

White Wood Aster

Ontario Government Response Statement



Photo: Rob Tervo

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 White Wood Aster (*Eurybia divaricata*) in Ontario was completed on December 5, 2019.

White Wood Aster is a tall, herbaceous perennial that grows in open, deciduous forests. It has deeply serrated leaves that are heart-shaped at the base of the plant. Small, flat topped clusters of flowers with yellow or purple centers bloom in the late summer to fall.

Protecting and Recovering White Wood Aster

White Wood Aster 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.

White Wood Aster is found only in eastern North America, with a range stretching from Maine and New Hampshire south to South Carolina and Alabama, west through Ohio, and into eastern Tennessee and Kentucky. It is relatively common in the Appalachian Mountains and surrounding area.

In Canada, White Wood Aster is found only in Ontario and Quebec with populations restricted to the southern portions of each province. It is believed there are over 49 extant local populations of White Wood Aster in Ontario, all of which are located on the Niagara Peninsula between Hamilton and Fort Erie. Of these populations, one has not been monitored in almost 20 years, and four other locations were surveyed in 2018 with no White Wood Aster detected at the sites. Additionally, the status of 19 of the extant local populations has not been reconfirmed in more than 10 years, and when last evaluated these populations were small in size (i.e., less than 30 plants) or population size was unknown. Therefore, reassessment of these populations may demonstrate considerable changes to the overall species population. There are also six locations where White Wood Aster is considered to be extirpated and one where it is historic, having not been found at that location in more than 45 years. There is one additional local population for which the status is considered 'unknown', but White Wood Aster has not been identified at this location since 1879, and it is therefore considered likely this population is extirpated. Additional populations are reported to occur in the southern part of the Niagara Region, but have not been officially added to the provincial record as confirmed local populations.

White Wood Aster is a perennial herbaceous plant found in open forests with a mix of deciduous tree species in the overstory. It prefers sites where moderate disturbance maintains an open canopy with suitable light conditions and is often found at sites along the edges of recreational trails. Excessive disturbance may render sites unsuitable since the species appears to prefer locations with a thick accumulation of leaf litter and is slow to recolonize regenerating forest areas.

White Wood Aster is able to reproduce both sexually through the creation of fertile seeds and asexually through the production of new shoots that grow from the roots of an existing plant and create a clone. This may result in local populations comprised of many stems containing the same genetic makeup if it was colonized by only one individual. Such populations have low genetic diversity and may be less adaptable to changing conditions or facing threats.

Plants flower in late summer to fall and are pollinated by insects, such as hoverflies (*Syrphus spp.*) and the Common Eastern Bumblebee (*Bombus impatiens*) among others. Seeds are dispersed by the wind but appear to have very low migration rates resulting in limited distribution, even to nearby suitable habitat.

Light conditions on the forest floor have a strong influence on the growth and reproduction of White Wood Aster for both sexually and asexually reproducing populations. In appropriate light conditions, if at least two genetically distinct plants are present, flowering and seed production increase. Mature individuals may also produce more clones in these conditions, increasing overall stem density. In closed canopy or low-light conditions, seed production decreases and clonal (asexual) growth becomes the primary source of reproduction.

The most significant threat to White Wood Aster in Ontario is land development that results in the removal of woodlands that the species relies on for habitat. Historically, much of the forest in the species' provincial range was removed for agriculture, and the remaining woodland habitat is highly fragmented, reducing opportunities for populations to cross-pollinate or disperse seeds to suitable growing conditions. Fragmentation may also increase the frequency and impact of low genetic diversity in populations as it is less likely natural dispersal will supply additional plants and new genetic material to these populations.

Although the species can tolerate and may even benefit from some level of disturbance, high intensity forest harvest, off-path use of all-terrain vehicles (ATVs), and excessive deer browse all have the potential to damage individual plants and alter growing conditions in a way that adversely affects White Wood Aster. In particular, forestry operations that compact soils, create clear-cuts or even-aged stands may negatively impact habitat, and use of herbicides or insecticides within the forest stand may damage White Wood Aster plants or their pollinators. Alternatively, suppression of natural disturbance processes and a lack of land management practices that simulate them may result in full canopy closure and excessive shading that can inhibit sexual reproduction and overall stem growth.

Invasive species are another significant threat to White Wood Aster through both competition and predation. Invasive plants, such as Garlic Mustard (*Alliaria petiolata*) and European Reed (*Phragmites australis ssp. australis*; commonly referred to as Phragmites) have been identified growing in or near areas with established White Wood Aster populations and have a demonstrated ability to outcompete and displace native plants. The Hairy Spider Weevil (*Barypeithes pellucidus*), an invasive insect that is widespread in southern Ontario, has been observed feeding heavily on White Wood Aster with a documented preference for the plant when other food sources

were available. Non-native earthworms may also have a negative impact on White Wood Aster by altering the leaf-litter depth needed for germination and over-wintering. Earthworms have been documented removing the leaf litter down to the bare soil and are an identified threat to the forest ecosystems on which White Wood Aster depends.

Further research is required to assess the current status of each local population and population dynamics over the long-term, to gain a better understanding of long-term population trends and distribution. Recent monitoring efforts have both identified new populations and indicated that plants may no longer exist as sites currently considered to be extant, suggesting that confirmation of the persistence of these local populations is needed. As a result, early recovery efforts for White Wood Aster will focus on filling knowledge gaps through monitoring known local populations and nearby suitable habitat. Research actions include identifying suitable propagation methods for potential use in local populations with low genetic diversity or small overall plant numbers and the evaluation of habitat management methods to improve the ability of existing plants to survive and reproduce.

Habitat maintenance and improvement is a key component of ensuring the survival of White Wood Aster in Ontario. Identifying and promoting methods of forest and land management that preserve habitat conditions, such as optimal canopy openness, and managing threats, including invasive species, are important recovery approaches. The government supports recovery actions for White Wood Aster that increase knowledge of the species, manage the habitat, limitations, and threats to the species, and promote the education and participation of landowners and members of the public that may use, own, or manage lands containing the species. As information is gathered about local populations, including their size and genetic diversity, the need for and feasibility of augmenting these populations should be evaluated.

Government's Recovery Goal

The government's goal for the recovery of White Wood Aster is to maintain the species' distribution in Ontario while promoting the viability of extant populations. The government supports investigating the necessity and feasibility of augmenting local populations to support population viability.

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 White Wood Aster, the government will directly undertake the following actions:

- Continue to protect White Wood Aster and its habitat through the ESA.
- Undertake communications and outreach to increase public awareness of species at risk in Ontario (e.g., through Ontario Parks Discovery Program, where appropriate).
- Educate other agencies and authorities involved in planning and environmental assessment processes on the protection requirements under the ESA.
- Consistent with the *Short Hills Provincial Park Management Plan (2002)*, continue to monitor populations and mitigate threats.
- Encourage the submission of White Wood Aster 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 White Wood Aster. Support will be provided where appropriate through funding, agreements, permits (including conditions) and/or advisory services.
- Continue to implement Ontario's *Invasive Species Act* to control the spread of invasive species (e.g., European Reed, also known as Phragmites) that threaten White Wood Aster by restricting the importation, deposition, release, breeding/growing, buying, selling, leasing or trading of the species.
- Continue to implement the *Ontario Invasive Species Strategic Plan (2012)* to address the invasive species (e.g. Garlic Mustard) that threaten White Wood Aster.
- Conduct a review of progress toward the protection and recovery of White Wood Aster 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 White Wood Aster. 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 the distribution, abundance, population composition, and ecology of White Wood Aster in Ontario.

Recent surveys of existing White Wood Aster populations and areas of suitable habitat have provided valuable information about the current distribution and status of the species, such as data on five previously unreported local populations, and the evidence that plants may be no longer present at four sites. There is a large number of additional local populations that have not been assessed in more than 15 years, for which little demographic information is available. Continued and expanded collection of monitoring information is warranted to document any demographic changes that may impact the populations’ ability to persist and to allow for prioritization of populations for recovery efforts. Populations with low rates of sexual reproduction may be less able to adapt to changing site conditions, and less genetically diverse. Minimal information has been collected as to the reproductive status of each population, including the ability to produce seed and percentage of each population comprised of clones. In addition, regular inventory of growing conditions at each site may provide valuable information regarding environmental factors influencing plant survival, seed production, and germination.

Actions:

1. **(High)** Develop and implement a survey and monitoring program for White Wood Aster. The program should be designed and implemented in such a manner that it may contribute to research actions and may involve the following:
 - developing a monitoring protocol to gather information on White Wood Aster population ecology. This may include methods for evaluating:
 - abundance of plants;
 - means and rates of reproduction;
 - habitat conditions at occupied sites; and
 - the presence and impact of threats.
 - refining distribution information for White Wood Aster in Ontario by conducting presence surveys at location of extant and historical populations, or where modelling suggests the species is likely to be found;

- evaluating detectability of White Wood Aster, considering factors such as seed bank dynamics, flowering rates, and conducting presence/absence surveys.
2. **(High)** Investigate the viability of White Wood Aster populations in Ontario and estimate the minimum viable population size and extirpation thresholds. Factors to consider include:
 - population size and composition including number of genetic individuals, genetic diversity, and diversity of plant ages/sizes;
 - changes or developments in a particular direction over time of populations at extant sites;
 - rates of vegetative and sexual reproduction;
 - pollination biology, and seed and seedling ecology;
 - the influence of site conditions; and
 - interactions between local populations and effects on their viability.
 3. Utilize information collected through monitoring and research activities to confirm the optimal habitat conditions for White Wood Aster reproduction and survival.
 4. Conduct research to determine optimal habitat management methods for White Wood Aster populations including evaluating the effect of different silvicultural practices (including site preparation, tending practices, etc.) on habitat quality.
 5. Conduct research to determine optimal methods of supporting White Wood Aster populations including:
 - identifying conditions under which augmentation may be necessary (e.g. low genetic diversity);
 - evaluating the approaches that would be most efficient to implement augmentation (e.g., appropriate seed sourcing, propagation methods); and,
 - evaluating practices that increase pollination rates, seed production, dispersal, germination, and seedling establishment in populations with sufficient genetic material.
 6. Investigate potential threats to the species and methods for mitigating impacts including:
 - evaluating impacts to the species from competition with non-native vegetation and insects;
 - evaluating levels of deer browse on the species and the effectiveness of available protection methods; and,
 - identifying suitable best management practices (e.g., invasive plant removal) for the habitat in which it is found.

Focus Area: Management and Habitat Protection

Objective: Maintain or improve the quality of habitat available for White Wood Aster, and where feasible and appropriate, enhance the ability of existing plants to reproduce.

White Wood Aster populations and habitat occur primarily on a mix of public and private lands, including those belonging to municipalities and conservation organizations. Many of the habitat areas in which it is found consist of fragmented woodlots separated by roads, agricultural areas, and development. As a result, a collaborative approach to population and habitat management and protection is needed to support the recovery of the species. Encouraging the use of best management practices across multiple sectors and land users will also support better long-term recovery.

Actions:

7. **(High)** Work collaboratively with landowners, land managers, and researchers to develop, implement and evaluate management plans and best management practices to maintain or improve the quality of White Wood Aster habitat at existing sites. Plans may include:
 - encouraging the use of silvicultural practices that allow for sustainable harvest while maintaining or improving habitat conditions;
 - strategies to remove and/or monitor the presence and impacts of invasive plants (e.g., Garlic Mustard) or harmful insect pests in areas with or adjacent to populations; and,
 - where deemed necessary and where there are willing partners, undertake on-the-ground efforts to restore, maintain or enhance White Wood Aster habitat within Ontario in collaboration with organizations, agencies and interested Indigenous communities and organizations.
8. Based on the results of actions 2 and 5, if determined necessary and feasible, implement, monitor and adapt augmentation actions for local populations in collaboration with landowners and local agencies to promote species viability. Efforts should focus on:
 - supplementing populations at risk of extirpation due to small size **(High)**; and
 - increasing genetic diversity where required to improve viability of the local population.
9. As opportunities arise, work with local landowners and community partners to support the securement of habitat of White Wood Aster through existing land securement and stewardship programs.

10. Implement approaches to avoid or reduce impacts of recreational activities on White Wood Aster and its habitat including:
 - redirecting recreational activities away from the species;
 - erecting physical barriers, if appropriate; and,
 - installing signage to alert land users to the presence of the species.

Focus Area: Outreach and Awareness

Objective: Increase public awareness of and participation in efforts to minimize threats to White Wood Aster.

White Wood Aster is found on a variety of land-use types with the potential to be impacted by private, commercial, and recreational activities. Therefore, the education and involvement of the public is a key factor in supporting recovery of the species, particularly to help manage the threats of inappropriate recreational vehicle use, and damage occurring incidentally to the species from activities such as brush clearing. Ensuring landowners are aware of the presence of the species and potential threats will require collaboration between agencies with an emphasis on sharing the best available information.

Actions:

11. Promote awareness about White Wood Aster among land owners, land managers and land users 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 and its habitat (e.g., distributing best management practices for recreational activities and trail management to land users).

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, or not later than five years after the government response statement is published. The review will help identify if adjustments are needed to achieve the protection and recovery of White Wood Aster.

Acknowledgement

We would like to thank all those who participated in the development of Ontario's Recovery Strategy and Government Response Statement for the White Wood Aster (*Eurybia divaricata*) 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
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