The Herbst Lab

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Population dynamics of the aquatic invertebrates of Walker Lake

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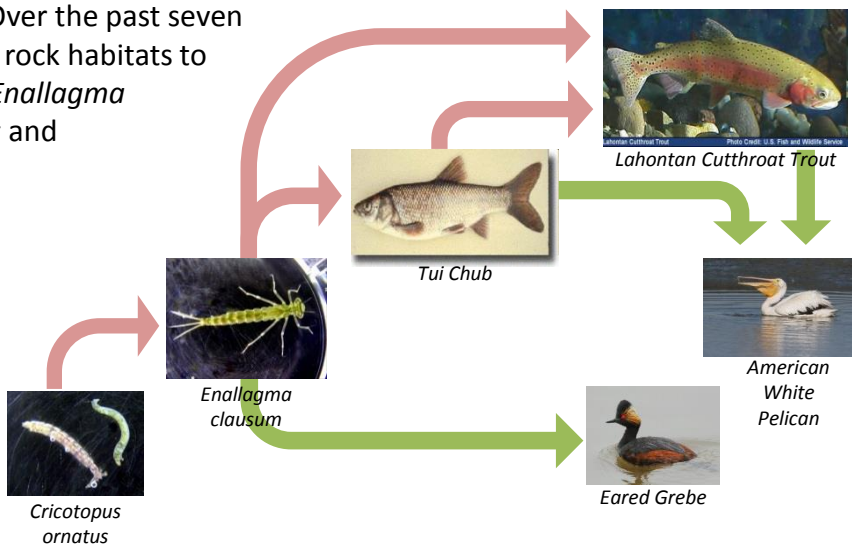
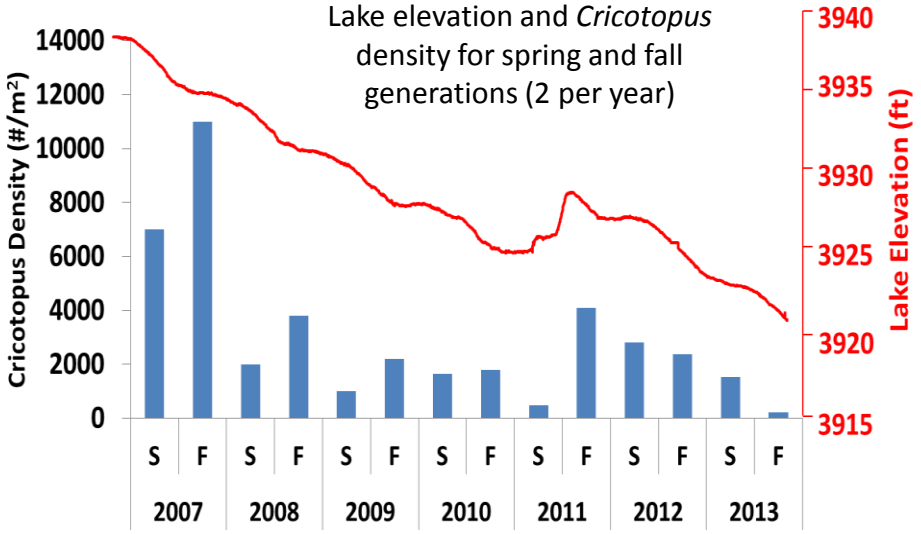
Walker Lake, Nevada, has experienced nearly 150 years of agricultural diversions, which have dropped lake levels over 150 vertical feet, and drastically increased the concentration of salts in the lake. The aquatic invertebrates of Walker Lake are an important part of the food web that sustains populations of wildlife at the lake. Understanding how invertebrate populations change as salinity fluctuates is vital to understanding the link between changing lake levels and the food web that supports native fish, bats, and migratory birds. Over the past seven years, we regularly sampled nearshore rock habitats to monitor populations of the damselfly *Enallagma clausum*, the midge *Cricotopus ornatus* and the alkali fly *Ephydra hians*.

The salt-sensitive midge Cricotopus resides near the base of the food web. Its loss could result in further disruption to fish and bird populations.



Walker Lake declined 19 feet between 2007 and 2013. In that time, population trends indicate a decline in the abundance of the midge *Cricotopus*, little change in the abundance of the damselfly *Enallagma,* and an increase in the salt-tolerant alkali fly *Ephydra*. After declining to a historic low in 2010, the lake level rose almost 4 feet in 2011 following an above average Sierra winter snowpack. This dilution of the lake resulted in reduced salinity and an increase in densities of *Enallagma* and *Cricotopus.*



Lake levels have steadily declined since 2011. Walker Lake is currently at a new historic low and salinities have exceeded 20 g/L. As the lake level continues to change, documenting shifts in the benthic invertebrate community will show recovery potential of Walker Lake's fish and birds, and contribute to the understanding of the limits and fluxes of desert lake biological communities.