Point Blue Publication Brief

Inland-breeding terns' response to California drought: Trend or tribulation?

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Broad-scale surveys of waterbirds in the interior of the West have been limited despite great losses of waterbirds' historic foraging and nesting habitats. Yet such work is crucial for assessing the conservation status of waterbirds and the effects of habitat management and environmental change on their populations.

In 2009–2012, Point Blue and collaborators replicated a 1997–1999 study of three tern species of conservation concern to reassess their populations throughout their inland breeding ranges in California.

Climatic conditions strongly influenced the distribution and abundance of all three species. This was especially true for precipitation, which was below the long-term mean in tern breeding areas for 3–4 years preceding the 2009–2012 surveys, greatly reducing foraging and nesting habitat.

In 2009–2012, statewide inland totals of the Black Tern (*Chlidonias niger*) and Forster's Tern (*Sterna forsteri*), respectively, were about 49% and 26% of those in 1997–1999. Likewise, the numbers of breeding sites for those species were greatly reduced, particularly in northeastern California and the San Joaquin Valley. Patterns were less clear and varied regionally for the Caspian Tern (*Hydroprogne caspia*), as totals were greatly influenced in all years by generally high, but variable, numbers at the Salton Sea. In northeastern California, however, drought reduced numbers of breeding Caspian Terns at least 10-fold from 1999.

It is unclear if these patterns will prove to be part of a longer-term declining trend or just a tribulation the terns faced from short-term fluctuations in precipitation. The latter may be likely given California's pattern of drought recurring about every 15 years through the 20th century. However, the relatively benign climatic patterns during this century may not persist in the future, and any drought effects come on top of the loss of >90% of California's historic wetlands and a severe over-allocation of the state's water resources.

California's recent severe drought emphasizes the importance of reliable water supplies for the wetland and flood-irrigated crop types that are terns' prime foraging habitats in the interior of the state. Although waterbirds are adapted to periodic droughts, if these are severe and prolonged, populations may drop below some critical threshold. Drought-induced bottlenecks in resources are a serious threat to waterbirds, particularly as over-allocation of water and climate change combine to impose longer dry periods.

Main Points

Populations of terns and other waterbirds in the interior of California may fluctuate dramatically over relative short time periods because of the state's highly variable annual precipitation.

These populations are vulnerable because of the great loss of historic wetlands, over-allocation and increasing competition for water, and the increased likelihood of more severe droughts in the future.

Securing reliable water supplies to manage habitats or crops will benefit breeding terns and other waterbirds in both wet and, especially, dry periods.

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