Alberta NAWMP Partnership

SCIENCE STORIES

SERIES NO. 9

WHAT DRIVES UPLAND SANDPIPER POPULATION TRENDS?

UPLAND SANDPIPERS (*BARTRAMIA LONGICAUDA*) MIGRATE FROM SOUTH AMERICA TO A LARGE PORTION OF CANADA AND THE UNITED STATES FOR BREEDING EVERY SPRING. THE CANADIAN PRAIRIES ARE A POPULAR DESTINATION – IF YOU DRIVE ALONG OUR PRAIRIE RURAL ROADS, YOU'LL LIKELY SEE A MALE UPLAND SANDPIPER STANDING ON A FENCEPOST AND SINGING HIS CHARISMATIC 'WOLF WHISTLE' CALL.

Intriguingly, the upland sandpiper's breeding population patterns are complex, with varying trends across their range. Prairie conservationists have a keen interest in gaining a deeper understanding of landscape factors driving these varied trends.

This understanding is important not only for conserving this grassland shorebird itself, but also other midcontinental shorebirds and grassland birds who share the same landscapes. Overall, the breeding populations of shorebirds and of grassland birds have dramatically declined in North America in recent decades.

To help fill this gap in understanding, the Alberta NAWMP Partnership's Science Fund supported an upland sandpiper study to analyze land cover changes – especially the conversion of grasslands to agricultural crops – as a potential driver of the bird's local breeding population trends.

Andres Rosales, a University of Saskatchewan student, conducted this study for a chapter in his master's thesis. His thesis research was guided by Dr. Kirsty Gurney and Dr. Ann McKellar, who are both at Environment and Climate Change Canada (ECCC), with valuable input from their ECCC colleague Dr. Scott Wilson.

Gurney explains that this study was part of a larger upland sandpiper research effort initiated by ECCC in collaboration with other agencies. For instance, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) was looking to learn why this species was experiencing different population trends in different parts of its breeding range in Canada. As well, the Midcontinent Shorebird Conservation Initiative identified the upland sandpiper as an "umbrella species", meaning that conservation of this species could help conserve other species in the midcontinental flyway of North and South America. Working landscapes are a prominent feature of the midcontinent flyway in both continents.

Long-term, broad-scale estimates indicate the upland sandpiper's breeding population is fairly stable overall. But a more detailed look shows strong geographic variations, including some locations with population increases and others with steep decreases. Gurney says, "The big question is why are these different populations doing different things?"

Rosales' study covered almost all of the upland sandpiper's breeding range, including its core range, which encompasses the Canadian Prairies and the U.S. Great Plains as far south as Kansas, and smaller areas as far east as Maine and New Brunswick.

As a ground-nesting species, the upland sandpiper needs large, open grasslands for nesting and rearing chicks, explains Rosales. However, from the trapping and tagging work that is also being conducted on this species, he knew that these birds also make use of pastures, hay fields, and even cereal and canola crops, especially in the Prairies. "Upland sandpipers are living in and using the same landscapes that producers manage every day."

His study's objective was to link grassland and cropland land cover changes with the upland sandpiper's local breeding trends, from 2012 to 2022.

For the 2012 to 2022 breeding trend estimates, Rosales used the eBird Status and Trends dataset. This citizen science dataset provides localized breeding trend estimates, each representing a 27-kilometre circle, across the bird's entire breeding range.

He explains that more and more researchers are choosing eBird Status and Trends as the dataset for this type of research mainly because it provides the best coverage for mapping range-wide, long-term breeding abundance trends at a detailed spatial scale. "Also, with

Pictured above: An upland sandpiper stands on a fencepost in the Allan Hills area of Saskatchewan. Credit: Kirsty Gurney, ECCC

eBird Status and Trends, each estimate comes with measures of uncertainty. So, we know which locations have trustworthy estimates that come from consistent and quality observations from eBirders, and which locations may be less travelled and less birded. As a result, we could incorporate that uncertainty into our analysis."

Next, using two publicly available land cover datasets, he determined the change in grassland area and cropland area between 2012 and 2022 for each of the eBird trend locations. And then he used a statistical model to see how changes in the estimated amounts of grassland and cropland area related to the upland sandpiper's breeding population trends.

"The majority of locations (59%) that we examined experienced a decline in grassland area, and that decline was associated with a decline in breeding abundance, as expected," says Rosales. "Also, an increase in cropland area tended to be associated with declining breeding abundance, although the magnitude of this relationship varied geographically."

Even though the Canadian Prairies and the U.S. Northern Great Plains share some general landscape similarities, their upland sandpiper breeding population trends differ.

"UPLAND SANDPIPER POPULATIONS ON THE CANADIAN PRAIRIES ARE GENERALLY INCREASING DESPITE THE WIDESPREAD EXPANSION OF CROPLAND."

"Upland sandpiper populations on the Canadian Prairies are generally increasing despite the widespread expansion of cropland. This is likely due to the extensive grasslands that still remain and the dominant crops – canola, wheat, pulses, oats and barley – possibly acting as suitable habitat," he says.

"The trends on the U.S. Northern Great Plains are more complex, with pockets of increasing populations interspersed with areas of decline. In this region, corn and soybean are the main crops, which seem to provide poorer habitat for this species. Cornfields become unsuitable for upland sandpipers when the plant height grows above 15 centimetres, which is typically early in the growing season. Grassland birds may occasionally use soybean fields for nesting but are faced with heightened risk and low survival. In addition, Midwestern cropping systems are associated with high agrochemical inputs, and the implications of this threat during the breeding season remain unknown for the upland sandpiper."

Looking ahead, he also cautions, "The positive population trend on the Canadian Prairies could change in the future as the cropland area continues to expand and the remaining grasslands continue to be lost."

Rosales' work identifies several ways the study's results could help conservationists:

"First, these findings suggest that the effects of grassland loss and cropland expansion were spatially variable, highlighting that conservation strategies should be spatially targeted rather than uniform across the bird's breeding range.

"Second, the results show the core grassland areas to keep intact. These are places where protecting or maintaining these critical habitats really pays off for upland sandpipers – and likely for other grassland shorebirds and grassland birds in general.

"Third, conservation practitioners who work in areas experiencing a strong negative impact from conversion of grassland to cropland should be encouraged to continue their important work with agricultural producers in promoting healthy landscapes and prioritizing the existing grassland ecosystems.

"And fourth, the results give us a way to track further changes in the status of the upland sandpiper in response to a changing landscape."

University of Saskatchewan graduate student Rosales takes measurements of an upland sandpiper. Credit: Sydney Marie Jones, University of Saskatchewan

Rosales concludes, "Sustainable management and effective conservation action for the upland sandpiper will depend on coordinated efforts among producers, researchers and conservation practitioners to balance agricultural productivity with sustainable landscapes for grassland birds."

He and Gurney emphasize that Alberta NAWMP's financial support really helped to move this study forward. Funding was also received from ECCC, and in-kind support from the U.S. Fish and Wildlife Service, the Biodiversity Research Institute, and the University of Saskatchewan.