

GREAT BASIN BIRDS



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RESEARCH

Walker Lake Satellite Telemetry Loon Study

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Walker Lake, in western Nevada, is a troubled desert terminal lake with an uncertain future. Decreased water flows have greatly reduced its volume and increased the lake's salinity over the past hundred years, seriously threatening the lake's fish population. A thousand or more Common Loons (*Gavia immer*) migrate into this setting each spring and fall to rest and feed for up to a month during their journey. The loss of Walker Lake's fish could have a devastating effect on that segment of the Common Loon population that uses the lake. Since biologists presently have little information regarding the breeding and wintering grounds of the Walker Lake loons, it is impossible to calculate and/or make plans to mitigate the effects of such an eventuality.

The night of April 22, 1998 marked the onset of field work on a joint project of the U.S. Fish and Wildlife Service (USF&WS), Boise State University, Great Basin Bird Observatory, and the Nevada Division of Wildlife. Five loons were captured from boats that night and three held for surgery and release the following day. Satellite transmitters weighing less than an ounce were implanted between skin and muscle at the base of the neck by the U.S. Geological Survey (USGS) biologist who developed this surgical procedure. The three transmitters were programmed to send a signal for eight hours each week, which satellites could receive and use to derive the loons' latitude and longitude for a minimum of twenty-five (25) weeks.

The three subjects remained at Walker Lake after release and were observed occasionally during monitoring efforts. On May 9, a satellite located one loon about 25 miles WSW of Flaming Gorge Valley in Utah. The following day, a second loon had moved to the north end of Pyramid Lake. Those two transmitters were not heard from again. The third loon left Walker Lake sometime after May 10, and had flown some 1,300 miles to its nesting area in Saskatchewan (east of Churchill Lake) by May 17. A month later, this transmitter also failed.

Analysis of sensor data indicates the loons were healthy and viable but that excessive anode passivation, the normal formation of a layer of lithium chloride on the anode surface, had kept transmitter batteries from continuing to perform. Passivation is responsible

for the batteries' long shelf life. The layer usually burns off whenever programming activates the transmitter and the batteries fire. Because the three transmitters were programmed to activate only once weekly (hoping to extend data gathering through the loons' arrival on wintering territories using available battery duration) this layer became excessively thick and eventually prevented firing of the batteries.

Based on these findings, the USGS colleague on the team arrived at a modified transmitter profile that allowed for the doubling of life of the incorporated batteries. Six of the refined units were programmed to transmit more frequently than the Walker Lake units, thereby avoiding excessive anode passivation, and were implanted August 22-26 in a Minnesota/Wisconsin study area. All six units continued to function properly in December, whereas none of the Walker Lake units lasted even two months. The modified transmitters still comprise less than 1% of body weight in all 1998 Walker Lake implant subjects. We are proposing to use them in an expanded 1999 study, if funding can be obtained.

As a result of the 1998 pilot study, blood samples were analyzed on loons captured at Walker Lake for the first time. Three of the five individuals carried near-lethal levels of mercury, creating the necessity to rapidly determine the source of contamination and assess the concomitant effects on the health of the public and on other species. Composite samples of tui chub from Walker Lake analyzed in 1996 by the USF&WS revealed elevated mercury levels. The Walker River watershed contains abandoned mills that may have used mercury in the extraction of gold and silver. We are in the process of developing proposals for further cooperative studies with the Department of Defense USF&WS, USGS, and the private sector to assess the extent of the mercury problem within the Walker ecosystem and on the loons' breeding and wintering grounds.

The Great Basin Bird Observatory is the public education cooperator of the study and will be exploring internet, public school, and volunteer methods of education.

All those involved wish to thank Senator Harry Reid for his help in securing funding for the 1998 effort.



1998 Avian Research at Mono Lake

Staff of the Mono Lake Committee

The following report provides a synopsis of the 1998 and on-going ornithological research projects at Mono Lake, California.