



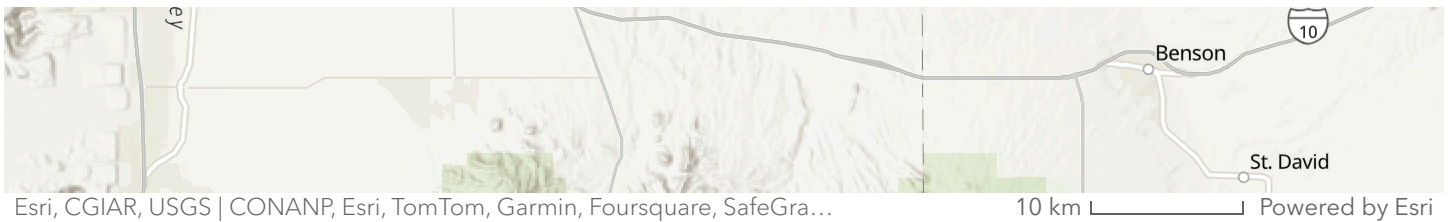
Case Study by CART



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Grassland Habitat Monitoring for Wintering Chestnut-collared Longspur

A Case Study on Community Engagement and Education
November 15, 2023



Introduction

The Chestnut-collared Longspur (*Calcarius ornatus*; CCLO) is a grassland bird that winters in shortgrass prairies and desert grasslands of the South-Central and Southwest United States and the Chihuahuan Grasslands of North Central Mexico. This species feeds on native grass seeds in high-density flocks, uses cattle water tanks as its primary water source, and prefers areas recently burned, grazed, or mowed.

Generally, grassland bird species' populations have been declining since 1970 due to a decrease in suitable grassland habitats. Land use practices such as agricultural development, paired with competition from invasive grass species, such as Lehmann's lovegrass (*Eragrostis lehmanniana*), are the largest drivers of grassland degradation. Specifically, trends show an 87% reduction in CCLO population since 1966, with 33% of this decline occurring between the years 2003 and 2015 ([Ashpole et al. 2023](#)). As a result, CCLO is categorized as Vulnerable on the International Union for Conservation of Nature's (IUCN) Red List, making them a high priority for surveying and monitoring to identify land management practices and conservation actions to support this vulnerable species.

For over ten years, the Tucson Audubon Society has collaborated with Audubon Southwest through the Important Bird Area (IBA) program to develop a protocol to survey two IBAs for CCLO: the San Rafael Grasslands IBA and the Las Cienegas National Conservation Area IBA. The collaboration leverages volunteer efforts and uses audio recordings from Autonomous Recording Units to survey CCLO population, preference in cattle water tank

conditions, and the presence of Lehmann's lovegrass. Data gathered can inform future management decisions that support healthy winter habitats for CCLO and inform our understanding of CCLO occupancy in the project area.



Key Issues Addressed

Land conversion for agriculture and urbanization is the largest cause of the CCLO's population decline. The species avoids areas where intensive management such as resource extraction and development (e.g. roads) occurs because they decrease the habitat quality. These same issues occur in northern breeding areas, contributing to an overall decrease in suitable nesting zones.

CCLO prefers native grass species that supply adequate shelter and high-quality food sources. Lehmann's lovegrass is an aggressive invasive species that outcompetes native grass

species, such as Grama grasses (*Bouteloua spp.*). Lehmann's also offers smaller caloric content than native grass species, leading the CCLO to avoid areas where the percentage of this invasive species is higher than native grasses.

Management decisions of landowners can negatively influence CCLO. Cattle tanks and ponds serve as a primary water source for CCLO in their wintering habitat. They need large quantities of water to aid the digestion of the native seeds they eat. However, the seasonal filling and draining of tanks, tank design, and nearby vegetation communities, reduce CCLO's ability to utilize cattle tanks and ponds as a water source.

Behavior traits of the CCLO challenge previous conservation efforts. As a skittish bird, CCLOs are difficult to identify and survey while in the field. Prior to this project, resource managers lacked a species and region-specific protocol to effectively monitor CCLO.

Project Goals

- Monitor CCLO in their wintering habitat in the IBAs through volunteer-led in-person surveys and audio recordings
- Analyze and record characteristics of cattle tanks and the percentage of Lehmann's lovegrass in areas the CCLO frequented
- Define a CCLO survey protocol for volunteers that is cohesive with the species behavioral patterns

Image Caption: *Flock of CCLO in the air. Courtesy of Richard Fray, Fun Birding Tours.*



Project Highlights

- **Tank Assessments:** When a survey team encountered a tank on their route, they spent up to an hour assessing tank characteristics and observing CCLO presence. For tank assessments, the team recorded information on tank edge quality (vegetated or rocky and the slope), water quality (muddy or clear), and surrounding vegetation (trees and shrubs). The survey teams assessed a total of 59 tanks in Las Cienegas and the San Rafael Valley.
- **Implementation of the Survey Protocol:** Survey teams successfully utilized the survey protocols in the IBAs. Each team was provided an assigned route to follow, each including 200-meter transects to survey. Along these routes, it was up to volunteers to document all occurrences of the CCLO and their exact coordinates including distance and direction of distant flocks.

- **Invasive Grass Data Collection:** Survey volunteers documented invasive grass species while surveying. The community composition of grass species is crucial to identify the impact invasive grasses have on CCLO presence. Volunteers were given identification guides to approximate the percentage of Lehmann's lovegrass present of total grass cover. Survey data suggests CCLOs favor areas where the percentage of Lehmann's lovegrass is between 0% and 20%.
- **Audio Recording to Increase Surveying Efficacy:** The project team placed audio recorders at the tanks to collect data for weeks to months. Volunteers spent about a day managing the recorders when it was time to retrieve the data and used the downloaded recordings to detect an approximate number of birds at each location. This reduced the frequency of teams going out into the field and disrupting CCLO, while also increasing accessibility to monitor the sites long term. After listening to the recordings, in-person surveying can increase in areas with the greatest presence of CCLO and confirm which tanks were not frequented by CCLO.

Image Caption: *CCLO favored cattle tank. Courtesy of Jennie MacFarland, Tucson Audubon Society.*



Lessons Learned

Data collected from the surveys gave surveyors a strong sense of tank conditions the CCLO prefers. CCLO was observed more at tanks with a gentle slope to allow birds to stand while drinking, as they frequently landed in areas where the slope was between 0.25% and 6%. The tank conditions in the survey area varied, but tanks with a combination of sparse short grass around their edge and no to few trees within 50 feet of the water had a higher presence of the CCLO. Natural predators of the CCLO tend to use trees or shrubs to perch while hunting, and survey data suggests the CCLO tend to avoid tanks where more tree cover is present. Possible recommendations for land managers include removal or relocation of tall vegetation from the tank's edge, and leveling the tank edge to decrease its slope.

Survey efforts suggest water availability affects occupancy of CCLO. 2020 was one of the driest years in Arizona, with an annual average precipitation of 6.56 inches. A lack of precipitation and monsoon events caused tanks and ponds in the shortgrass prairies and desert grasslands to dry up without human management. During the 2020 surveying season, the teams recorded less than ten CCLOs in the IBAs.

The project found that stationing audio recorders at different tanks, in addition to in-person group surveys, increases survey effectiveness. Wintering species can be challenging to identify because they lose distinguishable visual features, but some have distinct calls, such as the CCLO constant flock call. Analyzing recorded audio reduces pressure on a volunteer surveyor to accurately record the presence of hard-to-identify birds while in the field. Another benefit of leaving a recorder at tanks is to fill gaps of the species' presence outside of time spent surveying.

Image Caption: *Cattle tank with sound recorder Courtesy of Jennie MacFarland, Tucson Audobon Society.*



Next Steps

- Collaborate with landowners to incorporate the preferred habitat characteristics of CCLO into land management decisions. This could include keeping water in cattle tanks available during breeding season, and managing vegetation around tanks (e.g. seeding native grasses such as grama grass to outcompete invasives and decreasing the number of large shrubs).
- Continue to survey for CCLO occupancy and habitat use. The team will continue to update the protocol to provide volunteers with the information they need to be successful.
- Expand this survey protocol to other habitats and private land areas to assist in determining its overall effectiveness.

Image Caption: *Native grama grass in Arizona. Courtesy of Jennie MacFarland, Tucson Audubon Society.*



Resources

November 2023 Case Study Handout

Collaborators

- [Tucson Audubon Society](#)
- [Audubon Southwest](#)
- [Sonoran Joint Venture](#)
- [Arizona Important Bird Areas Program](#)

Funding Partners

- [Sonoran Joint Venture](#)
- [Arizona Game & Fish Department](#)

Resources

- MacFarland, J.C. (2020) "[Winter Grassland Bird Survey Protocol: Chestnut-collared Longspur Emphasis](#)"
- Ashpole J. et al. (2023). "[Chestnut-collared Longspur *Calcarius ornatus*](#)"

Photo Gallery

- [Photo Album and Credits](#)

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Suggested Citation

Kraker, H.J. (2023). "Grassland Habitat Monitoring for Wintering Chestnut-collared Longspur." *CART*. Retrieved from <https://arcg.is/1zDC9X1>.

Image Caption: *CCLO landing at a cattle tank. Courtesy of Richard Fray, Fun Birding Tours.*

More Information on CART