Natural. Valued. Protected.

Colicroot

Ontario Government Response Statement

Colicroot is an herbaceous perennial in the Nartheciaceae (Bog Asphodel) Family, a family of flowering plants. It has yellowy-green, lance-shaped leaves arranged in a rosette at the base. In the early summer, it produces an upright flowering stalk 40 to 100 cm tall, with small, white, tubular flowers.

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 Ministry of Natural Resources and Forestry (the Ministry) 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 Ministry 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 is shared by communities, as appropriate, and may be adapted if new information becomes available. In implementing the actions in the response statement, the ESA allows the Ministry to determine what is feasible, taking into account social and economic factors.

The Recovery Strategy for the Colicroot (*Aletris farinosa*) in Ontario was completed on June 15, 2017.

Ontario

Protecting and Recovering Colicroot

Colicroot is listed as an endangered 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 Ministry be met.

Globally, Colicroot is found in eastern North America, and extends north to Ontario and south from Virginia to Texas. In Canada, Colicroot is restricted to southwestern Ontario and estimated to represent less than 5% of the global range. Seven known populations of Colicroot are extant in Ontario; these seven known populations are distributed across four locations: in the area of the Rt. Honourable Herb Gray Parkway (HGP) in Windsor, on Bkejwanong (Walpole Island First Nation), in the town of LaSalle, and in West Elgin. Several more populations or subpopulations have been extirpated, representing a net loss of over 5,000 plants since 1986.

In 2015, the estimated population size in Ontario was 16,270 plants. The majority (~84%) of these plants are within the vicinity of the HGP area in Windsor with remaining plants distributed in populations at the other three locations. Several subpopulations are located in provincially and municipally protected areas within the Ojibway Prairie Complex. Colicroot may also exist at Turkey Point; however, the status of this population is unknown. Within four of the seven extant populations, there are several subpopulations with low numbers of individual plants and habitat management actions may not be enough to ensure these persist.

The Ontario Colicroot population size described above includes plants at five prairie restoration sites that have been transplanted to fulfill conditions of a permit to construct the HGP under the ESA. Thousands of previously unknown Colicroot plants were discovered through pre-construction surveys undertaken in this area. The majority of these Colicroot plants were transplanted to restoration sites adjacent to the HGP. Plants were also propagated from seed and planted at restoration sites, which have been managed to improve conditions for Colicroot. Monitoring at these sites has indicated that the out-planted and transplanted plants have successfully established. As of 2015, there was a total increase of approximately 3,973 growing plants, most of which were either produced through post-restoration reproduction or emerged from the seed bank in response to habitat manipulation.

Colicroot requires open habitat and is intolerant of shading from other vegetation. Colicroot primarily inhabits tallgrass prairie or oak savanna communities, which are extremely limited in Ontario. Approximately 97% of this habitat in southern Ontario has been lost to urban or agricultural land conversion. Colicroot can also be found in naturalized or semi-naturalized habitats such as old fields, roadsides, railway embankments, wet meadows, utility corridors, and woodland edges, where natural or human disturbance maintain suitable, open habitat. Colicroot can be found with other species at risk plants such as Dense Blazing Star (*Liatris spicata*), Skinner's Agalinis (*Agalinis skinneriana*), Willowleaf Aster (*Symphyotrichum praealtum*), Eastern Prairie Fringed-orchid (*Platanthera leucophaea*), Pink Milkwort (*Polygala incarnata*), Slender Bush-clover (*Lespedeza virginica*), and Small White Lady's-slipper (*Cypripedium candidum*).

Colicroot is limited in its dispersal ability and populations are located in southwestern Ontario where habitat is severely fragmented by dispersal barriers such as buildings, lawns, streets, and asphalt.

The major threats to Colicroot include habitat degradation from development and agricultural expansion, fire suppression and subsequent natural succession of vegetation, and invasive species. Periodic disturbance is required to maintain suitable habitat conditions for Colicroot. Both woody vegetation and invasive species pose a threat to Colicroot by out-competing the species for resources. Invasive species present in Colicroot habitat include Phragmites (European Common Reed)(*Phragmites australis* ssp. *australis*), Scots Pine (*Pinus sylvestris*), Autumn Olive (*Elaeagnus umbellata*), Multiflora Rose (*Rosa multiflora*), Black Locust (*Robinia pseudoacacia*), Sweet Clover (*Melilotus alba*), and Common Buckthorn (*Rhamnus cathartica*). Other threats to the species may include all-terrain vehicle (ATV) use, mowing, herbicide use, herbivory, and refuse dumping.

The recovery approaches for Colicroot will focus on: habitat management in collaboration with local Indigenous communities and organizations, local landowners, and partners; monitoring populations; and filling knowledge gaps with regards to the species' biology. Given that four of the seven known Colicroot populations include patches with very low numbers of individual plants, and the dispersal ability of the species is limited both biologically and by barriers, additional research and recovery efforts may be needed to maintain the distribution of the species.

Government's Recovery Goal

The government's goal for the recovery of Colicroot is to maintain the Ontario distribution and, where feasible, support increases in abundance of existing populations. The government supports investigating the feasibility of augmenting existing sites deemed to be non-viable without additional recovery efforts.

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 Ministry 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 Colicroot, the government will directly undertake the following actions:

- Continue to manage habitat in protected areas to maintain or improve suitability for the species using appropriate methods (e.g., removing woody vegetation, prescribed burning).
- Continue to implement the Ontario Invasive Species Strategic Plan to address the invasive species (e.g., Common Buckthorn) that threaten Colicroot.
- Continue to implement Ontario's *Invasive Species Act* to address the invasive species identified in the Act (e.g., Phragmites) that threaten Colicroot by restricting the importation, deposition, release, breeding/growing, buying, selling, leasing or trading of Phragmites.
- Educate other agencies and authorities involved in planning and environmental assessment processes on the protection requirements under the ESA.
- Encourage the submission of Colicroot data to the Ministry's central repository at the Natural Heritage Information Centre.
- Undertake communications and outreach to increase public awareness of species at risk in Ontario.
- Continue to protect Colicroot 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 Colicroot. 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 Colicroot. Actions identified as "high" will be given priority consideration for funding under the ESA. 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. The government will focus its support on these high-priority actions over the next five years.

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

Habitat loss, degradation, changes to ecological dynamics, and invasive species are considered major threats to Colicroot. The species occurs on municipal land, in protected areas, on private land, and on Bkejwanong (Walpole Island First Nation). The habitat requires active management (through disturbance and removal of invasive species) to ensure it remains suitable and populations are able to persist. A collaborative management approach to implement best management practices will share responsibilities, share lessons learned, reduce threats and ensure suitable habitat is maintained.

Actions:

1. **(High)** Develop and implement best management practices in collaboration with landowners, land managers, municipalities, and interested Indigneous communities and organizations, including Bkejwanong (Walpole Island First Nation), to improve habitat suitability and minimize threats to Colicroot and its habitat. Efforts should be made where appropriate to coordinate efforts with other species at risk plants (e.g., Dense Blazing Star) and tallgrass prairie habitat initiatives. Actions may include:
   - managing vegetation to improve habitat quality (e.g., controlling invasive species posing a direct threat, controlling native woody vegetation, and prescribed burns, as appropriate);

- monitoring the species' and habitat response to habitat management to inform adaptive implementation of management approaches; and,
- re-directing recreational activities (e.g., ATVs) through the use of signage and fencing.

2. As opportunities arise, support the securement of Colicroot habitat that exists on privately owned lands through existing land securement and stewardship programs.

Focus Area: **Monitoring**
Objective: Increase knowledge of Colicroot distribution, abundance, habitat, and the significance of threats in Ontario.

The status of Colicroot at several subpopulations is unconfirmed or unknown. Confirming the presence/absence of the species at these locations and sharing both current and historical knowledge will help determine where recovery efforts are best focused. Implementing a long-term monitoring program will track if current population levels of the species in the province are being maintained. Monitoring efforts should be coordinated with multiple species, when they co-occur. In addition, monitoring the effectiveness of transplantation methods and transplantation success at restoration sites will help to inform the status of the current population and future recovery efforts for the species.

Actions:

3. **(High)** Develop and implement a standardized long-term monitoring program at existing locations (including restoration sites) and conduct surveys where the continued presence of the species is unknown (e.g., Turkey Point). As appropriate, the monitoring program should target multiple species at risk plants (e.g., Dense Blazing Star) and tallgrass prairie habitat. The monitoring program will build and adapt from previous efforts and aim to:
   - monitor population dynamics, health and productivity;
   - assess and monitor all known threats and potential threats to populations; and,
   - monitor the status of transplanted Colicroot plants at restored sites.
4. As appropriate, encourage the recording, sharing and transfer of Traditional Ecological Knowledge, where it has been shared by communities, to increase knowledge of the species historically and currently, and support future recovery efforts. Coordinate these efforts with co-occurring species at risk (e.g., Dense Blazing Star) and tallgrass prairie habitat initiatives.

Focus Area: **Research**
Objective: Increase knowledge of Colicroot biology, population dynamics, habitat requirements and further refine current recovery techniques.

Filling key knowledge gaps related to the species such as the seed bank response to habitat management, ecological relationships with other species (e.g., whether mycorrhizal fungi has a role on transplantation success), population dynamics of the species, and effects of genetic inbreeding, will help guide management actions. Addressing these knowledge gaps will provide information to determine the species' ability to maintain self-sustaining populations.

The recovery of Colicroot will also benefit from refining current recovery implementation techniques, as appropriate and necessary. As part of the HGP project efforts, germination-propagation and transplantation trials were undertaken to increase knowledge of Colicroot restoration methods. Successful seed propagation methods were developed during experimental trials. Sod mat transplantation techniques have been successfully developed and used repeatedly. Further investigation is warranted to demonstrate that the results of these propagation methods can be replicated; continued monitoring and adaptive management is taking place at the restoration sites. Further research, and investigations into the feasibility of augmenting appropriate populations, will inform future recovery efforts for Colicroot in Ontario.

Actions:

5. **(High)** Research the species' life history characteristics and habitat requirements to inform recovery efforts, including:
   - studying the effects of genetic inbreeding, seed ecology, pollinator relationships, and flowering biology;
   - conducting population viability analyses;
   - studying the relationship with mycorrhizal fungi; and,
   - studying the species' sensitivity to edge effects and drought tolerance.
6. Research seed bank response to habitat management to determine whether populations still exist at locations that have been extirpated due to succession.
7. Investigate the feasibility of augmenting Colicroot by identifying potential sites for augmentation (i.e., existing sites where the population is deemed to be non-viable) and determining if feasible and appropriate.

8. Evaluate the effectiveness of current augmentation techniques, including conducting research to establish a standardized method to propagate Colicroot plants from seed.

Focus Area: **Awareness**
Objective: Increase local awareness of the species, its habitat requirements, and ways to minimize threats to Colicroot.

Community members, land managers, and land owners where the species occurs all have a vital role to play to 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 and how modifying these activities can help to protect it.

Actions:

9. Promote local awareness about Colicroot and co-occurring species at risk among land owners, land managers and interested Indigenous communities and organizations, including Bkejwanong (Walpole Island First Nation) and promote community involvement by sharing information on:
   - how to identify the species;
   - the species' habitat requirements;
   - protection afforded to the species and their habitat under the ESA; and,
   - actions that can be taken to reduce threats to the species 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 the Ministry. The Ministry 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 Ministry 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 Colicroot.

Acknowledgement

We would like to thank all those who participated in the development of the Recovery Strategy for the Colicroot (*Aletris farinosa*) 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
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