



Monitoring Vulnerable Grassland Birds After Habitat Restoration Efforts

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Borderlands Research Institute Research Scientist Dr. Mieke Titulaer and a volunteer from University of Chihuahua release a banded Baird's Sparrow in Marfa, Texas.



A Baird's Sparrow, banded in Marfa, Texas. Baird's Sparrows strictly breed in the Northern Great Plains and winter in the pristine grasslands of the Chihuahuan Desert. This species shows an annual population decline of 2.2 percent and is considered a "Tri-National Concern species."

Bird populations in North America are rapidly declining. A recent study estimated that a quarter of all birds from North America have disappeared in just the past 50 years. Of all bird groups, grassland birds have suffered the worst declines; about 54 percent of grassland birds have vanished since 1970.

For example, the Eastern Meadowlark (*Sturnella magna*), a fairly common prairie bird, could become less common if the population trend continues. This particular grassland bird species has faced a population reduction of 89 percent since 1970, and other grassland specialist species such as Baird's



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A Grasshopper Sparrow, banded in Marfa, Texas. The Grasshopper Sparrow has a broader range than the Baird's Sparrow and Sprague's Pipit and has been classified as a "Common Bird in Steep Decline" by Partners in Flight. It has lost up to 68 percent of its population since 1970 and shows an annual population loss of 2.5 percent.



A Sprague's Pipit, banded in the Marfa Grasslands. This bird is one of the most rapidly declining grassland species. It has lost 79 percent of its population since the 1960s and shows an annual population decline of 4.4 percent. It is listed as "Vulnerable" by the IUCN Red List.

Sparrow (*Centronyx bairdii*), Chestnut-collared Longspur (*Calcarius ornatus*), Thick-billed Longspur (*Rhynchophanes mccownii*) and Sprague's Pipit (*Anthus spragueii*) have lost from 65 percent to 94 percent of their populations since 1966. These grassland bird species declines reflect the urgent need to implement conservation actions in our grasslands.

Most grassland birds are migratory; they breed in the Northern Great Plains and spend the winter in the Chihuahuan

Desert. Their winter ecoregion encompasses Northern Mexico and the southwestern U.S. states of Texas, Arizona and New Mexico. Grassland birds rely on the few remaining and scattered patches of native grassland in the Chihuahuan Desert to survive during the winter.

Unfortunately, suitable grasslands are declining each year, leading to local extinctions of habitat susceptible species. Landscape changes like agriculture, overgrazing and shrub encroachment have a negative impact on grassland birds.

Specifically, shrub encroachment is a major problem in the desert grasslands of the Chihuahuan Desert. Approximately 25-50 percent of the desert scrub once used to be open grasslands. Restoring shrub-invaded grasslands could result in benefits for both grassland birds and livestock, as it would increase the area of suitable habitat for birds and grazing pastures.

Texas Parks and Wildlife Department, The National Fish and Wildlife Foundation, and the Borderlands Research Institute are collaborating in a Grassland Enhancement Project on private properties in Marfa and Marathon, Texas. Restoration has been conducted in two phases.

The first was done in the summer of 2019. This first effort consisted of spraying nearly 4,600 acres with herbicide that specifically attacks woody vegetation such as honey mesquite (*Prosopis glandulosa*). The herbicide kills the mesquite, but it leaves the dead skeletons standing. Because of this, the second phase will consist of removing those shrub skeletons using prescribed fire or mechanical treatments.

To monitor the effect of the habitat restoration on grassland bird species, the Borderlands Research Institute conducted bird surveys in the winters of 2019 and 2020, before and after the restoration treatment. So far, we have conducted over 500 transects, detected 20,557 birds from 67 different species, and taken ground cover data at 659 points each year. Using analytical tools, we can estimate the abundance of grassland birds and compare it through the years as restoration efforts take effect.

With only two years of data, we can already see a clear difference in bird communities in the grassland-dominated plots versus the shrub-invaded plots. As expected, preliminary results show greater density of grassland birds at sites with less shrub cover and greater grass cover, and this is especially true of declining birds that are strictly grassland-dependent such as the aforementioned species.

We also saw a reduction in shrub-dependent bird species on the plots that received herbicide treatment. We expect the decrease in shrub cover in restored areas to reflect an increase in grassland birds in the following years.

This project will increase suitable habitat for vulnerable wildlife species, enhance grasslands for livestock grazing, generate income for local ranchers, and mitigate shrub encroachment and desertification in West Texas. As grassland birds are good indicators of grassland ecosystem health, monitoring the response of grassland birds to restoration efforts will give us knowledge on the state of recovery of the North American grasslands. 🌱

