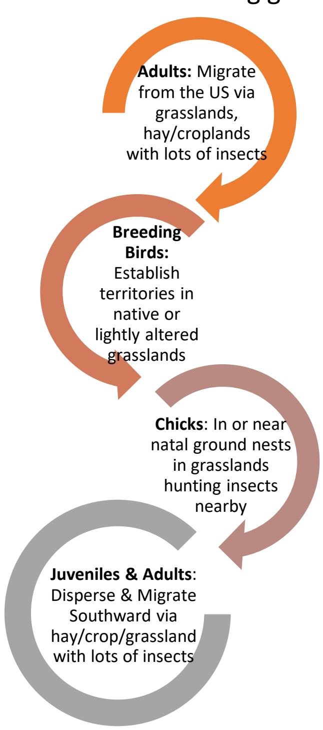
ALBERTA PRAIRIE CONSERVATION FORUM

Isolated Habitat Series

Species Ecology

Chestnut-collared Longspurs (*Calcarius ornatus*) arrive in Alberta during the spring to establish breeding territories in open grasslands or human-altered habitats, such as agricultural fields and lightly grazed pastures. They often exhibit site fidelity, returning to the same location year after year. Ground nests, concealed by vegetation, are constructed during this period. Eggs are laid from May to June, with chicks hatching after an incubation period of 10–12 days. [1,2,3,4,5]

After hatching, the young remain near the nest for several weeks, during which time they learn essential survival skills from their parents. By August, juveniles begin to disperse away from the nesting areas, gradually preparing for their southward migration. During migration, they frequently form flocks, traveling together to their wintering grounds.



Habitat Ecology

Migration Habitat: Chestnut-collared Longspurs use a variety of grassland and human-altered habitats during migration:

Open Grasslands and Hay/Crop Fields: Provide foraging opportunities for seeds and insects.

Sparse Vegetation: Low vegetation allows easy prey detection and movement.

Shelter: Vegetative cover, including dense grasses or agricultural stubble, offers protection during rest.

Breeding Territory Habitat: a variety of habitats are needed within breeding territories:

- **Native Grasslands**: Open grasslands with short or mixed grasses preferred for nesting.
- **Human-Altered Habitats:** Lightly grazed pastures or areas with minimal disturbance, such as hayfields, can sometimes support nesting.
- **Ground Cover:** Mid- to low- plants to conceal nests.
- **Edge Habitats:** Transition zones like edges of native grasslands and cultivated fields or wetlands may increase insect abundance and diversity.

Rarity

This bird is rare in Alberta due to habitat loss, fragmentation, and degradation. This species requires large, intact grasslands for breeding and foraging, but has some adaptability to human-altered habitats like lightly grazed pastures or hayfields. However, these areas are often affected by agricultural, overgrazing, and pesticide use.

Conservation Status Rank[6]	Imperiled Breeding Habitat
General Status Category[7]	May Be At Risk (Based on 2020 Assessment)
***Wildlife Act* Regulations**[8]	Not Listed, but Recommended for Endangered
COSEWIC Status[1]	Endangered
***SARA*-Listed**[9]	Endangered

Threats to Chestnut-collared Longspurs

Habitat Loss: Conversion of native grasslands to agricultural and urban areas.

Habitat Fragmentation: Insufficient large, contiguous grassland areas required for breeding territories.

Climate Change: Cumulative effects such as altered precipitation patterns and habitat degradation.

Pesticide Use: Reducing insect populations, a primary food source.

Declining Grassland Quality: Overgrazing and invasive plant species reducing habitat suitability.

Chestnut-collared Longspur (*Calcarius ornatus*)

Movement Behaviour

The distribution of insect prey significantly influences the movement behavior of Chestnut-collared Longspurs. These birds are ground foragers, relying heavily on areas with abundant and diverse insect populations during the breeding season when insects are a primary food source for both adults and chicks.

In regions where insect prey is unevenly distributed, longspurs may adjust their foraging patterns, moving between patches of higher prey density to maximize their energy intake. This can lead to more localized movements within their breeding territories or even shifts in territory selection to areas with richer prey availability. [1,2,3,4,5,10]

During migration, the availability of insect prey at stopover sites also plays a critical role. Longspurs may concentrate their movements in areas with diverse and abundant insect populations, such as grasslands with low vegetation or agricultural fields that support high insect densities.

Conversely, in habitats where prey is scarce due to factors like pesticide use or habitat degradation, their movement may become more erratic as they search for suitable foraging grounds.

Overall, the spatial distribution of insect prey directly impacts their habitat use, territory establishment, and foraging efficiency, making prey availability a key factor in their survival and reproductive success.

Mapping Habitat

Breeding territory habitat for Chestnut-collared Longspur were defined as contiguous areas of short- to mid-grass prairies where mating, nesting, fledging, and much of the foraging for insect prey takes place.

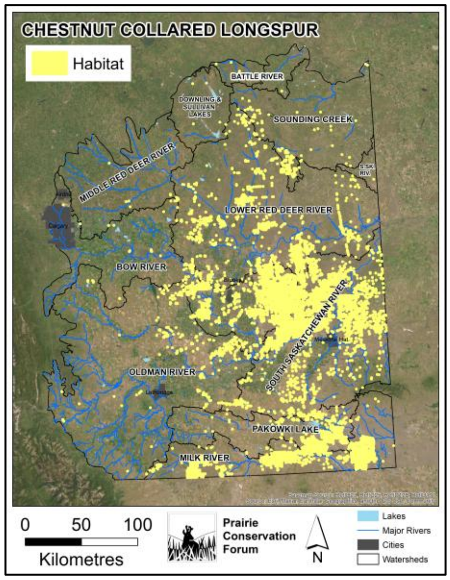


Figure 1 Chestnut Collared Longspur Breeding Territories

Breeding territories in the grasslands of Alberta were mapped using previous sightings or vocalizations of Chestnut Collared Longspur during the breeding season. For each observation, a buffer was applied to the recorded location to represent a minimum breeding territory size of 39 hectares. Any overlapping breeding territory polygons were merged into a single polygon for isolation analysis.

Across the grasslands of Alberta, 3,340 breeding territories were mapped (Figure 1). These territories were scattered throughout the region, with notable concentrations in the South Saskatchewan River, Lower Red Deer River, Milk River, and Pakowki Lake watersheds.

Isolated Breeding Territories

What is 'isolated habitat'?

...the degradation or loss of connections between resource patches [habitat].

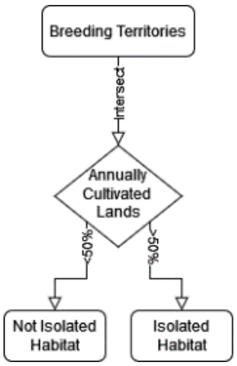
~Taylor 2022

Isolated Chestnut-collared Longspur breeding territories were identified as mapped areas deemed isolated due to the types and extent of land use activities present. Changing movement behavior within these territories imposes an energetic cost on birds during the breeding season. Activities such as habitat loss and fragmentation, as well as changes to insect populations, contribute to these conditions. Such factors may deter future use of these areas, even though birds are known to return to previously used territories.

What are isolating conditions to Chestnut-collared Longspur habitat?

- The Chestnut-collared Longspur faces several conditions that change movement and habitat use, primarily due to human activities and environmental changes:
- Habitat Loss and Fragmentation: Conversion of native grasslands into croplands and urban areas reduces the availability of suitable habitats.
- Pesticide Use: The widespread application of pesticides in agricultural areas can degrade habitat quality and reduce food availability.
- Climate Change: Changing climate patterns may alter the suitability of breeding and insect habitats.
- Habitat Degradation: Activities such as road construction and energy development have compounding impacts on habitat suitability.

How were isolated habitats identified?



Within breeding territories, three key indicators were assessed: Resistance Values* > 50 for more than 50% of the area, which highlights cumulative habitat disturbances; road density, focusing on fragmentation impacts with a threshold of less than 0.005 ha/ha; and cultivated land density, measuring the extent of grassland conversion with a threshold exceeding 50%.

* *Resistance values* represent the degree to which land cover or use may hinder longspur movement or habitat suitability.

What were the isolated habitat mapping results?

Of the 3,946 breeding territories mapped in the grasslands of Alberta, 2,020 (51%) were considered isolated (Figure 2). Of these, ten were isolated due to high proportion of unsuitable habitat in the territory, 307 due to high crop density, and 1,902 due to road density.

Interested in SAR habitat conservation?

Species-specific habitat management activities are meant to reduce isolating conditions and re-connect isolated habitat patches for a given SAR; however, there is no one-size-fits-all approach. Although a general practice that will protect many grassland SAR is to avoid driving across contiguous grassland between April 30 to mid-August[3].

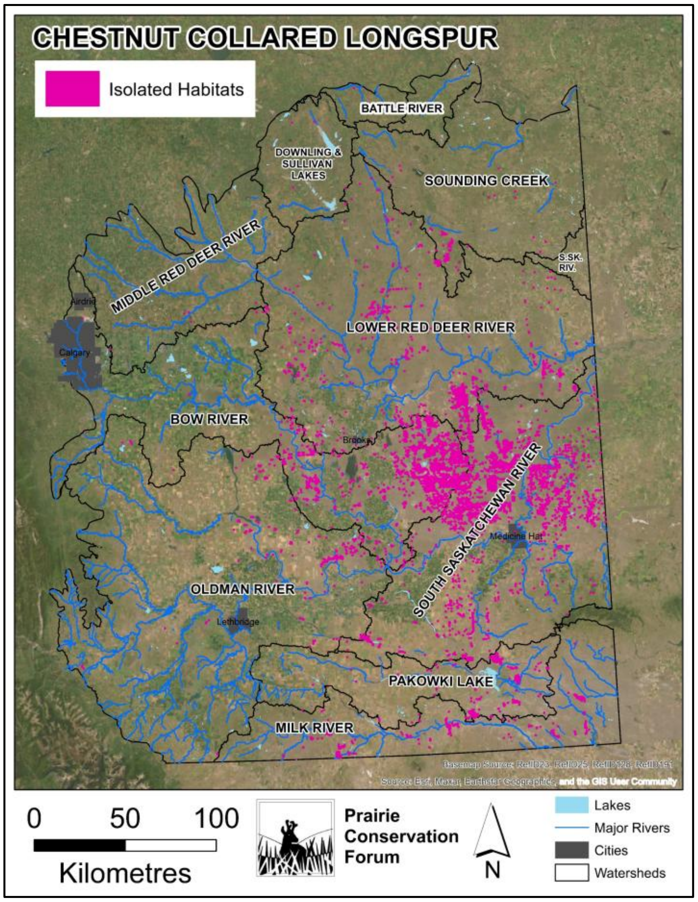


Figure 2 Chestnut Collared Longspur Isolated Breeding Territories

To learn more about chestnut collared longspur habitats check out the Saskatchewan Prairie Conservation Action Plan's Guide.

You can also check out the Agriculture Best Management Practices for Grassland Bird SAR

In the grasslands, it is often the case where habitat patches of one SAR overlap habitat patches of another. In some cases, the presence of one SAR, like a Ferruginous Hawk nest, may be a barrier to another SAR, like a swift fox den.

Visit PCF's *Isolated Habitat Webpage*, to find organizations who can:

- provide specific opportunities for habitat enhancement, development, and restoration of prairie habitats, and/or
- help you to establish your legacy through SAR habitat conservation on your land.

User Notice

Isolated habitat maps represent general areas that might benefit from SAR-specific habitat conservation efforts. PCF makes no representation or warranty, either expressed or implied, in fact or in law, with respect to the accuracy.

- ❖ To view the isolated habitat mapping for this species, check out PCF's Map Viewer
- ❖ For more specifics on PCF's Isolated Habitat initiative, check out PCF's *Isolated Habitat Website*
- ❖ To learn more about the SAR, click on the superscript numbers in the text

Chestnut-collared Longspur (*Calcarius ornatus*)