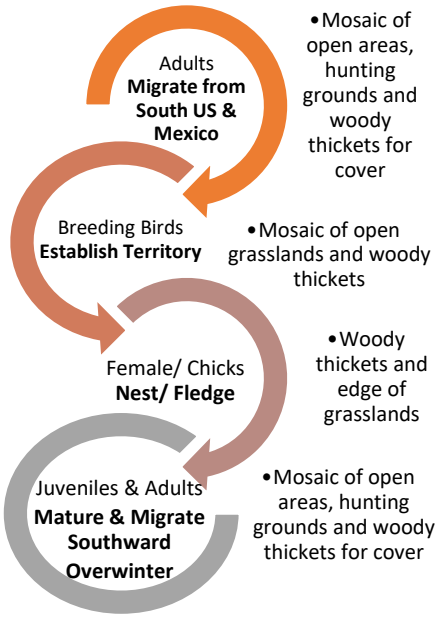
Species Ecology

Loggerhead Shrikes (*Lanius ludovicianus*) arrive in Alberta in early May to establish breeding territories in open grasslands or sparsely wooded areas, often using human-altered landscapes like pastures or fencelines. They display strong territorial behavior but may return to familiar sites each year. During this time, they construct nests in shrubs or small trees using twigs, grass, and other materials. Eggs are laid from May to June, hatching after an incubation period of approximately 14–16 days.[1,2,3]

Once hatched, nestlings remain close to the nest for several weeks, learning to fly and hunt while being supported by their parents. By early to mid-August, juveniles begin dispersing from their natal territories and preparing for migration. During this period, they focus on developing hunting skills critical for their survival during their journey to southern wintering grounds.



Habitat Ecology

Migrating Habitat in Alberta

Loggerhead shrikes require diverse habitats during their migration to ensure they have access to adequate resources for resting, feeding, and shelter.[1,2,3]

- **Open Areas:** Grasslands, agricultural fields, and pastures, to hunt.
- **Perching Sites:** Trees, shrubs, fence lines, and utility wires to hunt and rest.
- **Prey Hotspots:** Areas with rich sources of insects and small vertebrates, often correlated with areas with diverse habitat types.
- **Sparse Vegetation:** Sparse or low vegetation to hunt.
- **Shelter:** Dense shrubs and small trees offer protection from predators and harsh weather conditions.

Breeding Territory Habitat

Breeding Territories provide enough space for the shrikes to hunt, nest, and raise their young. [1,2,3]

- **Open areas:** for hunting insects and small vertebrate animals.
- **Scattered Shrubs and Trees:** as perches for hunting and as nesting sites.
- **Edge Habitats:** boundaries between grasslands and wooded areas, or along roadsides and fence lines, provide a mix of open space for hunting and cover for nesting.
- **Agricultural Lands:** provide hedgerows, shelterbelts, or other features as perches and nesting sites, as well as abundant insects.
- **Sparse Vegetation:** short or sparse vegetation makes it easier to spot and capture prey.

Rarity

Conservation Status Rank[5]	Vulnerable Breeding Habitat
General Status Category[6]	Sensitive
***Wildlife Act* Regulations**[7]	Special Concern
COSEWIC Status[1]	Threatened
***SARA*-Listed**[8]	Threatened

Loggerhead Shrikes are rare in Alberta due to multiple environmental pressures that impact their survival and breeding success.[3,6] Agricultural and urban land uses fragment their habitats, limiting the availability of suitable nesting sites and changing their hunting grounds. Pesticide use reduces prey populations, making it more difficult for shrikes to find sufficient food.

In grassland environments, scarce woody vegetation isolates shrike habitat by limiting the amount of perching and nesting sites, reducing suitable breeding areas. Competition for these resources is high and it forces Loggerhead Shrikes into locations that increase their exposure to predation and making territory defense more demanding.

As climate change drives grassland expansion, it reshapes the landscape, influencing the presence and structure of woody vegetation—an essential resource for perching, nesting, and predator avoidance.

Loggerhead Shrike (*Lanius ludovicianus*)

Movement Behaviour

Within their breeding territories, Loggerhead Shrikes move to protect resources. Males patrol boundaries using perches to monitor and defend against rivals or predators, more so during courtship and nesting.

As chicks hatch and approach fledging, movements shift toward finding food for growing chicks. After fledging, juveniles remain in the territory for several weeks, learning to hunt under parental guidance, dispersing from the territory in late summer to early fall.

Loggerhead Shrikes use a “sit-and-wait” hunting technique, where they perch conspicuously on elevated vantage points such as shrubs, fences, or utility wires to survey for prey and once spotted, they swoop down to capture insects, small mammals, or other prey. They are known for their unique behaviour of impaling prey on thorns or barbed wire.

Mapping Habitat

Breeding territory size for Loggerhead Shrikes can vary depending on habitat quality and resource availability. However, territories are generally between 8.5 and 20 ha in size. [1,4]

Breeding territories were mapped using Loggerhead Shrike observations during breeding season. A 15 ha buffer was applied to each location to represent territory size. Overlapping polygons were merged into one for habitat isolation analysis, with a total of 2,713 unique breeding territories in the grasslands of Alberta (Figure 1).

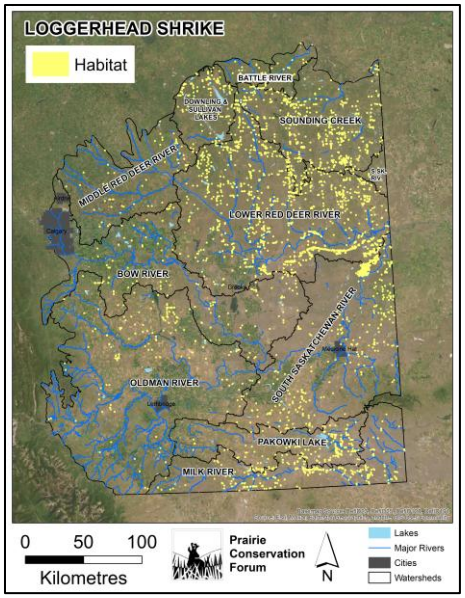


Figure 1 Loggerhead Shrike Breeding Territories

Isolated Breeding Territories

What does ‘isolated habitat’ mean?

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

~*Taylor 2022*

What are isolated breeding territories?

Isolated breeding territories have over 50% unsuitable habitat, more than 50% annually cultivated area, or less than 10% woody cover.

What is unsuitable habitat?

Loggerhead Shrikes can tolerate industrial, agricultural, and rural activities in their breeding grounds. However, excessive land use makes habitats unsuitable. Land uses were ranked by their benefits and costs to determine unsuitability. High-cost activities or habitat types that cumulatively covered more than half the territory area were considered to be unsuitable and deemed isolating.

How does cultivation affect habitats?

Annual cultivation threatens breeding habitats by creating conditions that deter birds from nesting or increase mortality risks. Cultivation leads to:

- Reduced insect diversity and numbers, impacting the bird's diet due to habitat loss and pesticide use.
- Less protective vegetation cover, as crops grow too late to provide adequate shelter for fledging chicks.

Why is woody vegetation isolating?

Woody vegetation with less than 10% cover in a territory reduces perching and nesting options for Loggerhead Shrikes, isolating populations by limiting access to prey and suitable territories. This fragmentation disrupts breeding success and connectivity, increasing vulnerability.

What were the isolated habitat mapping results?

In Alberta's grasslands, 2,713 breeding territories were mapped, with 2,589 (95%) considered isolated due to extensive land use and lack of woody plants (Figure 2). Specifically, territories where more than 50% of the land was unsuitable habitat or where crop density exceeded 50%, or where there was less than 10% shrub or tree cover, were deemed isolated. These conditions collectively hinder the connectivity and conservation efforts for Loggerhead Shrike populations in the region.

Interested in SAR habitat conservation?

Habitat management activities specific to each species aim to reduce isolation and connect separated habitat areas for targeted Species At Risk (SAR). There is no universally applicable method. A common practice to protect many grassland SAR is to avoid driving across continuous grassland from April 30 to mid-August.[9]

To learn more about Loggerhead Shrike habitats, check out the Saskatchewan Prairie Conservation Action Plan's *Guide to Managing for Optimal Habitat Attributes*.

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

In the grasslands, it is often the case where habitats 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.

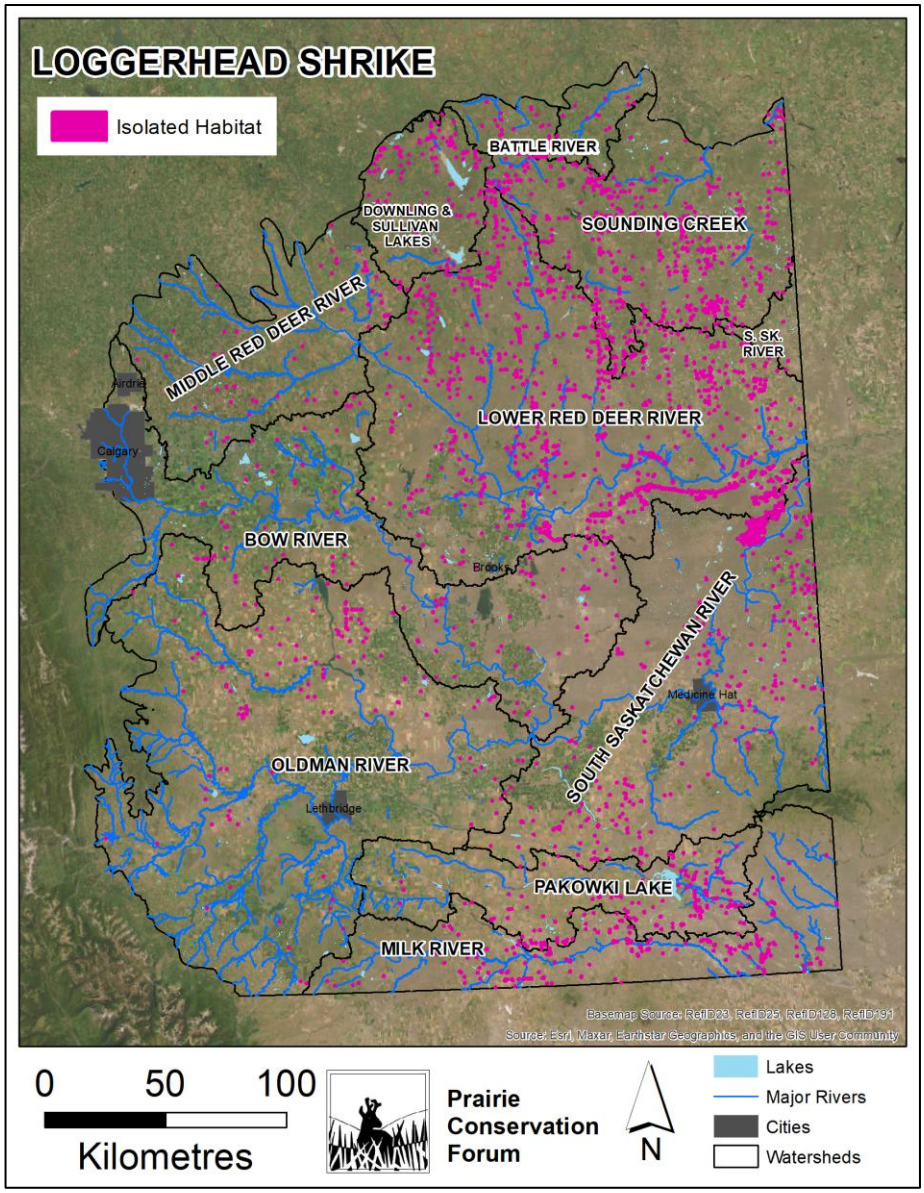


Figure 2 Loggerhead Shrike Isolated Breeding Territories in the Grasslands of Alberta

❖ 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 throughout the document

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.