# Little Brown Myotis, Northern Myotis and Tri-colored Bat

# Ontario Government Response Statement

## Protecting and Recovering Species at Risk in Ontario

Species at risk recovery is a key part of protecting Ontario's biodiversity. The *Endangered Species Act, 2007* (ESA) is the Government of Ontario's legislative commitment to protecting and recovering species at risk and their habitats.

Under the ESA, the Government of Ontario must ensure that a recovery strategy is prepared for each species that is listed as endangered or threatened. A recovery strategy provides science-based advice to government on what is required to achieve recovery of a species.

Generally, within nine months after a recovery strategy is prepared, the ESA requires the government to publish a statement summarizing the government's intended actions and priorities in response to the recovery strategy. The response statement is the government's policy response to the scientific advice provided in the recovery strategy. In addition to the strategy, the government response statement considers (where available) input from Indigenous communities and organizations, stakeholders, other jurisdictions, and members of the public. It reflects the best available local and scientific knowledge, including Traditional Ecological Knowledge where it has been shared by communities and Knowledge Holders, as appropriate, and may be adapted if new information becomes available. In implementing the actions in the response statement, the ESA allows the government to determine what is feasible, taking into account social, cultural and economic factors.

The Recovery Strategy for the Little Brown Myotis (*Myotis lucifugus*), the Northern Myotis (*Myotis septentrionalis*), and the Tri-colored Bat (*Perimyotis subflavus*) in Ontario was completed on December 5, 2019.

Little Brown Myotis, Northern Myotis and Tri-colored Bat are small, insectivorous bats. As predators of insects, some of which are considered pests in the agriculture and forestry sectors, these bats provide an important ecological service.

Little Brown Myotis is brown with black ears, black wings, and a black tail membrane. Its wingspan is approximately 22 to 27 cm. The tragus (prominence on the inner side of the external ear) is long, with a slightly rounded tip.

Northern Myotis, also known as Northern Long-eared Bat, is a small bat similar in size (wingspan of 23 to 26 cm) and colouration to Little Brown Myotis, but generally distinguishable by its longer ears and tail and its long, slender, and pointed tragus.

Tri-colored Bat, formerly known as Eastern Pipistrelle, has a distinct colouration; each hair is black at the base, yellow in the middle, and brown at the tip giving the bat an overall reddish-brown to yellowish-brown colour. Its wingspan is approximately 20 to 26 cm. Its ears and face are brown, and its wings and flight membranes are blackish.

## Protecting and Recovering Little Brown Myotis, Northern Myotis and Tri-colored Bat

Little Brown Myotis, Northern Myotis and Tri-colored Bat are listed as endangered species under the ESA, which protects the bats and their habitats. The ESA prohibits harm or harassment of the species and damage or destruction of its habitat without authorization. Such authorization would require that conditions established by the Ontario government be met. In addition to protection under the ESA, Little Brown Myotis, Northern Myotis and Tri-colored Bat are prescribed as Specially Protected Mammals under the *Fish and Wildlife Conservation Act, 1997* (FWCA).

### Little Brown Myotis

Globally, Little Brown Myotis is distributed over much of North America including 12 Canadian provinces and territories and 46 U.S. states. In the United States, Little Brown Myotis occurs in all continental states except Arizona, Texas and Louisiana. Little Brown Myotis was once one of the most common and widely distributed bats in Canada having been confirmed in every province and territory with the exception of Nunavut. In Ontario, the species was widespread in southern Ontario, and scattered distribution records suggest this is likely also true in northern Ontario. Due to catastrophic population declines, the species is now rare in southern Ontario. Recent studies found that Little Brown Myotis are likely more widespread and common in northern Ontario than previously thought. One study found that the highest encounter rates for Little Brown Myotis in Ontario were in northwestern Ontario (west of Thunder Bay). The northern limit of its distribution in Ontario is difficult to define because of limited survey effort; however, the species has been confirmed as far north as Moose Factory and Favourable Lake.

### Northern Myotis

Northern Myotis is a widespread species that is found in forest regions in Canada and much of the United States. It occurs in 36 U.S states, ranging across the eastern and north central states and southward to Florida. In Canada, Northern Myotis occurs in all 10 provinces as well as the Yukon and Northwest Territories. In Ontario, the species occurs throughout southern Ontario, to the north shore of Lake Superior and occasionally north of Moosonee, and west to the Manitoba border. Like Little Brown Myotis, the northern limit of Northern Myotis' range is difficult to determine due to limited survey effort and difficulties related to survey logistics.

Tri-colored Bat

The global range of Tri-colored Bats covers 4 Canadian provinces, 37 U.S. states, Mexico, Guatemala and Honduras. In the United States, Tri-colored Bat occurs from the east coast to Minnesota, south through Nebraska, Kansas, Oklahoma, New Mexico and Texas. The Canadian range of Tri-colored Bat encompasses mainland Nova Scotia, southern portions of New Brunswick, Quebec and Ontario. Tri-colored Bat has been recorded in several widespread locations in southern Ontario, from Kingston to Renfrew and as far north as Espanola and Alona Bay. Recent studies suggest that Tri-colored Bat may also exist in north central Ontario.

Ecological and Habitat Requirements

The ecological and habitat requirements of Little Brown Myotis, Northern Myotis and Tri-colored Bat vary by season. Their habitat is generally composed of overwintering habitat (i.e., hibernacula, such as caves and abandoned mines) used for hibernation and overwinter survival; summer habitat that includes roosting habitat and foraging habitat; and swarming sites, which are typically in the same area as hibernacula, used in the late summer and early fall for mating and socializing.

All three species overwinter in cold and humid hibernacula. Throughout the overwintering period these bats survive using stored fat reserves accumulated during the summer and fall. They also enter a state of torpor in which they decrease their metabolic rate and body temperature. This allows these bats to continue to persist in areas even when temperatures decline and insects, their primary food source, are not available. Hibernacula for Little Brown Myotis, Northern Myotis and Tri-colored Bat are generally underground openings, including caves, abandoned mines, wells, and tunnels. The physical and biological needs of the species may result in only specific sections of a site being useful as hibernacula. The sections used for hibernating typically have a temperature range between 2 and 10 degrees Celsius and relative

humidity levels that are greater than 80 percent. Perhaps because of these specific habitat requirements, suitable hibernacula are typically used year after year by overwintering bats. Where their distributions overlap, all three bat species may occur in the same hibernaculum but may be found in different sections. Of these three species, Tri-colored Bat is considered to have the most rigid overwintering habitat requirements; they typically roost in the deepest part of caves where temperature is the least variable. None of these species typically overwinter in buildings.

Upon emergence from hibernation in the spring, Little Brown Myotis, Northern Myotis and Tri-colored Bat females travel to summer ranges containing suitable maternity roosts (sites in which female bats gather to give birth and raise their young) and foraging habitat. Females generally give birth to one (Little Brown Myotis and Northern Myotis) or sometimes two (Tri-colored Bat) young and raise pups throughout the spring/summer. Maternity roost habitat may include cavities of canopy trees, foliage, tree bark, crevices on cliffs, and may include buildings and other anthropogenic (human made or influenced) structures such as bat boxes, bridges, and barns (Little Brown Myotis, in particular). Suitable maternity roosts, both natural and anthropogenic, can be used year after year, with bats showing high fidelity at some sites. Female offspring may also return as adults to their natal maternity roost in subsequent years to give birth and raise young. Males of all three species roost during the daytime in a variety of structures, and often switch sites during the summer. Male roosting habitat includes rock crevices, raised bark, foliage, tree cavities and caves. Many bat species, including Little Brown Myotis, Northern Myotis and Tri-colored Bat, preferentially roost in older trees in moderate stages of decay possibly because they provide greater opportunity for snags (dying trees), cavities and/or peeling bark for roosting. Roosts are used for thermal regulation, provide shelter from weather and predation, and can be sites of social interactions. Individuals may switch roosts regularly and therefore, may use a network of roosts in a roosting area.

All three bats are insectivorous, feeding on a wide range of insects and spiders, primarily at night. Foraging occurs over water (mainly Little Brown Myotis and Tri-colored Bat), and along waterways, forest edges, and in gaps in the forest (mainly Northern Myotis). Large open fields or clearcuts are generally avoided.

Mating occurs during late summer/autumn swarming periods, and during winter. Bats start to congregate in swarming habitat in the late summer and early fall. Swarming sites may function as mating sites, social sites for information transfer, and/or to allow individuals to assess potential sites for overwintering. As such, swarming behaviour often occurs in and around entrances or openings of hibernacula. These sites may be

hundreds of kilometres from their summering areas. In all three species, individuals generally reach sexual maturity after their first year.

All three species are long-lived with low reproductive rates. This life history strategy makes these bats highly vulnerable to extinction, as even small increases in annual mortality of adults can greatly impact extinction risk. Another limiting factor is that these species congregate in large numbers within their hibernacula, which makes them particularly susceptible to diseases and disturbance events.

The primary threat to Little Brown Myotis, Northern Myotis and Tri-colored Bat is White-nose Syndrome (WNS), a disease caused by an invasive fungus. Threats other than WNS include habitat loss and degradation, energy production, human intrusions, eradications and disturbance, and chemical contamination. Potential threats with unknown impacts for all three species include climate change and severe weather.

White-nose Syndrome affects cave-dwelling bats during their overwintering period. *Pseudogymnoascus destructans*, the fungus that causes this disease, thrives in the cool, humid environments of caves and abandoned mines, and grows on the tissues of hibernating bats. Infected bats may have white fuzzy patches on their muzzles and ears, and lesions on their wing membranes. This leads to dehydration and electrolyte imbalances, causing bats to arouse from hibernation more frequently and/or emerge from hibernation prematurely, and thereby depleting the bats' critical energy reserves. Large numbers of bats seen flying during the winter can be an indicator of WNS. This results in high levels of overwintering mortality, and bats that do survive until spring may experience tissue damage, physiological stress or reduced reproductive success. For this reason, the availability of appropriate foraging resources within reasonable commuting distances is particularly important for bats infected with WNS that survive the overwintering period. WNS was first detected in Canada in 2010, and to date has caused a 94 percent overall decline in known numbers of hibernating Myotis bats in Nova Scotia, New Brunswick, Ontario, and Quebec.

Urban and commercial development, conversion of land for agricultural and agricultural intensification can result in the removal, degradation and fragmentation of foraging and roosting habitat, including forests, wetlands and riparian areas. While forest harvesting can also result in removal or degradation of habitat such as through declines in the amount of older age class forests (i.e., late successional, 'old-growth') and removal of roosting trees or snags, some forest harvest practices can also lessen impacts. Closure of mines, which can involve collapsing or blocking the entrance to prevent entry by humans, can also result in habitat loss if bats are no longer able to access these areas.

Similarly, renovations or alterations to buildings used as maternity roosts could reduce or eliminate access to these anthropogenic habitats. Renovations or alterations to buildings used as maternity roosts can also change the internal conditions such as temperature and humidity. The impact of removing these habitats would depend on timing and the availability of other suitable habitats.

Wind turbines can cause mortality in bats by directly striking bats in flight, or as a result of barotrauma (rapid air pressure changes in close proximity to the moving blade of a wind turbine resulting in often fatal internal injuries). Wind turbines represent one of the largest sources of anthropogenic (human caused or influenced) mortality documented for bats. Although migratory bats are most vulnerable, there is evidence that relatively large numbers of Myotis species (especially Little Brown Myotis) are killed at some sites in Ontario. Estimating resulting mortality can be difficult because carcasses are hard to locate due to vegetation, decomposition, scavengers, and size of area that would need to be surveyed. Where data exist, evidence to date suggests mortality levels at a national scale are relatively low for Northern Myotis and Tri-colored Bat while mortality levels of Little Brown Myotis can be high in certain locations. Mitigation measures to reduce bat mortality related to wind energy production include feathering of wind turbine blades (adjusting the angle of the blade parallel to the wind) or raising the cut-in speed (the wind speed at which the turbine begins to generate electricity).

Disturbance of hibernating bats (e.g., due to humans entering caves or mines), can result in arousal from hibernation which can result in premature energy depletion, starvation, reduced energy reserve for reproduction and death. Because bats with WNS have more frequent arousal episodes already, the additive effect of human-caused arousals could be significant. Research activities conducted in hibernacula also present a risk of disturbing hibernating bats and many academics now take appropriate precautions when entering caves or mines, such as incorporating decontamination protocols, entering at times that reduce the risk of negative impacts and/or monitoring bat populations at the entrance to the hibernaculum through the use of Tuttle or Harp traps.

Occasionally bats in buildings are exterminated due to fears of contracting rabies or other diseases, and because of noise and the accumulation of feces. Of the three species of bats, Little Brown Myotis most regularly uses buildings for maternity colonies. Renovations or alterations to buildings used as maternity roosts may eliminate access to the roost, change the climatic characteristics (e.g., air flow, temperature) of the roost and/or trap bats inside if alterations are performed when occupied by bats. The effects of roost exclusion depend on availability of other suitable habitat, timing and bat

species; however, the effects can be significant to local populations, especially where maternity colonies contain most of the breeding females and offspring for a large area.

The threat of contaminants can affect bats through direct intake of contaminated prey or indirectly through reducing the abundance of insects on which bats feed. While population impacts due to pesticide spraying may be somewhat low when applied locally and for a short period of time, widespread and continuous application of pesticides could have a significant impact. Reduced prey availability could potentially result in increased time required for foraging and thus less fat stores, ultimately leading to poor body condition and reduced reproduction and survival rates.

The effects of climate change on bats are unknown. Direct effects of climate change may include the destruction of roosts and/or hibernacula as a result of increased storm frequency, a reduction in water, or increased extent, intensity and frequency of forest fires. In addition to direct effects, climate change is predicted to indirectly affect bat survival through its effect on insect populations. There may be as yet undetermined impacts of climate change on these bat species.

The impacts of WNS are being observed as a significant reduction in population numbers of bat species that overwinter in Ontario. The feasibility of recovering from this threat remains unknown and research is ongoing. Actions are now required to stimulate recovery of bat populations following the devastating impacts of this disease. It is important to note that bat species do not have the reproductive capacity to recover quickly from the high rates of mortality caused by WNS and, as such, populations impacted by this disease will be especially sensitive to any additive stressors. Therefore, its critical to also mitigate threats other than WNS such as ensuring availability of high-quality foraging, roosting, and hibernation habitat, particularly in areas where it may be limited. In the short term, actions to support the protection and recovery of Little Brown Myotis, Northern Myotis and Tri-colored Bat will focus on filling knowledge gaps related to the species' biology and habitat requirements and the effects of WNS and other threats, mitigating identified threats, conducting inventory and monitoring to increase knowledge of provincial populations, and working collectively to protect habitat and increase awareness. Ontario will also continue to work collaboratively with other jurisdictions to understand and address the threat of WNS.

Given knowledge gaps that exist with regard to these species, the uncertainty associated with the extent and impacts of WNS, and the difficulties in estimating population sizes, it is difficult to determine the feasibility of achieving specific targets for

populations in Ontario. Once further information is available about these species and the capability to recover from WNS, this information may be used to review and adapt protection and recovery activities and the goal may be re-evaluated.

**Government's Recovery Goal**

The government's short-term goal for the recovery of Little Brown Myotis, Northern Myotis and Tri-colored Bat is to maintain the persistence of these species at existing locations in Ontario while filling knowledge gaps related to their biology, habitat requirements, and the presence and severity of threats. The long-term goal is to support self-sustaining populations of Little Brown Myotis, Northern Myotis and Tri-colored Bat throughout their current Ontario ranges.

## Actions

Protecting and recovering species at risk is a shared responsibility. No single agency or organization has the knowledge, authority or financial resources to protect and recover all of Ontario's species at risk. Successful recovery requires inter-governmental co-operation and the involvement of many individuals, organizations and communities. In developing the government response statement, the government considered what actions are feasible for the government to lead directly and what actions are feasible for the government to support its conservation partners to undertake.

### Government-led Actions

To help protect and recover Little Brown Myotis, Northern Myotis and Tri-colored Bat, the government will directly undertake the following actions:

- Continue to protect Little Brown Myotis, Northern Myotis and Tri-colored Bat and their habitat through the ESA.
- Undertake communications and outreach to increase public awareness of species at risk in Ontario (e.g., through the Discovery Program of Ontario Parks, where appropriate).
- Continue to mitigate anthropogenic threats to habitat, where appropriate and feasible, in provincially protected areas.
- Educate other agencies and authorities involved in planning and environmental assessment processes on the protection requirements under the ESA.

- Encourage the submission of Little Brown Myotis, Northern Myotis and Tri-colored Bat data to Ontario's central repository (Natural Heritage Information Centre, NHIC) through the NHIC (Rare species of Ontario) project in iNaturalist or directly through the NHIC.

- Continue to support conservation, agency, municipal and industry partners, and Indigenous communities and organizations to undertake activities to protect and recover Little Brown Myotis, Northern Myotis and Tri-colored Bat. Support will be provided where appropriate through funding, agreements, permits (including conditions) and/or advisory services.

- Continue to apply provincial direction for Crown forestry practices in areas occupied by Little Brown Myotis, Northern Myotis and Tri-colored Bat.

- Continue to implement *Ontario's White-nose Syndrome Response Plan* to address the threat of *Pseudogymnoascus destructans* on Little Brown Myotis, Northern Myotis and Tri-colored Bat, and coordinate WNS prevention, surveillance and monitoring efforts with other provincial, national and international plans including Canadian Wildlife Health Cooperative (CWHC) National Wildlife Disease Database, North American Bat Monitoring Program, and national WNS Working Groups.

- Coordinate Ontario-based Little Brown Myotis, Northern Myotis and Tri-colored Bat research and monitoring, including government-supported efforts undertaken by partners, and integrate with national and international efforts (e.g., North American Bat Monitoring Program).

- As indicated in Ontario's Made-in-Ontario Environment Plan, commit to lowering greenhouse gas emissions to 30 percent below 2005 levels by 2030 and regularly report on progress.

- Work with partners and stakeholders to support beneficial insects in Ontario through actions such as education and promoting integrated pest management and best management practices.

- Conduct a review of progress toward the protection and recovery of Little Brown Myotis, Northern Myotis and Tri-colored Bat within five years of the publication of this document.

**Government-supported Actions**

The government endorses the following actions as being necessary for the protection and recovery of Little Brown Myotis, Northern Myotis and Tri-colored Bat. Actions identified as “high” may be given priority consideration for funding under the Species at Risk Stewardship Program. Where reasonable, the government will also consider the priority assigned to these actions when reviewing and issuing authorizations under the ESA. Other organizations are encouraged to consider these priorities when developing projects or mitigation plans related to species at risk.

| **Focus Area:** | **Research** |
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| Objective: | Increase knowledge of Little Brown Myotis, Northern Myotis and Tri-colored Bat biology, habitat requirements, and the presence and severity of threats. |

White-nose Syndrome caused a significant decline in populations of Little Brown Myotis, Northern Myotis and Tri-colored Bat in Ontario. While no widely tested treatment for WNS exists, intensive research is currently ongoing in the areas of treatment and mitigation. Further information on the degree of impact of this threat is necessary to inform future recovery efforts. Filling knowledge gaps around the species’ biology, ecology and habitat including population viability, habitat needs and tolerance to various stressors will help determine where recovery efforts are best focused. Evaluating the importance of anthropogenic (human-made or influenced) habitats and the effectiveness of bat houses will help determine where recovery efforts are best focused.

**Actions:**

1. **(High)** Investigate the effects of WNS on Little Brown Myotis, Northern Myotis and Tri-colored Bat survival, reproductive success and population-level impacts.
2. **(High)** Support and collaborate where appropriate on WNS research and incorporate results in developing emerging tools and mechanisms to prevent or reduce the spread, mitigate the effects of and/or treat WNS, as appropriate and feasible. Actions may include:
    - investigating the health and characteristics of populations or individuals remaining in WNS-affected areas and determine if natural, genetic resistance occurs within these remnant populations; and,

- investigating the population structure of bats in Ontario to better understand the movement of WNS between populations and across the landscape.

3. Conduct research to increase knowledge of Little Brown Myotis, Northern Myotis and Tri-colored Bat, including studies of:
   - the species' habitat (e.g., overwintering habitat characteristics, summer roosting/foraging habitat characteristics, migratory routes and important stopover locations and range, spatial distribution of habitat types); **(High)** and,
   - the species' biology and ecology (e.g., population structure, reproductive output, survival, site fidelity, use of habitat during different life stages, trends in prey and diet composition).
4. Determine the importance of anthropogenic habitats to the survival and recovery of Little Brown Myotis, Northern Myotis and Tri-colored Bat. This may include monitoring abandoned mines in the province to determine which are currently being used as hibernacula by these species.
5. Determine the effectiveness of bat house designs and their value for bat conservation and recovery.

| **Focus Area:** | **Threat Mitigation and Habitat Management** |
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| Objective: | Reduce threats and maintain or improve habitat for Little Brown Myotis, Northern Myotis and Tri-colored Bat. |

Given the sudden and dramatic declines of Little Brown Myotis, Northern Myotis and Tri-colored Bat in Ontario as a result of WNS, paired with the naturally low reproductive rates, the significance of other potential threats will be heightened. Working together to reduce the spread of WNS, mitigating known threats, and protecting habitat through conservation programs will foster a proactive and collaborative approach to species recovery. Threat mitigation and habitat management techniques should be conducted in a manner that does not increase risk the species. Mitigating and responding to the threat of WNS will require collective effort across jurisdictions.

**Actions:**

6. **(High)** Working collectively with industry (e.g., mining, aggregates, forestry, problem/nuisance wildlife removal, agriculture, wind power)

develop, implement, evaluate and promote best management practices to minimize the impacts of industry activities and operations on Little Brown Myotis, Northern Myotis and Tri-colored Bat and their habitat.

7. Undertake collaborative outreach with the mining industry and groups using caves to increase awareness and reduce impacts of activities on Little Brown Myotis, Northern Myotis and Tri-colored Bat, and prevent the spread of WNS.
8. In collaboration with landowners, land managers, Indigenous communities and organizations, develop and implement coordinated habitat management plans to increase habitat suitability and connectivity and to create, enhance and restore habitat at priority sites.
9. As opportunities arise, work with local land owners and community partners to support the securement of Little Brown Myotis, Northern Myotis and Tri-colored Bat habitat through existing land securement and stewardship programs.
10. Work collaboratively with the Canadian Wildlife Health Cooperative in maintaining and updating WNS decontamination protocols, coordinating national-level data management, and identifying related data gaps and data management needs.

| **Focus Area:** | **Inventory and Monitoring** |
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| Objective: | Increase knowledge of population trends, distribution and the effects of White-nose Syndrome and other threats on Little Brown Myotis, Northern Myotis and Tri-colored Bat. |

Confirming the current distribution of Little Brown Myotis, Northern Myotis and Tri-colored Bat will support a greater understanding of the species' range, population sizes and status in Ontario. Implementation of a standardized monitoring program will aid in understanding population trends and abundance, as well as habitat conditions and site-specific threats. This information will be key to assessing the effectiveness of recovery efforts and determining what further management actions may be required. Additionally, human disturbance or inadvertent alteration of habitat may occur during surveying and monitoring unless standardized methods are developed and employed. Collaborative efforts that address both research and monitoring priorities are encouraged where possible. Working collaboratively with conservation organizations, researchers, and

other involved groups will support coordinated implementation of survey and monitoring efforts, improve efficiency and prevent duplication of efforts.

**Actions:**

11. **(High)** Coordinate and implement standard inventory and monitoring of Little Brown Myotis, Northern Myotis and Tri-colored Bat and their habitat in historic, current, and potentially-inhabited locations, in collaboration with organizations currently involved in surveillance and monitoring, where possible, including:
    - implementing standardized survey and monitoring protocols and tools (such as the North American Bat Monitoring Protocol) that specifically target Little Brown Myotis, Northern Myotis and Tri-colored Bat;
    - identifying potential suitable summer and winter habitat;
    - conducting inventories of potential Little Brown Myotis, Northern Myotis and Tri-colored Bat hibernacula and roost sites, including those within anthropogenic sites (e.g. abandoned mines);
    - monitoring population-level effects of mortality at wind turbines;
    - developing and coordinating a centralized database for bat banding data; and,
    - monitoring species' population trends, distribution, threats, prey availability, habitat preferences and prevalence of use.
12. Collaborate with other organizations to maintain and implement an effective and coordinated WNS surveillance program.

| **Focus Area:** | **Awareness and Habitat Protection** |
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| Objective: | Increase public awareness of the species, their habitat and threats in order to promote local stewardship and facilitate the reduction of threats to Little Brown Myotis, Northern Myotis and Tri-colored Bat. |

Bats play a critical role in the health of ecosystems and their continued presence throughout Ontario is of great benefit to all Ontarians. Raising awareness amongst the public, local landowners and organizations of Little Brown Myotis, Northern Myotis and Tri-colored Bat, as well as how to reduce threats, will help promote and encourage protection of these species and their habitat in Ontario.

**Actions:**

13. Increase awareness amongst land managers, land owners, Indigenous communities and organizations, the recreational caving community, problem/nuisance wildlife control companies, wildlife rehabilitators and the general public of Little Brown Myotis, Northern Myotis and Tri-colored Bat, their biology, habitat and threats, including:
    - the importance of maternity colonies and methods to reduce threats during this life stage;
    - methods to reduce the spread of WNS (e.g., promotion of cave decontamination protocols, development and installation of signage, and as appropriate, access management);
    - methods to reduce disturbance (e.g., gate design) and unintentional harm to bats while alleviating landowner safety concerns;
    - the importance of bats to people, ecosystems, biodiversity and economies;
    - protections afforded to the species and their habitat under the ESA, including appropriate management of human-bat encounters; and,
    - how to participate in citizen science bat initiatives and report occurrence information and the importance of public participation in these programs to the recovery of the species.

## Implementing Actions

Financial support for the implementation of actions may be available through the Species at Risk Stewardship Program. Conservation partners are encouraged to discuss project proposals related to the actions in this response statement with Ministry of the Environment, Conservation and Parks staff. The Ontario government can also advise if any authorizations under the ESA or other legislation may be required to undertake the project.

Implementation of the actions may be subject to changing priorities across the multitude of species at risk, available resources and the capacity of partners to undertake recovery activities. Where appropriate, the implementation of actions for multiple species will be co-ordinated across government response statements.

## Reviewing Progress

The ESA requires the Ontario government to conduct a review of progress towards protecting and recovering a species no later than the time specified in the species' government response statement, which has been identified as five years in this government response statement. The review will help identify if adjustments are needed to achieve the protection and recovery of Little Brown Myotis, Northern Myotis and Tri-colored Bat.

## Acknowledgement

We would like to thank all those who participated in the development of Ontario's Recovery Strategy and Government Response Statement for the Little Brown Myotis (*Myotis lucifugus*), the Northern Myotis (*Myotis septentrionalis*), and the Tri-colored Bat (*Perimyotis subflavus*) for their dedication to protecting and recovering species at risk.

## For Additional Information:

Visit the species at risk website at ontario.ca/speciesatrisk
Contact the Ministry of the Environment, Conservation and Parks
1-800-565-4923
TTY 1-855-515-2759
www.ontario.ca/environment