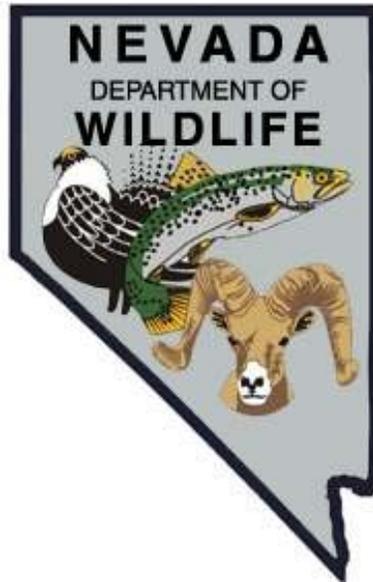


NEVADA DEPARTMENT OF WILDLIFE STATEWIDE FISHERIES MANAGEMENT



FEDERAL AID JOB PROGRESS REPORT

F-20-53
2017

WALKER LAKE
WESTERN REGION



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

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

State: Nevada
Project Title: Statewide Fisheries Program
Job Title: Walker Lake
Period Covered: January 1, 2017 through December 31, 2017

SUMMARY

The surface elevation of Walker Lake declined in 2017 to a new documented low resulting from a lack of sustained inflow. However, during spring and summer, the lake level rose in response to early spring flooding in the Walker basin. Total dissolved solids (TDS) also increased to the highest concentration ever observed. Based on the snow pack reported by the Natural Resource Conservation Service (SNOTEL sites), the Walker Basin accumulated 212 percent of median snow pack as reported on April 1, 2017. This was the first year since 2011 in which the lake level rose.

Lahontan cutthroat trout have not been stocked since 2009 and anglers have caught no fish in recent years. Additionally, gill netting was conducted in 2015 and no fish were caught. Tui chub (*Siphateles bicolor pectinifer* and *S.b. obesa*) also have not been observed in several years. The establishment of tui chub from Walker Lake into Rose Creek Reservoir during 2010 was successful as several hundred fish of at least three age classes have been observed for the past three years. During 2017, tui chub was confirmed in Cat Creek Reservoir, which is fed through a pipe from Rose Creek Reservoir.

BACKGROUND

Lake Lahontan, a large inland, freshwater sea, at its peak volume during the late Pleistocene epoch (approximately 15,000 years ago) covered much of northern Nevada. Climate change around the end of the Pleistocene epoch led to a gradual desiccation of this large inland lake. The only modern remnants of ancient Lake Lahontan that exist as true lakes are Pyramid Lake and Walker Lake. Over its long history, dry periods resulting from severe climatic changes caused Walker Lake to desiccate several times, the last of which happened approximately 2,100 years ago.

Lahontan cutthroat trout (LCT) has a long historical connection to the Lahontan basin as the dominant, predatory fish and, in Walker Lake, LCT has grown to over 13.6 kg (30 lbs). When explorers discovered the lake in the 1840's, its elevation was 1,244 m (4,080 ft) above mean sea level (MSL) and LCT were able to access the Walker River to naturally propagate. Shortly after, much of the river was diverted for agricultural and ranching use. The lack of a permanent flowing river, resulting from irrigation diversions and the construction of barriers, has prevented upstream spawning migrations since the early 1900's. The consequence of a declining lake is an increase in the TDS concentration, which shortens the life span of LCT.

Since the early 1950's, the LCT fishery in Walker Lake was maintained only through stocking. Historically, several strains have been planted with good results, but regardless of strain, as TDS levels increased, LCT survival decreased. High TDS levels (mostly composed of bicarbonate, sodium, sulfate, and chloride) affect gill and kidney functions and negatively impact survivorship and size of fishes. Throughout the late 1990's and up until 2009, NDOW used several acclimation methods to increase survival of stocked LCT. NDOW and USFWS experimented, with some success, stocking LCT into the river to allow self-acclimation in the plume of mixed water at the inflow to the lake. Success of this type of stocking is unknown. By 2009, the year that the last LCT was documented in Walker Lake, TDS levels increased to over 18,000 mg/L. Stocking efforts were discontinued after 2009 and fish are no longer stocked into Walker Lake.

Decreasing lake levels leading to increasingly toxic water quality conditions resulted in inhospitable conditions for all fishes. Other native species once existed in Walker Lake, but tui chub were the last known to survive, and none have been documented for several years. In 2012 when the last intensive monitoring of the Walker Lake fishery was conducted, the rising TDS level had severely diminished tui chub egg viability, affected tui chub survival, and likely exceeded tolerance levels for tui chub. Tui chub originating from Walker Lake are only known to exist in Rose Creek Reservoir and Cat Creek Reservoir, on land managed by the Hawthorne Army Depot.

OBJECTIVES

- Assist with netting, angler surveys, water quality monitoring, or other activities as requested by the Walker Lake Fisheries Improvement Team.
- Assist NDEP with conducting water quality analysis to determine current TDS levels.
- Monitor progress of the construction of a new boat ramp at Sportsman's Beach at least three times per year.

PROCEDURES

Assist with netting, angler surveys, water quality monitoring, or other activities as requested by the Walker Lake Fisheries Improvement Team. No gill nets were set during 2016 or 2017. Tui chub populations in Rose Creek Reservoir were monitored on May 24 and 25, 2017. Twenty baited minnow traps were set around the shore in approximately a one to four foot depth of water and allowed to sit for four hours. Fish captured were measured to nearest millimeter and released back into the reservoir. A visual survey consisted of walking two laps around the shoreline and tallying all fish observed.

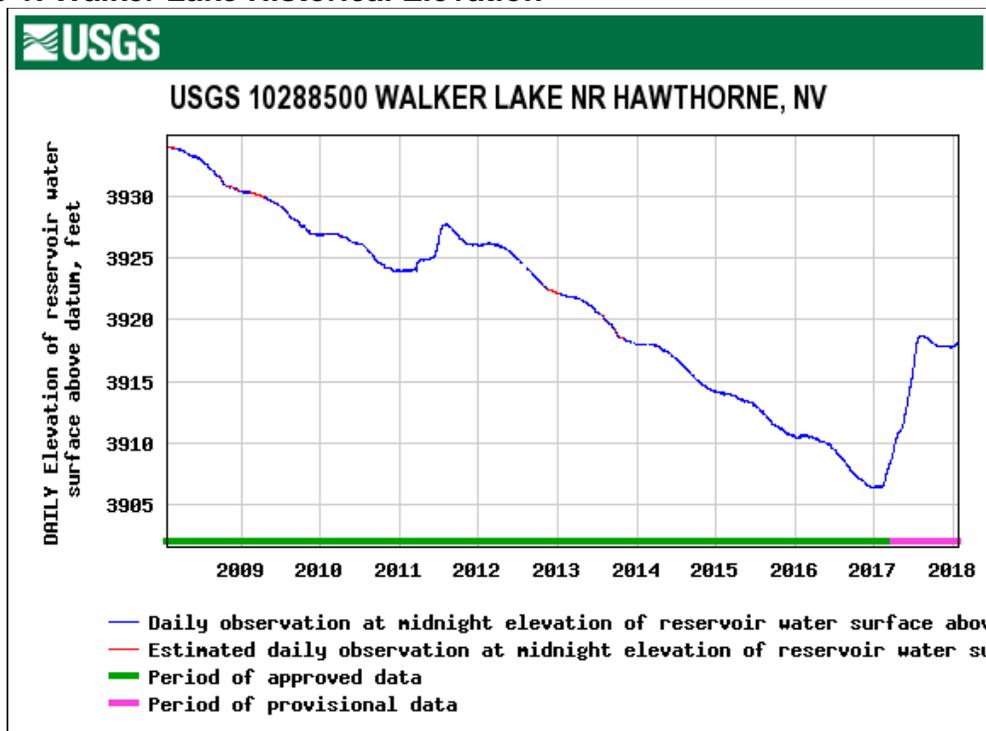
Assist NDEP with conducting water quality analysis to determine current TDS levels. NDEP did not request assistance for water quality analysis during 2017.

Monitor progress of construction of new boat ramp at Sportsman’s beach at least three times per year. The construction site was visited on at least five occasions during 2017. As of February 2018, no “on the ground” activities had begun. No coordination regarding permitting, environmental documentation, and clearances took place. It is unclear if BLM and Nevada State Parks are still pursuing this project.

FINDINGS

Assist with netting, angler surveys, water quality monitoring, or other activities as requested by the Walker Lake Fisheries Improvement Team. No sampling occurred in Walker Lake during 2017. During 2012, an evaluation of tui chub suggested that very few fish, if any, under five years were able to survive at the high TDS levels. It is likely there are no tui chub or LCT currently in Walker Lake.

Figure 1. Walker Lake Historical Elevation



The tui chub population in Rose Creek Reservoir, which is a population established using tui chub from Walker Lake, was estimated to be 17,664 in 2015. During 2016, a reliable population estimate could not be determined due to lack of fish captured during minnow trapping efforts. In 2017, the tui chub population was estimated to be comprised of 5,284 individuals. Predation by tiger trout could also be affecting the juvenile population, however, stomach contents collected from five tiger trout revealed only aquatic invertebrates. Several age classes of tui chub were evident during the visual survey and all fish appeared healthy. The addition of artificial habitat structures should provide escape cover for juvenile tui chub from tiger trout. Rose Creek Reservoir has been added to the Urban Fishing Pond Program and additional

details regarding use of habitat structures are reported in the Western Region Urban Ponds Job Progress Report.

Several meetings were attended during 2017 in response to public requests resulting from rising lake levels. Information was distributed regarding short term, and long-term, plans for Walker Lake as well as water quality requirements for tui chub and LCT.

Assist NDEP with conducting water quality analysis to determine current TDS levels. NDEP did not request assistance with water quality analysis during 2017. TDS levels were recorded as high as 26,000 mg/l during 2016; however, during 2017 TDS levels may have decreased slightly in response to a 13-foot rise in lake level.

Monitor progress of construction of new boat ramp at Sportsman's Beach at least three times per year. As of February 2018, no "on the ground" activities had begun. Permitting, environmental documentation, and clearances were ongoing during 2015, however, no communication between NDOW, the BLM, and Nevada State Parks occurred and the status of this project is unclear.

MANAGEMENT REVIEW

In 2017, Walker Lake elevation reached an all-time documented low while TDS rose to the all-time documented high (26,000 mg/l+). No LCT have been sampled since May of 2009, and it is likely that conditions at Walker Lake have exceeded the limitations for fish survival. Target TDS levels for reintroduction of LCT are 16,000 mg/l for stocking with acclimation, 12,000 mg/l as a sustainable high, and 8,000 mg/l for stocking without acclimation.

The water acquisition program administered by the National Fish and Wildlife Foundation (NFWF) has been successful at gaining water rights from many willing sellers in Smith and Mason valleys. Litigation regarding the transfer of those purchased rights is ongoing; however, administrators for NFWF are optimistic that within the next couple of years water will begin to be delivered to the Walker Lake.

In 2008, Mineral County employees constructed a primitive boat launch next to the existing State Park launch. For several months, the new launch was usable to four-wheel drive vehicles. However, during the summer of 2009, State Park personnel placed the State Park facilities at Walker Lake on caretaker status and no maintenance has been conducted on the new, primitive ramp. Much of the ramp has now washed out, the incline is too steep, and the dirt is too soft and loose for use. During 2016, launching at Sportsman's Beach (BLM site) was difficult, although possible.

A refuge population of tui chub was established in Rose Creek Reservoir from 2010 to 2012. The population appears to be healthy and annual monitoring should continue to evaluate the status of the tui chub population. If juvenile tui chub numbers

remain low, additional artificial habitat structures will provide protective cover. Tui chub have escaped to Cat Creek Reservoir.

RECOMMENDATIONS

- Work with the Walker Basin Recovery Implementation Team to determine and implement measures that work towards restoration of LCT in Walker Lake.
- Monitor tui chub refuge populations at Rose Creek Reservoir and Cat Creek Reservoir utilizing 20 minnow traps set over one night in the summer, and visual surveys around the entire perimeters of each pond conducted on one occasion in the summer.

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