

1-1-2009

Effects of increasing total dissolved solids on the Walker Lake, Nevada, fishery

Karie A. Wright

Nevada Department of Wildlife, Yerington

Follow this and additional works at: <http://digitalcommons.usu.edu/nrei>

Recommended Citation

Wright, Karie A. (2009) "Effects of increasing total dissolved solids on the Walker Lake, Nevada, fishery," *Natural Resources and Environmental Issues*: Vol. 15, Article 16.

Available at: <http://digitalcommons.usu.edu/nrei/vol15/iss1/16>

This Article is brought to you for free and open access by the Quinney Natural Resources Research Library, S.J. and Jessie E. at DigitalCommons@USU. It has been accepted for inclusion in Natural Resources and Environmental Issues by an authorized administrator of DigitalCommons@USU. For more information, please contact becky.thoms@usu.edu.



The Effects of Increasing Total Dissolved Solids on the Walker Lake, Nevada, Fishery

Karie A. Wright¹

¹Nevada Department of Wildlife, Nevada Department of Wildlife, 50 Hatchery Way, Yerington, NV 89447, USA; E-mail: kawright@ndow.org

Pleistocene Lake Lahontan once occupied much of Nevada. Walker Lake, a desert terminal lake, is remnant of Lake Lahontan. It is fed by the Walker River, running from the east side of the Sierra Nevada through over 160 km of farming community before terminating at Walker Lake. Since the mid 1800s agricultural diversions have resulted in an approximately 45 m drop in lake elevation. Due to lack of flow and barriers created along the Walker River system, the historic Lahontan cutthroat trout (LCT) (*Oncorhynchus clarki henshawi*) have been unable to migrate and spawn upstream and maintain a self-sustaining population. The Nevada Department of Wildlife (NDOW) and the United States Fish and Wildlife Service (USFWS) historically stocked about 2.0×10^5 LCT and currently stock about 7.0×10^4 floy tagged LCT annually. However, increasingly toxic lake conditions are reducing survivability of the native LCT. High total dissolved solids (TDS, mostly bicarbonate, sodium, sulfate, and chloride) affect gill and kidney functions that impact survivorship and size of fishes. High TDS have resulted in unsuccessful acclimation of stocked

trout; fish die quickly when stocked directly from fresh water into Walker Lake. Fish planted in the river above the lake however, possibly self acclimate in the mixing zone. NDOW is currently working with the USFWS to examine survivorship of stocked LCT using tag recovery information. Figure 1 shows a decline in the ability of anglers to catch LCT since 1992, concurrent with an increase in TDS. While other native species once existed in Walker Lake, the LCT and Lahontan tui chub (*Gila bicolor pectinifer* and *G. bicolor obesa*) are the only species that have persisted in increased TDS. TDS has reached over 1.6×10^4 mg/l twice recently (in 2005 and 2007). Examinations of LCT survivorship, recruitment of tui chub, zooplankton composition and abundance, as well as intensive water quality analysis are currently part of an extensive study on Walker Lake. NDOW and USFWS hope to provide various management strategies to prolong the survival of fishes in Walker Lake while others work on requiring water rights for the lake.

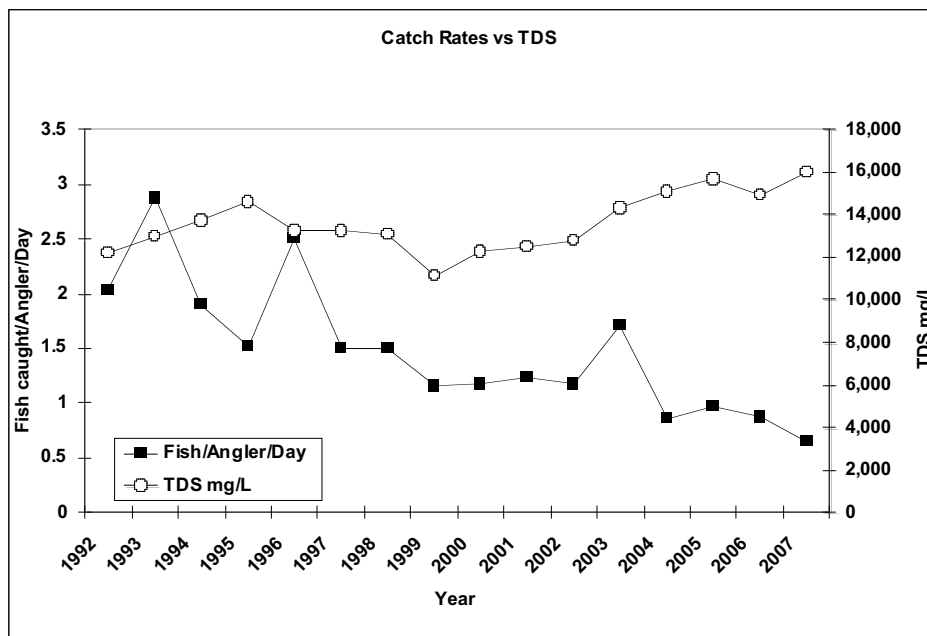


Figure 1—Catch rates from roving creel surveys show a decline in fish caught since 1992 as LCT respond to increasing TDS. Catch rates are also affected by fish planting numbers being reduced by more than half of historical numbers.