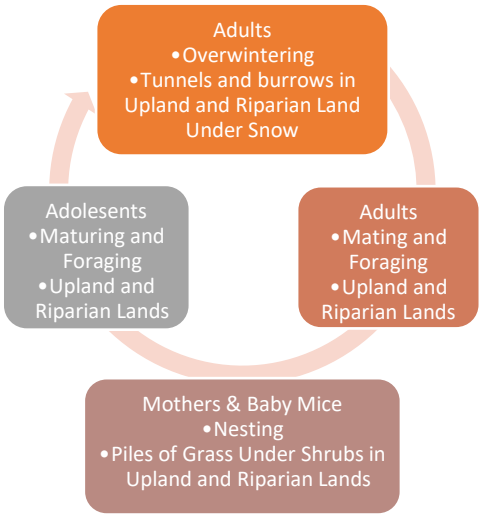
Species Ecology

The Western Harvest Mouse (*Reithrodontomys megalotis* ssp. *dychei*), is a nocturnal mouse with a lifespan of about one year, during which time, female mice may have multiple litters[1]. In the dry grasslands of Southeast Alberta, these mice mate in snow-free conditions, March to September. Birth occurs in small grass nests, after which time baby mice shelter in the nests with their mothers until mature enough to forage in the surrounding environment for seeds, bugs and young plants.

Throughout their lifespan, adult and adolescent mice do not travel far from where they were born, where they share trails, tunnels and burrows created by other rodents, and move around under the snow in winter. These mice are strictly nocturnal rodents, and prefer dark or rainy nights when they are least likely to be detected by predators[2].



Habitat Ecology

These mice do not travel far within a day, nor within their lifespan. They nest, forage, mate and overwinter within a relatively small area.

Little is known about how far these mice travel from their birth site in a night, or during their lifespan, but studies have shown re-captured mice travelled between 50m and 375m in a night[1,2].

Nesting Habitat: Consists of small piles of grass (10cm tall and up to 1m wide) at the base of shrubs, which blend in with the surrounding grass[1].

Foraging/Mating/Overwintering Habitat: In Alberta, these mice are found on loamy to sandy soils, in upland and riparian grasslands and shrublands that have lots of built-up leaf litter and multiple layers of vegetation to provide food and cover from predators[1,3,4].

Rarity

In Alberta, Western harvest mouse is considered rare, because it is at the northern extent of its range and is isolated from other populations in BC and the United States[1]. Additionally, this mouse has a limited distance that it travels in its lifespan, has a fluctuating population size, and other than on C.F.B. Suffield is only found at five other locations in Alberta. It may be the case where it is underreported due to lack of surveys and difficulty with detecting.

Movement Behaviour

At night, mice are constantly on the go, as they search for their mate or their next meal. They emerge at night to forage in areas where they are protected from predation and avoid areas where land use activities can result in fatal accidents. The distance they travel every night depends on the season, population density, habitat, and food supply[1].

Movement corridors are areas between habitat patches that offer cover from predators and have a low risk of accidental death, but don't contain the needed resources for a given activity.

The use of movement corridors by Western harvest mouse is not well known; however, results of a monitoring program on C.F.B. Suffield show a population that extends over 100km along the edge of the west terrace of the South Saskatchewan River[4]. Within C.F.B. Suffield, the lands occupied by this population are federally designated as critical habitat, and for the purposes of this initiative were not considered isolated[1].

Conservation Status Rank[5]	Critically Imperiled
General Status Category[6]	Undetermined
COSEWIC Status[7]	Endangered
SARA-Listed[8]	Endangered

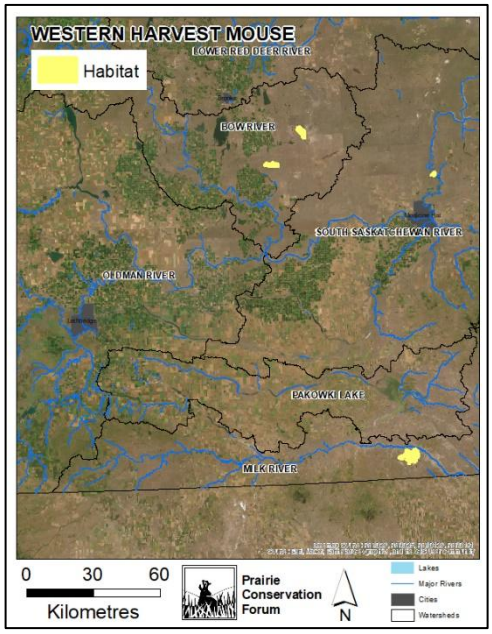
In Alberta, outside of C.F.B. Suffield, these mice have been previously observed at ten locations; however, two are historic observations that were lost due to development in urban centres (Town of Milk River & Medicine Hat) [3,4].

Western Harvest Mouse (*Reithrodontomys megalotis* ssp. *dychei*)

What are Western Harvest Mouse habitats?

These mice live out their lives in a relatively small area, within which they forage, reproduce, mature and overwinter during their approximate year-long lifespan. These small areas within which they do all of their life's activities are referred to as home ranges.

For this project, home ranges were mapped using Grassland Vegetation Inventory (GVI) polygons within 300m from the location of a previous mouse observation point[1,3,4], with the GVI polygons representing home range habitat through which the observed mouse may have travelled.



Outside of the C.F.B. Suffield National Wildlife Area population, five (5) home ranges were mapped: one in the Milk River Watershed, one in the South Saskatchewan River Watershed, and three in the Bow River Watershed.

What does 'isolated habitat' mean?

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

~*Taylor 2022*

How do home ranges become isolated?

Factors that create isolating conditions are associated with different types of land use activities and land cover within and between home ranges that prevent or deter access or movement.

What are barriers to movement?

Barriers to Western harvest mouse movement are natural features or land use/land cover conditions that prevent or deter mice from crossing areas or accessing the other side.

Barriers could be in the form of an impassable physical object, as well as inherent land use activities associated with a land cover type that cause high levels of mortality.

What are barriers to Western Harvest Mouse movement?

Land uses or cover that create isolating conditions for Western harvest mouse include[1]:

- Highways, which often increase accidental mortality rates such that they are significant enough to affect population size or behaviour,

- Wide rivers and canals, which are usually filled with water year-round, thus impassable and avoided,
- Cultivated lands, where various ongoing activities, such as tilling or applying pesticides, can cause mortality, and where removal of plant cover can increase exposure to predation,
- Different types of developments, such as urban, commercial and industrial that introduce any number of stressors to the nocturnal rodent, such as removing plant cover, and introducing light and noise pollution through incompatible night-time activities, and
- Hayed or heavily grazed lands, where ongoing, long-term activities can increase the risk of accidental mortality as well as increase predation.

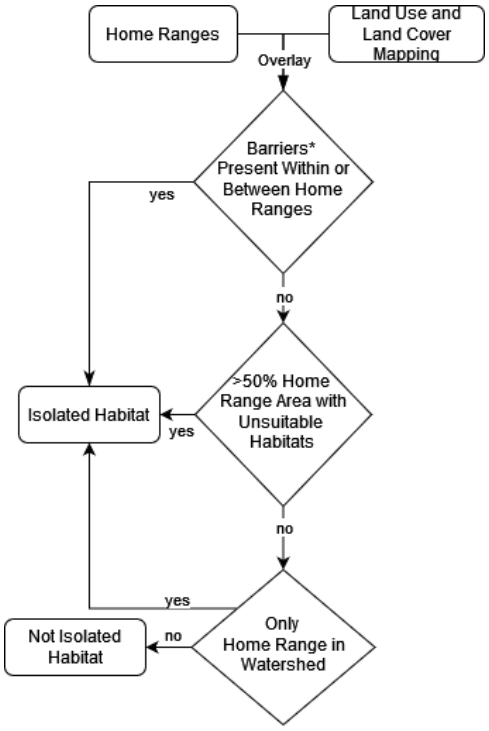
❖ To view the isolated habitat mapping for this species, check out PCF's Map Viewer

❖ For more specifics on PCF's Isolated Habitat initiative, check out PCF's *Isolated Habitat Website*

❖ Click on the superscript numbers in the text to access more knowledge

How did you determine isolating conditions to home ranges?

For this mouse, isolating conditions were determined by assessing over 100 different types of land use and land cover features[4,6] for their potential level of impediment or change to Western harvest mouse movement behaviour (seasonally, nightly, etc.).



*Barriers are any land use or land cover polygon or group of polygons that constitute a long, linear or large, non-linear feature that is impassable by a mouse

What were the mapping results?

Of the five Western harvest mouse home ranges mapped in the grasslands of Alberta, outside of C.F.B. Suffield, all were isolated (100%) (Figure 1).

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.

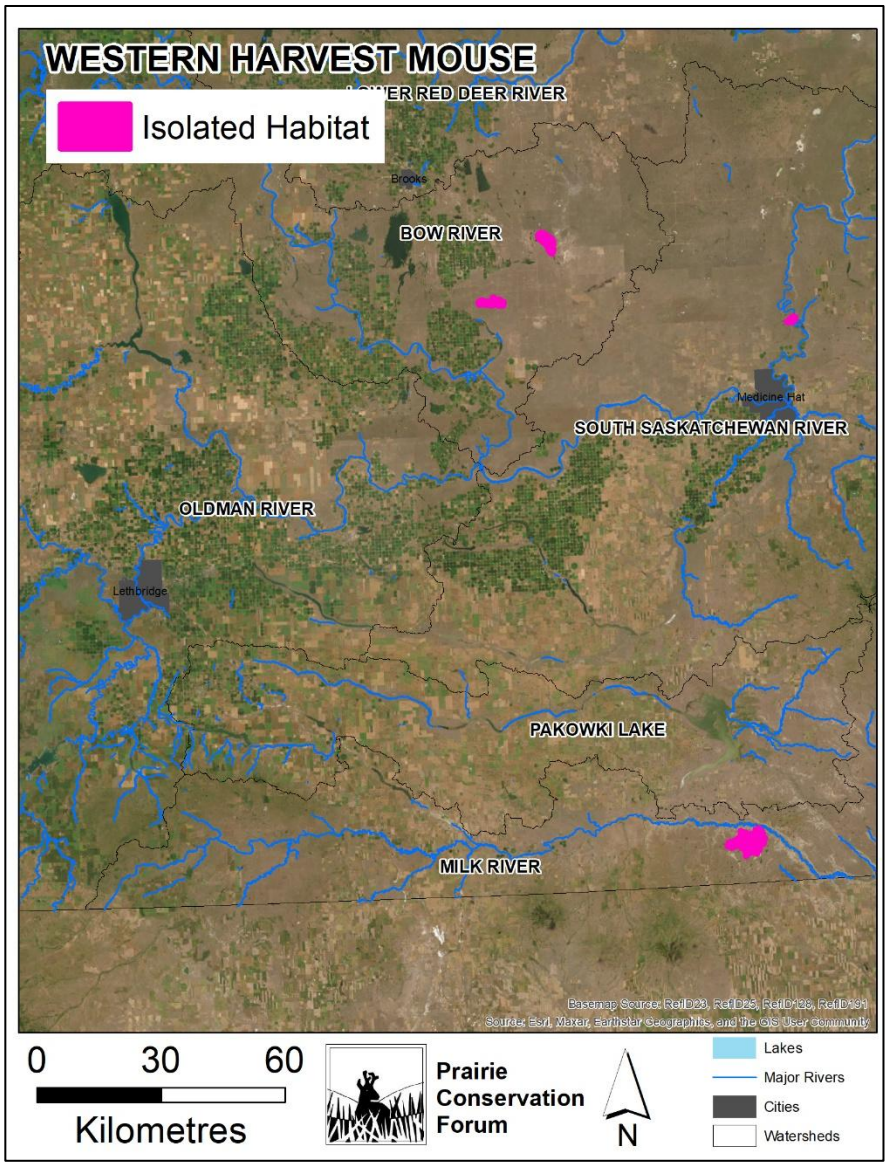


Figure 1 Western Harvest Mouse Isolated Home Ranges

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, like a swift fox den.

Visit PCF's *Isolated Habitat Webpage* to check out a list of member organizations that can provide specific opportunities for enhancement, development, and restoration of native prairie habitats, as well as help you to establish a legacy of SAR habitat conservation.

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.