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## A Climate Change Vulnerability Assessment of California's At-Risk Birds

### Conservationists must develop new strategies and adapt existing tools to address climate change.

To support statewide climate change conservation planning, we developed a framework for assessing climate change vulnerability of California's at-risk birds and integrating it into the existing California Bird Species of Special Concern list.

We defined climate vulnerability based on the evidence that climate change will negatively impact a population. We quantified climate vulnerability by scoring sensitivity (intrinsic characteristics of a species that make it vulnerable) and exposure (the magnitude of climate change it is expected to experience) for 358 bird taxa in California.

Using the combined sensitivity and exposure scores as an index, we identified 128 species as vulnerable to climate change. Birds associated with wetlands had the largest representation on the list relative to other habitat groups. Of the 29 state or federally listed taxa, 21 (72%) were also classified as climate vulnerable, increasing concern about their conservation. The complete list of species and their climate vulnerability scores are available on the California Avian Data Center (<http://data.prbo.org/apps/bssc/index.php?page=climate-change-vulnerability>).

The 2008 California Bird Species of Special Concern list assigned taxa to three levels of priority (category 1 was the highest priority). After incorporating climate vulnerability into this list, ten taxa were raised in priority on the integrated list—three taxa went from priority 2 to priority 1 (Greater Sage Grouse, Yellow Rail [winter], Alameda Song Sparrow) and seven taxa went from priority 3 to priority 2 (Suisun Song Sparrow, Samuel's Song Sparrow, Snowy Plover [interior population], Cassin's Auklet, Bendire's Thrasher, San Francisco

Common Yellowthroat, Modesto Song Sparrow). Five taxa were new to the list and ranked as priority 3 (Black Oystercatcher, Scott's Oriole, Royal Tern, Elegant Tern, and Rhinoceros Auklet).

Climate change does not act alone in threatening biodiversity. Biodiversity is threatened by familiar stressors such as habitat loss and degradation, invasive species, pollution, over-exploitation, and disease. Climate change exacerbates these familiar stressors which, together, are predicted to cause mass global extinctions. **Our process illustrates a simple, immediate action that can be taken to inform climate-change adaptation strategies for wildlife.**

#### Main Points

- We identified 128 of 358 California birds as vulnerable to climate change.
- Birds associated with wetlands had the largest representation on the list relative to other habitat groups.
- Of the 29 state or federally listed taxa, 21 were also classified as climate vulnerable.
- Integrating climate vulnerability and California's Bird Species of Special Concern list added five taxa to the list and increased the priority rank for ten.

#### Paper Citation:

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