

Relationship between environmental heterogeneity and the abundance and distribution of shortgrass steppe birds

by Amber Carver

For well over a decade, conservation scientists have been engaged in dialogue on how to reverse declines in North American grassland bird populations¹⁻⁴.

Despite habitat conservation and improvement, many populations continue to decline⁵.

Although the importance of habitat heterogeneity to grassland bird communities has long been recognized^{1,4,6,7}, large-scale application of heterogeneity-centric management has been slow in coming.

As grassland birds become increasingly scarce, rangeland scientists are searching for ways to amend the land management paradigm.

Monitoring the outcome of changes to management practices is vital to gauging the effectiveness of these techniques.

In 2013, I was admitted to the Master of Science program at the University of Colorado Denver.

Collaborators on my master's project included the Bird Conservancy of the Rockies and the USDA Agricultural Research Service.

I received funding from the Denver Field Ornithologists for both years of my project, which went toward a per diem and lodging for undergraduate assistants.

My focus was the importance of habitat heterogeneity to ground-nesting birds. Specifically, I was interested in the extent to which heterogeneity-centric management affects population viability of species that breed on the shortgrass steppe.

The shortgrass steppe is an important breeding ground for several bird species.



McCown's Longspur nest with eggs, Central Plains Experimental Range, Weld Co., CO. 2014. Amber Carver

This bird community evolved in the context of episodic environmental disturbance, including bison grazing and drought, which led to a shifting mosaic of habitat conditions^{4,7}.

The replacement of wild bison with domestic livestock and the tendency toward uniform moderate grazing have resulted in more homogenous habitat that supports fewer bird species⁴.

Supporting the full community of shortgrass steppe birds requires providing an array of habitat conditions, rather than adhering to the one-size-fits-all approach.

In 2014, scientists at the Central Plains Experimental Range (CPER)

in northern Colorado initiated the Adaptive Grazing Management Plan, a long-term project comparing the outcome of season-long uniform ("Traditional") grazing against that of intra-seasonal rotational ("Adaptive") grazing.

The premise is that Adaptive grazing can both support livestock gains and provide habitat for birds.

The goal of my master's research project was to assess the impact of Adaptive grazing on nest success,

and I began monitoring nests during the first year of the grazing project.

During my master's research project (2014 and 2015), I located 576 nests belonging to seven species.

However, the majority of these belonged to only three species: Lark Bunting (*Calamospiza melanocorys*), Horned Lark (*Eremophila alpestris*), and McCown's Longspur (*Rhynchophanes mccownii*).

All are migratory open-cup nesters. However, Lark Bunting nests in tall vegetation that has not been recently grazed⁸, while Horned Lark and McCown's Longspur nest in heavily grazed areas dominated by shortgrass and cactus⁹.

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Among my three primary species, McCown's Longspur is of particular interest because it is restricted to the shortgrass steppe¹⁰.

This species has undergone greater population decline than the other two⁵, and it is now of conservation concern in Colorado and Nebraska.

By contrast, Horned Lark is Holarctic and may breed on alpine¹¹ or arctic¹² tundra in addition to the shortgrass steppe.

Thus, Horned Lark may be considered a shortgrass opportunist, rather than strictly shortgrass-obligate.

Lark Bunting preferentially nests in tall vegetation, but the species is considered a generalist⁶.

This makes McCown's Longspur unique among the three species in its restriction to the shortgrass steppe and its need for recent, heavy grazing.

It is likely that McCown's Longspur followed nomadic bison herds when they were present on the landscape.

In the absence of wide-ranging grazers, McCown's Longspur dis-

tribution may be influenced most by the distribution of rainfall, which drives vegetation growth.

McCown's Longspur nest survival is higher in heavily grazed areas with little or no cover by shrubs¹³.

Nomadism in this species has not been demonstrated scientifically, but McCown's Longspur could avoid regions with heavy rainfall.

During both years of my project, rainfall was above average, and the abundance of McCown's Longspur was markedly low.

My sample was dominated by Lark Bunting, which accounted for 448 of my nests. This mixed-grass specialist was likely taking advantage of abnormally wet conditions in northeastern Colorado.

I realized early in my project that the effects of Adaptive grazing would take many years to unfold and would not become apparent during my master's project.

Instead, I focused on differences in nest-site characteristics and the features driving nest survival.

In 2015, I was admitted to the Uni-

versity of Colorado Denver doctoral program, which will allow me to continue my research at the CPER.

I look forward to continuing to study ground-nesting birds and learn how their abundance and survival is influenced by patterns in habitat and weather.

Literature Cited

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Male McCown's Longspur, Central Plains Experimental Range, Weld Co., CO. 2014. Amber Carver



Female McCown's Longspur, Central Plains Experimental Range, Weld Co., CO. Banded in 2014 and recaptured 0.15 mi from previous capture site in 2015. Amber Carver

Field Trips

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Riverside Cemetery/Platte River, Denver County Sunday, March 27 8:30 AM - 12:00 PM

Kevin Corwin (Email: kevygudguy@aol.com
Phone: 720-482-8454)

Trail Difficulty: Easy
Maximum Participants: 12

Directions: Entrance is at 5201 Brighton Blvd in Denver. Gates open at 8 a.m.

Meet the leader at Riverside Cemetery. Park next to the main office building, which is on your right as you enter the property.

This will be an easy hike on flat terrain, though we may walk cross-country down into the wetlands along the Platte and among groves of trees on the west edge of the cemetery.

We may pause to inspect a few of the monuments and markers in the cemetery.

After canvassing the cemetery, we will walk a short distance to the Heron Pond Natural Area.

We will cover somewhere between 1 and 3 miles, depending on the birds and weather.

Bring water, snacks, and whatever optics you choose to use.

Restrooms are available in the maintenance building next to the cemetery office.

Register online or contact leader.

—Scheduled by Bill Wuerthele



Typical Black-billed Magpie eating ticks from elk, Golden, 6 February 2016. Kay Niyo

Renew now to keep newsletter coming

Dues deadline looming! After March 1, we will no longer send out *The Lark Bunting* to those who have not paid their 2016 dues. Please renew at <http://dfobirds.org/DFO/Membership.aspx> where you can pay your dues through PayPal or by check and review your contact information.

If you prefer, go to <http://dfobirds.org/LarkBunting/LB.pdf> and print the last page and mail with your check.

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