Beneficial Management Practices for Bats

Bat-Friendly Farming

Photo: Nancy Rigor

Last updated May 16, 2022

What is bat-friendly farming?

Bat-friendly farming involves using techniques that protects and enhances habitats and avoids harm to bats. This includes:

- Retaining and restoring habitats that support bats
- Protecting bat colonies
- Eliminating hazards for bats
- Reducing pesticide use
- Following applicable best practice recommendations

This brochure provides beneficial practices for agriculture to ensure bat-friendly farms can benefit from the services of bats.

Why should I be bat-friendly?

Bats Provide Pest Control. Bats eat a lot of insects, including many that damage crops or harass and sicken livestock. This natural pest control saves farmers significant amounts of money[1,2].

Alberta bats are a natural and important part of local ecosystems.

North American bats need help. Stewardship helps farms and bats.

Bats provide billions of dollars worth of pest control services to the North American agricultural sector[2]

Bats Benefit Crops	Bats Benefit Livestock and Humans
Bats can eat their own weight in insects every night. Small bats can eat 5,000 mosquito-sized insects per night. In four months, a colony of 100 Little Brown Myotis can eat about 96 kg (212 lbs) of insects. A large colony (of 1000 bats) could eat over a ton of insects during the summer. A colony of 150 Big Brown Bats can eat 38,000 cucumber beetles (eliminating about 33 million larvae), 16,000 June bugs, 19,000 stinkbugs and 50,000 leafhoppers in a single summer.[3] These types of insects are agricultural pests. Bats can disrupt moth egg-laying behaviour, reducing pest larvae and crop damage simply by being present and emitting high-frequency hunting calls.[4]	Bats benefit cattle[5,6] and human health by consuming biting insects (such as biting flies and mosquitoes), which helps to improve yields and may reduce the transmission of insect-borne diseases. Biting insects can cause: 1.Western Equine Encephalitis 2.West Nile Virus 3.Bovine Leukosis Virus 4.Poor growth rates of calves, poor weight gain and milk output as a result of harassment by flies.

Alberta Bats

Legislation Protecting Bats and Their Habitat

- *The Wildlife Act* (Provincial) describes protections for bat roosts and hibernation sites in Alberta. Disturbances to bats are not permitted from 1 Sept—30 April for hibernation sites. Live bats can only be held in captivity temporarily while being removed from a building.
- *Species at Risk Act* (**SARA**, Federal) provides additional protections to bats and their habitat in specific areas on Federal land. Little Brown Myotis and Northern Myotis are currently listed as Endangered and additional species are being considered for listing.
- Activities around important habitat for bats such as streams and wetlands are managed under the *The Water Act* and Alberta has a provincial "Wetland Policy" to conserve, protect, restore and manage provincial wetlands.

These bats often roost in buildings on farms and feed on pests of crops and livestock

Little Brown Myotis

Big Brown Bat

Bat Facts

- There are at least **9 species of bats in Alberta** and they all eat nothing but bugs (insects and spiders).
- Bats live in every part of Alberta and prefer areas where roosting, foraging and drinking habitats are close together (within a few kilometres).
- **Bats often roost in trees (big, old, live or dead trees with peeling bark, cracks, or cavities) and rock crevices. A few species often roost in buildings, bridges and bat houses.**
- Females of most species have their pups in **maternity colonies**, which can range anywhere from a few individuals up to over a thousand. Males typically roost alone.
- **Open water and wetland habitat** is important for bats and provides sites for both drinking and feeding. Bats are often found within 1 km of water sources.
- Bats are common in agricultural areas. Organic farms have higher levels of bat activity than large, industrial monoculture farms[7]. Habitat diversification helps bats by providing insect prey that hatch at different times[7].
- Bats leave summer roosts for winter hibernation roosts which are found in mines, caves, deep rock crevices, and potentially other underground habitats. Big Brown Bats may also hibernate in buildings but are seldom reported.
- All bats migrate but three species leave Alberta entirely during the winter. Some bats may fly as far south as Mexico.
- Bat populations increase very slowly. **Recovery from losses can take decades.** Most bats produce only one pup per year and only 50% of pups survive their first winter.
- Bats can live long lives—up to at least 39 years in Alberta.

Potential farm-related threats to bats include:

◊ Habitat loss or degradation

◊ Evicting or excluding bats from building roosts or demolishing old buildings being used by bats, especially when poorly timed.

◊ Hazards that cause entrapment or entanglement (e.g., barbed wire or water troughs).

◊ Cats (especially if they find and repeatedly target a roost).

◊ Insecticides deplete insect prey and the long-term impacts of pesticides on bats is poorly understood.

Other threats include:

◊ Disturbance at hibernation sites (waking bats depletes fat reserves needed to survive the winter).

◊ White-nose syndrome (an invasive fungal disease that has resulted in the death of millions of bats across North America – this disease does not affect humans or other animals).

◊ Wind energy developments (primarily affects migratory bats but can affect resident bats too).

Best Practices for Bats

Natural Habitats

Protect foraging habitat for bats: insect prey is abundant in healthy **wetlands and riparian areas**. Protect these habitats by maintaining vegetation on perimeters. Use fencing and off-site watering to prevent livestock from damaging streambanks and wetlands. Restore wetlands and riparian areas. Retain wild and native habitat remnants on farms.

Retain trees for bat roosting: keep large (>30 cm diameter) trees with defects (peeling bark, cracks, cavities); plant and retain young trees to ensure future roost trees exist for bats. Trees at risk of falling and causing damage can be de-limbed or topped to retain the standing trunk (3 m or taller) to provide bat roosting habitat (see *Best Practices for tree topping, limbing and removal in riparian areas*).

Provide/protect water sources for bats: ponds and water troughs can provide drinking water for bats who drink while flying. Avoid stringing wire fences across water features and retain water that is drinkable for wildlife.

Retaining shelterbelts or hedgerows/connectivity: promote habitat connectivity. Bats use these lines of vegetation along field and road margins as protected areas of cover during flights between roosting and foraging or drinking habitats. These features also provide roosting habitat when large trees are retained. Use native tree, shrub and plants. See "Shelterbelts in Alberta" for recommendations on management.

Diversify habitats: large crop monocultures have fewer bats. Where possible, increase the complexity of the landscape by planting different crops or intersperse crop areas with areas of natural vegetation; incorporate native plant, shrub and tree species where possible. Retain large trees. Develop a sustainable grazing plan that supports native plant communities. Avoid cultivating ephemeral wetlands. See "Biodiversity Conservation Guide for Farmers and Ranchers in Alberta".

Buildings & Bat Houses

Build bat roosts, keep and maintain building colonies: most buildings and bat houses in Alberta are used by Big Brown Bats or Little Brown Myotis. Bat houses can be used to enhance roosting options on your property, thereby increasing the number of bats present. Not all designs are suitable for bats—follow the plans and guidelines available on the Alberta Bats website (www.albertabats.ca/). Bat colonies in buildings are an important part of local bat populations. Buildings are often preferred by bats and support larger colonies than natural roosts. See how to safely and easily maintain these sites in the Alberta Bats' "Managing Bats in Buildings Guidebook".

Managing Hazards

Remove or minimize hazards for bats: ensure bats have a way to escape entrapment if they fall into any deep, smooth-sided feature (such as rain barrels, watering troughs, metal vents, chimney stacks, buckets), prevent access or add a piece of wood or a climbable surface; avoid use of sticky tape or place it inside cages to prevent access by bats or birds. Use smooth wire on the top line of fencing to avoid snagging bats on barbed wire. Remove invasive burdock, which can entangle bats.

Pesticides

Minimize/target pesticide use: instead of spraying fields for pests on a standard schedule, spray only when the pest is present and control is necessary, and then use the minimum effective amount of pesticide required; consider wind conditions when spraying to prevent spray drift and when planting to avoid neonicotinoid dust drift; ensure that pesticides do not enter waterways or wetlands; observe or exceed recommended buffers beside wetland features; retain pesticide-free areas within your farm to maintain insect populations; consider implementing organic farming practices on some or all of your land, as organic farms have been shown to have higher numbers and diversity of insects . **Pesticide use can affect non-target insects**, reducing overall prey availability in an area.

ROOSTING

Old buildings and big, old trees provide roosts for bats

DRINKING

Water sources are important for bats (especially open water)

FORAGING

Areas with native vegetation, crops and wetlands provide insect prey

You Can Help

Photo: Cory Olson

Bats represent a real economic asset on the farming landscape. Acting as a steward for bats and bat habitat will protect your local, natural capital. Incorporate bats into your Farm Plan. Cooperate with adjacent landowners for a local strategy for bat conservation. Look for overlaps in conservation strategies with other wildlife species.

Additional resources for learning about bats or how to enhance habitat and/or minimize impacts are available at:

- Alberta Community Bat Programs (www.albertabats.ca/resources)
- Beneficial Management Practices for Bats (multisar.ca/wp-content/uploads/2015/10/Multisar-Bat-BMP-Report-Final.pdf) & Fact Sheet (multisar.ca/wp-content/uploads/2015/10/Bat-Fact-Sheet-FINAL-for-WEB.pdf)
- Alberta Environment — Bats (www.alberta.ca/bats.aspx)
- ALUS Canada—sustaining agriculture, wildlife and nature (alus.ca)

Photo: Mud River Photography

What about disease?

Rabies is present in Alberta bat populations at extremely low rates. Less than 0.5% of bats are estimated to have rabies, but rates may be much greater (possibly 8% or more) for bats that come into contact with people or behave strangely.

Any bare skin contact with a bat should be considered as a rabies exposure. If you have been bitten or scratched by a bat you should:

1. Wash the wound well with soap and warm water under moderate pressure for at least 15 minutes.

2. Seek medical care from your health care provider as soon as possible. Call Health Link @ 8-1-1 to arrange medical treatment.

The health risks associated with bat guano in Alberta are typically low but caution is recommended. *Histoplasma,* a fungus that causes Histoplasmosis in people, may be found in areas with accumulations of bat guano and its status in Alberta is poorly understood. Proper protective equipment, or professional services, is needed when cleaning up the feces of any wild animal.

To minimize the chance of exposure, ensure pets are vaccinated against rabies. Never handle bats, or any wildlife, with bare hands.

Selected References:

- [1]Maine, J.J. and J.G. Boyles. 2015. Bats initiate vital agroecological interactions in corn. PNAS 112 (40): 12438–12443. www.pnas.org/cgi/doi/10.1073/pnas.1505413112
- [2]Boyles, J. G., P.M. Cryan, G.F. McCracken, and T.H. Kunz. 2011. Economic importance of bats in agriculture. Science 332(6025):41-42.
- [3]Whitaker, J.O., Jr. 1995. Food of the Big Brown Bat, *Eptesicus fuscus*, from maternity colonies in Indiana and Illinois. Am. Midl. Nat. 134:346–360.
- [4]Russo, D., L. Bosso, and L. Ancillotto. 2018. Novel perspectives on bat insectivory highlight the value of this ecosystem service in farmland: Research Frontiers and Management Implications. Agriculture, Ecosystems and Environment 266: 31-38. https://doi.org/10.1016/j.agee.2018.07.024
- [5]Ancillotto, L., A. Ariano, V. Nardone, I. Budinski, J. Rydell, and D. Russo. 2017. Effects of free-ranging cattle and landscape complexity on bat foraging: Implications for bat conservation and livestock management. Agric., Ecosystems and Env. 241:54-61. http://dx.doi.org/10.1016/j.agee.2017.03.001
- [6]Palmer, M.S., J. Krueger, and F. Isbell. 2019. Bats join the ranks of oxpeckers and cleaner-fish as partners in pest-cleaning mutualism. Ethology 00:1-6. https://doi.org/10.1111/eth.12840
- [7]Monck-Whipp, L., A.E. Martin, C.M. Francis and L. Fahrig. 2018. Farmland heterogeneity benefits bats in agricultural landscapes. Agric. Ecosystems and Env. 253:131-139.

WCS CANADA

ALBERTA COMMUNITY BAT PROGRAM

For updates and additional resources, visit

www.albertabats.ca

This project was generously funded by the Calgary Foundation, Edmonton Community Foundation, Alberta Ecotrust, Alberta Conservation Association, and Environment and Climate Change Canada