NEVADA DEPARTMENT OF WILDLIFE
STATEWIDE FISHERIES MANAGEMENT

FEDERAL AID JOB PROGRESS REPORTS

F-20-54
2018

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, 2018 through December 31, 2018*

SUMMARY

The water level at Chimney Reservoir remained good for the fisheries throughout 2018. After an above average winter in 2016/2017, the snow pack in 2017/2018 was 60% for the Lower Humboldt River watershed and the boat ramp was accessible throughout the year. Angler success rates based on the 2017 angler mail-in questionnaire were 0.29 fish per angler and 0.25 fish per day. Tiger muskie was stocked in Chimney Reservoir again in 2018 in an effort to control carp abundance. To date, there have been no angler reports of catching a tiger muskie and there has been limited return of tiger muskie from population survey efforts.

Fish monitoring occurred using several survey methods such as electroshocking, gill netting, and frame netting to estimate trends in CPUE among species. Some species were weighed and measured to collect body condition information, and stomach samples were obtained from a small number of walleye and wiper.

BACKGROUND

Chimney Reservoir is located along the Little Humboldt River and is fed by both 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 SA and stores 35,000 AF, with an average depth of 16 ft and a maximum depth of 55 ft. Both forks of the Little Humboldt River support Lahontan cutthroat trout in the headwaters, which contribute a very limited trout fishery, if at all, in Chimney Reservoir.

Chimney Reservoir is managed with a Warmwater General Fishery Concept, which applies to waterbodies that produce average sized fish year after year. Special regulations are usually not imposed, although at times, there might be a size restriction. Populations are usually self-supporting, but periodic stocking may be required to supplement existing populations due to inadequate spawning habitat or following low water levels, usually associated with drought. Angler catch rates should range between 0.25 and 0.75 fish per hour and 1.0 and 2.0 fish per angler day. White and black crappie, walleye, channel catfish, and yellow perch are also managed under this concept.

Additionally, the reservoir fisheries is managed with a Trophy Warmwater Fisheries Management Concept that is applicable for waterbodies having fish with exceptional growth capabilities and provide a memorable angling experience for catching larger than

average fish at above average rates. In Chimney Reservoir, these fish consist of top predators such as largemouth bass, smallmouth bass, spotted bass, wipers (white bass x striper hybrid), walleye, stripers, channel catfish, and tiger muskie (muskellunge x northern pike hybrid). For the wiper population to be considered a "Trophy fishery," a significant percentage of the population should reach the minimum size established for the Department's Trophy Fish Program, which is 20 in, or 5.0 lbs for wipers. At this time, a minimum size has not been established for tiger muskie. Angler success rates should range between 0.50 and 1.75 fish per hour and zero to 1.0 fish per angler day. Special angler regulations including reduced harvest limits, harvest size restrictions, catch and release angling, or tackle restrictions are commonly prescribed. At Chimney Reservoir, fishing is open year-round. The limit is 15 gamefish of which, not more than 5 may be black bass, 5 may be walleye, 2 may be wiper, and zero may be tiger muskie. The minimum length for wipers is 15 inches.

OBJECTIVES and APPROACHES

Objective: General Fisheries Management

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 rivers (above the reservoir) and Little Humboldt River (below the reservoir).
- Augment the fisheries with approximately 200,000 walleye fry or 2,000 catchable walleye, 2,000 channel catfish, 2,000 wipers, 1,000 yellow perch, 1,000 bluegill, 1,000 crappie, 1,000 largemouth bass, and 1,000 tiger muskie by utilizing source stock from other states as well as purchasing fish from approved commercial/government suppliers.
- Monitor fish species abundance and body 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 substrate sampling around boat docks and reservoir substrates when on-site.
- Collect at least 5 crappie for mercury level analysis by EPA.
- Augment the Sacramento blackfish population by stocking 2,000 adult fish.
- Collect stomach samples from wiper, walleye, and tiger muskie to assess food habits.

PROCEDURES

Conduct a general fisheries assessment through opportunistic angler contacts and mail-in angler questionnaire data. Mail-in, angler questionnaire data for

2017 was summarized. No opportunistic angler contacts were made while conducting other work at Chimney Reservoir in 2018.

Analyze stream gauge data collected by the Department of Conservation and Natural Resources on the North and South Forks of the Little Humboldt Rivers (above the reservoir) and Little Humboldt River (below the reservoir). Nevada Division of Water Resources (NDWR) provided stream gauge data for water delivered to Chimney Reservoir in the South Fork Little Humboldt River and North Fork Little Humboldt River along with reservoir capacity levels throughout 2018.

Augment the fisheries with approximately 200,000 walleye fry or 2,000 catchable walleye, 2,000 channel catfish, 2,000 wipers, 1,000 yellow perch, 1,000 bluegill, 1,000 crappie, 1,000 largemouth bass, and 1,000 Tiger Muskie by utilizing source stock from other states as well as purchasing fish from approved commercial/government suppliers. Walleye fry, channel catfish, wiper, and tiger muskie were stocked in 2018.

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 fish populations was completed by 4 net-nights of gill netting, 2 net-nights of frame netting, and 14,487 s of electroshocking (Table 1). Length and weights of fish were measured in order to gather information on body condition.

Table 1. Monitoring Populations at Chimney Reservoir, 2018.

Sample Number	Date	Sample Type	UTM (NAD 83)		Time		Soak Time/Shock time
			Easting	Northing	Set	Pulled	
1	4/4	Electroshock	-	-	-	-	8,977
2	5/18	Electroshock	-	-	-	-	5,510
3	7/16-7/17	Frame net	485703	4583291	1100	1100	1 net-night
4	7/16-7/17	Frame net	486354	4587200	1100	900	1 net-night
5	7/16-7/17	Gill net	484939	4582603	1200	1200	1 net-night
6	7/16-7/17	Gill net	485409	4582868	1200	1100	1 net-night
7	7/16-7/17	Gill net	485642	4583836	1100	1000	1 net-night
8	7/16-7/17	Gill net	484803	4582965	1100	1100	1 net-night

Conduct quagga mussel veliger sampling through plankton tows at established transects at least twice per year. Veliger sampling did not occur in 2018.

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

Collect at least 5 each of crappie during netting and electroshocking surveys for mercury level analysis by EPA. Crappie were collected and mailed to EPA in Richmond, CA for mercury analysis.

Augment the Sacramento blackfish population by stocking 2,000 adult fish into Chimney Reservoir. Stocking of adult Sacramento blackfish did not occur in 2018.

Collect stomach samples from wiper, walleye, and tiger muskie to assess which forage fish is being utilized by the piscivorous fish populations. Stomach samples were collected from two walleye and two wipers.

FINDINGS

Conduct a general fisheries assessment through opportunistic angler contacts and mail-in angler questionnaire data. While on-site conducting other fisheries work, no anglers were observed fishing.

Mail-in questionnaire data from 2017 (the latest information available) estimated 346 anglers fished 397 days to catch 101 fish. Angler catch rates came to 0.29 fish per angler and 0.25 fish per day, which were well below the five-year average. Five-year averages were 1.45 fish per angler and 0.76 fish per day. Figures 1 and 2 summarize angler questionnaire data from the previous five years.

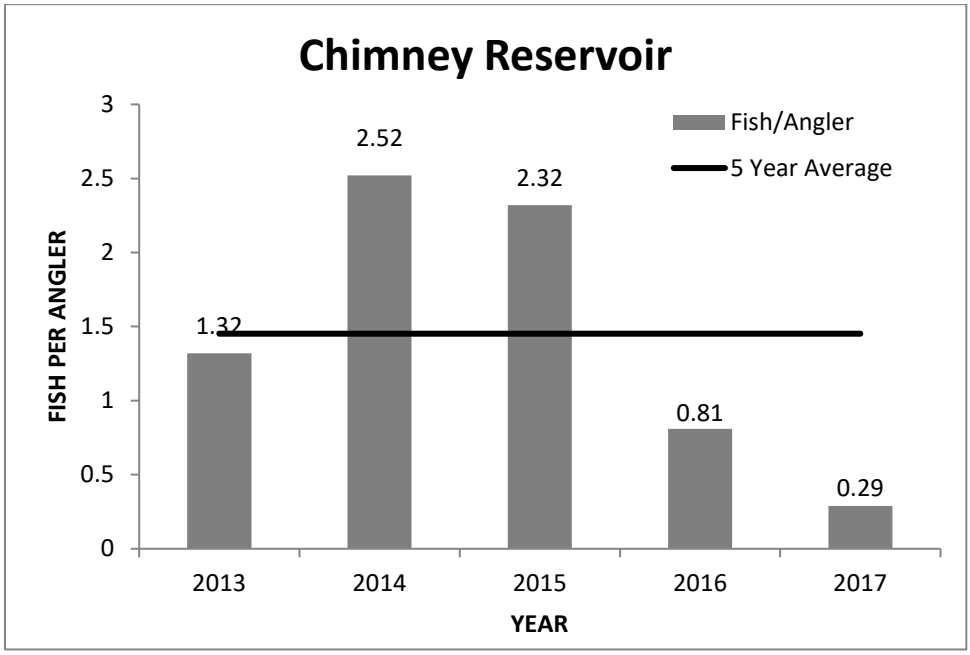


Figure 1. Chimney Reservoir Angler Questionnaire Fish/Angler, 2013-2017.

During each visit to Chimney Reservoir, a general habitat assessment was conducted that included measuring water temperature, visually observing water level and clarity, and assessing road conditions. Table 2 summarizes the information collected for 2018. Water clarity at Chimney Reservoir is typically poor due to fine sediment and at times phytoplankton growth, and 2018 was no exception. Water was released from Chimney Reservoir for downstream irrigation needs. There was no issue with anglers being able to access fishing areas due to road conditions and the ramp was accessible for boat launching all year.

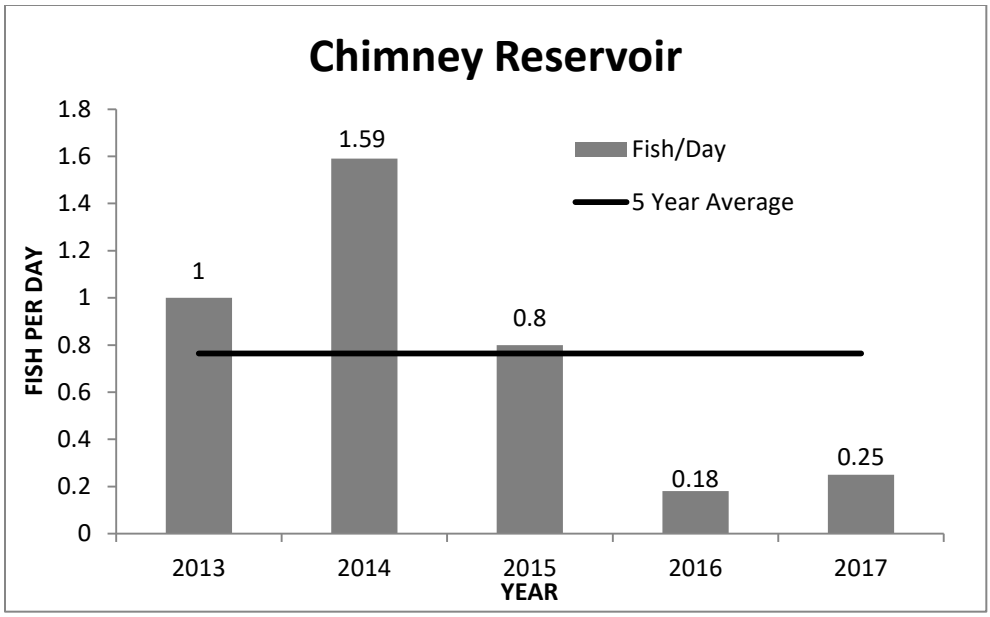


Figure 2. Chimney Reservoir Angler Questionnaire Fish/Day, 2013-2017.

Table 2. General Habitat Assessments at Chimney Reservoir, 2018.

Date	Water Temperature (°F)	Water Level	Water Clarity	Number of Anglers	Road Conditions
3/15/2018	35	80%	12 in visibility	0	Good
4/4/2018	47	80%	12 in visibility	0	Good
4/25/2018	54	80%	< 1-ft visibility	0	Good
5/1/2018	52	80%	< 1-ft visibility	0	Good
5/18/2018	61	80%	< 1-ft visibility	0	Good
7/13/2018	78	70%	< 6 in visibility	0	Good
7/16/2018	75	70%	< 6 in visibility	0	Good
10/24/2018	59	50%	< 6 in visibility	0	Good

Analyze stream gauge data collected by the Department of Conservation and Natural Resources on the North and South Forks of the Little Humboldt Rivers (above the reservoir) and Little Humboldt River (below the reservoir). Discharge into Chimney Reservoir from both forks of the Little Humboldt River during the irrigation season (April to September) was 4,766 acre-ft in 2018. However, the annual average discharge into Chimney Reservoir since 2001 is 10,875 acre-ft (Figure 3).

During 2018, water storage was measured 20 times by NDWR and the maximum water stored occurred starting April 10 at 24,356 acre-ft. Water was flowing into Chimney Reservoir until June 26 and water was released for irrigation from April through September. The reservoir was at 12,000 AF at the end of the irrigation season.

Augment the fisheries with approximately 200,000 walleye fry or 2,000 catchable walleye, 2,000 channel catfish, 2,000 wipers, 1,000 yellow perch, 1,000 bluegill, 1,000 crappie, 1,000 largemouth bass, and 1,000 Tiger Muskie by utilizing source stock from other states as well as purchasing fish from approved

commercial/government suppliers. Chimney Reservoir was stocked with 385,000 walleye fry, 4,000 channel catfish, 2,010 wiper, and 1,049 tiger muskie in 2018 (Table 3).

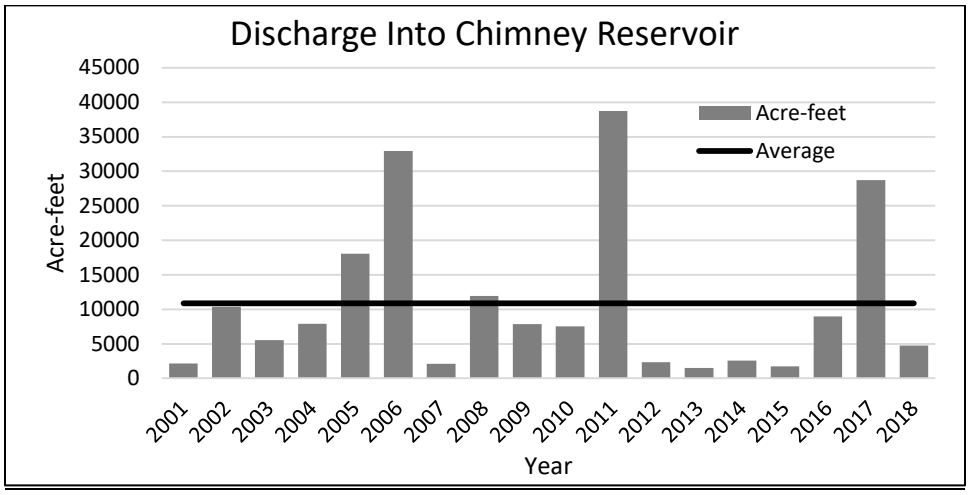


Figure 3. Annual Discharge of Water into Chimney Reservoir, 2001-2018.

Table 3. Five-Year Stocking History in Chimney Reservoir, 2014-2018.

	Species	Source	No.	lbs	Average Size (in)
2018	Walleye	Gavin Point NFH, SD	385,000	–	–
	Channel catfish	Colorado Catch	4,000	100	4.3
	Wiper	Colorado Catch	2,010	105	5.1
	Tiger muskie	Speas Hatchery WYG&F	1,049	28	5.5
2017	Walleye	Gavins Point NFH, SD	400,000	–	–
	Channel catfish	Colorado Catch	2,000	200	7
	Tiger muskie	Speas Hatchery, WYG&F	250	25	7.7
2016	Walleye	Gavins Point NFH, SD	400,000	–	–
	Wiper	Colorado Catch	1,671	191	7
2015	Walleye	Gavins Point NFH, SD	500,000	–	–
	Tiger muskie	Oswald Fisheries	1,040	–	12.6
2014	Largemouth bass	Bilk Creek Reservoir	213	–	9.5
	White crappie	Willow Creek Reservoir	1,878	–	5.9

Monitor population of fish species and body 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. Sampling (all methods combined) caught 461 white crappie averaging 143 mm TL, six black crappie averaging 170mm TL, 48 walleye averaging 292 mm TL, 10 channel catfish averaging 348 mm TL, 6 tiger muskie averaging 192 mm TL, 74 yellow perch averaging 118 mm TL, 9 wiper averaging 421mm TL, 4 Tahoe sucker averaging 188 mm TL, 6 Sacramento blackfish averaging 112 mm TL, 1 speckled dace at 56 mm TL, and 1 Lahontan cutthroat trout measuring 220 mm TL (Table 4). However, carp was by far the most numerous fish species caught and numbered in the 1,000s with most of them being from 2.0 to 5.0 in. Carp were not measured, weighed, or counted during the 2018 survey due to their extremely high numbers during sampling. The one LCT caught electroshocking was released unharmed back to the lake.

Table 4. Chimney Reservoir 2017 and 2018 survey results.

Survey Method		***CPUE 2017***	***CPUE 2018***
	Tiger muskie	1.8 fish/hour	1.5 fish/hour
	White crappie	51.3 fish/hour	25.1 fish/hour
	Black crappie	0 fish/hour	1.5 fish/hour
	Yellow perch	7.2 fish/hour	15.7 fish/hour
	Walleye	2.7 fish/hour	7.5 fish/hour
	Channel catfish	0 fish/hour	0.2 fish/hour
	Wiper	0 fish/hour	0.7 fish/hour
	Lahontan cutthroat trout	0 fish/hour	0.2 fish/hour
	Sacramento Blackfish	2.7 fish/hour	1.0 fish/hour
	Tahoe sucker	0 fish/hour	1.0 fish/hour
	Speckled dace	0 fish/hour	0.2 fish/hour
	All fish	65.7 fish/hour	54.7 fish/hour
	Trophy sportfish*	1.8 fish/hour	2.2 fish/hour
Electroshocking	General warmwater sportfish**	61.2 fish/hour	54.7 fish/hour
	Channel catfish	0.67 fish/net night	2.25 fish/net night
	White crappie	5.75 fish/net night	53.0 fish/net night
	Walleye	0.5 fish/net night	3.75 fish/net night
	Wiper	0 fish/net night	1.5 fish/ net night
	Yellow perch	0 fish/net night	0.75 fish/net night
	Sacramento blackfish	0 fish/net night	0.25 fish/net night
	All fish	13.67 fish/net night	61.5 fish/net night
	Trophy sportfish*	0 fish/net night	1.5 fish/ net night
Gill nets	General warmwater sportfish**	6.92 fish/net night	60.0 fish/net night
	White crappie	4.17 fish/net night	74.0 fish/net night
	Walleye	0 fish/net night	0.8 fish/net night
	Yellow perch	0 fish/net night	2.0 fish/net night
	Sacramento blackfish	0 fish/net night	0.3 fish/net night
	All fish	6 fish/net night	80 fish/net night
	Trophy sportfish*	0 fish/net night	0 fish/net night
Frame nets	General warmwater sportfish**	4.1 fish/net night	79.5 fish/net night
	Crappie	1 fish/100m	No Survey
	Channel catfish	0.25 fish/100m	No Survey
	Sacramento Blackfish	1 fish/100m	No Survey
	Carp	1.5 fish/100m	No Survey
	All fish	3.75 fish/100m	No Survey
	Trophy sportfish*	0 fish/100m	No Survey
Beach seine	General warmwater sportfish**	1.25 fish/100 m	No Survey

*Trophy sportfish = tiger muskie and wipe

** General warmwater sportfish = walleye, channel catfish, white crappie, black crappie, yellow perch, and largemouth bass

A large enough sample size of white crappie, yellow perch, and walleye were captured during surveys to create length frequency graphs that show distinct size/age class (Figure 4).

An estimated five classes of white crappie were found (Figure 4). Young of the year were 20 mm and comprised 0.65 percent of the sample. Class 1 ranged from 80 to 130 mm and comprised 46.45 percent of the sample. Class 2 ranged from 150 to 200 mm and comprised 49.03 percent of the catch. Class 3 ranged from 250 to 270 mm and comprised 3.23 percent of the sample and one large crappie of an unknown age/class comprised 0.65 percent of the sample.

Walleye showed three classes (Figure 4), with class 1 ranging from 160 to 260 mm and comprising 55.56 percent of the sample. Class 2 ranged from 300 to 400 mm and comprised 42.22 percent of the sample and one large walleye of an unknown class comprised 2.22 percent of the sample.

Two classes of yellow perch were sampled (Figure 4), with class 1 ranging from 80 to 140 mm and comprising 91.04 percent of the sample. Class 2 ranged from 190 to 210 mm and comprised 8.96 percent.

Electroshocking and gill netting have been conducted consistently at Chimney Reservoir over the last four years (Figure 5). White crappie was captured at the highest frequency. In 2017 and 2018, yellow perch capture rate increased dramatically, but CPUE of largemouth bass and wipers has been inconsistent. Figure 5 summarizes electroshocking and gill netting results by species over the last four years.

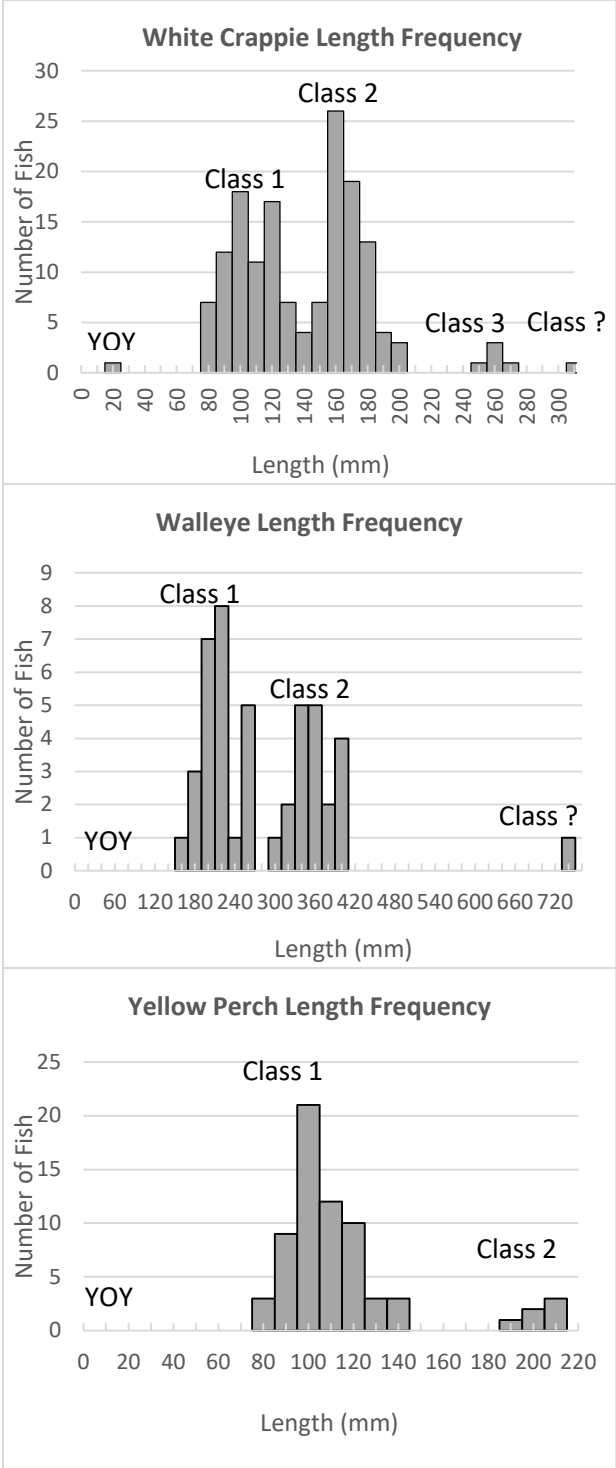


Figure 4. Length frequency showing age/size classes for white crappie, walleye, and yellow perch.

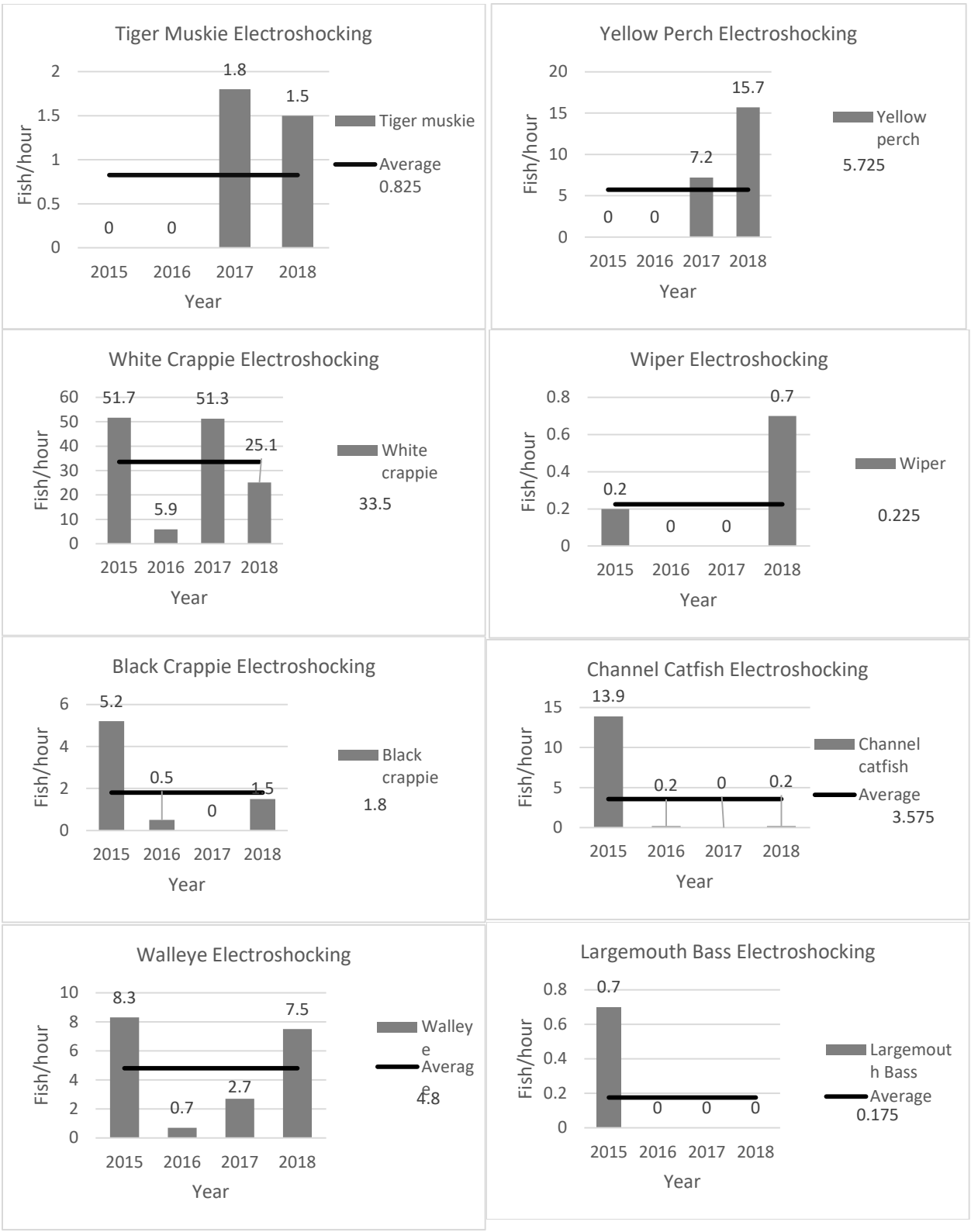
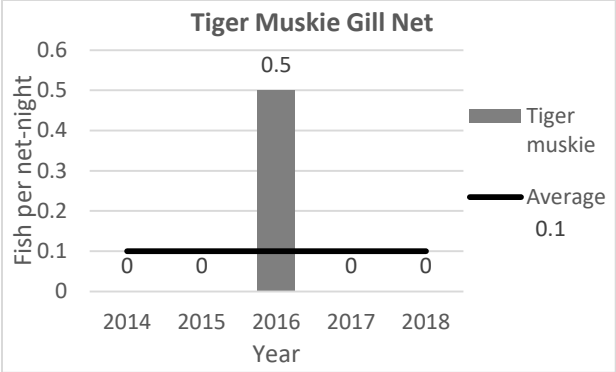
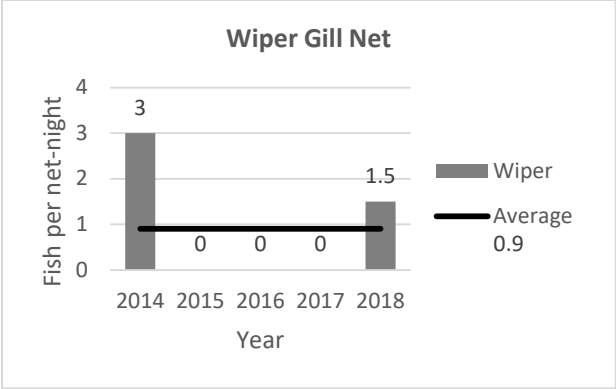
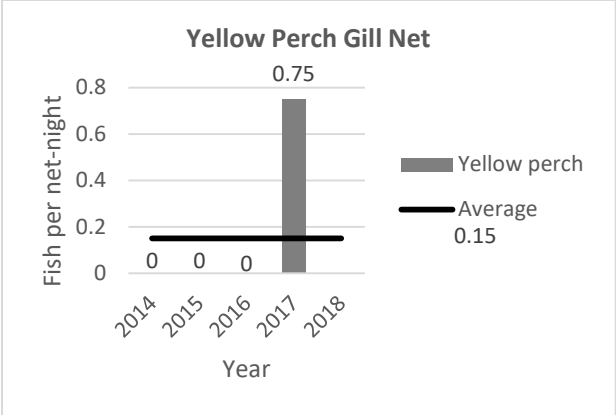
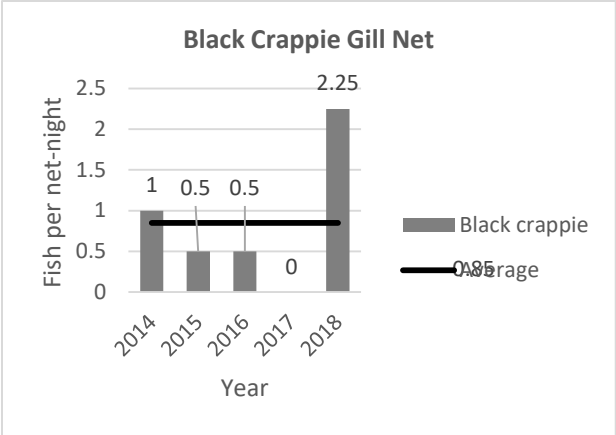


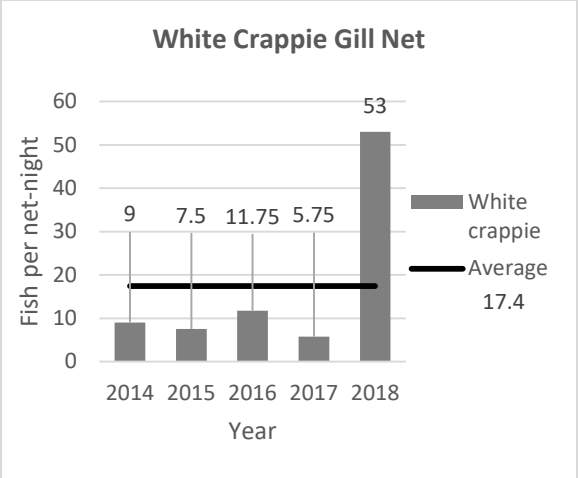
Figure 5. Chimney Reservoir electroshocking results for eight gamefish species, 2015 - 2018.

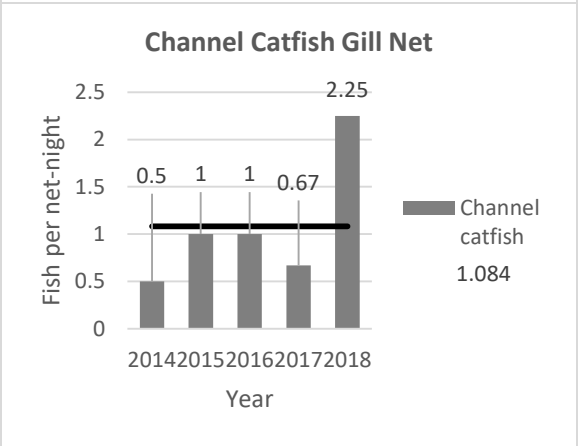












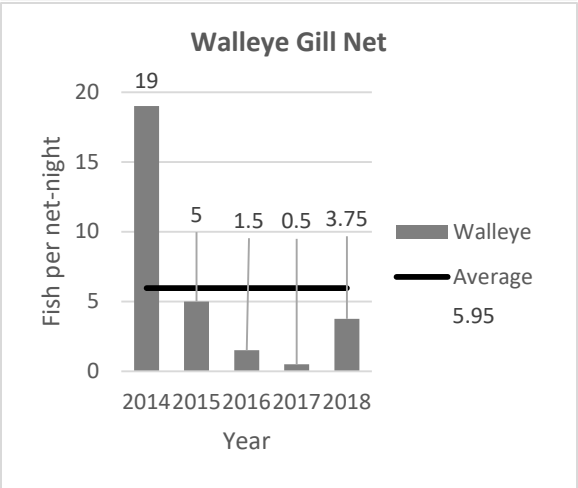


Figure 5 Cont. Chimney Reservoir gillnetting results for seven gamefish species, 2014 - 2018.

Nine different gamefish species have been sampled over the last five-years. White crappie has made up the largest percentile of all gamefish caught, averaging 66.9 percent from 2014 through 2018 (Table 5).

Table 5. Percent Composition of gamefish Chimney Reservoir, 2014-2018.

Species Composition (%) of Gamefish									
	Tiger muskie	White crappie	Black crappie	Yellow Perch	Walleye	Channel Catfish	Wiper	Largemouth Bass	LCT
2014	0	46.48	2.82	0	44.37	0.7	5.63	0	0
2015	0	69.78	3.36	0	11.75	13.91	0.24	0.96	0
2016	1.27	68.79	3.82	0.64	15.29	5.73	4.46	0	0
2017	1.09	77.05	7.65	4.37	4.92	4.92	0	0	0
2018	0.99	72.4	3.3	12.15	7.88	1.64	1.48	0	0.16
Avg	0.67	66.90	4.19	3.43	16.84	5.38	2.36	0.19	0.03

When caught, some gamefish species were measured and weighed to assess body condition. Relative weight (W_r) is an index calculated as:

$$W_r = (W/W_s) * 100$$

Where W =individual weight of a fish, W_s = length-specific standard weight predicted from a weight-length regression developed to represent a species across a geographic range. Standard weight equations (W_s) were obtained from Blackwell et al. 2000. The relative weight index uses 100 as a benchmark for a standard body condition of fish. Measures over 100 are considered good condition and measures less than 100 are considered poorer with severity depending on the distance from the benchmark of 100 (Guy and Brown 2007). This was the second year of this work at Chimney Reservoir and average body conditions for white crappie, black crappie, yellow perch, walleye, and channel catfish exceeded the benchmark of 100. These species appear healthy and make good use of available forage. The average index for wiper was 99.2, which was considered normal for the species. Table 6 summarizes the W_r index from the past two years.

Table 6. Body condition indices for Chimney Reservoir gamefish, 2017 - 2018.

	2018				2017			
	n	Average *Wr*	Min *Wr*	Max *Wr*	n	Average *Wr*	Min *Wr*	Max *Wr*
White crappie	106	**115.6**	51.8	238.3	75	138.2	72.2	207.7
Black crappie	2	**117.9**	105.9	129.9	0	**	**	**
Yellow perch	14	**128.1**	74.2	239.6	0	**	**	**
Walleye	56	**103.1**	72.6	150.3	9	113.9	70	206.3
Channel catfish	10	**129.2**	83.9	257.7	8	119.9	84.4	157.8
Wiper	9	**99.2**	79.3	119.5	0	**	**	**

** No samples obtained

Conduct quagga mussel veliger sampling through plankton tows at established transects at least twice per year. Veliger monitoring was not conducted due to high winds and poor conditions when sampling was scheduled.

Monitor for the presence of quagga mussels by conducting tactile surveys around boat docks and reservoir substrates when on-site. Tactile sampling for adult

quagga mussels occurred along the dam and boat ramp multiple times when on-site. All areas were found negative for adult quagga mussels.

Collect at least 5 each of crappie netting and electroshocking surveys for mercury level analysis by EPA. Chimney Reservoir has a health advisory issued by the Nevada Division of Public and Behavioral Health for the consumption of fish. It is recommended that walleye should not be consumed and for all other species that no more the one 8-oz meal per month be consumed. In 2017, two walleye and five crappie were collected and walleye averaged 1.10 mg Hg/kg and crappie averaged 1.35 mg Hg/kg. White crappie, thus, showed the highest historical results, suggesting there should be a no consumption advisory. Conversely, in 2018, a larger sample of white crappie was analyzed. Based on results, consumption for both crappie and walleye would suggest a one 4-ounce meal per month based (but close enough to the no consumption advisory) based on EPA mercury consumption rates. However, Nevada Division of Environmental Protection and Division of Public and Behavioral Health control or guide health advisories in the state and have not regulated any changes in the consumption rate as of yet.

Table 5. EPA Mercury Analysis Results for White Crappie, 2018.

Species	Length (mm)	Weight (g)	Mercury (mg/kg)
White crappie	305.0	460.0	**1.10**
White crappie	310.0	485.0	**0.93**
White crappie	270.0	275.0	**1.20**
White crappie	260.0	245.0	**0.82**
White crappie	190.0	75.0	**1.10**
White crappie	265.0	230.0	**1.50**
White crappie	181.0	85.0	**0.80**
White crappie	187.0	80.0	**0.80**
White crappie	175.0	60.0	**0.93**
White crappie	200.0	90.0	**0.96**
White crappie	187.0	85.0	**0.98**
White crappie	186.0	80.0	**0.79**
White crappie	185.0	70.0	**0.94**
		Average	**0.99**

Augment the Sacramento blackfish population by stocking 2,000 adult fish into Chimney Reservoir. Adult Sacramento blackfish stocking did not occur in 2018. NDOW planned to use a commercial operator to obtain the Sacramento blackfish, but unfortunately, the conditions at Rye Patch Reservoir were not conducive for netting Sacramento blackfish in 2018. The water level in Rye Patch Reservoir was too high and the commercial purse seine method used to harvest fish could not sample at deeper locations where Sacramento blackfish inhabited. An attempt to collect Sacramento blackfish will continue in 2019.

Collect stomach samples from wiper, walleye, and tiger muskie to assess which forage fish is being utilized by the piscivorous fish populations. Stomach samples were collected from two walleye and two wipers in 2018 (Table 6). Six tiger

muskie were also captured, but unfortunately, they were too small to collect stomach contents.

Table 6. Stomach Contents - Chimney Reservoir, 2018.

Species	Total Length (mm)	Weight (grams)	*Wr*	Stomach Contents
Wiper	455	1270	91.5	Unidentifiable fish parts
Wiper	403	735	79.3	Small crappie
Walleye	390	555	90.7	Empty
Walleye	410	650	90.6	Unidentifiable fish parts

MANAGEMENT REVIEW

The water level at Chimney Reservoir remained good from a fisheries perspective throughout 2018. The launch ramp was accessible to boats throughout the year and water was released to meet downstream irrigation demands. The 2017 angler mail-in questionnaire showed angler success rates of 0.29 fish per angler and 0.25 fish per day and, based on a Warmwater General Fishery Concept, Chimney Reservoir is not meeting management objectives. This concept also suggests that walleye should average 18.0 in, but the average walleye sampled in 2018 was 11.5 in.

Fish species representing a General Warmwater Fishery Concept showed that gill netting CPUE was 60.0 fish/net-night, which was well above other Nevada fisheries. It is worth noting that white crappie comprised 53.0 fish per net-night and most of these were of age class 1 and 2. Walleye and yellow perch also showed strong age class 1 and 2 representation within their populations.

Water conditions in 2016 and 2017 were beneficial to white crappie spawning habitat resulting in greater production, especially in 2018. Unfortunately, high water and good spawning habitat also benefited carp production. During electroshocking surveys in spring of 2018, the number of 2.0 to 5.0 in carp was very alarming. In fact, there were so many carp in that size class that sampling was stopped. It is safe to say that carp are the most abundant fish species in Chimney Reservoir.

White crappie, black crappie, yellow perch, walleye, channel catfish, and wipers were measured and weighed to examine body condition. For all species average relative weight indices were above or near the standard, implicating fish were in good health. Several factors influence relative weight such as time of year fish are sampled. Fish can be pre- or post-spawn, or forage conditions may change throughout the year. This was the second year assessing fish health in Chimney Reservoir and, over time, standard weights will be established for individual species through increased sampling over various times of the year. Obtaining species-specific standard weights for sportfish species at Chimney Reservoir will assist in management of Nevada waters in understanding the relationship of fish health/body condition in relation to carp abundances. In the past, an attempted to control carp using rotenone was conducted, but the treatment was not as successful as anticipated. More recently, several piscivorous fish species (walleye, wiper, tiger muskie) have been introduced into Chimney Reservoir with the goal of

controlling carp abundance. Monitoring sportfish composition and abundance, along with monitoring fish health/body condition, is important for understanding and managing Chimney Reservoir as a productive sport fishery.

Monitoring results for adult quagga mussels along the shoreline and boat ramp were negative in 2018. Ongoing monitoring and boater education should help prevent establishment of aquatic invasive species into Chimney Reservoir.

The average mercury concentration for 13 white crappie was 0.99 mg/kg. This was slightly lower than the 1.35 mg/kg observed in 2017, but significantly greater than concentrations in 2006 that averaged 0.69 mg/kg.

Six tiger muskie were captured in 2018 and all six were stocked just a few months prior. To date, there has not seen a good return on tiger muskie, based on volunteer angler reporting or from NDOW population surveys. With a small number of tiger muskie captured since the original stocking in 2015, it is difficult to make an assessment about the tiger muskie population. Tiger muskie were introduced in November 2015 and augmented again in 2017 and 2018 to control carp abundance. Monitoring results showed that carp were the most abundant fish species and represented 48 percent of the fishes sampled in 2017. In 2018, carp were so abundant that survey crews had to stop counting carp in order to survey sport fish. Continued fish monitoring, along with collection of stomach samples from tiger muskie will indicate if tiger muskie is having an impact on carp. Generally, water clarity in Chimney Reservoir is less than six inches, which could play a factor in the foraging efficiency of tiger muskie. However, tiger muskies continue to be difficult to locate and catch during surveys.

RECOMMENDATIONS

- 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 rivers (above the reservoir) and Little Humboldt River (below the reservoir).
- Augment the fisheries with approximately 200,000 walleye fry or 2,000 catchable walleye, 2,000 channel catfish, 2,000 wipers, and 3,000 tiger muskie by utilizing source stock from other states, nearby in-state sources, as well as purchasing fish from approved commercial or government suppliers.
- Monitor populations of fish species and body 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.
- Monitor for the presence of quagga mussels by conducting tactile surveys around boat docks and reservoir substrates when on-site.
- Augment the Sacramento blackfish population by stocking 2,000 adults.
- Collect stomach samples from wiper, walleye, and tiger muskie to assess forage utilization.

REFERENCES

Blackwell, B.G., M.L. Brown, and D.W. Willis. 2000. Relative weight (*Wr*) status and current use in fisheries assessment and management. Reviews in Fisheries Science 8:1-44.

Guy, C.S. and M. Brown. 2007. Analysis and interpretation of Freshwater Fisheries Data. American Fisheries Society. Bethesda Maryland.

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