

DRAFT Government Response Statement
to the
Recovery Strategy for the Purple Twayblade in Ontario

1 **Purple Twayblade**

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 Purple Twayblade \(*Liparis liliifolia*\) in Ontario](#) was
24 completed on July 22, 2019.

25 Purple Twayblade is a small orchid that grows between 10 to 25 cm tall. It has two
26 broad oval leaves and a single stalk that grows multiple translucent, purplish-brown
27 flowers.

28 **Protecting and Recovering Purple Twayblade**

29 Purple Twayblade is listed as a threatened species under the ESA, which protects both
30 the plant and its habitat. The ESA prohibits harm or harassment of the species and

DRAFT Government Response Statement
to the
Recovery Strategy for the Purple Twayblade in Ontario

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

33 Globally, Purple Twayblade is found in North America. It occurs in the eastern and mid-
34 western United States, from New England and Minnesota south to South Carolina and
35 Oklahoma. In Canada, it is found in Ontario and Quebec, with the majority of
36 populations occurring in southwestern Ontario in the Windsor-Essex area. Observations
37 in eastern Ontario and western Quebec during the 21st Century demonstrate that the
38 Canadian range extends over 260 km farther eastward than believed in the preceding
39 century.

40 Based on the provincial recovery strategy, seven local populations are considered
41 extant in Ontario with the possibility of recognizing three others. The Cedar Creek,
42 Deyo's Woods and Happy Valley Forest populations, although considered extant, have
43 not been confirmed respectively in 33, 22 and 19 years, including during the most
44 recent survey in 2008. The Frontenac Provincial Park population is currently considered
45 extant, but Purple Twayblade has not been detected here since a flood event which
46 may affected the population. Given the lack of recent observations at these four sites,
47 the number of extant populations in Ontario may be as low as three. Additionally, three
48 populations are considered historical and three are considered extirpated (i.e., no longer
49 exist). The total Ontario population is estimated at 2,320 plants; the largest known
50 population occurring in the Spring Garden Natural Area with approximately 2,100 plants.
51 Most Ontario populations are estimated to have fewer than 30 plants and are
52 considered to have poor to fair viability. Additional survey and monitoring efforts would
53 be beneficial to confirm the status and abundance of Purple Twayblade at historical and
54 extant sites.

55 Purple Twayblade has been found in a wide range of habitats, including mixed
56 deciduous forest, shrub-thicket, shrub alvar, forested swamps, tallgrass prairie and
57 coniferous plantations, and can tolerate a variety of soil conditions, such as sand, silt,
58 and a mix of clay with other soils. It prefers open to semi-open areas, with most
59 Canadian populations occurring near the top of well-drained slopes. It can quickly
60 colonize areas following a disturbance; therefore, disturbances that reduce tree cover
61 (e.g., fires) are important in maintaining suitable habitat conditions. Despite a wide
62 tolerance to a variety of habitat and soil conditions, the species' distribution is restricted
63 by the presence and abundance of a specific mycorrhizal soil fungus in the genus
64 *Tulasnella*. This fungus supplies orchid seeds and seedlings with important nutrients
65 until the plant is capable of photosynthesis and is critical for its existence. A greater
66 understanding of the distribution of this fungus in southern Ontario would help to identify
67 areas with potentially suitable habitat to inform Purple Twayblade recovery efforts.

DRAFT Government Response Statement
to the
Recovery Strategy for the Purple Twayblade in Ontario

68 Several knowledge gaps exist on the ecology and reproductive biology of Purple
69 Twayblade. Although the species requires cross-pollination to produce viable seeds, the
70 mechanism of pollination and the species' pollinators are currently unknown. As is true
71 of many orchids, Purple Twayblade roots may remain in a dormant state when
72 conditions are unfavourable; however, this has not been confirmed. Purple Twayblade
73 seeds can remain viable in or on the soil (i.e., form a seed bank). It is unknown exactly
74 how long the seeds remain viable but evidence suggests they can remain dormant for
75 over four years. Further research on the pollinators, dormancy, and longevity of seeds
76 will also help inform recovery efforts.

77

78 The main threats to Purple Twayblade are habitat loss from development (i.e., urban,
79 residential, agricultural), invasive plants, and alterations to the natural disturbance
80 regime (e.g., fire suppression). Forest succession without regular disturbance typically
81 creates a more closed canopy and dense understory where conditions are not suitable
82 for Purple Twayblade growth. Potential development in the Windsor-LaSalle area
83 currently poses a threat to local populations on or near private property. Additionally,
84 Garlic Mustard (*Alliaria petiolata*), Common Buckthorn (*Rhamnus cathartica*), and Scots
85 Pine (*Pinus sylvestris*) have been documented at four sites where the species is found.
86 These invasive plants are thought to threaten Purple Twayblade, but it is unknown
87 exactly how they impact the species. Research suggests Garlic Mustard and Common
88 Buckthorn may affect plant growth or development by interfering with the formation of
89 mycorrhizal associations on which the species depends. Given the plant's obligate
90 association with the mycorrhizal fungi, factors affecting the survival or persistence of the
91 fungus may also threaten populations of Purple Twayblade.

92 Other potential threats include plants being consumed (i.e. herbivory) and habitat
93 alteration by invasive invertebrates, grazing by White-tailed Deer (*Odocoileus*
94 *virginianus*), and the application of herbicides, fungicides and pesticides. The use of
95 chemicals near Purple Twayblade habitat may impact populations by destroying or
96 depleting soil mycorrhizae populations or by reducing the availability of pollinators. It
97 has been suggested that the application of the herbicide, on adjacent crops may have
98 led to the extirpation of one local population. Further investigation on whether these
99 threats are currently impacting Ontario populations is required to develop and
100 implement appropriate recovery actions. Although flooding has occurred at the
101 Frontenac Provincial Park population, the impact of prolonged flooding on Purple
102 Twayblade is not fully known. Continued monitoring at this site would be beneficial to
103 determine the species' presence/absence, it's tolerance to prolonged submersion, and
104 whether any suitable habitat remains at this location.

DRAFT Government Response Statement
to the
Recovery Strategy for the Purple Twayblade in Ontario

105 The *Tulasnella* fungus, upon which Purple Twayblade depends, is more widely
106 distributed than the orchid at some sites where it occurs. This suggests that Purple
107 Twayblade recruitment is limited by the areas to which seeds disperse as well as the
108 patchy distribution and abundance of *Tulasnella* fungus within occupied sites.

109 Several knowledge gaps exist on the status, biology and threats of Purple Twayblade
110 populations that will require further research to support effective implementation of
111 recovery actions. Ontario's protection and recovery approaches will focus on actions to
112 increase understanding, manage populations and promote awareness. Research,
113 survey and monitoring actions will help increase understanding of the species' ecology
114 (e.g., mycorrhizal relationship, pollinators), threats, distribution and population viability.
115 Recovery actions will address threats, biological limitations and habitat conditions.
116 Promoting awareness will raise consciousness of the species, its habitat requirements
117 and actions that can be taken to minimize threats. Information about the status and
118 viability of those populations that have not been recently confirmed and the
119 effectiveness of management actions in improving species viability will help focus
120 recovery efforts and inform decisions as to what additional population management
121 actions (e.g., augmentation) are required.

Government's Recovery Goal

The government's goal for the recovery of Purple Twayblade in Ontario is to maintain existing or newly discovered extant populations and support increases in abundance and distribution by reducing threats and addressing biological limitations, where feasible and appropriate.

127 Actions

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

135 Government-led Actions

136 To help protect and recover Purple Twayblade, the government will directly undertake
137 the following actions:

DRAFT Government Response Statement
to the
Recovery Strategy for the Purple Twayblade in Ontario

- 138 • Evaluate the relationship of the Town of LaSalle Candidate Natural Heritage Area
139 CH3-M11, the McAuliffe Woods Conservation Area and the Canard River –
140 Mitchell Property populations to other known populations to determine the
141 number of extant populations.

- 142 • Continue to implement the *Ontario Invasive Species Strategic Plan (2012)* to
143 address the invasive species (e.g., Garlic Mustard) that threaten Purple
144 Twayblade.

- 145 • Educate other agencies and authorities involved in planning and environmental
146 assessment processes on the protection requirements under the ESA.

- 147 • Encourage the submission of Purple Twayblade data to the Ontario's central
148 repository through the citizen science projects that they receive data from (i.e.,
149 iNaturalist.ca) and directly through the [Natural Heritage Information Centre](#).

- 150 • Undertake communications and outreach to increase public awareness of
151 species at risk in Ontario.

- 152 • Continue to protect Purple Twayblade and its habitat through the ESA.

- 153 • Support conservation, agency, municipal and industry partners, and Indigenous
154 communities and organizations to undertake activities to protect and recover
155 Purple Twayblade. Support will be provided where appropriate through funding,
156 agreements, permits (including conditions) and/or advisory services.

- 157 • Encourage collaboration, and establish and communicate annual priority actions
158 for government support in order to reduce duplication of efforts.

- 159 • Conduct a review of progress toward the protection and recovery of Purple
160 Twayblade within five years of the publication of this document.

161 **Government-supported Actions**

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

DRAFT Government Response Statement
to the
Recovery Strategy for the Purple Twayblade in Ontario

- 204 o determining number of plants and/or seeds necessary to
205 maintain viable Purple Twayblade populations at existing
206 sites;
- 207 o evaluate detectability of both adult plants and viable
208 seeds;
- 209 o investigating mycorrhizal associations including the
210 distribution and abundance at occupied sites; and,
- 211 o studying factors influencing establishment (e.g.,
212 germination requirements).
- 213 3. Conduct research to identify the optimal methods for
214 maintaining and restoring Purple Twayblade populations. This
215 may include:
- 216 o evaluating the effectiveness and suitability of habitat
217 management and restoration techniques (e.g., invasive
218 species removal, canopy thinning, prescribed burning) for
219 occupied and potential sites; and,
- 220 o investigating methods for within-site assisted seed
221 dispersal (to microsites where *Tulasnella* is present),
222 transplanting, and propagation.

223	Focus Area:	Management and Habitat Protection
224	Objective:	Maintain or improve species distribution and the quality of habitat 225 available for Purple Twayblade and reduce threats.

226 Purple Twayblade populations occur on private and public lands. Collaborative efforts
227 between land owners and community partners should focus on maintaining and/or
228 improving habitat and minimizing threats. Purple Twayblade populations face several
229 threats including habitat loss from development activities, invasive species and forest
230 succession. Undertaking habitat management and restoration activities at extant
231 locations including implementing best management practices will help support the
232 species' recovery. In addition, opportunities for restoration at historical sites with
233 suitable habitat should be explored given the possibility that individuals may remain
234 dormant underground and the viability of seeds in the seed bank. At extant or historical
235 sites where habitat restoration or enhancement efforts are determined to be ineffective
236 or insufficient, additional actions may be required to support long-term population
237 viability.

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DRAFT Government Response Statement
to the
Recovery Strategy for the Purple Twayblade in Ontario

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Actions:

4. **(High)** Undertake habitat management and restoration techniques to maintain and/or restore habitat at existing locations, where appropriate. Emphasis should be placed on:
 - identifying and mitigating threats affecting the species (e.g., forest succession, invasive species, and herbivory);
 - prioritizing sites containing the mycorrhizal fungi and in close proximity to existing Purple Twayblade populations to support natural expansion and/or re-establishment; and,
 - working collaboratively with land owners to implement best management practices to maintain or improve habitat quality within and adjacent to occupied areas.
5. In collaboration with landowners and local agencies implement, monitor and adapt actions identified as necessary and feasible to maintain or increase populations at appropriate sites where habitat enhancement efforts are insufficient. Activities may include:
 - assisted seed dispersal to areas with established populations of mycorrhizal fungus; and
 - augmenting populations through transplantation or propagation if available adult plants and seed are insufficient to maintain a viable population.
6. As opportunities arise, work with land owners and community partners to support the securement of Purple Twayblade habitat through existing land securement and stewardship programs.

Focus Area:	Awareness
Objective:	Increase awareness of the species, its habitat requirements and actions that can be taken to minimize threats

Purple Twayblade occurs on public land managed by municipalities and conservation organizations, and on private land. Collaboration amongst organizations and landowners will be necessary to effectively implement recovery actions, help improve efficiencies and reduce duplication of efforts. Education and outreach will help to increase awareness of the species, its threats and potential management actions to reduce threats to the species' and its habitat. Promoting the use of best management practices to land users will also support the species' recovery.

DRAFT Government Response Statement
to the
Recovery Strategy for the Purple Twayblade in Ontario

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Actions:

7. Collaborate with organizations, land managers, land users and Indigenous communities and organizations to promote awareness of Purple Twayblade by sharing information on:
 - how to identify the species;
 - the species' habitat requirements;
 - the 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 to land users).

287 **Implementing Actions**

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

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

298 **Reviewing Progress**

299 The ESA requires the Ontario government to conduct a review of progress towards
300 protecting and recovering a species not later than five years from the publication of this
301 response statement. The review will help identify if adjustments are needed to achieve
302 the protection and recovery of Purple Twayblade.

303 **Acknowledgement**

304 We would like to thank all those who participated in the development of the Recovery
305 Strategy for the Purple Twayblade (*Liparis liliifolia*) in Ontario for their dedication to
306 protecting and recovering species at risk.

DRAFT Government Response Statement
to the
Recovery Strategy for the Purple Twayblade in Ontario

307 **For Additional Information:**

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

309 Contact the Ministry of the Environment, Conservation and Parks

310 1-800-565-4923

311 TTY 1-855-515-2759

312 www.ontario.ca/environment