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New Research: Mountain Meadow Restoration Can Bring Birds Back

In a new study led by scientists at Point Blue Conservation Science and in collaboration with The Institute for Bird Populations, authors evaluated the successes of mountain meadow restorations by analyzing eight years of bird data collected by field biologists. The authors concluded that, when “pond and plug” and similar techniques were followed, the number of birds of many species increased over time as habitat conditions improved.

The paper, published in *Restoration Ecology*, may prove of particular value to restoration practitioners, many of whom rely on peer-reviewed scientific journal articles to guide their work.

“This paper is the culmination of many years of work monitoring meadows. And it definitely increases the amount of evidence we have that one of the most commonly used approaches is having the effects we want,” says Brent Campos, a lead author of the study.

Restoration of degraded meadows and their streams aims to increase the amount of water flowing out of the stream channel during spring runoff and elevate groundwater levels in the dry season. Currently there are major efforts being made to restore meadows across the Sierra Nevada that have been degraded from overgrazing, agricultural use, or deliberate stream channel modifications. Evaluations of meadow restoration are needed to ensure objectives--such as increased biodiversity--are being met and identify modifications that may improve outcomes.

The study authors evaluated the expectation that meadow birds would increase in abundance following restoration. From 2009 to 2017 biologists sampled birds at 31 montane meadows in California previously restored using a common technique: partially filling the over-sized stream channel with meadow soils. The authors then assessed how the abundance of 12 species of meadow-associated birds changed from 1 to 18 years after restoration, and whether the amount of deciduous shrubs and trees (an indicator of bird habitat quality) at the time of restoration affected the rate of bird response.



According to the research, six of the twelve species studied increased in abundance after restoration, while five stayed roughly the same and one may have decreased. The amount of deciduous trees and shrubs at the restoration site at the time of restoration was a strong predictor of bird abundance. The study's authors concluded that both hydrologic measures (partially filling in degraded stream channels) and vegetative measures (planting shrubs and trees such as willows and cottonwoods at restoration sites) were helpful in creating habitat for birds, with the latter approach accelerating the positive impacts of restoration.

"Having access to one of the longest term datasets around for bird monitoring and meadow restoration was really essential to this paper," said Helen Loffland, a meadow bird specialist with The Institute for Bird Populations, and one of the paper's co-authors. "And it was heartening to see such positive responses from the birds in areas where both hydrologic and vegetative restoration measures were used."

"We know that restoration practitioners are out there trying to do the best job possible with limited funding," said Campos. "We hope that this new research will help them in their work restoring meadows' key functions of fostering biodiversity, reducing downstream flooding, purifying water, and storing carbon."

The study sites included areas throughout the Sierra including the Perazzo Meadows restoration site near Truckee, Red Clover Valley near Portola, and a restoration site in Tasmam Koyom (Humbug Valley) in Plumas County.

"It is pretty incredible to visit the Tasmam Koyom site, which is only 6 years out from the restoration completion and see such an abundance of birds," said Ryan Burnet, another co-author. "To see so many more song sparrows or yellow warblers is really encouraging. Normally, you'd need to wait 10 or even 20 years to see a biological response like that."

The article, "Bird response to hydrologic restoration of montane riparian meadows" was published in the peer-reviewed journal *Restoration Ecology* ([DOI 10.7717](https://doi.org/10.7717)).

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About Point Blue Conservation Science:

Point Blue advances conservation of birds, other wildlife and ecosystems through science, partnerships, and outreach. Our highest priority is to reduce the impacts of habitat loss, climate change, and other environmental threats while promoting nature-based solutions for wildlife and people, on land and at sea. Visit Point Blue at www.pointblue.org.