussels to other waters.

Gill netting surveys were conducted with four nets fished, totaling 92 hrs. Forty-one catfish were caught, which dominated the catch. In addition, nine walleye, four Sacramento blackfish, four white bass, and numerous carp were also caught. No wipers were caught during gill net surveys during 2014.

Walleye fry and wipers were not stocked due to persistent drought conditions and resultant low water levels.

The ongoing drought also caused the suspension of the wiper study, which was scheduled to start in 2014. The study was aimed at evaluating the current wiper status and the reservoir’s potential to support a trophy fishery. The study will be rescheduled at a time when the reservoir level is adequate to support a sport fishery.

BACKGROUND

Lahontan Reservoir was created in 1915 by the construction of Lahontan Dam, which impounded water from the Carson River and Truckee River (via the Truckee Canal) for farmland irrigation, hydropower, flood control, domestic water, and recreation. This was part of the Newlands Reclamation Project created by the Bureau of Reclamation.

Maximum surface area of the reservoir is 14,600 acres with a maximum storage of 319,000 acre-ft (AF). At maximum pool, the deepest point reaches 85 ft. The reservoir is eutrophic, which creates a very productive fishery. As a result of Comstock mining practices, an estimated 7,500 tons of mercury were discharged into the Carson River drainage and, consequently, methylmercury concentrations in many fishes are above the safe state and federal consumption levels. Division of Public and Behavioral Health and NDOW advise “No consumption of fish from Lahontan Reservoir, the Carson River below Dayton, and all waters in Lahontan Valley.”

Despite the health advisory, Lahontan Reservoir continues to provide excellent recreation through angling. The prominent sport fishes include white bass, wipers (white bass x striped bass hybrid), largemouth bass, smallmouth bass, channel and white catfish, white and black crappie, yellow perch, and walleye. Fingerling wiper and larval walleye are generally stocked annually.

In 1981, NDOW began issuing a commercial fishing permit at Lahontan Reservoir in an attempt to reduce the Sacramento blackfish population. Prior to commercial fishing, substantial blackfish mortality events were documented in the reservoir at the Carson River inlet during the spring when blackfish would spawn. During the first four years of commercial operation, the average annual harvest of blackfish was nearly 350,000 lbs. In 2005, a harvest moratorium was instituted due to declining catch rates, which was viewed as a possible indication of a population decline. The blackfish harvest moratorium was withdrawn in 2008 and a commercial collection permit was again issued to the previous permittee.

OBJECTIVES

General Management Objectives:

- Conduct a general fisheries assessment through opportunistic angler contacts and mail-in angler questionnaire data.
- Conduct a general habitat assessment through visual observations of water quantity (lake level) and water quality (clarity) when on site.
- Document dissolved oxygen and temperature when conducting veliger sampling.
- Monitor for the presence of quagga mussels by conducting tactile surveys around boat docks and reservoir substrates when on-site.
- Conduct quagga mussel veliger sampling through plankton tows at established transects at least three times per year.

- Stock one million walleye fry and 5,000 juvenile wipers.
- Monitor sport fish populations through gill netting four net-nights in late spring/early summer.
- Assess YOY species composition and production through beach seining at least eight locations during late spring/early summer.

Study Specific Objectives:

- Tag 2,000 hatchery raised wipers with color specific Floy tags.

PROCEDURES

Conduct a general fisheries assessment through opportunistic angler contacts and mail-in angler questionnaire data. Information obtained from anglers included time fished; number, size and species of fish caught; location where fished; place of residence; and type of bait or lure used. Angler questionnaire data was derived from a survey mailed to 30,000 anglers purchasing a Nevada fishing license.

Conduct a general habitat assessment through visual observations of water quantity (lake level) and water quality (clarity) when on site. Lake level data was received from USGS gauge number 10312100 near the dam throughout the year. Clarity was measured directly using a Secchi disk and measurements were taken in June, August, and September near the dam.

Document dissolved oxygen and temperature when conducting veliger sampling. Temperature was recorded with each visit to the reservoir. Dissolved oxygen was only recorded at the surface during June, August, and September due to low reservoir levels.

Monitor for the presence of quagga mussels by conducting tactile surveys around boat docks and reservoir substrates when on-site. Sampling was conducted through inspection of the boat dock at Sportsman's Marina. Buoys and rock structures near the dam were also inspected for adult quagga mussels by snorkeling during three occasions in spring and summer.

Conduct quagga mussel veliger sampling through plankton tows at established transects at least three times per year. Veliger sampling was conducted on June 17, August 14, and September 9. Three stations have been established to sample for quagga mussel veligers, however, only one station, near the dam, had enough water to conduct vertical tows. Vertical tows were made from the hypolimnion to the surface and a minimum of 1,000 L of lake water was filtered through a 63- μ m mesh plankton net. The samples were preserved in 75% ethanol and were analyzed by Pisces Molecular and Eco Analysts.

Stock one million walleye fry and 5,000 juvenile wipers. No fish were stocked into Lahontan Reservoir during 2014 due to low water levels.

Monitor sport fish populations through gill netting four net nights in late spring/early summer. On June 17 and 18, 2014, gill nets were set in L-Cove, Virginia Beach, Coyote Island, and the island near the dam. Sites were chosen based on public safety, angler creel information, commercial harvester data, historical locations, and reservoir level. Nets were set perpendicular to shore and anchored with three pound weights. Nets were 120 ft long, six feet deep, and mesh size ranged from 0.5 to 2.5 in, which increased by 0.5 in increments every 20 ft. Nets were allowed to fish over one 24 hour period.

Assess YOY species composition and production through beach seining at least eight locations during late spring/early summer. On August 12, 2014, Beach 1 on the Churchill County side was the only location suitable for seining; reservoir storage was approximately 16,000 AF. Muddy beaches made it difficult to walk and effectively collect a sample, however, two consecutive transects totaling 250 feet of shoreline were sampled. The seine was six feet tall, 50 ft long, mesh size ¼ in, with a 6X6X6 ft purse in the middle. The seine was pulled perpendicular to the shoreline.

Tag 2,000 hatchery raised wipers with color specific Floy tags. Persistent drought conditions and low water levels have resulted in postponement of this study.

FINDINGS

Conduct a general fisheries assessment through opportunistic angler contacts and mail-in angler questionnaire data. Currently, Lahontan Reservoir holds the Nevada record for walleye (15 lbs 4 oz caught in 1998) and wiper (25 lbs 9 oz caught in 2009). In 2014, 18 anglers were contacted that reported catching mostly white bass; however, wipers and catfish were also caught. The catch rate was 1.38 fish per hour and 3.61 fish per day which represents a decrease from 2010 - 2013. In 2013, 23 anglers were contacted; catching mostly white bass, but wipers and walleye were also caught. The catch rate was 2.07 fish per hour and 6.65 fish per day. Angler catch rates in 2012 were 1.21 fish per hour and 2.07 fish per day. Angler catch rates in 2011 were 0.54 fish per hour and 1.21 fish per day. In 2010, catch rates were 0.26 fish per hour and 0.74 fish per day. Angler use in 2013 was similarly low compared to the previous three years and was likely due to low reservoir levels; however, catch rates were up in 2013, which was likely the result of concentrated fish populations near the dam due to extremely low water levels during summer and fall.

Angler use reported from the mail-in angler questionnaire was again low in 2013 (Table 1), which was likely due to low reservoir levels. Angler catch rate was up from 2012, but down substantially from the seven year average of 7.92 fish per angler day.

Conduct a general habitat assessment through visual observations of water quantity (lake level) and water quality (clarity) when on site. Figure 1 shows reservoir levels as measured by USGS gauge 10312100. Measurements reported here were taken from the first of each month.

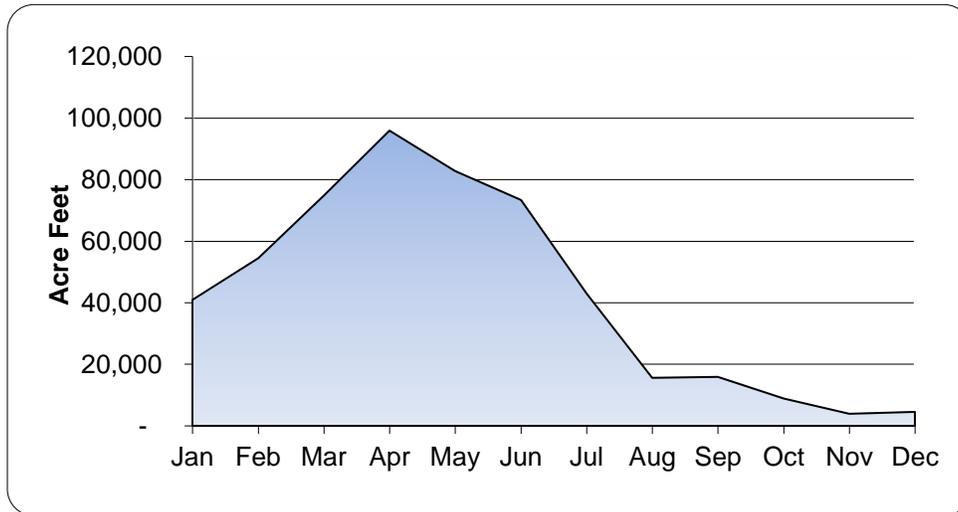
Table 1

Historical, Mail-in, Angler Questionnaire Survey Summary

	2007	2008	2009	2010	2011	2012	2013
No. Anglers	5,432	2,020	3,375	2,495	2,267	2,651	1,304
No. Days Fished	43,304	11,082	18,065	13,110	10,668	17,208	7,556
No. Fish Caught	260,005	66,960	46,804	28,845	19,208	35,494	18,369
No. Fish Per Angler Day	6.00	33.01	2.59	2.20	1.80	2.06	2.43
Average Storage	152,744	76,139	76,887	93,203	189,783	132,729	68,273

Figure 1

Monthly Reservoir Storage (Acre-Ft)



Maximum capacity at Lahontan Reservoir is 319,000 acre-ft and, in 2014, the lowest storage was reported on October 29 at 3,820 acre-ft, or 1% of capacity (Table 2). From 2012 to 2013 and again from 2013 to 2014, the reservoir level fluctuated dramatically and dropped rapidly in the summer, which likely affected spawning, growth, and survival of many fish species. Many of the sport fish species in Lahontan Reservoir use inundated vegetation during spring and early summer as spawning habitat and it additionally provides cover for their young during the summer. When reservoir levels are low and/or drop dramatically, this crucial habitat is not available, which has a detrimental impact on the fishery. The average monthly reservoir level during 2014 was 42,844 AF, which represents the lowest in recent history. In 2013, it was 68,273 AF, which was similar to 2008 (76,139 AF) and 2009 (76,887 AF). Maximum reservoir storage in 2014 was reached on April 7 (much sooner than usual and the same day as 2013) at 95,970 AF or 31% of capacity. At this level, much of the vegetation in bays,

the river inlet, and sandy beaches was not inundated. Secchi depths were taken in June, August, and September with an average visibility of five feet.

Table 2

Lahontan Reservoir
Annual Storage (acre-feet)

	2006	2007	2008	2009	2010	2011	2012	2013	2014
Jan	221,277	159,900	91,200	39,530	27010	95,790	188,600	65,140	40,880
Feb	245,282	174,900	101,900	56,040	49600	117,200	201,600	78,410	54,480
Mar	274,233	205,600	110,300	74,830	71970	132,100	211,400	98,580	74,830
Apr	235,779	231,900	121,100	103,500	99800	176,100	216,800	123,900	95,880
May	301,658	233,400	106,200	107,400	115400	185,500	200,600	119,600	82,810
Jun	312,396	223,100	120,600	144,700	134000	202,500	184,500	115,300	73,420
Jul	272,916	182,500	108,900	155,900	180900	282,900	142,100	89,110	42,950
Aug	217,263	136,500	69,990	108,200	142700	292,200	97,040	51,010	15,580
Sep	172,965	92,600	30,040	66,010	95970	235,100	56,920	17,610	15,920
Oct	152,970	65,340	16,890	33,890	67900	194,900	33,990	7,530	8,910
Nov	152,302	59,460	11,540	18,670	66420	181,500	23,640	18,640	3,930
Dec	161,079	67,730	25,010	13,970	66760	181,600	35,560	34,450	4,540
Avg.	226,677	152,744	76,139	76,887	93,203	189,783	132,729	68,273	42,844

Document dissolved oxygen and temperature when conducting veliger sampling. Dissolved oxygen was measured on three occasions from June through September and ranged from 2 mg/L to 5 mg/L. Water temperature was measured three feet below the surface on at least 10 days throughout the year and ranged from 63°F (May) to 70°F (September). Temperature and dissolved oxygen levels were suitable for warmwater fish species throughout the year.

Monitor for the presence of quagga mussels by conducting tactile surveys around boat docks and reservoir substrates when on-site. Physical inspection of boat docks, buoys, rocky substrates, and boats all came up negative for adult quagga and zebra mussels.

Conduct quagga mussel veliger sampling through plankton tows at established transects at least three times per year. Plankton tows were conducted three times this year, low water levels during summer (less than 15 ft) made it difficult to get a vertical tow accomplished without inundating the equipment with mud. Results of NDOW and BOR sampling were shared at the annual Aquatic Invasive Species Task Force meeting. Preliminary results, sampling protocol, and an explanation of the potential positive results from previous BOR veliger sampling was presented by BOR during the 2012 annual meeting. In 2014, all NDOW and BOR veliger testing results were negative.

Stock one million walleye fry and 5,000 juvenile wipers. No fish were stocked into Lahontan Reservoir during 2014 due to low water levels (Table 3).

Table 3

Lahontan Reservoir
Stocking History

Year	County	Date	Species	Source	Number	Size (in)
2014	Churchill	N/A	Walleye	Gavins Point NFH	-	
2013	Churchill	4/24/2013	Walleye	Gavins Point NFH	285,000	0.5
2012	Churchill	5/3/2012	Walleye	Gavins Point NFH	438,000	0.5
	Lyon	5/3/2012	Walleye	Gavins Point NFH	500,000	0.5
	Churchill	5/4/2012	Wiper	Colorado Catch	1,000	8
2011	Churchill	6/1/2011	Wiper	Colorado Catch	3,700	9
	Lyon	4/21/2011	Walleye	Gavins Point NFH	475,000	0.5
2010	Churchill	6/3/2010	Wiper	Colorado Catch	3,162	8
	Churchill	4/23/2010	Walleye	Gavins Point NFH	365,000	0.5
	Lyon	4/23/2010	Walleye	Gavins Point NFH	400,000	0.5
2009	Churchill	5/27/2009	Walleye	Gavins Point NFH	486,540	0.5
	Lyon	5/27/2009	Walleye	Gavins Point NFH	437,838	0.5
2008	Churchill	4/22/2008	Walleye	Gavins Point NFH	400,000	0.5
	Lyon	4/22/2008	Walleye	Gavins Point NFH	700,000	0.5

Monitor sport fish populations through gill netting four net nights in late spring/early summer. Gill netting data for 2014 is included in the gill netting history in Table 4. From 2005 to 2007, intensive gill net surveys resulted in an average of 376 net hours; however, in the years since that time, effort has been lessened. For the purpose of evaluation, the use of catch per unit effort (CPUE, in fish caught per hour) is used for comparison instead of total number caught to compensate for the inconsistency in total annual net hours.

Table 4

Lahontan Reservoir
2005 - 2014 Gill Net Data

	White bass		Walleye		Crappie		Wiper		Sac. Blackfish		Catfish Combined		Net Hours
	Number	CPUE	Number	CPUE	Number	CPUE	Number	CPUE	Number	CPUE	Number	CPUE	
2014	4	0.04	9	0.10	3	0.03	0	0.00	4	0.04	41	0.45	92
2013	6	0.06	5	0.05	21	0.21	13	0.13	7	0.07	23	0.23	99
2012	1	0.01	20	0.22	54	0.60	5	0.06	13	0.15	38	0.42	89.5
2011	0	0.00	9	0.09	14	0.14	0	0.00	1	0.01	8	0.08	99
2010	1	0.01	8	0.08	13	0.12	1	0.01	22	0.21	61	0.58	106
2009	0	0	4	0.05	43	0.52	1	0.01	19	0.23	30	0.36	83
2007	266	0.74	105	0.29	78	0.22	262	0.73	28	0.08	160	0.44	360
2006	892	2.19	211	0.52	58	0.14	320	0.78	0	0	55	0.13	408
2005	2	0.01	57	0.16	5	0.01	21	0.06	0	0	19	0.05	360

White bass numbers have remained low compared to densities documented in 2006 and 2007. In Lahontan, white bass tend to exhibit large boom and bust cycles in population numbers. This is represented in Table 4 by the low CPUE of 0.01 during 2005, the high CPUE of 2.19 in 2006, and again a low CPUE of 0.00 in 2009. This is likely attributed to good water years when spawning activity is highly successful due to the abundance of inundated vegetation, which provides protection to YOY white bass

and results in increased survival. In 2014, white bass dominated the beach seine survey, which suggests a successful spawn occurred during the spring.

Table 5

Lahontan Reservoir
2014 Gill Net Size of Fish

	White Bass	Walleye	Crappie	Sac Blackfish	Channel Catfish	White Catfish
Number	4	9	3	4	23	18
Ave. mm	235	519	190	394	362	294
Ave. in	9.6	20.43	7.48	15.51	14.26	11.57

No wipers were caught gill netting during 2014. Sacramento blackfish had an increase in CPUE to 0.15 during 2012 only to have it drop back to 0.07 in 2013 and 0.04 in 2014. Crappie were caught at a rate of 0.21 fish per net hour during 2013, however, numbers fell to near the ten year low during 2014 to 0.03. Walleye catch rate showed an increase during 2012 to 0.22 only to have it fall again in 2013 to 0.05 and 0.10 during 2014. White catfish and channel catfish were evaluated together and appeared to be the least affected by the three year drought, fish per net hour nearly doubled from 2013 to 2014 at 0.23 and 0.45, respectively.

There continues to be wild populations of sport fish in the reservoir despite the dramatic fluctuations and extreme low water level experienced over the past three years. Unfortunately, reservoir levels are forecasted to be extremely low during the summer of 2015 (snowpack is approximately 33% of average for the 2015 water year as of February), therefore populations are not expected to rebound in the near future.

Assess YOY species composition and production through beach seining at least eight locations during late spring/early summer. Only two transects were available for beach seine survey due to extremely low water levels during summer. White bass dominated the limited survey effort, which suggests a small successful spawn occurred during the spring in 2014. Total catch was comprised of 46 white bass averaging 56mm (2.2 in), four crappie averaging 68mm (2.68 in), one yellow perch at 58 mm (2.28 in), one channel catfish at 397 mm (15.63 in), and two white catfish averaging 268 mm (10.55 in). Beach seining was not accomplished during 2013 due to rapidly receding water levels, which resulted in muddy conditions.

MANAGEMENT REVIEW

Catfish appear to be doing well, CPUE from gill net surveys and angler surveys were good, however, white bass dominated the catch during angler surveys (75% of total catch) and beach seining (90% of total catch).

Walleye fry stocking augments natural reproduction in the reservoir and during extremely low water such as in 2008-2010 and 2012-2014, when natural reproduction was limited, it may prove beneficial.

Only large walleye were caught during gill netting in 2014, conversely, no large walleye were caught during gill netting in 2013. During 2012, more than half (60%) of the walleye caught during gill netting surveys were under 10 in, which was a large increase from previous years and suggested that natural reproduction was successful and/or an increase in survivorship of stocked fry occurred during early spring. Conversely, during 2013, no walleye less than 10 in was caught suggesting reproduction and survival of juveniles may be limited during extremely low water years.

No wipers were observed during 2014. During 2013, all wipers caught during gill netting were in the 7.5-10.1 in range suggesting that stocking 8 in fish during 2012 was successful; however, growth was slow during 2013. No wipers have been stocked in the previous two years and it is likely that survival has been low during the three year drought.

No large-scale mortality events were reported during 2014. It was evident that all fish populations benefitted from the above average reservoir levels during 2011; however, population survey results in 2012- 2014 indicated that overall reproduction and survival of sport fish and forage fish was negatively affected during the recent drought.

The Truckee Canal breached in 2008 and, after temporary repairs, the Army Corps of Engineers allowed for a maximum of 350 cfs to be diverted from the Truckee River to Lahontan Reservoir in 2009. Very limited flows occurred in 2010 and no flows were observed in 2011. Major reconstruction of portions of the canal was completed during 2012 and 350 cfs at Derby Dam has continued to flow, although by the time water reached the reservoir, the actual flow was about 200 cfs due to evaporation and infiltration. The canal flowed for most of 2013 and the early part of 2014, however, when flows do not meet downstream demands on the Truckee River, the canal is turned off and flow discontinues to Lahontan.

RECOMMENDATIONS

General Management Objectives:

1. Conduct a general fisheries assessment through opportunistic angler contacts and mail-in, angler questionnaire data.
2. Conduct a general habitat assessment through visual observations of water quantity (lake level) and water quality (clarity) when on site.
3. Document dissolved oxygen and temperature when conducting veliger sampling.
4. Monitor for the presence of quagga mussels by conducting substrate sampling around boat docks and reservoir substrates when on-site.
5. Conduct quagga mussel veliger sampling through plankton tows at established transects at least three times per year.
6. Stock one million walleye fry and 5,000 10 in wipers.
7. Monitor sport fish populations through gill netting four net-nights in late spring/early summer.

8. Monitor sport fish populations through electrofishing four established transects in late spring/early summer.
9. Assess YOY species composition and production through beach seining at least eight locations during late spring/early summer.

Study Specific Objectives:

1. Tag 2,000 hatchery raised wipers with color specific Floy tags.

Prepared by: Kris Urquhart
Fisheries Biologist III
Western Region

Date: February 2015