

# No home where the buffalo roam? Birds decline after bison return to conservation grasslands

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American bison narrowly escaped extinction due to overhunting in the 19th century, but their populations have since rebounded thanks to

modern [conservation efforts](#). Today, bison are increasingly being reintroduced to new areas of their historic range. Many of these areas provide important nesting habitat for grassland birds, which are now among the [most rapidly declining birds in North America](#).

Historically, wild bison roamed freely throughout the North American Great Plains, but today, most bison are managed as livestock rather than wildlife. Their confinement within fenced pastures and protection from predation raises the question of how modern bison affect the wildlife around them, especially increasingly imperiled grassland birds. We addressed this question using data collected over an 18-year period during which bison were reintroduced to an [Important Bird Area](#) in Nebraska, in the central Great Plains.

## **Bobo-linking bison reintroductions with bird population change**

Iconic grassland songbirds, bobolinks (*Dolichonyx oryzivorus*) have [experienced steep declines](#) in recent decades, culminating in a drop of ~60% over the past 50 years. Conservation actions to prevent their continued losses are a high priority. While bison are being reintroduced to grasslands used by nesting bobolinks, no previous studies had addressed how bison reintroduction affects them or their nesting success, which is believed to be a [main factor](#) driving their population declines.

"Given bobolinks' worrying declines, the best way to determine how to manage grassland habitat for their future survival is by conducting research to see how different factors affect their populations," explained Kristen Rosamond, one of the lead authors of a [new study](#) on birds' responses to bison reintroduction published in the journal *Animals*.

## **Does bringing back the bison benefit grassland birds?**

We assessed bobolink populations before and after a 2015 bison reintroduction on conservation grasslands managed by the Crane Trust as a refuge for whooping cranes, sandhill cranes, and other migratory birds, using data on banded birds collected between 2002 and 2019. We hypothesized that bringing bison back to these grasslands would improve bird habitat. We expected to find increased numbers of birds after the bison reintroduction, but what we found instead was a [complete surprise](#).

"We found steep declines in numbers of bobolinks in grasslands where bison were reintroduced, contrary to our expectations," reported Rosamond. Four years after the bison reintroduction, the number of adult bobolinks had dropped by 62%, while the bison population had doubled. The number of juvenile bobolinks had dropped even more steeply, by 84%, suggesting that breeding birds' nesting success was particularly negatively affected.

"When we realized our data showed a bird decline, our first question was whether bobolink populations had also declined in the surrounding area, since we know they are declining globally," said Nico Arcilla, senior author of the study. "But we found that during the time period of our study, bobolink numbers did not change in neighboring grasslands where bison were not reintroduced. Likewise, bobolink numbers in the state as a whole remained stable. This means the steep bobolink declines we found took place exclusively where bison were reintroduced."

## **Light grazing and haying keep bobolinks from straying**

Why did bobolinks decline so steeply where bison were reintroduced? After all, bobolinks and other grassland birds lived side-by-side with bison for thousands of years, so what is different now? In the past, bison roamed freely through large areas of the continent, whereas today, bison

may be contained in relatively small areas in [high densities year-round](#). Under these conditions, intensive grazing can result in declines in plants that bobolinks need to shelter their nests from predators as well as to provide food, and bison may trample nests or chicks before they are able to fly. Other research has revealed that intensive bison grazing can also negatively affect [other bird species](#) of conservation concern, such as Henslow's sparrows (*Ammodramus henslowii*) and dickcissels (*Spiza americana*).

Ideally, conservation land managers maintain habitat quality for bobolinks and other grassland birds with similar needs through periodic disturbances, such as rotational grazing and hay harvesting, which take place outside the bird nesting season. We found that in grasslands rotationally grazed by cattle, adult bobolink numbers peaked after the departure of cattle, and juvenile bobolink numbers increased over time following the departure of cattle. In grasslands grazed by breeding bison herds, however, grazing was more intense, as bison remained in the same areas for longer periods, or year-round, as their population increased. This means that grasslands and birds did not have the opportunity to rebound, as they did after rotational grazing by cattle, and instead decreased over time.

## **Can bobolinks weather these changes?**

Climate change is bringing [warmer and wetter weather](#) to this region, which could benefit bobolinks. Rosamond explained, "In addition to investigating the effects of bison reintroduction and other land management changes, we explored bobolinks' responses to changing weather, such as higher temperatures and higher levels of precipitation. We found that annual numbers of adult and juvenile bobolinks increased in response to wetter and warmer winters and summers. Unfortunately, however, this pattern did not appear to mitigate the severe declines of bobolinks following the bison reintroduction."

Substantially reducing the number of bison in grasslands such as our study area would likely mitigate their negative impacts on birds, as would implementing a rotational grazing system that would move them between different grasslands and allow grazed grasslands, and nesting birds like bobolinks, to recover. However, maintaining lower bison densities for breeding herds that are protected from predators and hunting requires regular, systematic removal or translocation of bison, which can be expensive, complicated and dangerous. While the resources required to do so may be available for lands managed by the U.S. National Park Service or other federal agencies, for example, they may be beyond the capacities of many smaller, private conservation groups with budget and staff limitations. We hope that conservation land managers will take these considerations into account, and ensure that we keep hearing the songs of migratory birds ringing through America's grasslands, now and in the future.

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**More information:** Rachel H. Kaplan et al, Bobolink (*Dolichonyx oryzivorus*) Declines Follow Bison (*Bison bison*) Reintroduction on Private Conservation Grasslands, *Animals* (2021). [DOI: 10.3390/ani11092661](#)

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