

DRAFT Government Response Statement
to the
Recovery Strategy for the Round-leaved Greenbrier in Ontario

1 **Round-leaved Greenbrier**

2 **Ontario Government Response Statement**

3 **Protecting and Recovering Species at Risk in Ontario**

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

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

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

23 The [Recovery Strategy for the Round-leaved Greenbrier \(*Smilax rotundifolia*\) in Ontario](#)
24 was completed on December 7, 2018.

25 Round-leaved Greenbrier is a perennial vine that may grow as a long tangle of
26 branched stems on the ground, or may climb over shrubs and trees up to a height of
27 five m or more. The vines produce clusters of small, greenish flowers in the spring that
28 turn into round, blue-black berries.

29 **Protecting and Recovering Round-leaved Greenbrier**

30 Round-leaved Greenbrier is listed as a threatened species under the ESA, which
31 protects both the plant and its habitat. The ESA prohibits harm or harassment of the

DRAFT Government Response Statement
to the
Recovery Strategy for the Round-leaved Greenbrier in Ontario

32 species and damage or destruction of its habitat without authorization. Such
33 authorization would require that conditions established by the Ontario government be
34 met.

35 Globally, Round-leaved Greenbrier is found across central and eastern North America.
36 The species' range extends from southwestern Ontario west to Kansas, south to the
37 Gulf of Mexico, east to the Atlantic Ocean, and north to southern Nova Scotia. The
38 species is generally common throughout its range in the United States, although it is
39 considered vulnerable in Illinois.

40 In Canada, Round-leaved Greenbrier occurs in both southwestern Ontario and
41 southwestern Nova Scotia. In Ontario it is restricted to three regions: Essex County,
42 Norfolk County, and the Niagara Region. There are 14 extant populations that occur in
43 Ontario within the Carolinian zone in southern Ontario, 13 of which have been
44 reconfirmed as present since 2017, and the remaining population was last documented
45 in 2013. There are an additional three populations classified as historical but presumed
46 to be extant as suitable habitat still exists at the locations, and surveys have not been
47 completed recently to confirm presence or absence. A population at Point Pelee
48 identified from one sample collected in the 1800s is believed to be extirpated.

49 Round-leaved Greenbrier is a perennial vine that generally grows in forest understories
50 and openings where soil is moist and seasonally flooded. It has been documented in a
51 small assortment of swamp and fresh to moist forest ecosystem types, and is always
52 associated with a canopy dominated by deciduous tree species. The species is able to
53 tolerate high levels of shade, but appears to grow best in forests with areas of edge or
54 openings in the canopy created by minor disturbance (moderate timber harvest, small
55 fires, etc.). Although the species has been observed in dry and upland habitats in the
56 U.S., it appears to be restricted by soil moisture content at the northern extent of its
57 range.

58 Round-leaved Greenbrier is capable of reproducing both sexually, through the
59 production of fertile seeds, and vegetatively through the production of shoots from
60 existing stems. Plants are dioecious, meaning that each plant produces only male or
61 female flowers. In order to reproduce sexually it must cross-pollinate with another plant
62 as it cannot self-fertilize. Sex of the plants within each community has been
63 documented for 8 of the 14 extant Ontario populations. Three populations were
64 determined to contain only male plants, one contained only females, and the remaining
65 four had a mix of sexes. A historical population was found to contain both sexes in 1989
66 but, if extant, this may have changed. The sex ratios of dioecious plant populations,
67 such as Round-leaved Greenbrier, may be influenced by genetics, environmental

DRAFT Government Response Statement
to the
Recovery Strategy for the Round-leaved Greenbrier in Ontario

68 conditions, changes in sex as plants age, or increased susceptibility to mortality of one
69 sex based on conditions at the site. Populations may also be single sex if the area was
70 colonized by a single plant that reproduced asexually to create all of the existing stems.
71 There is little information available to indicate which of these factors may influence
72 Round-leaved Greenbrier in Ontario.

73 Round-leaved Greenbrier relies on pollination by an assortment of insects, including
74 mosquitos, other small flies, and bees. Recent studies have suggested a lack of
75 successful natural pollination due to limited observation of pollinator visitation to both
76 male and female flowers. Studies of select populations have suggested that the species
77 produces less fruit than similar plants, and that it is consumed less by wildlife over the
78 winter, which may result in decreased seed dispersal.

79 Round-leaved Greenbrier appears to be tolerant of a wide variety of disturbances, when
80 they occur in moderation and at a low frequency. Plants have demonstrated the ability
81 to weather some damage to the above ground growth provided the root system remains
82 intact and conditions remain suitable for growth.

83 The most significant threat to Round-leaved Greenbrier in Ontario is land development
84 that results in the removal of woodlots and swamps that the species relies on for
85 habitat. Historically, much of the forest in the species' provincial range was removed for
86 agriculture, and the remaining woodland habitat is highly fragmented, reducing
87 opportunities for populations to cross-pollinate or disperse seeds to suitable growing
88 conditions. The most significant limitation resulting from the fragmentation of its habitat
89 is the reduced genetic diversity in single-sex populations which is expected to reduce
90 their long-term viability.

91 Although the species can tolerate and even benefit from moderate disturbances, high
92 intensity timber harvest, off-path use of All-Terrain Vehicles (ATVs), and excessive deer
93 browse all have the potential to damage individual plants, and negatively alter growing
94 conditions around established populations. Excessive opening of the canopy or abrupt
95 change in environmental conditions may directly affect the sex ratios, or render the soil
96 moisture unsuitable. Alternatively, suppression of natural disturbance processes and a
97 lack of forest management practices to simulate them resulting in full canopy closure
98 and excessive shading may prevent plant dispersal and establishment. Soil moisture
99 may also be influenced by human alterations to land drainage through ditching,
100 watercourse alteration, berm construction, and irrigation practices, which may leave
101 plants more susceptible to damage during the freeze-thaw cycle in the spring. Other
102 potential threats to Round-leaved Greenbrier include development and land clearing
103 overlapping the edges of occupied habitat and incidental damage from hydro corridor

DRAFT Government Response Statement
to the
Recovery Strategy for the Round-leaved Greenbrier in Ontario

104 maintenance and crop management. Invasive plants such as Garlic Mustard (*Alliaria*
105 *petiolata*), Glossy Buckthorn (*Frangula alnus*), European Buckthorn (*Rhamnus*
106 *cathartica*), Multiflora Rose (*Rosa multiflora*) and Tartarian Honeysuckle (*Lonicera*
107 *tatarica*) may also pose a threat due to competition for resources, and native insects
108 and small herbivores may also feed on the plant.

109 Further research is required to gain a better understanding of the current status of each
110 population and population dynamics over the long-term, to identify the factors limiting
111 fertilization, germination, and establishment of seedlings, and to determine what impact
112 the existence of single-sex populations may have on continued persistence. Additional
113 research may be required to examine the best approaches to addressing identified
114 limiting factors to sexual reproduction, and determine if they are necessary and feasible.

115 The number of populations of Round-leaved Greenbrier in Ontario may always have
116 been low, and populations in Ontario appear to be persisting over time. As a result,
117 recovery efforts for Round-leaved Greenbrier will focus on preserving the existing
118 populations and supporting their natural and sustainable reproduction through
119 management of direct threats and biological limitations. The government supports
120 recovery actions for Round-leaved Greenbrier that increase knowledge of the species,
121 manage the habitat, limitations, and threats to the species, and promote the education
122 and participation of landowners and members of the public that may use, own, or
123 manage lands containing the species.

Government's Recovery Goal

The government's goal for the recovery of Round-leaved Greenbrier is to maintain viable populations across the species' distribution in Ontario, and where feasible, support natural population increases by addressing threats and limitations. The government supports investigating the necessity and feasibility of augmenting single-sex populations.

130 Actions

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

DRAFT Government Response Statement
to the
Recovery Strategy for the Round-leaved Greenbrier in Ontario

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139 **Government-led Actions**

140 To help protect and recover Round-leaved Greenbrier, the government will directly
141 undertake the following actions:

- 142
- 143
- 144
- Continue to implement the [Ontario Invasive Species Strategic Plan \(2012\)](#) to address the invasive species (e.g., Garlic Mustard) that threaten Round-leaved Greenbrier.
 - Educate other agencies and authorities involved in planning and environmental assessment processes on the protection requirements under the ESA.
 - Encourage the submission of Round-leaved Greenbrier data to the Ontario’s central repository through the citizen science project that they receive data from (i.e., [iNaturalist.ca](#)) 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 Round-leaved Greenbrier 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 Round-leaved Greenbrier. 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.
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159 **Government-supported Actions**

160 The government endorses the following actions as being necessary for the protection
161 and recovery of Round-leaved Greenbrier. Actions identified as “high” may be given
162 priority consideration for funding under the Species at Risk Stewardship Program.
163 Where reasonable, the government will also consider the priority assigned to these
164 actions when reviewing and issuing authorizations under the ESA. Other organizations
165 are encouraged to consider these priorities when developing projects or mitigation plans
166 related to species at risk.

167

DRAFT Government Response Statement
to the
Recovery Strategy for the Round-leaved Greenbrier in Ontario

Focus Area: Research and Monitoring

Objective: Increase knowledge of the distribution, abundance, population composition, and habitat conditions of Round-leaved Greenbrier in Ontario.

Recent surveys of existing Round-leaved Greenbrier populations have provided valuable information as to the abundance at many known locations and what sexes of plants are found there. This information can be used to prioritize populations for recovery efforts, particularly those that contain only a single sex, those showing no evidence of seedling establishment, and/or those that are separated by a significant distance from other local populations. Populations lacking in sexual reproduction may be less able to adapt to changing site conditions, and less genetically diverse. Continued and expanded collection of monitoring information is warranted to document any demographic changes that may impact the populations' ability to persist. In addition, regular inventory of growing conditions at each site may provide valuable information regarding environmental factors influencing sex ratios and reproductive success that may be addressed or managed. Examination of the sites classified as historical but presumed to be extant (Cedar Creek, White Oak Woods, and McCleod Road) should also occur to determine if viable populations exist at these locations, and to ensure they are represented in research and monitoring programs.

Actions:

1. **(High)** Develop and implement a monitoring program for Round-leaved Greenbrier. The program should be designed and implemented to contribute to research on population viability and include the following:
 - evaluate detectability of Round-leaved Greenbrier and survey locations where the population is considered to be historical;
 - investigate population dynamics including:
 - genetics, including the effects of in-breeding;
 - reproductive biology (e.g., pollination, seed production, germination);
 - recruitment (e.g., effects of site disturbance, sex representation); and,
 - factors inhibiting growth, including invasive species.

DRAFT Government Response Statement
to the
Recovery Strategy for the Round-leaved Greenbrier in Ontario

- 203 2. **(High)** Conduct research to determine optimal methods for
204 managing Round-leaved Greenbrier populations including
205 practices that increase pollination rates (e.g., artificial
206 pollination), seed production, dispersal, germination, and
207 seedling establishment.
- 208 3. Investigate the hypothesis that sexual expression in Round-
209 leaved Greenbrier may be affected by environmental conditions.
- 210 4. Investigate the necessity and feasibility of augmenting single-
211 sex populations.
212

Focus Area: Management and Habitat Protection

Objective: Maintain or improve the quality of habitat available for Round-leaved Greenbrier, and where feasible and appropriate, enhance the ability of existing plants to reproduce.

217 Round-leaved Greenbrier populations and habitat occur primarily on private lands, but
218 are also found on properties belonging to municipalities and conservation organizations.
219 Many of the habitat areas in which it is found consist of fragmented woodlots separated
220 by roads, agricultural areas, and development. As a result, a collaborative approach to
221 population and habitat management and protection is needed to support the recovery of
222 the species. Encouraging the use of best management practices across multiple sectors
223 and land users will also support better long-term recovery. Should research and
224 monitoring determine appropriate techniques for, and biological value from, increasing
225 plant sexual reproduction for this species, collaborative evaluation of their potential
226 overall effects could be beneficial, and associated actions may be warranted.

Actions:

- 227
- 228 5. **(High)** Work collaboratively with land owners, land managers,
229 and researchers to develop, implement and evaluate
230 management plans and best management practices to maintain
231 or improve the quality of Round-leaved Greenbrier habitat and
232 viability of populations at existing sites. Plans may include:
- 233 ○ encouraging the use of silvicultural practices that allow
234 for sustainable harvest while maintaining or improving
235 habitat conditions;
 - 236 ○ steps to minimize impacts of land use and water
237 management on natural drainage regimes;

DRAFT Government Response Statement
to the
Recovery Strategy for the Round-leaved Greenbrier in Ontario

- 238 ○ strategies to remove and/or monitor the presence and
239 impacts of invasive plants (e.g., Glossy Buckthorn and
240 Garlic Mustard) in areas with or adjacent to populations;
241 and,
242 ○ habitat and land management approaches that
243 encourage the establishment and maintenance of natural
244 vegetated corridors, that support the survival and
245 movement of pollinators necessary for Round-leaved
246 Greenbrier sexual reproduction.
- 247 6. In collaboration with landowners and local agencies implement,
248 monitor and adapt actions identified as necessary to promote
249 pollination, seed production, dispersal, germination, and
250 seedling establishment (see Action 2).
- 251 7. As opportunities arise, work with local land owners and
252 community partners to support the securement of habitat of
253 Round-leaved Greenbrier through existing land securement and
254 stewardship programs.
- 255 8. Implement approaches to avoid or reduce impacts of
256 recreational activities on Round-leaved Greenbrier and its
257 habitat including:
- 258 ○ redirecting recreational activities away from the species;
259 ○ erecting physical barriers, if appropriate; and,
260 ○ installing signage to alert land users to the presence of
261 the species.

Focus Area:	Outreach and Awareness
Objective:	Increase public awareness of and participation in efforts to minimize threats to Round-leaved Greenbrier.

266 Round-leaved Greenbrier is found on lands utilized for recreational, commercial,
267 agricultural, and residential uses. Therefore, the education and involvement of the
268 public is a key factor in supporting recovery of the species, particularly to help manage
269 the threats of inappropriate recreational vehicle use, and damage occurring incidentally
270 to the species from activities such as road corridor maintenance and brush clearing.
271 Ensuring landowners are aware of the presence of the species and potential threats will
272 require collaboration between agencies with an emphasis on sharing the best available
273 information.

DRAFT Government Response Statement
to the
Recovery Strategy for the Round-leaved Greenbrier in Ontario

274 **Actions:**

- 275 9. Promote awareness about Round-leaved Greenbrier among
276 land owners, land managers and land users by sharing
277 information on:
- 278 ○ how to identify the species;
 - 279 ○ the species' habitat requirements;
 - 280 ○ protection afforded to the species and its habitat under
281 the ESA; and,
 - 282 ○ actions that can be taken to reduce threats to the species
283 and its habitat (e.g., distributing best management
284 practices for recreational activities to land users).

285 **Implementing Actions**

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

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

295 **Reviewing Progress**

296 The ESA requires the Ontario government to conduct a review of progress towards
297 protecting and recovering a species not later than five years from the publication of this
298 response statement. The review will help identify if adjustments are needed to achieve
299 the protection and recovery of Round-leaved Greenbrier.

300 **Acknowledgement**

301 We would like to thank all those who participated in the development of the Recovery
302 Strategy for the Round-leaved Greenbrier (*Smilax rotundifolia*) in Ontario for their
303 dedication to protecting and recovering species at risk.

DRAFT Government Response Statement
to the
Recovery Strategy for the Round-leaved Greenbrier in Ontario

304 **For Additional Information:**

305 Visit the species at risk website at ontario.ca/speciesatrisk

306 Contact the Natural Resources Information and Support Centre

307 1-800-667-1940

308 TTY 1-866-686-6072

309 nrisc@ontario.ca