

NEVADA DEPARTMENT OF WILDLIFE STATEWIDE FISHERIES MANAGEMENT



FEDERAL AID JOB PROGRESS REPORT F-20-48 2012

Lahontan Reservoir
WESTERN REGION



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

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ANNUAL PROJECT REPORT**

State: *Nevada*
Project Title: *Statewide Fisheries Program*
Job Title: *Lahontan Reservoir*
Period Covered: *January 1, 2012 through December 31, 2012*

SUMMARY

This year was a below average water year in the Carson Basin. Reservoir elevation dropped from March through November and the Nevada Division of State Parks closed all boat launches when reservoir levels dropped below safe launching levels.

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 is scheduled to begin during 2013.

The Sacramento blackfish commercial harvest moratorium was suspended in 2008. During 2012, commercial operations resumed normal activities and fish were taken to markets outside Nevada. Upon a suspected positive result for quagga mussels, the commercial fishing permit was amended to prevent the unintentionally spread of mussels. Commercial fishing operations in Lahontan again resumed in the fall of 2011. The operator now must kill all fish prior to hauling them on ice and can use no water from the reservoir.

Gill netting surveys were conducted with 4 nets fished, totaling 89.5 hrs. Crappie, walleye, and catfish dominated the catch, but Sacramento blackfish, yellow perch, white bass, wipers, and carp were also caught.

Walleye fry were stocked again this year to help improve the fishery. Fry averaged 0.5 in and 938,000 were stocked and split evenly between Churchill and Lyon counties during April. Wipers were stocked to augment the existing population. Wipers were purchased from Colorado Catch, averaged 8 in, and 1,000 were stocked at the North Shore Marina during June.

Collection of sport fish for mercury analysis was conducted in 2012. Mercury concentration in fish tissue was higher than average and is likely a result from the large spring runoff during 2011, which scoured upstream sediments and allowed additional mercury to become available for methylation and subsequent bioaccumulation in fish. A "non-consumption of fish" health advisory remains in effect for Lahontan Reservoir.

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. At maximum pool, the deepest point reaches 85 feet. The reservoir is eutrophic, which creates a very productive fishery. Furthermore, methylmercury concentrations in many fishes are above the safe State and Federal consumption level. Nevada State Health Division 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. From 2005 through 2007, there was a commercial harvest moratorium on Sacramento blackfish; in 2011, the moratorium was lifted and blackfish were once again commercially harvested and sent to markets outside of Nevada. Commercial harvest also occurred during 2012.

OBJECTIVES AND APPROACHES

Management Objective: To administer an annual fisheries program that assesses general fish population dynamics, angler use and success, habitat conditions, and maintains contact with necessary land management entities.

Approaches:

- 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.
- Concurrent to gillnet surveys, collect sport fish for mercury monitoring in cooperation with Nevada Division of Environmental Protection.
- Document dissolved oxygen and temperature when setting gillnets.
- Monitor for the presence of quagga mussels by conducting substrate sampling around boat docks and reservoir substrates when on-site.
- Coordinate with the Bureau of Reclamation to conduct quagga mussel veliger sampling through plankton tows at established transects at least three times per year.
- Stock 1 million walleye fry and 3,000 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.

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 of fished; place of residence; and type of bait or lure used. Angler questionnaire data was derived from a survey mailed to about 10% of license purchasers.

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 and clarity was measured directly using a Secchi disk. The Secchi disk measurements were taken in June at three locations (near the dam, at mid-lake on the Churchill County lobe, and in the “Narrows”).

Concurrent to gillnet surveys, collect sport fish for mercury monitoring in cooperation with Nevada Division of Environmental Protection. Fillets of Sacramento blackfish, wiper, walleye, crappie, and white catfish were sent to EPA lab in Richman, CA for analysis.

Document dissolved oxygen and temperature when setting gillnets. Temperature was recorded with each visit to the reservoir. Dissolved oxygen was not recorded during 2012 due to availability of equipment; the D.O. probe of the Hydrolab was inoperative at the time.

Monitor for the presence of quagga mussels by conducting substrate sampling around boat docks and reservoir substrates when on-site. Sampling was conducted through inspection of boat docks at Sportsman’s Marina and Silver Springs boat launch. Buoys and rock structures were also inspected for adult quagga mussels by snorkeling during three occasions in spring and summer.

Coordinate with the Bureau of Reclamation to conduct quagga mussel veliger sampling through plankton tows at established transects at least three times per year. Coordination consisted of communications between Bureau of Reclamation (BOR) and NDOW regarding results of respective agency sampling.

Stock one million walleye fry and 3,000 juvenile wipers. A total of 938,000 walleye fry averaging 0.5 in were stocked on April 18 and April 25. Fish were received from Gavin’s Point National Fish Hatchery in South Dakota. They were planted around the reservoir in Churchill and Lyon counties. On June 7, 1,000 juvenile wipers averaging 8 in were stocked.

Monitor sport fish populations through gill netting four net nights in late spring/early summer. Locations of gill nets were in L-Cove, Crappie Cove, Catfish Cut, and 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 3-lbs weights. Net were 120 ft long, 6 ft deep, and mesh sizes ranging from 0.5 to 2.5 in, which increased 0.5 in increments every 20 ft.

Assess YOY species composition and production through beach seining at least eight locations during late spring/early summer. Beach seining was not accomplished during 2012 due to rapidly receding reservoir levels. Muddy beaches made it difficult walk and effectively collect a sample. Time was spent measuring fish collected by the commercial operator.

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 2012, 29 anglers were contacted; catching mostly white bass and crappie, but wipers and walleye were also caught. The catch rate was 1.21 fish per angler hour, which represents an increase from 2010 and 2011. Angler catch rates in 2011 were 0.54 fish per day and 1.21 fish per hour and in 2010 were 0.74 fish per day and 0.26 fish per hour. Angler use in 2012 was similarly low to the previous 3 years and was likely due to cool spring temperatures and low reservoir levels.

Angler use reported from the mail-in angler questionnaire was again low in 2011 (Table 1) and this was likely due to low reservoir levels. Angler catch rate was down at 1.80 fish per angler day.

Table 1

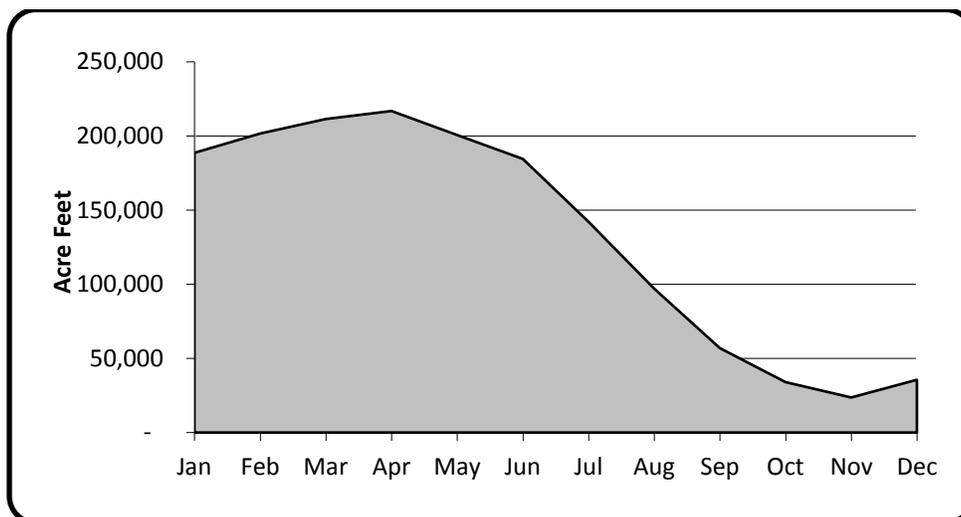
Historical, Mail-in, Angler Questionnaire Survey Summary

	2006	2007	2008	2009	2010	2011
No. Anglers	4,294	5,432	2,020	3,375	2,495	2,267
No. Days Fished	22,106	43,304	11,082	18,065	13,110	10,668
No. Fish Caught	109,265	260,005	66,960	46,804	28,845	19,208
No. Fish Per Angler Day	4.94	6.00	33.01	2.59	2.20	1.80
Average Storage	226,677	152,744	76,139	76,887	189,783	132,729

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.

Figure 1

Monthly Reservoir Storage (Acre-Feet)



Maximum capacity at Lahontan Reservoir is 319,000 acre-ft and, in 2012, the lowest storage was reported on November 9 at 22,480 acre-ft, or 7% of capacity (Table 2). From 2008 to 2010 and again during 2012, the reservoir level fluctuated dramatically and dropped rapidly in the summer, which likely affected spawning and growth of many fish species. During 2011, however, reservoir levels increased throughout the year and did not drop as dramatically in the fall. This was due to a late and wet spring and summer. Many of sport fish species use inundated vegetation during spring and early summer as spawning habitat as well as it provides cover for their young during the summer. Average monthly reservoir level during 2012 was 132,729 acre-ft (AF), which was nearly doubled from 2008 (76,139 AF) and 2009 (76,887 AF). However, the minimum storage level during 2012 was the lowest occurring in the previous 10 years. Maximum reservoir storage in 2012 was reached on March 8 (much sooner than usual) at 213,000 AF or 67% of capacity. At this level, much of the vegetation in bays, river inlet, and sandy beaches was not inundated. Secchi depth was taken on June 12 and visibility was 3.0 ft. This was expected for this time of year due to aquatic vegetation and turbidity from high summertime out-flows.

Concurrent to gillnet surveys, collect sport fish for mercury monitoring in cooperation with Nevada Division of Environmental Protection. A health advisory issued by the Division of Public and Behavioral Health that recommends anglers consume no fish from the Carson River Basin below Dayton, including Lahontan Reservoir due to mercury concentrations found in fish. Fish analyzed for mercury in 2012 is shown in Table 3. During 2011, high spring runoff probably contributed to the above average levels of mercury found in fish during 2012. Mercury was likely scoured from sediments above the high water line in the Carson River during spring flood flows transported to Lahontan Reservoir. Mercury became available for bacterial methylation in lake sediments and then was taken up by benthic organisms. It quickly worked its way up the food chain and bioaccumulated in fish.

Table 2

Lahontan Reservoir
Annual Storage (acre-feet)

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

Document dissolved oxygen and temperature when setting gillnets. Dissolved oxygen was not measured during 2012 due to equipment failure. Water temperature was measured on at least 10 days throughout the year and ranged of 62°F to 75°F, which was suitable for warmwater fish species.

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

Coordinate with the Bureau of Reclamation to conduct quagga mussel veliger sampling through plankton tows at established transects at least three times per year. Results of NDOW and BOR sampling were shared at the annual Aquatic Invasive Species Task Force meeting. A presentation of the preliminary results, sampling protocol, and an explanation of the potential positive results from previous BOR veliger sampling was also given by BOR. All veliger testing results for 2012 were negative.

Stock one million walleye fry and 3,000 juvenile wipers. A total of 938,000 walleye fry averaging 0.5 in were stocked on April 18 and April 25. Seven boxes containing approximately 2 gal of water each had a temperature of 58.1°F and were tempered for a minimum of 30 min to reach reservoir a temperature of 66.2°F degrees Celsius before the fry were released. Mortality was estimated at 5-20% The fish were received from Gavin’s Point National Fish Hatchery in South Dakota. The fry were planted in Churchill and Lyon counties.

On June 7, 1,000 juvenile wipers averaging 8 in were stocked into Lahontan at the Sportsman Beach State Park in Churchill County. Fish were hauled by permit from Colorado Catch Hatchery and mortality was less than 5%.

Table 3

Lahontan Reservoir
Hg Sampling 2012

Species	Length mm	Weight grams	Mercury Wet (mg/kg)
Sac. Blackfish	380.0	680	1.90
Sac. Blackfish	425.0	880	2.20
Sac. Blackfish	396.0	760	2.00
Sac. Blackfish	410.0	920	1.80
Sac. Blackfish	405.0	840	2.10
Average	403.2	816.0	2.00
Wiper	420.0	820	6.50
Average	420.0	820.0	6.50
Walleye	415.0	650	3.10
Walleye	370.0	480	3.30
Walleye	232.0	82	3.00
Walleye	250.0	125	2.00
Walleye	270.0	143	3.00
Average	307.4	296.0	2.88
Crappie	250.0	210	1.50
Crappie	275.0	260	2.20
Crappie	279.0	290	1.90
Crappie	310.0	420	2.60
Crappie	270.0	260	3.00
Average	276.8	288.0	2.24
White catfish	300.0	350	1.60
White catfish	280.0	310	1.90
White catfish	273.0	240	3.20
White catfish	312.0	400	1.80
Average	291.3	325.0	2.13

Monitor sport fish populations through gill netting four net nights in late spring/early summer. Gill net data shows 89.5 net hours fished during 2012 (Table 4), but during 2005 to 2007, net hours averaged 376 hrs. The inconsistency in total annual net hours is compensated for by using catch per unit effort (CPUE, in fish caught per hour) during evaluation instead of total number caught.

No adult white bass were captured in 2009, only one was caught during 2010, none were caught during 2011, and only one was caught during 2012. White bass have exhibited a boom and bust cycle in population numbers, represented 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. Sacramento blackfish have recently shown an increase in CPUE to 0.15 during 2012. Crappie were caught at a rate of 0.6 fish per net hour during 2012, which was a 7 yr high. Walleye and wipers were also caught at greater rates than during the previous four years.

Table 4

Lahontan Reservoir
2012 Gill Net Data

	White bass		Walleye		Crappie		Wiper		Sac. Blackfish		Net Hours
	Number	CPUE	Number	CPUE	Number	CPUE	Number	CPUE	Number	CPUE	
2012	1	0.01	20	0.22	54	0.60	5	0.06	13	0.15	89.5
2011	0	0.00	9	0.09	14	0.14	0	0.00	1	0.01	99
2010	1	0.01	8	0.08	13	0.12	1	0.01	22	0.21	106
2009	0	0	4	0.05	43	0.52	1	0.01	19	0.23	83
2007	266	0.74	105	0.29	78	0.22	262	0.73	28	0.08	360
2006	892	2.19	211	0.52	58	0.14	320	0.78	0	0	408
2005	2	0.01	57	0.16	5	0.01	21	0.06	0	0	360

All fish with the exception of white bass showed an increase in CPUE during 2012 in spite of extremely low reservoir levels during the summer. This may be due to an increase in fish concentration and larger percentage of cover area by the nets based on a smaller lake area. The changes observed from 2009 through 2012 also suggest that the walleye population is increasing and becoming more stable.

Two wipers caught measured less than 5 in. This was well below the average 8 in stock size and suggests that back crossing with white bass may be occurring.

Assess YOY species composition and production through beach seining at least eight locations during late spring/early summer. Beach seining was not accomplished during 2012. This time was instead spent measuring fish collected by the commercial operator. An unannounced random inspection on July 18 found the commercial operator complied with all permit stipulations. All game fish captured by the operator were measured and compared with reported results from previous hauls. Reported and actual numbers appeared to be similar and consistent with NDOW gill netting data (Figure 2). Average size of wiper and walleye were higher in the commercial operators haul (Figure 3), which may result from limitations with gill netting (very large fish can escape before becoming trapped.)

Figure 2.

Lahontan Reservoir
2012 Gill Net and Commercial Haul Percentage

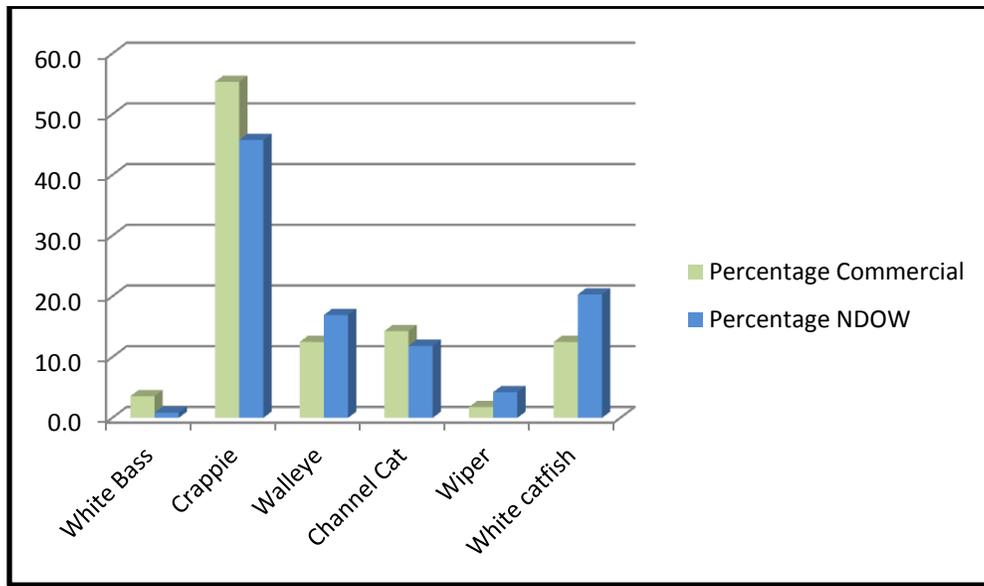
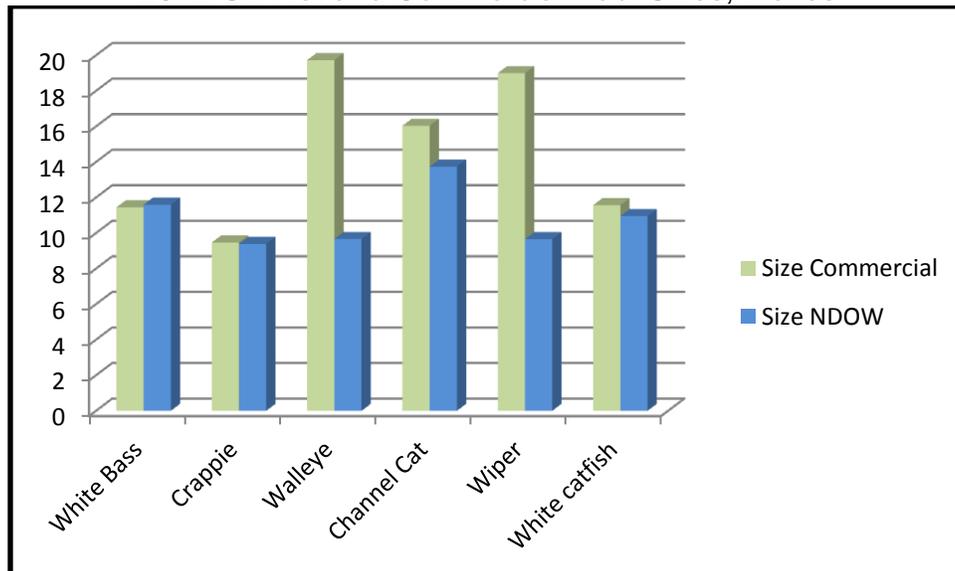


Figure 3.

Lahontan Reservoir
2012 Gill Net and Commercial Haul Sizes, Inches



MANAGEMENT REVIEW

Approaches were completed during 2012 with the exception of dissolved oxygen monitoring and beach seining.

White crappie appear to be doing well, CPUE from gill net surveys and angler surveys were good. Between white and black crappie, white crappie made up approximately 90% of the catch. Walleye fry stocking augmented natural reproduction occurring in the reservoir and during extremely low water such as in 2008-2010 and 2012, when natural reproduction is limited, it may prove beneficial.

No large walleye were caught during gill netting in 2012. More than half (60%) of walleye caught during gill netting were under 10 in, which was a large increase from previous years and suggests that natural reproduction was successful and/or an increase in survivorship of stocked fry occurred during early spring.

No large-scale mortality events were reported during 2012. It is expected that all fish populations benefitted from the above average reservoir levels during 2011 however overall reproduction of sport fish and forage fish is likely to have suffered during 2012.

The Truckee Canal was breached in 2008 and after temporary repairs, the Army Corps of Engineers allowed only 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 the 350 cfs flow at Derby Dam reached the reservoir at about 200 cfs due to evaporation and infiltration.

RECOMMENDATIONS

A study should be initiated to determine the effectiveness of current regulations on white bass and wipers, which states a limit of 15 fish. On several occasions during 2011 and 2012, anglers were found to be harvesting up to ten wipers per day. Given that wipers do not reproduce and must be augmented annually, this type of harvest may not be sustainable. Wipers have also proven to grow to world class sizes in Lahontan Reservoir and if favorable conditions exist, then it supports a trophy wiper fishery. Wipers should be stocked as either fry or catchable-sized in order to avoid a gap in age and size class, which is likely to occur in the absence of augmentation.

General Management Objective: To administer an annual fisheries program that assesses general fish population dynamics, angler use and success, habitat conditions, and maintain contact with necessary land management entities.

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

Study Specific Objectives: Wiper Study; Assess size distribution and angler harvest of wipers for determining the success of the current regulation.

1. Collect growth rate and catch rates through hook and line sampling and opportunistic angler contacts during spring and summer.
2. Tag 2,000 hatchery raised wipers with color specific Floy tags.
3. Concurrent to monitoring sport fish populations (gill netting and beach seining) assess wiper life history information including growth rates and life span.
4. Use data collected through tagged fish return to assess wiper life history information including growth rates and life span.

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