Ministry of the Environment, Conservation and Parks
2018

Blue Ash

Ontario Government Response Statement


Photo: John Ambrose

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.

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 considered (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 Blue Ash (*Fraxinus quadrangulata*) in Ontario was completed on December 13, 2017.

Blue Ash is a medium-sized tree reaching heights of 15 to 20 m with scaly, light grey bark. It has compound leaves with 5 to 11 leaflets and four-sided angled twigs.

Ontario

Protecting and Recovering Blue Ash

Blue Ash is listed as a threatened species under the ESA, which protects both the plant and its habitat. 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.

Globally, Blue Ash is found across multiple states in the central United States from Ohio to Wisconsin, extending south to northern Georgia and Arkansas. The species' ranking across the United States ranges from critically imperiled to secure. In Canada, populations are only known to exist in southwestern Ontario in Elgin, Essex, Chatham-Kent, Lambton, and Middlesex counties.

In Ontario, Blue Ash is known to occur at Point Pelee, Peche Island, islands in Lake Erie (including Pelee Island), and valleys along the Thames River, Sydenham River, and Catfish Creek. Blue Ash is also grown commercially and has been previously planted in some urban settings for ornamental purposes. Approximately 56 naturally-occurring sites are known in Ontario and occur on conservation lands, in provincial and national parks, on municipal and private lands, and on First Nations' lands. It is possible that more sites may continue to be found. Many of the existing sites have not been recently confirmed. Following surveys in 2012 and 2013 at sites along the Thames River, Sydenham River, Point Pelee National Park, Pelee Island and Middle Island, the number of mature individuals in Ontario was estimated to be no more than 2500. Low numbers of mature trees were found at six of the surveyed sites (ranging from 2-4 mature trees). It is unknown whether these population estimates are accurate given potential changes in the degree of threats and resulting effects.

Blue Ash is found in three main habitat types in Ontario: in moist deciduous floodplain forests, on stabilized dunes, and on limestone bedrock. It is somewhat shade tolerant and will grow in open and partially shaded conditions. Blue Ash also requires disturbance to ensure suitable conditions (e.g., light availability) are created for seedlings to establish. Most sites where Blue Ash is found are small in size and highly fragmented, largely from habitat loss during European settlement and subsequent development. Seeds are largely dispersed by wind and may be dispersed large distances by water or animals; however, dispersal distances are not completely understood as well as the minimum patch sizes and distance between patches required to support a viable population. Knowledge gaps also exist on the effects of fragmentation on genetics, dispersal, and population viability.

Blue Ash first bear fruits as it becomes reproductively mature at about 25 years of age; this may be a limiting factor. The seeds are housed within the fruit (i.e., keys or samaras) and are vulnerable to predation and fungi as the fruits lack a protective thick coat. There are also long intervals of five or more years between highly-productive seed years, and in order to establish, seeds require sufficient light gaps. Seeds have been known to remain viable for as long as eight years, although conflicting evidence exists on the long-term persistence of the seed bank. As such, Blue Ash may have limited opportunities to establish.

The major threat to Blue Ash is habitat loss causing fragmentation and habitat degradation. Much of Blue Ash is now found in areas that are generally unsuitable for development (e.g., floodplains); however, several emerging threats to Blue Ash have been identified with unknown severity, including Emerald Ash Borer (EAB) (*Agrilus planipennis*).

Emerald Ash Borer (EAB)

Emerald Ash Borer is an invasive, wood-boring insect that was first discovered in Ontario in 2002 and poses an environmental and economic threat to ash trees in Canada, including Blue Ash. It feeds on all ash species in Ontario, including Blue Ash, and infestations exist across much of southern Ontario. Blue Ash has shown some evidence of greater resistance to EAB or lower preference by EAB than other native ash species; however, further research and monitoring is required to determine the level of impact as infestations have also caused stress and damage. To reduce or delay the impacts of EAB on native ash trees, pesticides have been injected in the bark of some high-value ash trees. While these methods have shown positive results, they are costly and are likely not feasible for large-scale application.

The insect is regulated by the Canadian Food Inspection Agency (CFIA) by restricting the movement of firewood in regulated areas. As part of a long-term strategy to reduce the effects of EAB on native ash trees, the CFIA approved the release of four species of parasitoid wasps as biological control agents to reduce the EAB population and destruction of Canada's ash trees. Four species of wasps have been approved for release because of their differing ability to parasitize EAB eggs in sapling and mature ash trees, and to ensure their presence even if weather events may favour one species over another. The release is closely monitored through ongoing scientific studies in collaboration with Canadian Forest Service and MNRF.

Due to the economic and environmental threat of EAB to ash trees in Canada, the National Tree Seed Centre has taken the lead in Canada in collecting native ash seeds for genetic conservation, including Blue Ash. The National Tree Seed Centre is a national facility that collects, processes, tests, and stores the seeds of Canadian tree and shrub species for conservation and research purposes.

Current threats also include habitat loss due to development, deer browsing, and physical damage to Blue Ash from Double-crested Cormorants (*Phalacrocorax auritus*), particularly on Middle Island in Lake Erie. Nesting Double-crested Cormorants can cause physical damage to trees by breaking branches and stripping leaves for nesting material, as well as nitrification of surrounding soils due to accumulated guano, and reduction or elimination of seedlings. The severity of these threats is unknown and likely varies between sites depending on the species present and their population levels.

Damage or removal of Blue Ash may also occur as a result of misidentification during regular utility maintenance activities and management of EAB impacts during removal of other native ash trees. Additional invasive species, a lack of a natural disturbance regime to provide canopy openings, recreational vehicles (e.g., ATVs) and trampling have also been identified as possible threats to Blue Ash and its habitat.

As a result of identified and potential threats combined with reproductive limitations in a fragmented landscape, Blue Ash may be at risk of further decline. Given the knowledge gaps related to Blue Ash in Ontario that exist, recovery approaches will focus on increasing knowledge of the species' biology, monitoring populations, improving habitat quality, researching, mitigating and monitoring the severity of threats, and increasing awareness of the species amongst land users and managers. Conservation partners are encouraged to collaborate with appropriate agencies to research and implement recovery efforts and techniques for Blue Ash. The University of Guelph Arboretum and the National Tree Seed Centre in New Brunswick are currently providing leadership in the genetic conservation of Blue Ash seeds. The Canadian Forest Service and CFIA continue to lead federal EAB research and management initiatives; Ontario will continue to work collaboratively with other jurisdictions to respond to the threat of Emerald Ash Borer to native ash trees, including Blue Ash.

In addition to these province-wide recovery initiatives, local or regional recovery efforts should be implemented to address threats to the species. Conducting research associated with threat mitigation techniques, as well as investigating biological characteristics and responses of the species before and after recovery efforts will assist in filling knowledge gaps. Continuing to inventory and monitor populations, as well as the severity and scope of threats and their impacts, will also support effective implementation of recovery actions. Additionally, the government will focus its recovery efforts on naturally occurring populations or those populations previously established for restoration or recovery purposes within the species' natural range, rather than populations planted in recent years for ornamental purposes.

Successful techniques to propagate and out-plant Blue Ash currently exist, suggesting that augmentation is technically feasible. In determining whether augmentation is necessary and feasible, social and economic factors, the likelihood of success, long-term contribution to species recovery, and the resources required may be considered, at the appropriate scale, in addition to biological and technical feasibility. Knowledge gaps currently exist related to the severity of some threats and the current status of populations in Ontario. Further research is needed to determine whether augmentation is necessary and feasible to support the recovery of Blue Ash.

Government's Recovery Goal

The government's goal for the recovery of Blue Ash is to maintain the distribution of the species and support increases in population abundance. The government supports investigating the necessity and feasibility of augmenting existing populations.

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 Blue Ash, the government will directly undertake the following actions:

- Continue to manage habitat in protected areas (e.g., Fish Point Provincial Nature Reserve) to maintain or improve suitability for the species using appropriate methods (e.g., construction of fenced exclosures to prevent herbivory) and continue to monitor ash trees in response of Emerald Ash Borer (e.g., in Komoka Provincial Park in London).
- Continue to implement the *Ontario Invasive Species Strategic Plan* (2012) to address the invasive species (e.g., Emerald Ash Borer) that threaten Blue Ash.
- Collaborate with federal partners, such as Environment and Climate Change Canada, Parks Canada and the Canadian Forest Service in implementing protection and recovery actions for Blue Ash, including those related to the genetic conservation of native ash trees, and investigating the impact of Emerald Ash Borer on native ash trees, including Blue Ash.
- Explore taking appropriate management actions in accordance with provincial policy direction on cormorants to support protection and recovery for Blue Ash.
- For populations that occur on Pelee Island, explore opportunities to work collaboratively with the Township of Pelee, including the Pelee Island Environmental Advisory Committee, the federal government and local partners to integrate approaches to stewardship, implement recovery actions and explore integrated approaches to managing species at risk.
- Educate other agencies and authorities involved in planning and environmental assessment processes on the protection requirements under the ESA.
- Encourage the submission of Blue Ash data to Ontario's central repository through the citizen science projects that they receive data from (e.g., iNaturalist) and directly through the Natural Heritage Information Centre.
- Undertake communications and outreach to increase public awareness of species at risk in Ontario.
- Continue to protect Blue Ash and its habitat through the ESA.
- Support conservation, agency, municipal and industry partners, and Indigenous communities and organizations to undertake activities to protect and recover Blue Ash. Support will be provided where appropriate through funding, agreements, permits (including conditions) and/or advisory services.
- Encourage collaboration, and establish and communicate annual priority actions for government support in order to reduce duplication of efforts.

Government-supported Actions

The government endorses the following actions as being necessary for the protection and recovery of Blue Ash. 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 and Monitoring**
Objective: Increase knowledge of Blue Ash distribution, abundance, habitat, condition, and the significance of threats in Ontario.

Knowledge of where Blue Ash is present, the status of existing populations and their long-term viability are important for the protection of the species and its habitat. Developing population viability models and implementing a long-term monitoring program will support species' recovery by tracking the effects of threats on the species and monitoring the status and health of populations in the province. The extent of impact of EAB on Blue Ash is largely unknown at this time until sites infested with EAB are revisited. Filling key knowledge gaps related to the species and understanding threats, such as the level of impact caused by EAB and potential mitigation techniques, will help guide management actions.

Actions:

1. **(High)** Conduct research into the detectability and habitat conditions of Blue Ash and use to inform presence/absence surveys at historical population locations and locations where Blue Ash is predicted to occur.
2. **(High)** Develop population viability models for Blue Ash in Ontario and implement a standardized long-term monitoring program in collaboration with landowners, land managers (including conservation authorities), researchers, municipalities, and interested Indigenous communities and organizations. Use this information to assess and monitor the status of populations and increase understanding of how population viability is affected by multiple threats and limitations. Monitoring should include:
   - population dynamics, including factors such as size, demographics, health (including presence of disease), seed production, dispersal, seedling establishment and recruitment;
   - the existence and severity of threats, including EAB; and,

- habitat conditions, including presence of other tree species that could outcompete Blue Ash.

3. **(High)** Investigate the effectiveness of potential measures to mitigate impacts of EAB on Blue Ash. This may include:
   - evaluating existing EAB control measures to determine best practices for the conservation of Blue Ash; and,
   - studying the resistance of Blue Ash to EAB infestation.
4. Conduct research on the biology and ecology of Blue Ash including studying seed dispersal mechanisms and distances, as well as the potential effects of climate change on the species.
5. Investigate the feasibility and necessity of augmenting Blue Ash, including:
   - determining whether augmentation would increase or decrease risk to the species (e.g., Emerald Ash Borer) and the associated resources to mitigate potential risks; and,
   - assessing the long-term contribution of local population management actions to the recovery of Blue Ash, including the identification of any priority sites.

Focus Area: **Management and Protection**
Objective: Maintain or improve the quality of habitat and reduce threats to the species at locations where it exists in Ontario.

Habitat loss, fragmentation and degradation are considered major causes of decline for Blue Ash. Current threats to the species vary by site but may also include invasive species (e.g., EAB and invasive plants), deer browsing, and physical damage caused by Double-crested Cormorants. The species' habitat may require management actions (through creation of canopy openings and control of invasive species) to ensure it remains suitable and seedlings are able to establish. Continued development of best management practices will provide guidance on how to minimize impacts to the species when undertaking protection and recovery management actions. The species occurs on municipal land, in protected areas, on private land, and has been known to occur on First Nations' land. As a result, a collaborative approach to habitat management and protection is needed to support recovery of the species.

Actions:

6. **(High)** Develop, implement and evaluate best management practices in collaboration with landowners, land managers, municipalities, the research community and interested Indigenous communities and organizations to improve habitat suitability, minimize threats to Blue Ash and its

habitat, and preserve genetic material. The effectiveness of actions should be monitored and adapted and may include:

- collaborating with relevant partners to conserve the genetic diversity (e.g., genetic archive) of Blue Ash to support research and recovery efforts;
- implementing management techniques to improve tree health, and to increase seed germination and seedling establishment (e.g., controlling native woody vegetation to open canopy), canopy release, prescribed burns, managing vegetation to improve habitat quality;
- installing exclusion fencing to deter browsing by deer;
- re-directing recreational activities (e.g., ATVs) through the use of signage and fencing;
- assessing whether mitigation measures influence multiple threats; and,
- implementing appropriate techniques to mitigate the impacts of EAB including using the most up to date research to inform adaptive implementation of management approaches.

7. As opportunities arise, support the securement of Blue Ash habitat that exists on privately owned lands through existing land securement and stewardship programs.
8. As appropriate, encourage the recording, sharing and transfer of Traditional Ecological Knowledge on Blue Ash, where it has been shared by communities, to increase knowledge of the species and support future recovery efforts.

Focus Area: **Awareness**
Objective: Increase local awareness of the species and ways to minimize threats to Blue Ash.

Community members, land managers, and landowners where the species occurs all have a vital role to play in reducing threats to the species. By increasing local awareness, individuals will become more knowledgeable about the types of activities that may inadvertently impact the species. The movement of firewood and pests such as EAB has the potential to threaten Blue Ash, and federal restrictions are in place to regulate the movement of firewood. Increasing public awareness will help reduce the movement of firewood and minimize the threat of EAB. Additionally, Blue Ash may be mistaken for other ash trees and increasing awareness will ensure protection of the species during regular vegetation and EAB management by land managers (e.g., utility companies and municipalities).

Actions:

9. Promote awareness about Blue Ash among local landowners, land managers and interested Indigenous communities and organizations and promote community involvement by sharing information on:
   - how to identify the species;
   - the species' habitat requirements;
   - protection afforded to the species and its habitat under the ESA; and,
   - actions that can be taken to reduce threats to the species, including EAB, and its habitat.

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 program 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 not later than five years from the publication of this response statement. The review will help identify if adjustments are needed to achieve the protection and recovery of Blue Ash.

Acknowledgement

We would like to thank all those who participated in the development of the Recovery Strategy for the Blue Ash (*Fraxinus quadrangulata*) in Ontario for their dedication to protecting and recovering species at risk.

For additional information:
Visit the species at risk website at ontario.ca/speciesatrisk
Contact your MNRF district office
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