

Waterbirds affected by low water, high salt levels in lakes: study

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A recent study from researchers at the University of Montana, National Audubon Society, Oregon State University and East Cascades Audubon Society shows food sources for migratory birds decline with low water levels and high salt content in lakes.

The study is based on data gathered for more than 25 years at Lake Abert in Oregon, one of the most important stops for migrating waterbirds in the western United States. It found that as surface [water levels](#) decline, salinity increases and affects the availability of [brine shrimp](#) and other invertebrates - a key food source for waterbirds.

According to the latest results of the study, Lake Abert has decreased by 618 acres - nearly 200 football fields in size - since 1986. The water levels have decreased due to water diversions for human uses, drought and a changing climate. During periods of low water and high salinity, bird sightings at Lake Abert declined by as much as 82 percent.

"Very few long-term studies of natural saline [lake](#) systems exist," said Nathan Senner, a postdoctoral fellow at UM. "Our dataset is thus one of the few that can confirm what people have shown with laboratory experiments - once salinities become too high, it really has negative effects on both [birds](#) and invertebrates."

The study combines data on waterbird use, lake measurements and invertebrate abundance to document how waterbird numbers changed over 25 years in response to the changes in lake area, salinity and food sources.

Reduction in lake area and increase of salinity also has economic costs. One of the report's coauthors, Keith Kreuz, had to give up his business at Lake Abert due to uncertainty in the abundance of brine shrimp from year to year. Brine shrimp are used worldwide as a food source in commercial fish

farming and for fish food in aquariums.

"We lost our 35-year-old brine shrimp business because of low lake levels, which resulted in toxic high salinity levels and ecosystem collapse," Kreuz said. "It is unfortunate because Lake Abert could help the local economy by supporting a thriving low-impact, sustainable fishery if only recently diverted water was once again allowed to flow into the lake."

Saline lakes, which provide critical habitats for migratory birds, are threatened globally and especially in the arid western United States. As lake levels diminish, so can bird populations. For some species, including Wilson's phalarope, eared grebe and American avocet, at least half of their global populations rely on this network of saline lakes for food and rest during migration. Some also nest in the region. Proper management of Lake Abert and other [saline lakes](#) in the West is critical to waterbird conservation in the Western Hemisphere.

"Water in the West is a precious resource, and there is urgent need to better understand and manage use of water throughout the region for the benefit of birds and people," said Stan Senner, vice president for bird conservation at the National Audubon Society.

For this study, waterbird data were drawn from the Bureau of Land Management and the East Cascades Audubon Society surveys, which used the time and efforts of dozens of community scientists to document changing bird numbers at Lake Abert.

"ECAS was pleased to work with community scientists to study the long-term effects of this beautiful lake and the birds that depend upon it," said John Reuland, volunteer coordinator for the Lake Abert study.

Johnnie Moore, former chair of the UM Department of Geosciences and world-renowned [water](#)

scientist, also contributed to the study, which was published in the international journal *Biological Conservation*.

More information: Nathan R. Senner et al. A salt lake under stress: Relationships among birds, water levels, and invertebrates at a Great Basin saline lake, *Biological Conservation* (2018). DOI: [10.1016/j.biocon.2018.02.003](https://doi.org/10.1016/j.biocon.2018.02.003)

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