

NEVADA DEPARTMENT OF WILDLIFE STATEWIDE FISHERIES MANAGEMENT



FEDERAL AID JOB PROGRESS REPORTS

F-20-52
2016

CHIMNEY RESERVOIR
WESTERN REGION



**NEVADA DEPARTMENT OF WILDLIFE, FISHERIES DIVISION
JOB PROGRESS REPORT**

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

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

SUMMARY

General Management Objective

Chimney Reservoir is managed with a general warmwater fishery and a warmwater trophy fishery. The water level at the reservoir was low throughout 2016, but the boat ramp was accessible to launch boats throughout the year. Water releases from the reservoir occurred during April, May, June, and July for irrigation use. A small water release occurred in November 2016 to provide needed stock water to downstream users. Anglers reported catching walleye and channel catfish in the spring and summer. Monitoring for quagga mussels veligers was not completed in 2016.

Tiger muskie was introduced into the reservoir in November 2015 to be used as a biological control for carp. More intensive monitoring of tiger muskie occurred in 2016 in order to better analyze the addition of another piscivorous fish species and its impact on forage fish species.

BACKGROUND

Chimney Reservoir is located on the Little Humboldt River and is fed by the North Fork Little Humboldt River and the South Fork Little Humboldt River. The reservoir was built in 1974 to provide water storage for downstream irrigation. When full, Chimney Reservoir covers 2,150 surface acres and stores 35,000 AF, with an average depth of 16 ft and a maximum depth of 55 ft.

Chimney Reservoir is managed as a general warmwater fishery and a warmwater trophy. Currently walleye, wipers, crappie, channel catfish, largemouth bass, yellow perch, and tiger muskie are the warmwater gamefish present in Chimney Reservoir. In the early 1990's, trout were stocked, but a fishery did not become established. Both forks of the Little Humboldt River support Lahontan cutthroat trout in the headwaters, which contribute a very limited trout fishery in Chimney Reservoir.

OBJECTIVES AND APPROACHES

General Management Objectives

To administer an annual fisheries program that assesses general fish population dynamics, angler use and success, annual stocking programs, 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.
- Analyze stream gauge data collected by the Department of Conservation and Natural Resources on the north and south forks of the Little Humboldt River (above the reservoir) and Little Humboldt River (below the reservoir).
- Augment the population with approximately 200,000 walleye fry, 2,000 channel catfish, and 2,000 wipers by utilizing source stock from other states, as well as, purchasing fish from approved commercial/government suppliers.
- Augment the largemouth bass population with 1,000 largemouth bass from a suitable nearby water.
- Monitor population of fish species by conducting 2 net-nights of gill netting, 2 net nights of frame netting, 5 electroshocking transects, and 3 beach seining transects.
- Conduct quagga mussel veliger sampling through plankton tows at established transects at least twice per year.
- Monitor for the presence of quagga mussels by conducting substrate sampling around boat docks and reservoir substrates when on-site.

Study Specific Objective

The objective is to analyze if a predatory fish, such as walleye and wiper are utilizing the carp population as a forage fish in Chimney Reservoir.

Approaches:

- Collect stomach samples from 25 wipers and 25 walleye in order to assess the utilization of forage fish.
- Introduce of sterile tiger muskie into Chimney Reservoir to biologically control carp.

PROCEDURES

General Management Objective

Conduct a general fisheries assessment through opportunistic angler contacts and mail-in angler questionnaire data. Mail-in, angler questionnaire data for 2015 was summarized. Opportunistic angler contacts were made when on site conducting other work on Chimney Reservoir in 2016.

Collect stream flow data on the north and south forks of the Little Humboldt River (above the reservoir). Nevada Division of Water Resources (NDWR) provided stream gauge data on water delivered to Chimney Reservoir in the South Fork Little Humboldt River and North Fork Little Humboldt River during 2016. Reservoir capacity levels were also provided throughout 2016.

Augment the population with approximately 200,000 walleye fry, 2,000 channel catfish, and 2,000 wipers by utilizing source stock from other states, as well as, purchasing fish from approved commercial/government suppliers. Stocking of walleye fry and wiper was completed in 2016. Channel catfish were not stocked into Chimney Reservoir in 2016.

Augment the largemouth bass population with 1,000 largemouth bass from a suitable nearby water. The largemouth bass population was not augmented in 2016.

Monitor population of fish species by conducting 2 net-nights of gill netting, 2 net nights of frame netting, 5 electrofishing transects, and 3 beach seining transects. Populations of fish species were monitored through gill netting, frame netting, electroshocking, and beach seining in 2016.

Conduct quagga mussel Veliger sampling through plankton tows at established transects at least twice per year. No veliger sampling occurred in 2016.

Monitor for the presence of quagga mussels by conducting tactile surveys around boat docks and reservoir substrates when on-site. Monitoring for adult quagga mussel occurred visually around the dam and boat ramp areas in 2016.

Study Specific Objectives

Collect stomach samples from 25 wipers and 25 walleye in order to access the utilization of forage fish. Stomach samples were collected from a limited number of walleye in 2016. No stomach samples were collected from wipers in 2016.

Introduction of sterile tiger muskie into Chimney Reservoir as a biological control of carp. Tiger muskie was introduced into Chimney Reservoir in November 2015 as a biological control of carp. Monitoring of tiger muskie and forage fish occurred in 2016.

FINDINGS

General Management Objective

Conduct a general fisheries assessment through opportunistic angler contacts and mail-in angler questionnaire data. Eight anglers were contacted while on site conducting other fisheries work at Chimney Reservoir in 2016. Anglers reported fishing a total of 26 hours and catching 15 fish, which resulted in an angler success rate of 1.88 fish per angler and 0.58 fish per hour. Sizes of fish caught are presented in Table 1.

Table 1. Length Frequency and Species Composition Data – Opportunistic Surveys.

Species	# Caught	Size Class							
		<10"	10-11.9"	12-13.9"	14-15.9"	16-17.9"	18-19.9"	20-24.9"	>25"
Walleye	1	0	0	0	0	0	1	0	0
Channel Catfish	14	0	2	1	3	4	4	1	0

Mail-in questionnaire data for 2015 at Chimney Reservoir indicated that 101 anglers fished 234 days to catch 187 fish. Anglers caught 2.32 fish per angler and 0.80 fish per day in 2015. The five-year average (2011-2015) is 1.27 fish per angler and 0.70 fish per day. Figures 1 and 2 summarize the angler questionnaire data from the last 5 years.

Collect stream flow data on the north and south forks of the Little Humboldt River (above the reservoir) and Little Humboldt River (below the reservoir). Upstream flow data for the South Fork and North Fork Little Humboldt River was received from the Nevada Department of Conservation and Natural Resources. The total discharge of both streams into Chimney Reservoir was 8,981 AF of water in 2016. Figure 3 displays a history of annual water discharged into Chimney Reservoir from the South Fork and North Fork Little Humboldt Rivers.

During 2016, water storage was measured ten times by Nevada Division of Water Resources. The maximum water stored occurred on May 12 at 5,580 AF and the minimum was on November 14 at 1,845 AF. A total of 7,428 AF of water was released from Chimney Reservoir in 2016 for irrigation and stock water purposes.

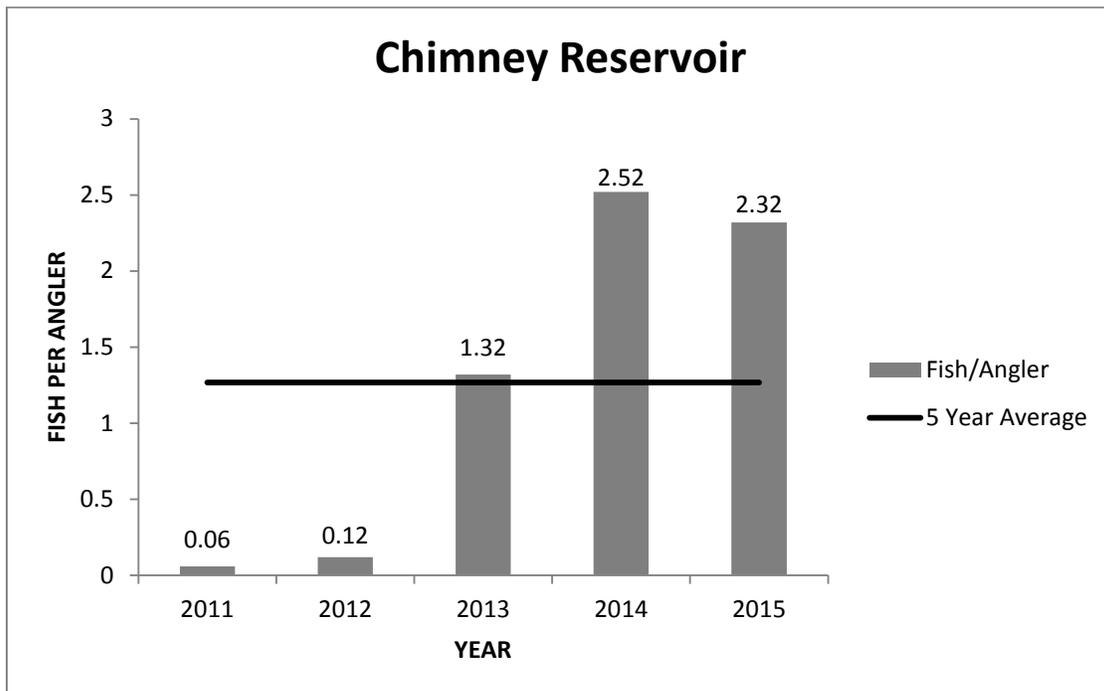


Figure 1. Chimney Reservoir Angler Questionnaire fish/angler 2011-2015.

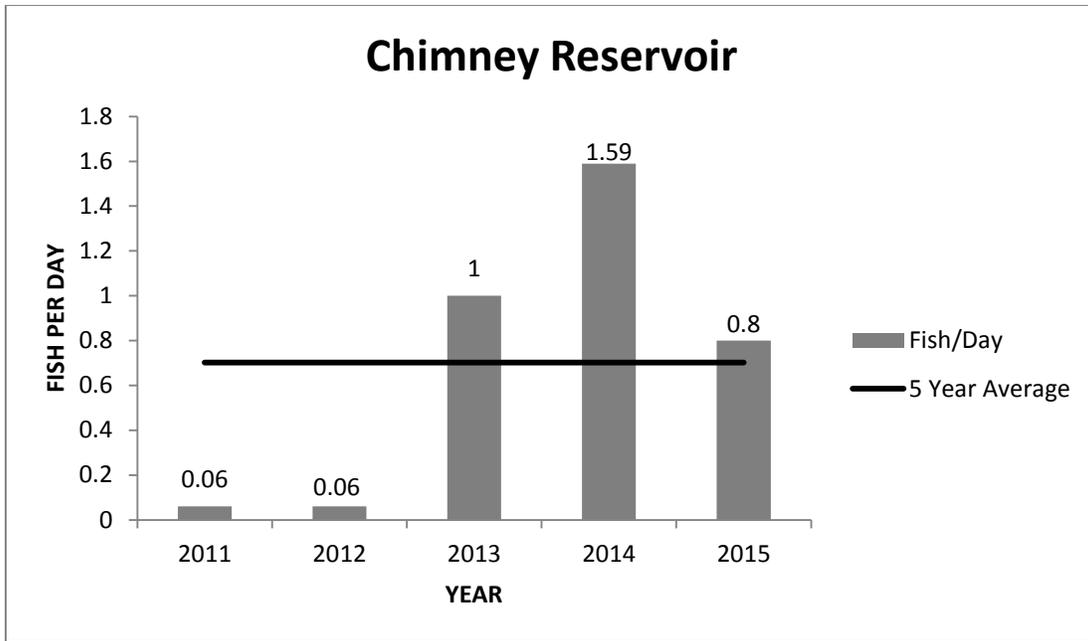


Figure 2. Chimney Reservoir Angler Questionnaire fish/day 2011-2015.

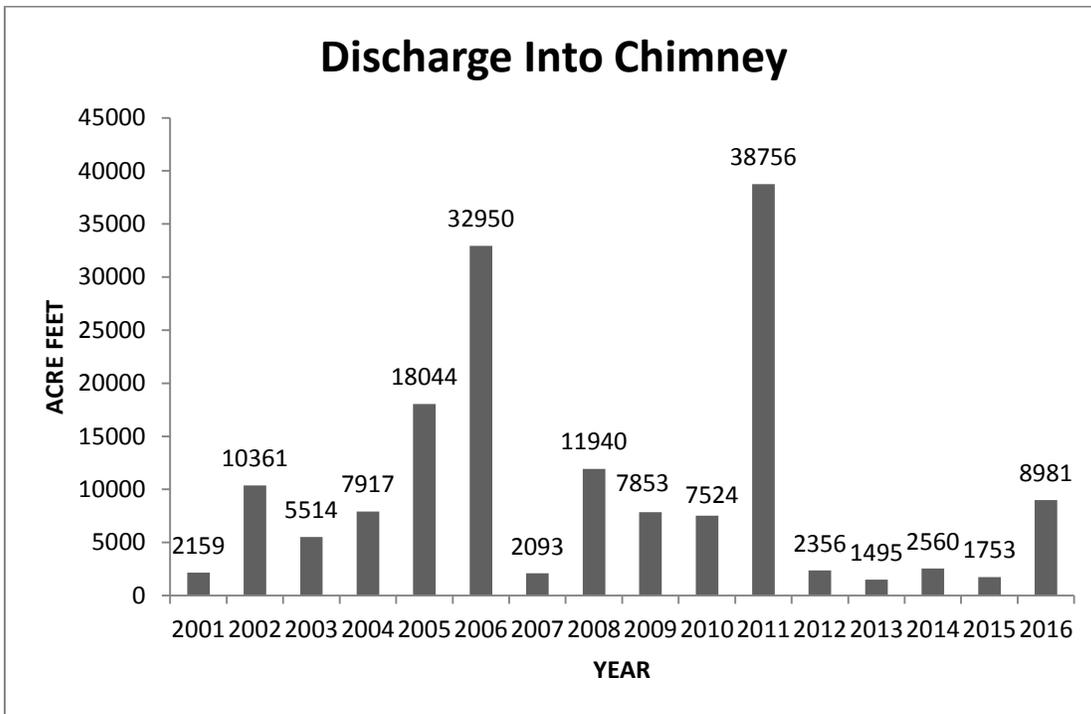


Figure 3. Yearly Total Discharge of Water into Chimney Reservoir 2001-2015.

Augment the population with approximately 200,000 walleye fry, 2,000 channel catfish, and 2,000 wipers by utilizing source stock from other states, as well as, purchasing fish from approved commercial/government suppliers. On April 20, 400,000 walleye fry were stocked into Chimney Reservoir and on May 26, 1,671 wiper were stocked (Table 2).

Augment the largemouth bass population with 1,000 largemouth bass from a suitable nearby water. The largemouth bass population was not augmented in 2016.

Table 2. Five-Year Chimney Reservoir Stocking History 2012-2016

Year	Species	Source	Number of Fish	Pounds of Fish	Average Size (inches)
2012	Walleye	Gavins Point NFH, SD	600,000	—	—
	Largemouth Bass	Bilk Creek Reservoir	363	96	9.6
	Wiper	Colorado Catch	2,200	550	7.9
	Channel catfish	Colorado Catch	900	200	8.0
2013	Walleye	Gavins Point NFH, SD	200,000	—	—
	Wiper	Colorado Catch	10,000	—	4
	Channel Catfish	Colorado Catch	4,000	400	5
	Largemouth Bass	Bilk Creek Reservoir	639	—	9.6
	White Crappie	Willow Creek Reservoir	1,805	—	4.69
2014	Largemouth Bass	Bilk Creek Reservoir	213	—	9.5
	White Crappie	Willow Creek Reservoir	1,878	—	5.9
2015	Walleye	Gavins Point NFH, SD	500,000	—	—
	Tiger Muskie	Oswald Fisheries	1,040	—	12.6
2016	Walleye	Gavins Point NFH, SD	400,000	—	—
	Wiper	Colorado Catch	1,671	191	7

Monitor population of fish species by conducting 2 net-nights of gill netting, 2 net nights of frame netting, 5 electroshocking transects, and 3 beach seining transects. Monitoring populations of fish species was conducted on May 31, June 1, and June 2 and again on June 20 through 22. The entire shoreline of Chimney Reservoir was electroshocked during the day light hours on May 31 and June 1. Four frame net-nights were conducted on May 31 through June 2 and one beach seine transect on June 1. Eight gill nets were set for a total of 16 net-nights from June 20 to 22. Each gill net was check six times (approximately every seven hours) to reduce fish mortality. Locations of monitoring sites are summarized in Table 4.

Table 3. Monitoring location on Chimney Reservoir 2016.

Sample Number	Date	Sample Type	UTM (NAD 83)		Time		Soak Time/shock time
			Easting	Northing	Set	Pulled	
1	5/31-6/1	Electroshock	Entire	Shoreline	-	-	15,343 seconds
2	5/31-6/1	Frame net	484791	4584941	1130	900	22.5 hr
3	5/31-6/1	Frame net	486682	4584581	1200	1000	22 hr
4	6/1-6/2	Frame net	484791	4584941	930	1000	24.5 hr
5	6/1-6/2	Frame net	484966	4583987	930	1000	24.5 hr
6	6/1	Beach seine	484929	4585791	900	930	--
7	6/20-6/22	Gill net	485070	4582829	1200	645	42.75 hr
8	6/20-6/22	Gill net	484925	4582802	1215	700	42.75 hr
9	6/20-6/22	Gill net	484933	4582630	1230	715	42.75 hr
10	6/20-6/24	Gill net	485019	4583166	1230	715	42.75 hr
11	6/20-6/22	Gill net	485568	4583793	1245	745	42 hr
12	6/20-6/22	Gill net	485886	4583735	1300	800	42 hr
13	6/20-6/22	Gill net	485101	4584601	1330	815	41.75 hr
14	6/20-6/22	Gill net	485031	4584212	1345	800	42.25 hr

A total of 114 crappie were caught averaging 189.3 mm in length, 24 walleye averaging 483.7 mm, seven wiper averaging 182.1 mm, nine channel catfish measuring 284.4 mm, two tiger muskie averaging 345 mm, one yellow perch measuring 260 mm, 139 carp averaging 452 mm, and four Sacramento blackfish averaging 410.5mm in total length. Results of gill netting, frame netting, beach seining, and electroshocking are summarized in Figures 4 through 7.

Conduct quagga mussel Veliger sampling through plankton tows at established transects at least twice per year. Veliger sampling was not conducted in 2016 due to extremely low water levels. The reservoir was not deep enough to carry out sampling protocol developed by the Bureau of Reclamation.

Monitor for the presence of quagga mussels by conducting tactile surveys around boat docks and reservoir substrates when on-site. Monitoring for adult quagga mussel occurred visually around the dam and boat ramp areas and none were found.

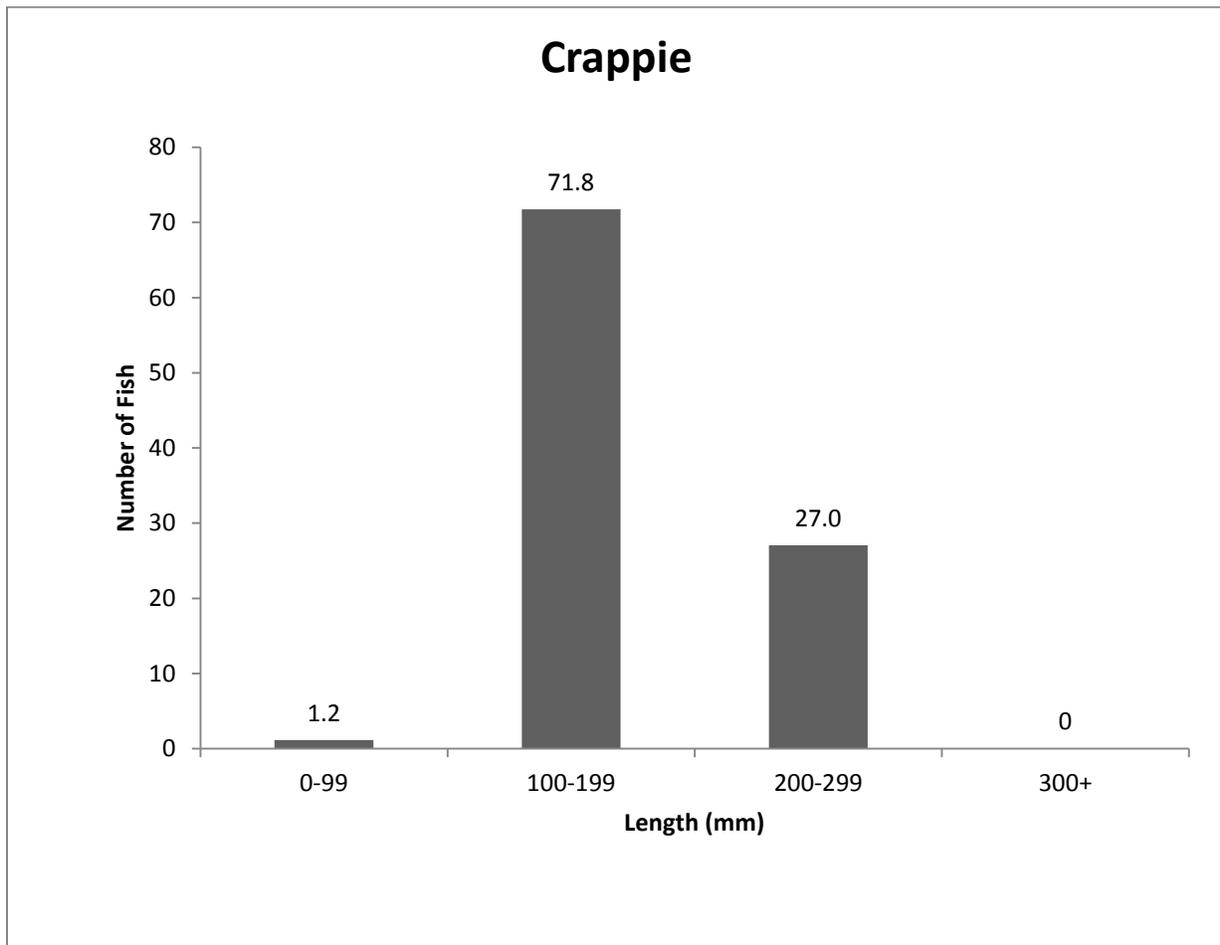


Figure 4. Crappie length frequency Chimney Reservoir 2016.

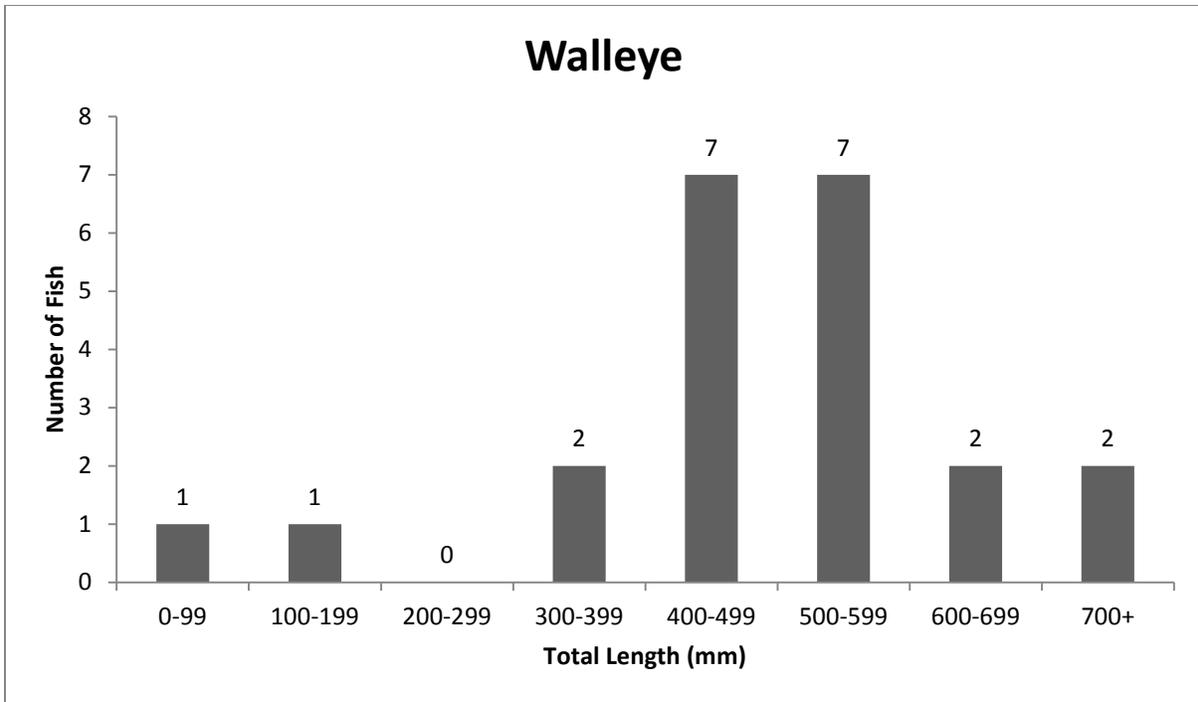


Figure 5. Walleye length frequency Chimney Reservoir 2016.

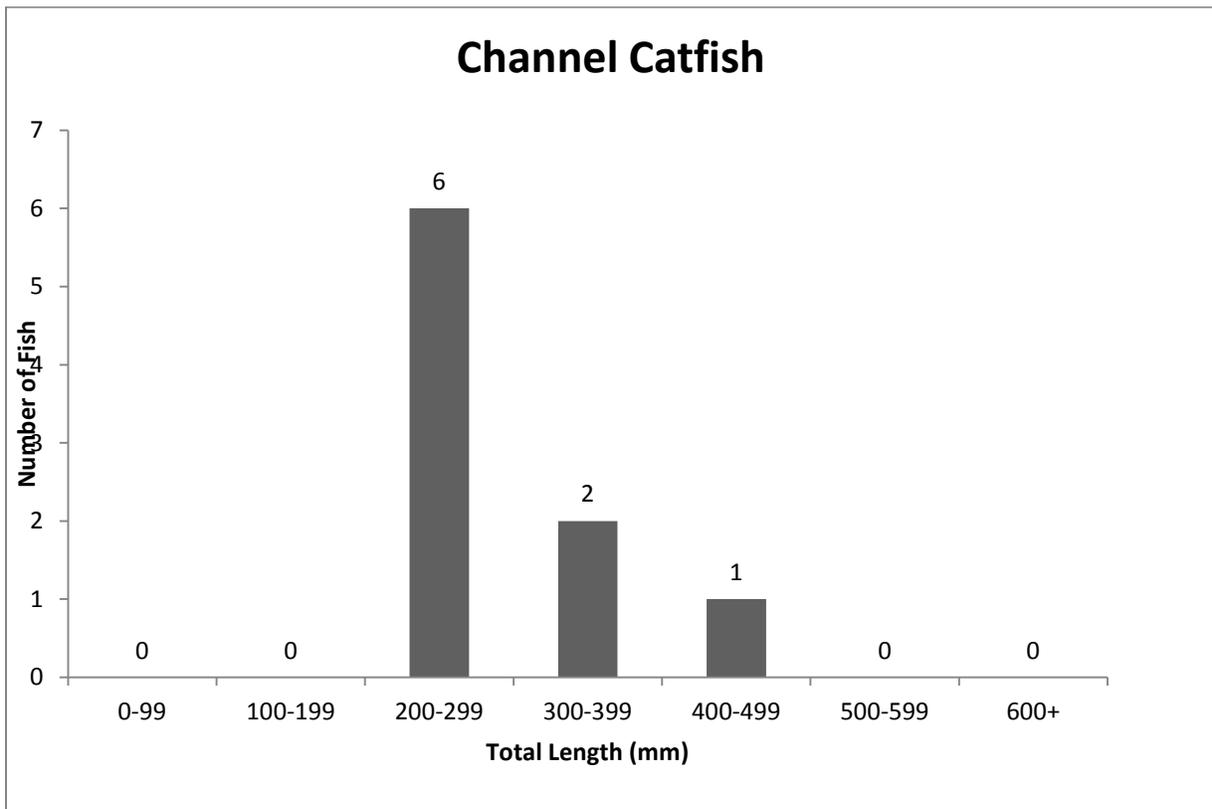


Figure 6. Channel catfish length frequency Chimney Reservoir 2015.

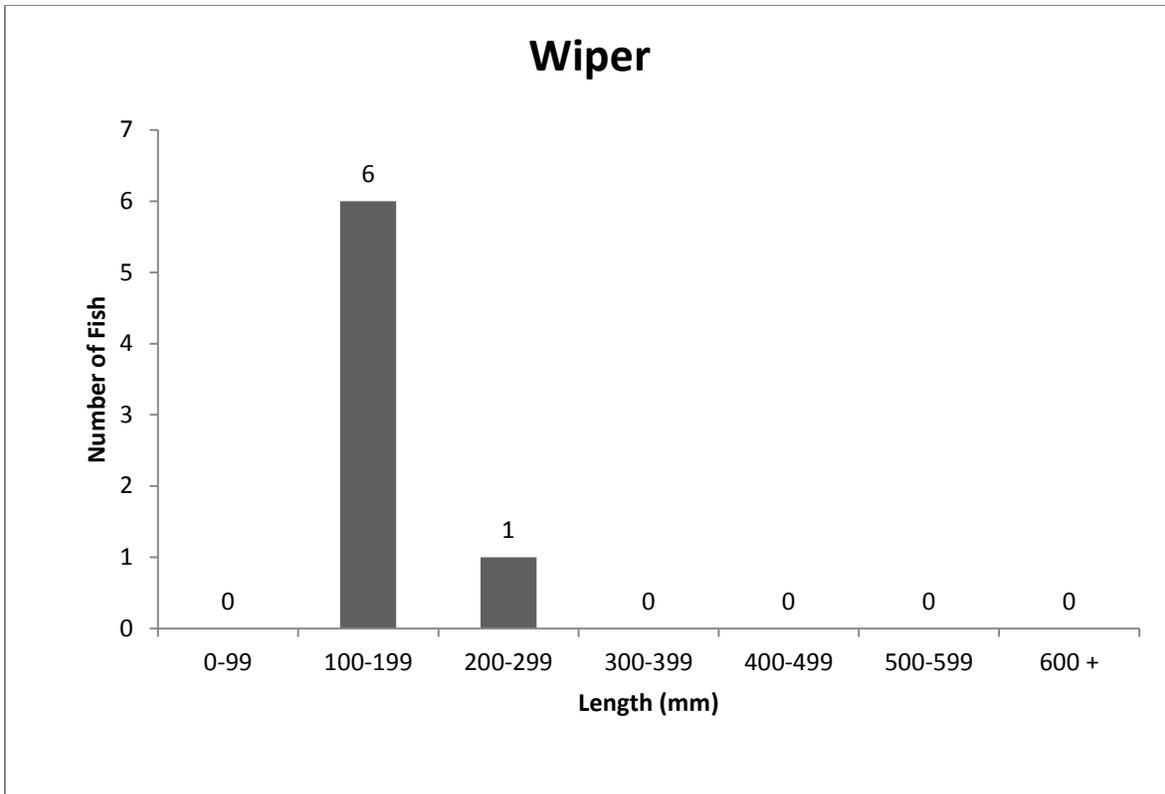
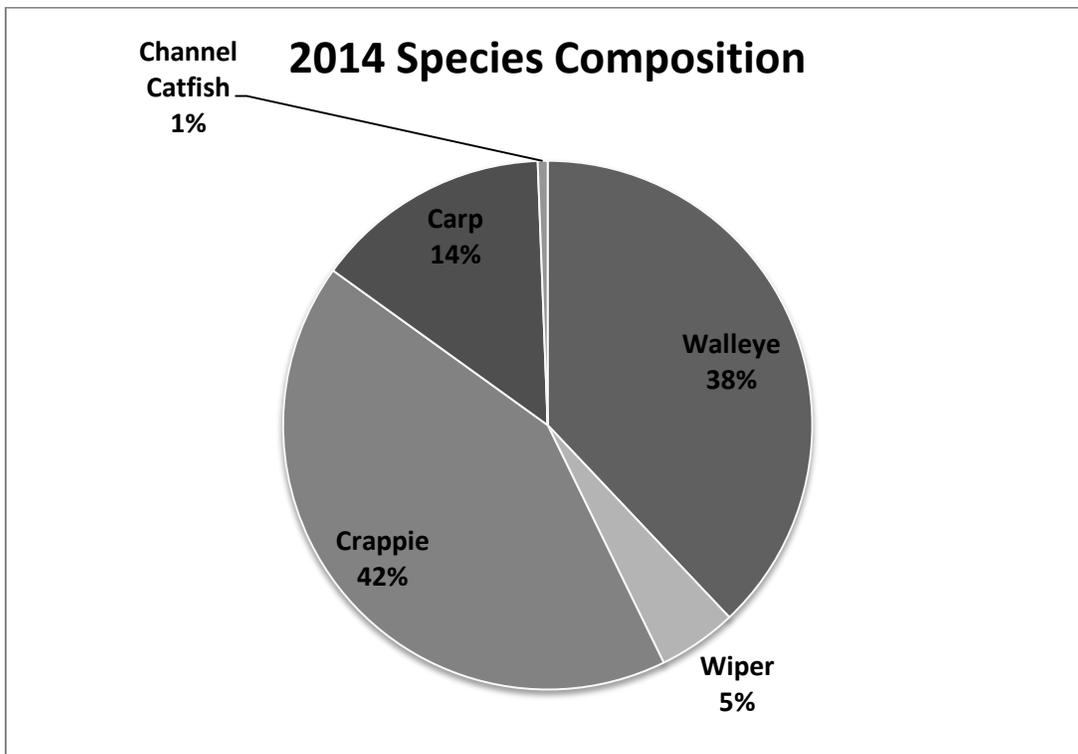


Figure 7. Wiper length frequency Chimney Reservoir 2016.



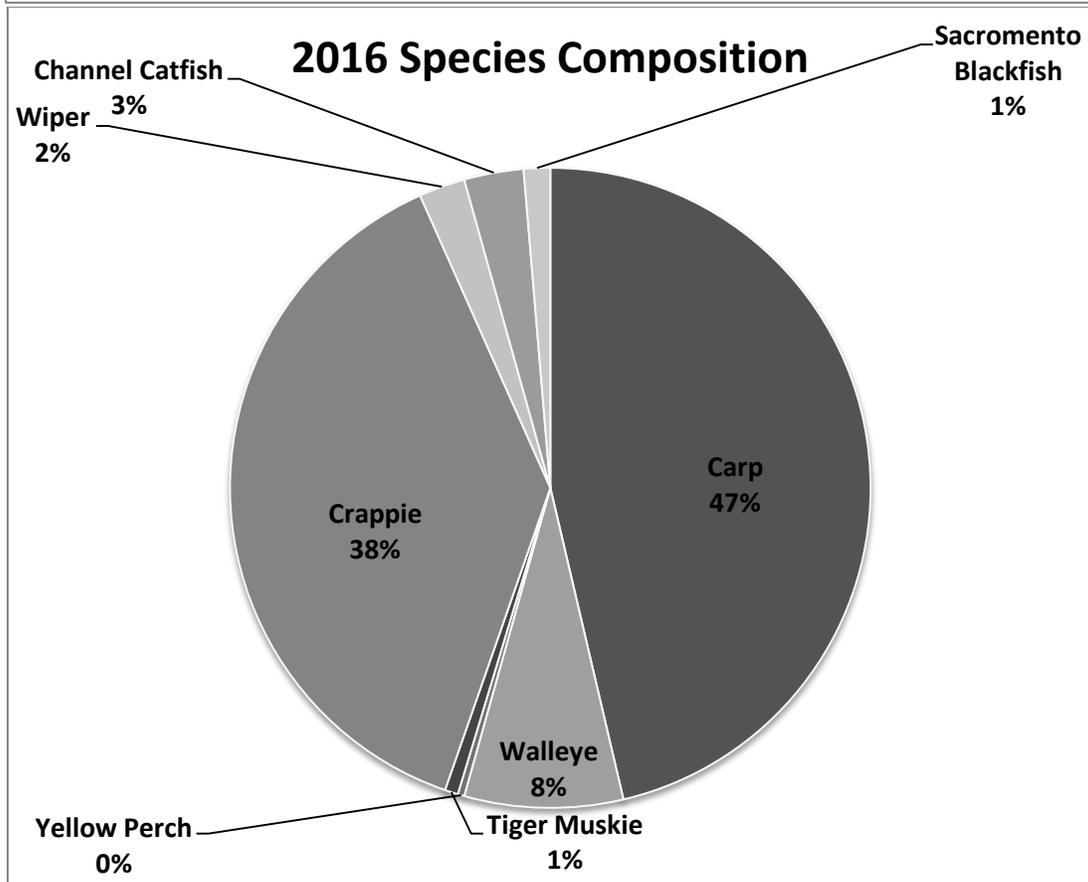
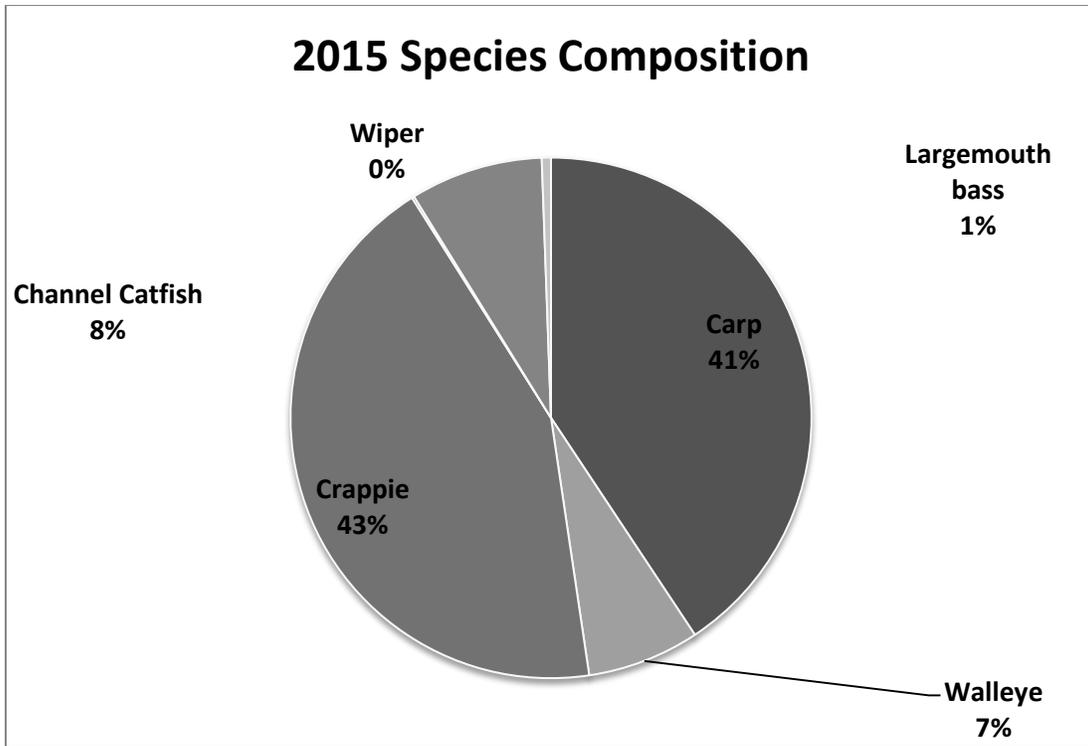


Figure 8. Fish species composition Chimney Reservoir 2014- 2016.

Study Specific Objectives

Collect stomach samples from 25 wipers and 25 walleye in order to access the utilization of forage fish. Stomach samples were collected from six walleye in 2016. No wipers were captured that were large enough to obtain stomach samples. Stomach sample results are summarized in Table 4.

Table 4. Walleye stomach content Chimney reservoir 2016

Species	Total Length (mm)	Stomach Contents
Walleye	490	Empty
Walleye	480	Damsel Fly
Walleye	505	Crappie
Walleye	680	Crappie
Walleye	590	Unidentified fish bones
Walleye	600	Unidentified fish bones

Introduction of sterile tiger muskie into Chimney Reservoir as a biological control of carp. There were 1,040 tiger muskie averaging 327 mm introduced into Chimney Reservoir in November 2015. Monitoring surveys in 2016 found only two tiger muskie that averaged 345 mm TL. Stomach samples were obtained using gastric lavage and both appeared to be empty. The average length increased only 18 mm over a six-month period (November 2015 to June 2016).

GENERAL MANAGEMENT REVIEW

Angler success, which is measured as fish per day and fish per angler from angler questionnaire data, was slightly above the five-year average at Chimney Reservoir in 2016. This is a sign the fishery is beginning to rebound from the 2011 chemical treatment and anglers are beginning to have success catching wipers, walleye, and channel catfish.

Monitoring results for adult quagga mussels along the shoreline and boat ramp were all negative in 2016. Ongoing monitoring and boater education should help prevent establishment of aquatic invasive species into Chimney Reservoir and the Little Humboldt River.

Tiger muskie was introduced into the reservoir in November 2015 in an effort to control the carp population. Monitoring results show that carp are once again the most abundant species in the reservoir and represent 47 percent of the total abundance sampled in 2016. Continued monitoring of tiger muskie, along with examining stomach contents, will indicate whether it will have an impact on reducing the carp population in the reservoir. Only two tiger muskie were sampled in 2016. Both appeared to have empty stomachs and their growth rate over the six months was less than expected. Water clarity could play a factor in the foraging efficiency since it was generally less than six inches in the reservoir.

Artificial fish habitat structures were purchased using Habitat Conservation Fee monies in order to provide additional escape cover for gamefish and baitfish fry and fingerlings. Chimney Reservoir was chosen for the habitat structures due to the lack of escape cover for fish during periods of low water. Complex aquatic habitat with various types and layers of structure promotes healthy, abundant populations of many fish species through protection from predation and production of invertebrate food sources. Available habitat also attracts larger fish and in turn increases angler opportunity. During periods of low water, Chimney Reservoir lacks beneficial habitat for fish (Appendix A).

RECOMMENDATIONS

General Management Objective

- Conduct a general fisheries assessment through opportunistic angler contacts and mail-in, angler questionnaire data.
- Analyze stream gauge data collected by the Department of Conservation and Natural Resources on the north and south forks of the Little Humboldt River (above the reservoir) and Little Humboldt River (below the reservoir).
- Augment the population with approximately 200,000 walleye fry or 2,000 catchable walleye, 2,000 channel catfish, 2,000 wipers, and 1,000 tiger muskie by utilizing source stock from other states, as well as purchasing fish from approved commercial or government suppliers.
- Augment the largemouth bass population with 1,000 largemouth bass from a suitable nearby water.
- Monitor population of fish species and fish condition (relative weight) by conducting 2 net-nights of gill netting, 2 net-nights of frame netting, 5 electroshocking transects, and 3 beach seining transects.
- Conduct quagga mussel veliger sampling through plankton tows at established transects at least twice per year.
- Monitor for the presence of quagga mussels by conducting tactile surveys around boat docks and reservoir substrates when on-site.

Study Specific Objectives

- Collect stomach samples from 25 wipers and 25 walleye in order to assess the utilization of forage fish by wipers and walleye.

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Western Region

Date: March 8, 2017

Artificial Aquatic Habitat Structures



Bradley Bauman
Nevada Department of Wildlife
September 6, 2016

Artificial fish habitat structures were purchased using Habitat Conservation Fee monies in order to provide additional escape cover for gamefish and baitfish fry and fingerlings in waters that lack cover and structure. Chimney Reservoir was chosen for the habitat structures due to the lack of escape cover for fish during periods of low water. Complex aquatic habitat with various types and layers of structure promotes healthy, abundant populations of many fish species through protection from predation and production of invertebrate food sources. Available habitat also attracts larger fish and in turn increases angler opportunity. During periods of low water, Chimney Reservoir lacks beneficial habitat for fish.

During 2012 through 2016, severe drought in the Great Basin has resulted in low water levels in most of the reservoirs in Nevada. During periods of low water levels, there is no vegetation becoming inundated and gamefish and baitfish fry and fingerlings have no place to hide and escape from the piscivorous fish. Chimney Reservoir has walleye, wiper, and tiger muskie and Sacramento blackfish, carp, and crappie are their main prey.

Annual survey and monitoring revealed there were reductions in the number of smaller baitfish occurring from 2012 to 2016. The main prey for walleye in Chimney Reservoir is crappie. Annual monitoring and surveys have revealed there has been a reduction in smaller year classes of crappie.

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 Habitat structures are made of PVC pipe with slots cut into the main pipe where the limbs are inserted. The 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 singletree (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 16 structures were placed at four locations in Chimney Reservoir on June 20 and 21, 2016. Each location was near the low water mark that has been observed over the last four years. Various types of structures were placed in clusters at each of the four locations (Table 1). Clusters of various structures were chosen to provide a diverse array of escape cover for baitfish and gamefish.

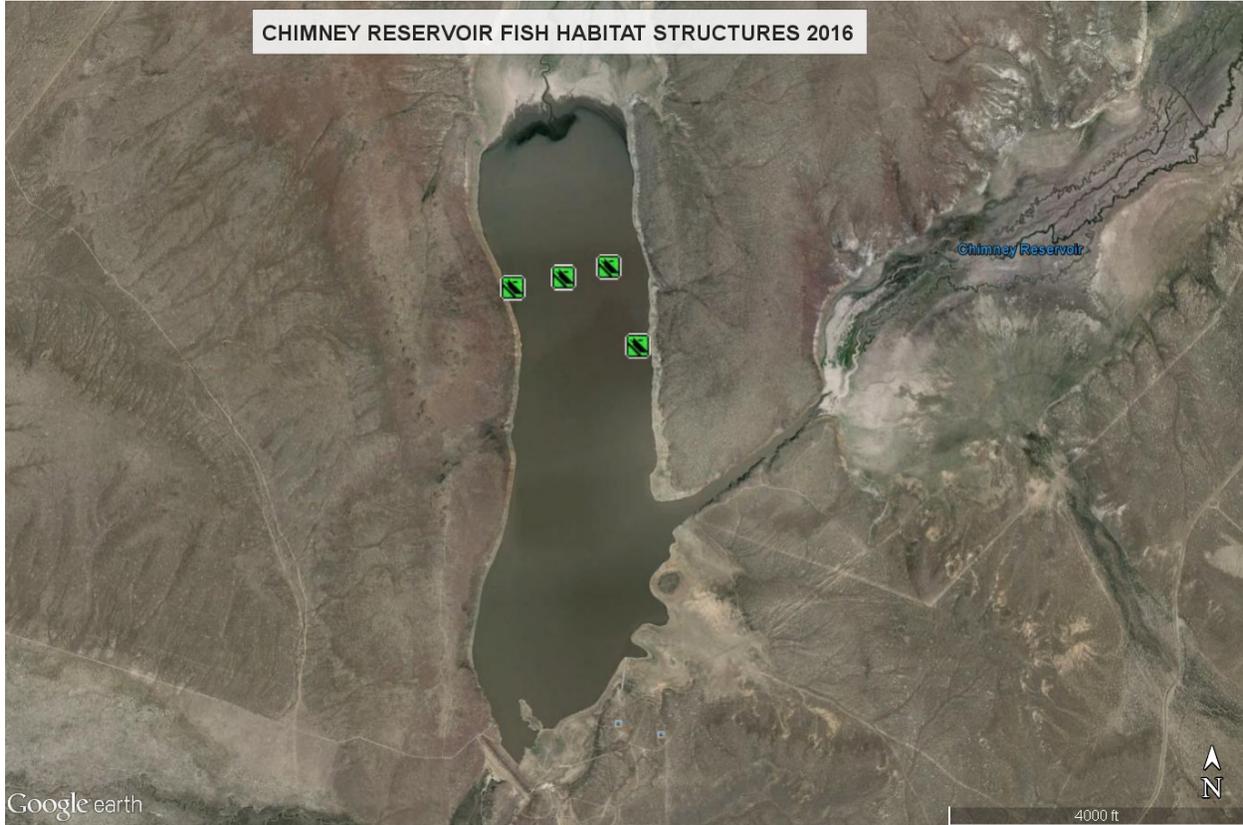


Figure 4. Four locations where structures were placed in clusters at Chimney Reservoir on June 20 and 21, 2016.

Table 1. UTM locations and type of structures that were placed in Chimney Reservoir.

Date	Easting	Northing	Type
6/20/2016	485520	4584313	2 Root Wads, 2 Safe Havens
6/21/2016	484971	4584577	3 Safe Havens, 1 Root Wad, 1 Single Tree
6/21/2016	485195	4584621	3 Safe Haven, 1 Single Tree
6/21/2016	485395	4584667	2 Safe Haven, 1 Single Tree