NEVADA DEPARTMENT OF WILDLIFE
STATEWIDE FISHERIES MANAGEMENT

FEDERAL AID JOB PROGRESS REPORTS

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2016

RYE PATCH RESERVOIR
WESTERN REGION

NEVADA DEPARTMENT OF WILDLIFE, FISHERIES DIVISION
ANNUAL PROGRESS REPORT

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ANNUAL PROGRESS REPORT

State: *Nevada*
Project Title: *Statewide Fisheries Program*
Job Title: *Rye Patch Reservoir*
Period Covered: *January 1, 2016 through December 31, 2016*

SUMMARY

Rye Patch Reservoir finally received noticeable water flow from the Humboldt River in 2016 after three consecutive years of receiving virtually no water. The water level was low starting in January 2016 and increased steadily until July when the reservoir level began to decrease due to irrigation demands. The main boat ramp was accessible during the majority of the year, but the Pitt Taylor boat ramp was left dry for the entire year. Reservoir levels varied from a minimum of 10,380 AF to a maximum of 57,790 AF and the Pershing County Water Conservation District (PCWCD) did release water from the reservoir in 2016 for downstream irrigation.

Angler success was gauged through opportunistic angler contacts and mail-in angler questionnaire data. Anglers were contacted in May and June 2016. Mail-in angler questionnaire data was received from 2015. Walleye fry, wiper, channel catfish, and rainbow trout were stocked into Rye Patch Reservoir during 2016. Nevada Carp Corporation did conduct commercial fishing operations to harvest Sacramento blackfish in fall and winter.

In the fall and winter of 2015, a fish die off occurred at Rye Patch Reservoir that was caused by a bloom of toxic golden algae. The loss to the fishery was significant, but increased fish stocking occurred in 2016 to rebuild the fishery.

BACKGROUND

Rye Patch Reservoir, located on the Humboldt River east of Lovelock, Nevada in Pershing County, covers 10,280 surface acres, stores 213,000 AF, and has a maximum depth of 61 feet when full. The water in the reservoir is controlled by PCWCD and is used for irrigation downstream in Lovelock Valley. The reservoir is located within the Rye Patch State Recreation Area managed by Nevada Division of State Parks.

Reservoir levels have historically fluctuated as irrigation demands changed and in recent years, the below normal precipitation failed to fill the reservoir. This greatly influences angler use and success. Rye Patch Reservoir is currently managed as a general warmwater fishery, supporting one of the few walleye fisheries in the state. Other popular game fish include wiper, crappie, catfish, largemouth bass, smallmouth bass, spotted bass, bluegill, yellow perch, and rainbow trout. Commercial fishing operations are also present and target Sacramento blackfish.

OBJECTIVES

- Conduct a general fisheries assessment through opportunistic angler contacts and mail-in, angler questionnaire data.
- Conduct a general habitat assessment by monitoring reservoir storage and water quality when on site.
- Monitor population of fish species by conducting 2 net-nights of gill netting, 2 net-nights of frame netting, 10 electroshocking transects, and 5 beach seining transects.
- Stock approximately one million walleye fry, 3,000 walleye, 2,000 channel catfish, 5,000 white bass, 2,000 crappie, 2,000 yellow perch, and 3,000 wipers.
- Coordinate with Bureau of Reclamation to conduct quagga mussel veliger sampling using plankton tows at established transects at least three times per year.
- Monitor for the presence of quagga mussels by conducting tactile surveys around boat docks and reservoir substrates when on-site.
- Coordinate with NDEP on water quality sampling to specifically monitor salinity and nutrient levels that are favorable for a golden algae (*Prymnesium parvum)* bloom.

PROCEDURES

Conduct a general fisheries assessment through opportunistic angler contacts and mail-in angler questionnaire data. Opportunistic angler contacts were conducted throughout 2016, but only nine angler contacts were made in May and June. Angler success was measured as fish per angler and fish per hour. Additionally, species of fish caught and the size of fish caught were recorded.

The 2015 mail-in angler questionnaire data was summarized. The voluntary angler questionnaire was mailed to 30,000 of the fishing license holders for the year to estimate angler use and success for waters around the state.

Conduct a general habitat assessment by monitoring reservoir storage and water quality when on site. While on site at Rye Patch Reservoir, visual assessments were made about general habitat conditions, reservoir levels, and storage in 2016.

Monitor population of fish species by conducting two net nights of gill netting, two net nights of frame netting, ten electroshocking transects, and five beach seining transects. Monitoring fish species composition and size class strength was completed throughout the spring and summer of 2016. The commercial fishing operation crew was utilized to sample nine transects using the 1,200 ft purse seine in March, April, and June. Gill netting was conducted four net-nights using 140 ft x 6 ft monofilament experimental gill nets divided into seven different mesh sizes ranging from 0.5 to 2.0 in. Frame net surveys were conducted four net-nights using fyke type frame nets with two 25 ft wings and one 50 ft lead anchored and set perpendicular to the shoreline. A buoy was used to mark the location of each gill net and frame net set. Electroshocking and beach seining was not conducted in 2016.

Stock approximately one million walleye fry, 3,000 walleye, 2,000 channel catfish, 5,000 white bass, 2,000 crappie, 2,000 yellow perch, and 3,000 wipers. Walleye fry, wiper, channel catfish, and rainbow trout were stocked into Rye Patch Reservoir in 2016.

Coordinate with Bureau of Reclamation to conduct quagga mussel veliger sampling through plankton tows at established transects three times per year. Veliger sampling followed guidelines outlined in the Bureau of Reclamation Sample Collection Protocols for Dreissenid Veliger Early Detection Monitoring.

Monitor for the presence of quagga mussels by conducting tactile surveys around boat docks and reservoir substrates when on-site. Tactile and visual monitoring for the presence of adult quagga mussels around boat docks and reservoir substrates was completed throughout 2016.

Coordinate with NDEP on water quality sampling to specifically monitor salinity and nutrient levels that are favorable for a golden algae (*Prymnesium parvum)* bloom. NDOW coordinated with NDEP to conducted annual water quality sampling on Rye Patch Reservoir in 2016

FINDINGS

Conduct a general fisheries assessment through opportunistic angler contacts and mail-in angler questionnaire data. Nine anglers were contacted with success rates that averaged 0.33 fish per angler and 0.30 fish per hour. Table 1 summarizes this data by month. There were three fish measured that are presented in Table 2.

Table 1. Rye Patch Reservoir Opportunistic Angler Surveys 2016.

Month	Survey Days	Anglers	Angler Hours	Fish	Fish/Angler	Fish/Hour
May	6	4	10	1	0.25	0.10
June	7	5	11	2	0.40	0.50
Summary	13	9	21	3	0.33	0.3

Table 2. Length Frequency and Species Composition Data 2016.

Species	# Caught	Size Class							
		<10”	10-11.9”	12-13.9”	14-15.9”	16-17.9”	18-19.9”	20-24.9”	>25”
Channel catfish	1	0	0	1	0	0	0	0	0
Wiper	2	0	0	0	0	2	0	0	0

Angler success rates for the 2015 mail-in angler questionnaire were of 1.49 fish per day and 5.36 fish per angler, which was below the 5-year average of 1.87 fish per day and 7.72 fish per angler. Historical data from the mail-in angler questionnaire are presented in Figures 1 and 2.

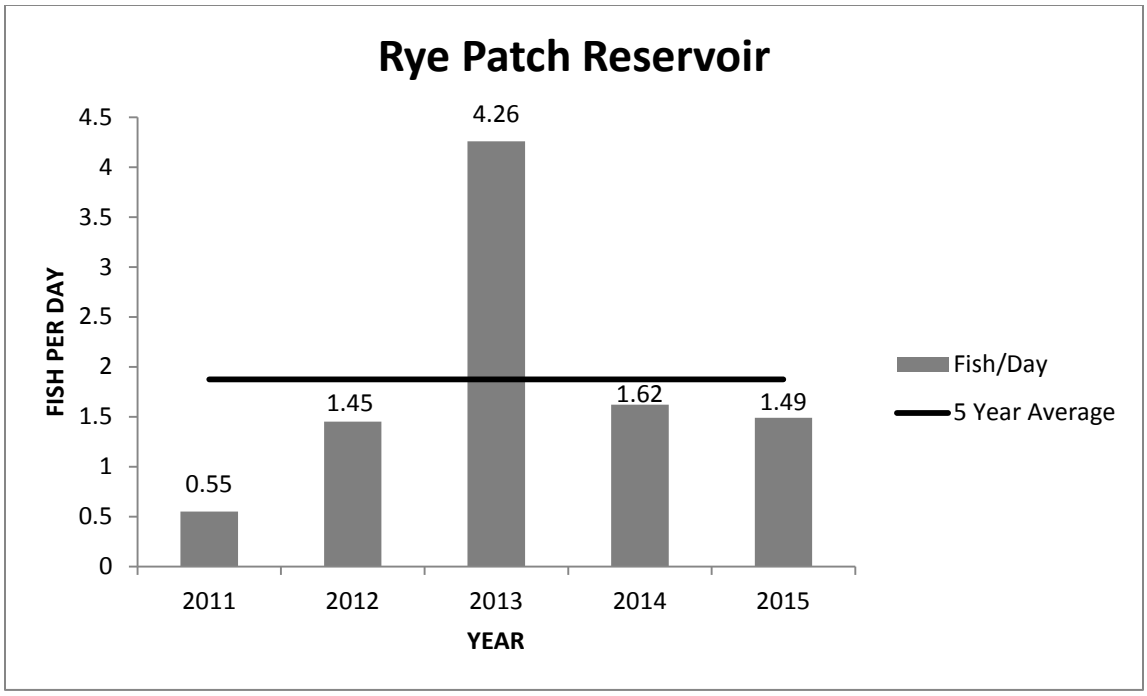

Figure 1. Rye Patch Reservoir Angler Questionnaire fish/day 2011-2015.

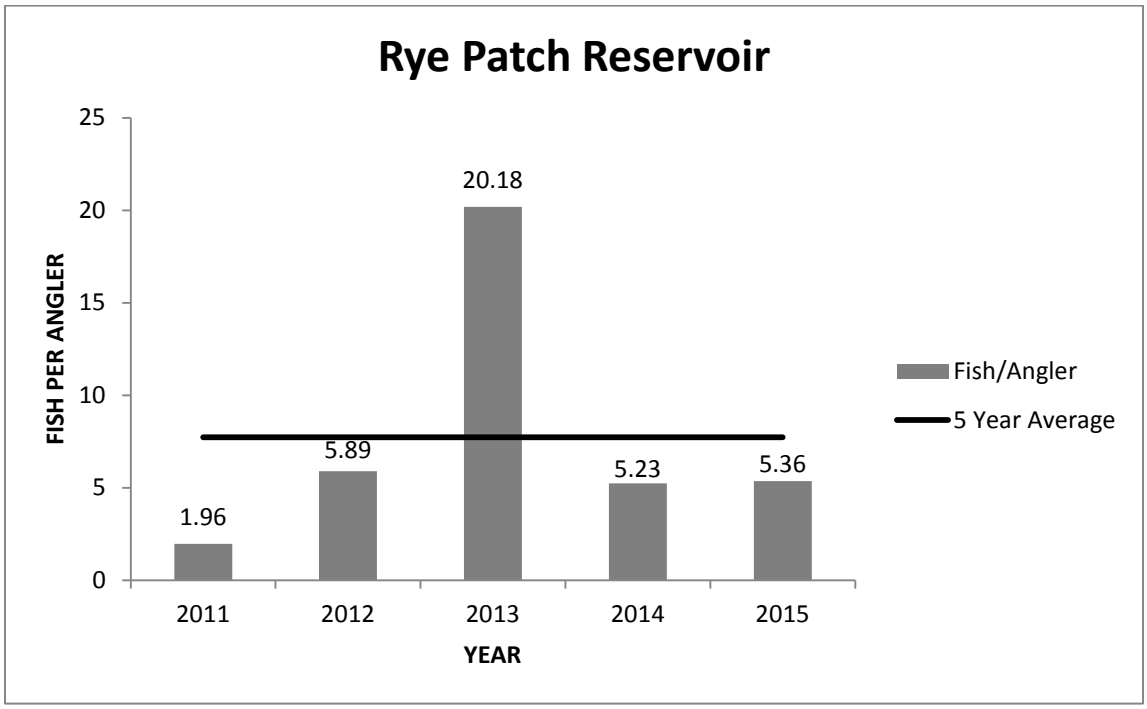

Figure 2. Rye Patch Reservoir Angler Questionnaire fish/angler 2011-2015.

Conduct a general habitat assessment by monitoring reservoir storage and water quality when on site. During 2016, Rye Patch Reservoir received flow from the Humboldt River. Water levels increased from January to July, which inundated willows, tamarisks, and other shoreline vegetation that had grown over the past three years. Water levels declined from July through November when water was released to meet

downstream irrigation demands. Figure 3 portrays Pershing County Water Conservation District monthly water storage records for Rye Patch Reservoir throughout the year.

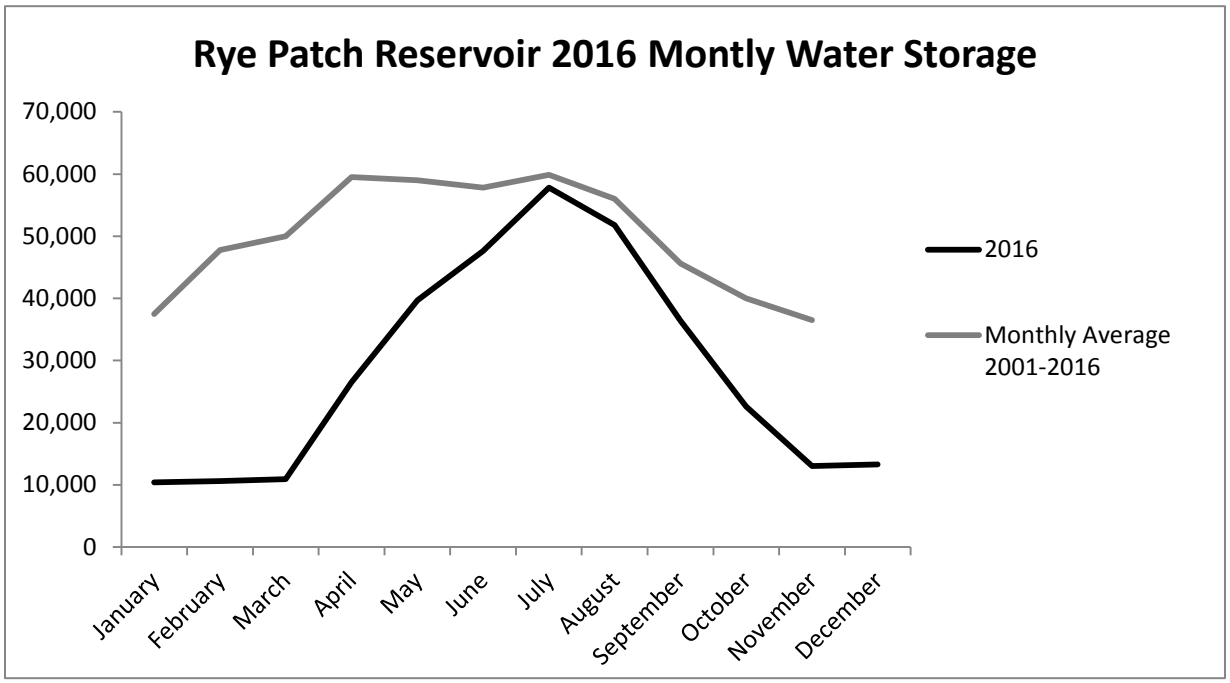

Figure 3. Monthly water storage at Rye Patch Reservoir 2016.

Monitor population of fish species by conducting 2 net nights of gill netting, 2 net nights of frame netting, 10 electroshocking transects, and 5 beach seining transects. Fish were monitored during 17 sampling events in March, April, May, and June 2016 (Table 3). Sampling included gill netting, frame, netting, and purse seining. Electroshocking did not occur in 2016 due to mechanical issues with the electroshocking boat.

Gill netting, frame netting, and purse seining surveys resulted in capturing two wipers averaging 7.2 in (182.5 mm), 50 channel catfish averaging 13 in (330 mm), 283 carp measuring 16.4 in (416 mm), and 1,463 Sacramento blackfish measuring 15.4 in (391 mm). Species composition and length frequencies for channel catfish, carp, and Sacramento blackfish are summarized in Figures 2 through 5.

Stock approximately one million walleye fry, 3,000 walleye, 2,000 channel catfish, 5,000 white bass, 2,000 crappie, 2,000 yellow perch, and 3,000 wipers. About 1,200,000 walleye fry, 4,135 channel catfish, 2,091 wiper, and 500 rainbow trout were stocked into Rye Patch Reservoir in 2016. The five-year stocking history is summarized in Table 5.

Table 3. Rye Patch Reservoir purse seine, gill net, and frame net locations 2016.

Sample Number	Date	Sample Type	UTM (NAD 83)		Time		Soak Time/shock time
			Easting	Northing	Set	Pulled	
1	3/17/2016	Purse Seine	389323	4488026	--	--	--
2	3/26/2016	Purse Seine	388973	4485237	--	--	--
3	3/26/2016	Purse Seine	389363	4489445	--	--	--
4	4/3/2016	Purse Seine	388807	4480993	--	--	--
5	4/3/2016	Purse Seine	388922	4482050	--	--	--
6	5/23/2016	Frame net	388348	4484943	1100	1100	24 hr
7	5/23/2016	Frame Net	388524	4485073	1115	1115	24 hr
8	5/23/2016	Gill Net	388720	4484088	1030	1130	25 hr
9	5/23/2016	Gill Net	388758	4482139	1000	1130	25.5 hr
10	5/24/2016	Frame net	388348	4484943	1030	1130	25 hr
11	5/24/2016	Frame net	388524	4485073	1100	1200	25 hr
12	5/24/2016	Gill Net	388720	4484088	1130	1230	25 hr
13	5/24/2016	Gill Net	388758	4482139	1200	1300	25 hr
14	6/25/2016	Purse Seine	389171	4488020	--	--	--
15	6/25/2016	Purse Seine	389770	4491540	--	--	--
16	6/26/2016	Purse Seine	388844	4482312	--	--	--
17	6/26/2016	Purse Seine	388424	4484534	--	--	--

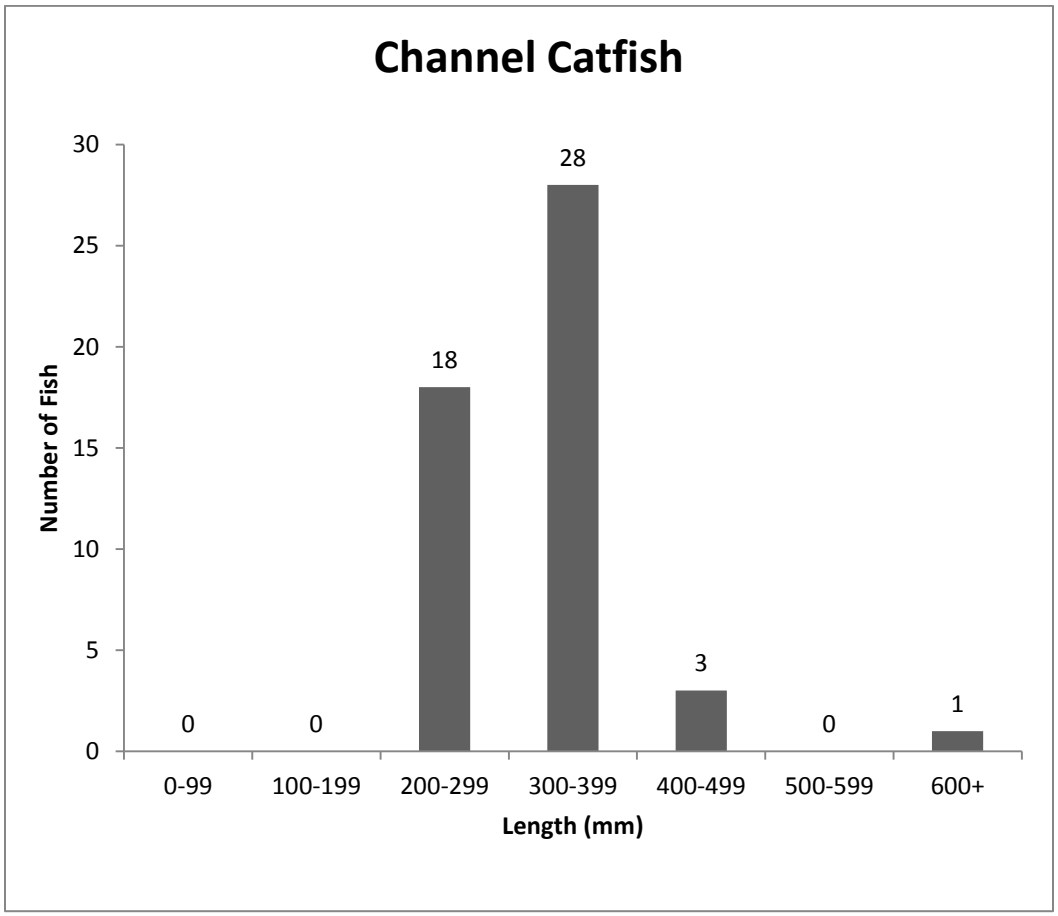

Figure 2. Length frequencies of channel catfish in Rye Patch Reservoir 2016.

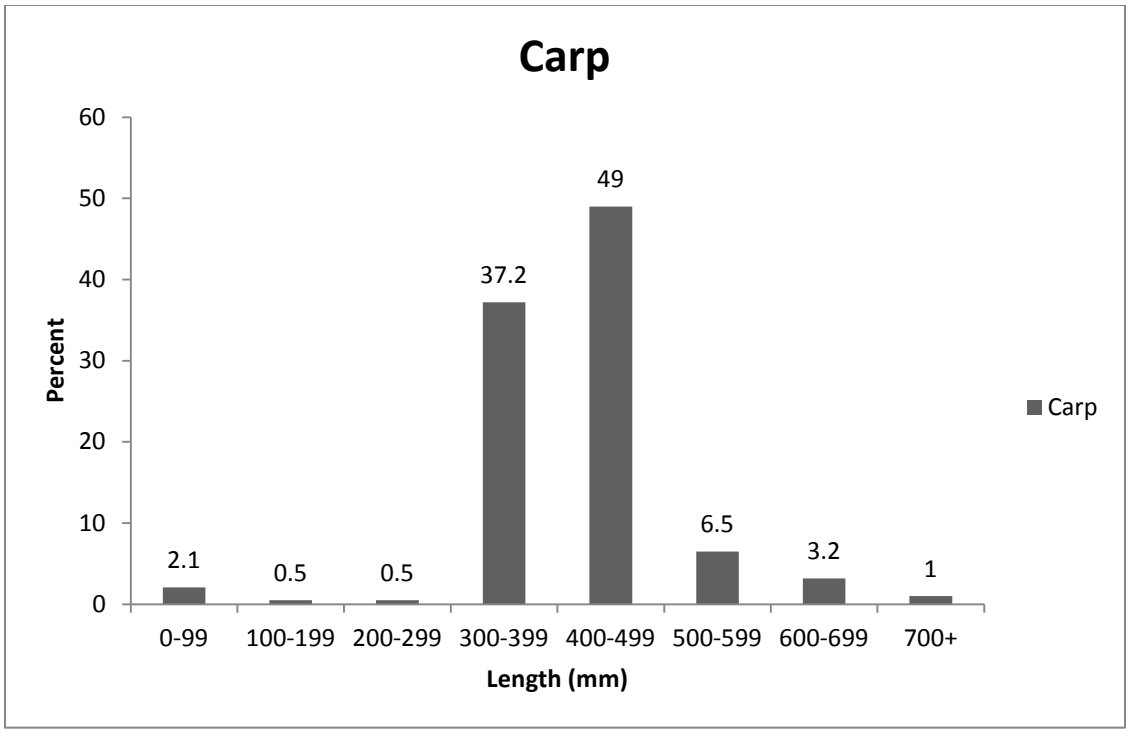

Figure 3. Length frequencies of carp in Rye Patch Reservoir 2016.

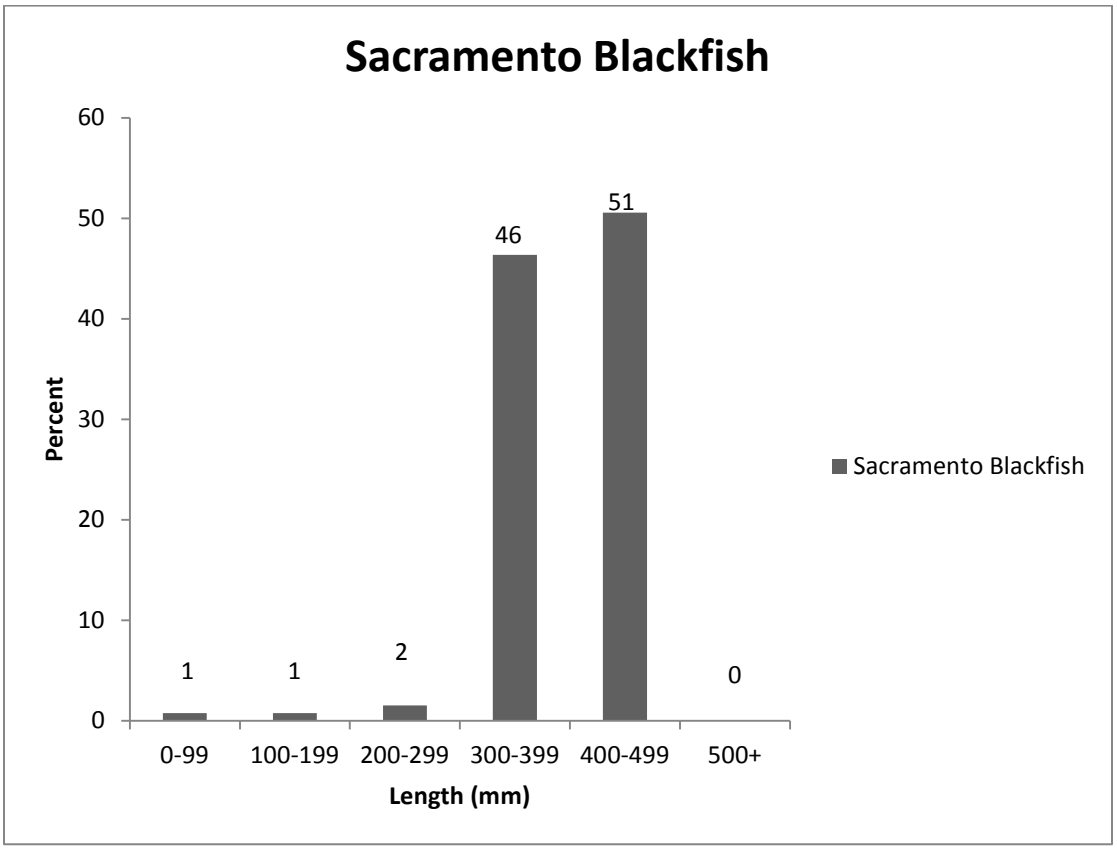

Figure 4. Length frequencies of Sacramento blackfish, Rye Patch Reservoir 2015**.**

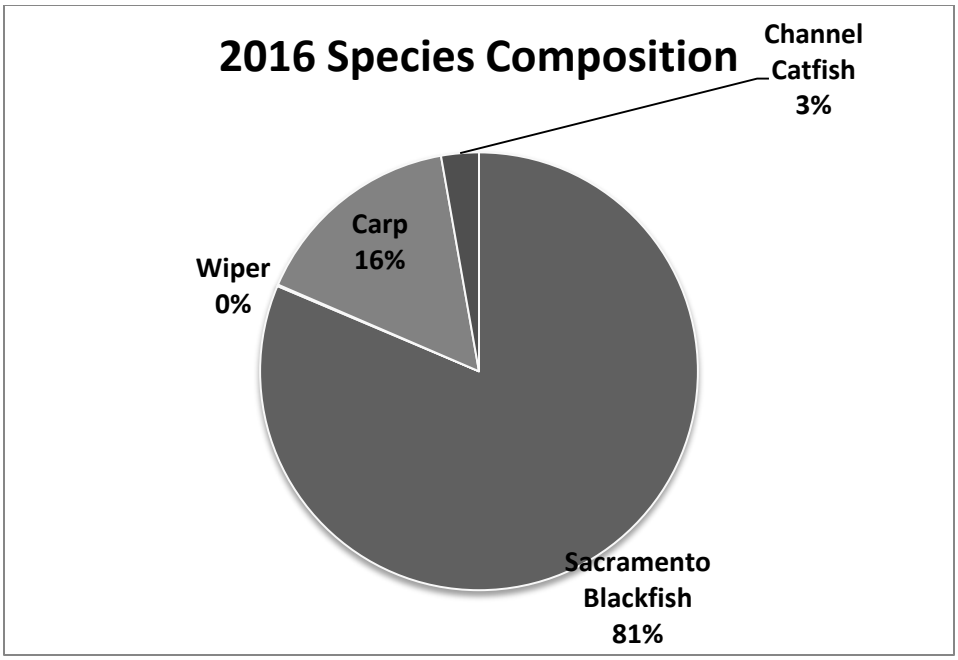

Figure 6. Rye Patch Reservoir game fish species composition 2016**.**

Table 5. Rye Patch Reservoir Fish Stocking Records 2012-2016.

Year	Species	Strain	Source	Number of Fish	Pounds of Fish	Average Size (inches)
2012	Rainbow	Eagle Lake	Mason Valley, NV	501	157	9.2
	Walleye	–	Gavins Point NFH, SD	750,000	–	0.5
	Wiper	–	Colorado Catch	3,700	925	8.0
2013	Rainbow	Eagle Lake	Mason Valley	500	222	10.4
	Walleye	–	Gavins Point NFH, SD	300,000	–	0.5
	Wiper	–	Colorado Catch	20,000	900	4
2014	–	–	–	–	–	–
2015	Walleye	--	Gavins Point NFH	1,000,000	--	--
	Rainbow	Triploid	Mason Valley, NV	518	175	9.5
2016	Walleye	--	Gavins Point NFH, SD	1,200,000	--	0.5
	Channel catfish	--	Colorado Catch	4,135	364	5
	Wiper	--	Colorado Catch	2,091	239	7
	Rainbow Trout	Triploid	Mason Valley, NV	500	169	7.5

– No data available

Coordinate with Bureau of Reclamation to conduct quagga mussel veliger sampling through plankton tows at established transects three times per year. All quagga mussel sampling in 2016 by NDOW and BOR were negative for veligers.

Monitor for the presence of quagga mussels by conducting tactile surveys around boat docks and reservoir substrates when on-site. The main Rye Patch Reservoir boat dock, Pitt-Taylor boat launch, and several areas with substrates suitable for adult quagga mussels were surveyed visually and tactilely on different visits in 2016. All tactile and visual surveys were negative for adult quagga mussels.

GENERAL MANAGEMENT REVIEW

Analysis of the mail-in angler questionnaire data from 2015 revealed that angler success was slightly below average. Nevada Carp commercially fished during the fall and winter of 2015 and they assisted NDOW in assessing the impacts of the fish die off that occurred in the fall and winter of 2015.

Reservoir storage data was provided by PCWCD for the beginning of each month. In 2016, Rye Patch Reservoir stored a maximum of 57,790 AF, 29 % of the reservoir's capacity. Water was released for irrigation in 2016 and irrigation drew the reservoir down to 13,025 AF in November. BOR collected samples to monitor for the presence of quagga mussels and all samples were negative for veliger presence. Visual observations of the boat ramp, dam, and hard substrates near the boat ramp did not reveal adult quagga mussels.

Sport fish species composition and length frequency monitoring was tracked through gill netting, frame netting, and purse seining. Wiper and channel catfish were the only game fish represented and Sacramento blackfish and carp were the most abundant fish species found in 2016. Walleye and crappie were not found during sampling, probably due to a bloom of toxic golden algae during winter of 2015. The effects of the bloom resulted in a significant reduction of all fish species. Channel catfish, carp, and Sacramento blackfish, however, did not appear to be affected as much as the other fish species. Water temperature and elevated chloride levels are major driving factors creating an environment for toxic golden algae blooms.

Mossback artificial fish habitat structures were purchased using Habitat Conservation Fee funding to provide escape cover for game fish and baitfish fry and fingerlings in areas that lacked cover and structure. Complex aquatic habitat with various types and layers of structure promotes healthy, abundant populations for many fish species through protection from predation and production of invertebrate food sources. These structures also attract larger fish and in turn increase angling opportunity. During periods of low water, Rye Patch Reservoir, lack beneficial habitat for fish (Appendix A).

RECOMMENDATIONS

- Conduct a general fisheries assessment through opportunistic angler contacts and mail-in, angler questionnaire data.
- Conduct a general habitat assessment by monitoring reservoir storage and water quality when on site.
- Monitor population of fish species and fish condition (relative weight) by conducting 2 net nights of gill netting, 2 net nights of frame netting, 10 electroshocking transects, and 5 beach seining transects.
- Stock approximately one million walleye fry, 3,000 walleye, 2,000 channel catfish, 5,000 white bass, 2,000 crappie, 2,000 yellow perch and 3,000 wipers.

- Coordinate with Bureau of Reclamation to conduct quagga mussel veliger sampling through plankton tows at established transects at least three times per year.

Prepared by: Brad Bauman
Fisheries Biologist
Western Region

Date: March1, 2017

Appendix A

Artificial Aquatic Habitat Structures

Bradley Bauman
Nevada Department of Wildlife

September 6, 2016

Mossback artificial fish habitat structures were purchased using Habitat Conservation Fee funding in order to provide escape cover for game fish and baitfish fry and fingerlings in waters that lack cover and structure. Rye Patch Reservoir was chosen for additional habitat structures due to the lack of complex habitats during periods of low water. Complex aquatic habitat with various types and layers of structure promotes healthy, abundant populations of fishes through protection from predation and production of invertebrate prey. Available habitat also attracts larger fish and in turn increases angler opportunity.

During 2012-2016, severe drought in the Great Basin resulted in low water levels in many Nevada reservoirs. During periods of low levels, no vegetation becomes

inundated to provide game fish and baitfish fry and fingerlings with areas to hide and escape from the piscivorous fishes such as walleye and wiper. Sacramento blackfish and black and white crappie are the main prey species in the reservoir.

The main prey for walleye is Sacramento blackfish. Annual monitoring surveys have revealed a reduction in the smaller class of Sacramento blackfish since 2012. In 2014, the body condition of walleye was very poor due to the lack of smaller size class Sacramento blackfish.

The artificial fish habitat structures were purchased from Mossback Fish Habitat. These structures are designed to provide escape cover for smaller gamefish and baitfish. Mossback Fish Habitats are made of PVC pipe with slots cut into the main pipe where the limbs are inserted, and limbs are made of a combination of low-density polyethylene, paper, and pulp. Three different types of structures were purchased: root wad kit, safe haven kit, and safe haven single-tree (Figure 1-3).

Figure 1. Root wad kit designed to increase structure in shallow water areas to provide cover for baitfish and smaller gamefish (https://mossback-rack-2.myshopify.com/).

Figure 2. Safe haven kit designed to provide structure from the shoreline to deeper waters to provide cover for baitfish and smaller gamefish. (https://mossback-rack-2.myshopify.com/)

Figure 3. Safe haven single tree designed for both shallow and deep water to provide structure and cover for baitfish and smaller gamefish as well as ambush cover for predatory fish. (https://mossback-rack-2.myshopify.com/)

A total of 18 structures were placed in Rye Patch Reservoir on May 23, 24, and 25, 2016 (Figure 4). These structures were placed in five different locations. Each location selected for placement of the structures was near the low water level observed over the last four years. Various types of structures were placed in clusters at each of the five locations (Table 1). Clusters of various structures were chosen to provide a diverse array of escape cover for baitfish and gamefish.

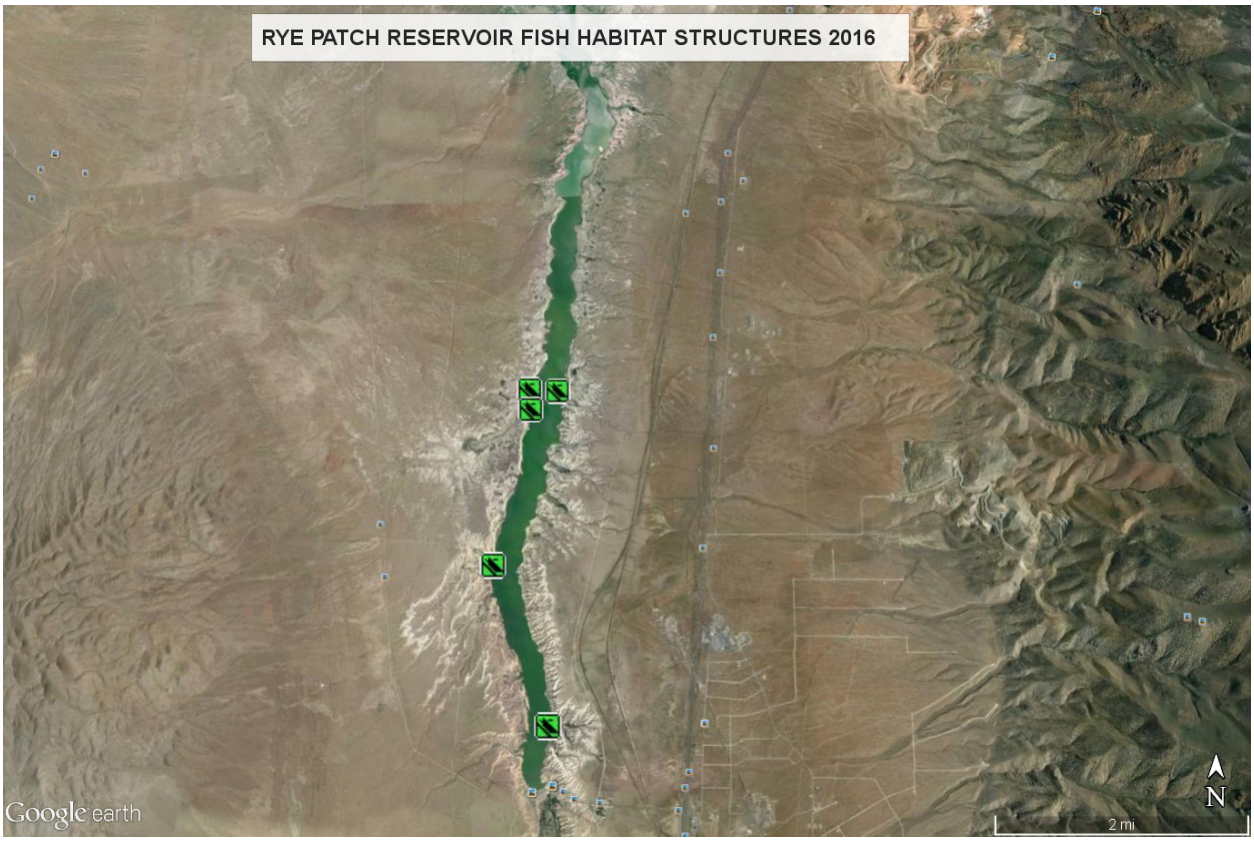

Figure 5. Five locations where structures were placed in clusters at Rye Patch Reservoir on May 23, 24, and 25, 2016.

Table 1. UTM locations and type of structures that were place in Rye Patch Reservoir.

Date	Easting	Northing	Type
5/23/2016	389120	4481526	2 Safe Havens, 1 Root wad, 1 Single Tree
5/23/2016	388276	4483765	3 Safe Havens, 1 Root Wad, 1 Single Tree
5/24/2016	388811	4486185	2 Safe Havens, 1 Single Tree
5/25/2016	389220	4486478	2 Safe Haven, 1 Root Wad, 1 Single Tree
5/25/2016	388791	4486499	1 Safe Haven, 1 Single Tree