

PROPOSED

Species at Risk Act
Recovery Strategy Series
Adopted under Section 44 of SARA

Recovery Strategy for the Virginia Mallow (*Sida hermaphrodita*) in Canada

Virginia Mallow



2015



Government
of Canada

Gouvernement
du Canada

Canada

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For copies of the recovery strategy, or for additional information on species at risk, including COSEWIC Status Reports, residence descriptions, action plans, and other related recovery documents, please visit the [Species at Risk Public Registry](http://sararegistry.gc.ca/default.asp?lang=En&n=24F7211B-1)¹.

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¹ <http://sararegistry.gc.ca/default.asp?lang=En&n=24F7211B-1>

RECOVERY STRATEGY FOR THE VIRGINIA MALLOW (*Sida hermaphrodita*) IN CANADA

2015

Under the Accord for the Protection of Species at Risk (1996), the federal, provincial, and territorial governments agreed to work together on legislation, programs, and policies to protect wildlife species at risk throughout Canada.

In the spirit of cooperation of the Accord, the Government of Ontario has given permission to the Government of Canada to adopt the *Recovery Strategy for the Virginia Mallow (Sida hermaphrodita) in Ontario* (Part 2) under Section 44 of the *Species at Risk Act*. Environment Canada has included an addition (Part 1) which completes the SARA requirements for this recovery strategy.

Environment Canada is adopting the provincial recovery strategy with the exception of section 2.0, Recovery. In place of section 2, Environment Canada is adopting the Government of Ontario's goal and the government-led and government-supported actions of the *Virginia Mallow: Ontario Government Response Statement*² (Part 3) as the population and distribution objective and the broad strategies and general approaches to meet the population and distribution objective, and is adopting the habitat regulated under Ontario's *Endangered Species Act, 2007* as critical habitat for the Virginia Mallow.

The federal Recovery Strategy for the Virginia Mallow (*Sida hermaphrodita*) in Canada consists of three parts:

Part 1 – Federal Addition to the *Recovery Strategy for the Virginia Mallow (Sida hermaphrodita) in Ontario*, prepared by Environment Canada.

Part 2 - *Recovery Strategy for the Virginia Mallow (Sida hermaphrodita) in Ontario*, prepared by Holly J. Bickerton for the Ontario Ministry of Natural Resources³.

Part 3 – *Virginia Mallow: Ontario Government Response Statement*, prepared by the Ontario Ministry of Natural Resources.

² The Government Response Statement is the Ontario Government's policy response to the recovery strategy and summarizes the prioritized actions that the Ontario Government intends to take and support.

³ On June 26th, 2014, the Ontario Ministry of Natural Resources became the Ontario Ministry of Natural Resources and Forestry.

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PART 2 - *Recovery Strategy for the Virginia Mallow* (*Sida hermaphrodita*) in Ontario, prepared by Holly J. Bickerton, for the Ontario Ministry of Natural Resources.

PART 3 – *Virginia Mallow: Ontario Government Response Statement*, prepared by the Ontario Ministry of Natural Resources.

PART 1 - Federal Addition to the *Recovery Strategy for the Virginia Mallow* (*Sida hermaphrodita*) in Ontario, prepared by Environment Canada

PREFACE

The federal, provincial, and territorial government signatories under the [Accord for the Protection of Species at Risk \(1996\)](#)⁴ agreed to establish complementary legislation and programs that provide for effective protection of species at risk throughout Canada. Under the *Species at Risk Act* (S.C. 2002, c.29) (SARA), the federal competent ministers are responsible for the preparation of recovery strategies for listed Extirpated, Endangered, and Threatened species and are required to report on progress within five years.

The Minister of the Environment is the competent minister for the recovery of the Virginia Mallow and has prepared the federal component of this recovery strategy (Part 1), as per section 37 of SARA. SARA section 44 allows the Minister to adopt all or part of an existing plan for the species if it meets the requirements under SARA for content (sub-sections 41(1) or (2)). The Ontario Ministry of Natural Resources (now the Ontario Ministry of Natural Resources and Forestry) led the development of the attached recovery strategy for the Virginia Mallow (Part 2) in cooperation with Environment Canada.

Success in the recovery of this species depends on the commitment and cooperation of many different constituencies that will be involved in implementing the directions set out in this strategy and will not be achieved by Environment Canada, or any other jurisdiction alone. All Canadians are invited to join in supporting and implementing this strategy for the benefit of the Virginia Mallow and Canadian society as a whole.

This recovery strategy will be followed by one or more action plans that will provide information on recovery measures to be taken by Environment Canada and other jurisdictions and/or organizations involved in the conservation of the species. Implementation of this strategy is subject to appropriations, priorities, and budgetary constraints of the participating jurisdictions and organizations.

⁴ <http://registrelep-sararegistry.gc.ca/default.asp?lang=en&n=6B319869-1#2>

ACKNOWLEDGEMENTS

The initial draft of the federal addition was prepared by Bruna Peloso and Kathy St. Laurent (Environment Canada, Canadian Wildlife Service – Ontario). Lee Voisin, Elizabeth Rezek, Krista Holmes, Madeline Austen and Lesley Dunn (Environment Canada, Canadian Wildlife Service – Ontario) and Amelia Argue, Jay Fitzsimmons, Eric Snyder, Aileen Wheeldon, Vivian Brownell, Amanda Fracz and Michael Oldham (Ontario Ministry of Natural Resources and Forestry) reviewed and provided comments and advice during the development of this document.

Acknowledgement and thanks is given to all other parties that provided advice and input used to help inform the development of this recovery strategy including various Aboriginal organizations and individuals, landowners, citizens and stakeholders who provided input and/or participated in consultation meetings.

ADDITIONS AND MODIFICATIONS TO THE ADOPTED DOCUMENT

The following sections have been included to address specific requirements of the federal *Species at Risk Act* (SARA) that are not addressed in the Province of Ontario's *Recovery Strategy for the Virginia Mallow* (*Sida hermaphrodita*) in Ontario (Part 2) and to provide updates or additional information.

Under SARA, there are specific requirements and processes set out regarding the protection of critical habitat. Therefore, statements in the provincial recovery strategy referring to protection of the species' habitat may not directly correspond to federal requirements, and are not being adopted by Environment Canada as part of the federal recovery strategy. Whether particular measures or actions will result in protection of critical habitat under SARA will be assessed following publication of the final federal recovery strategy.

1. Species Status Information

The Virginia Mallow, a tall perennial herb of periodically flooded riparian areas and floodplains, has a global conservation status of Vulnerable⁵ (G3); however, it should be noted that the species has not been reviewed since 2004 (NatureServe 2013a). Globally, the total number of occurrences is low and declining; the estimated number of occurrences is 21-80 of which very few (4-12) are considered to be Good Viability⁶ (NatureServe 2013a).

The national conservation status for the Virginia Mallow in the United States is Vulnerable (N3), and it is considered Possibly/Presumably Extirpated, Imperiled or Critically Imperiled in 8 out of the 13 (61.5%) American states within its range (Appendix A) (NatureServe 2013a).

In Canada, the species' national conservation status is Critically Imperiled (N1), and the conservation status in Ontario, the only province where the species occurs in Canada, is also Critically Imperiled (S1) (NatureServe 2013a). The Virginia Mallow is listed as Endangered⁷ on Schedule 1 of the federal *Species at Risk Act* (SARA). In Ontario, the Virginia Mallow is listed as Endangered⁸ under the provincial *Endangered Species Act, 2007* (ESA).

⁵ Status definitions can be found in Appendix A.

⁶ Good Viability: One hundred to 300 plants associated with naturally open/disturbed areas within a floodplain system or mosaic of forested and cleared areas. If the area is notably disturbed with little tree canopy, then larger numbers of plants may also be considered at this rank level (NatureServe 2013b).

⁷ A wildlife species facing imminent extirpation or extinction in Canada.

⁸ A species that lives in the wild in Ontario but is facing imminent extinction or extirpation.

Virginia Mallow is at the northern edge of its North American range in Ontario and is restricted to the Carolinian Zone of southwestern Ontario. It is estimated that less than 1% of its global range occurs in Canada; the remainder occurs in the United States.

2. Recovery Feasibility

Based on the following four criteria outlined in the draft SARA Policies (Government of Canada 2009), there are unknowns regarding the feasibility of recovery of the Virginia Mallow. In keeping with the precautionary principle, a full recovery strategy has been prepared as would be done when recovery is determined to be feasible.

1. Individuals of the wildlife species that are capable of reproduction are available now or in the foreseeable future to sustain the population or improve its abundance.

Yes. Monitoring has demonstrated that there are reproductive individuals in the two known locations in Ontario: one in Haldimand County and the other in the Regional Municipality of Niagara (i.e., Niagara Region).

In Haldimand County, the population increased from approximately 83 stems in 2001 to approximately 2,300 stems in 2008 (COSEWIC 2010). Bickerton (2011) reported that according to Grand River Conservation Authority (GRCA) ecologists, the estimated population size for this site was over 5,000 stems in 2010, representing a further increase in this population. The population in the Regional Municipality of Niagara is smaller, with a total of 210 stems; population numbers have remained constant during 2008 and 2010 surveys (Bickerton 2011). However, ongoing monitoring is needed to ensure this population is stable.

Recent research has established that viable seed is produced at the Haldimand County location and that an extensive network of long rhizomes⁹ exist at this occurrence (K. Stevens pers. comm. to E. Snyder 2014). It is likely that both sexual and asexual reproduction are taking place; sexual reproduction being predominantly responsible for the establishment of new stems (K. Stevens pers. comm. to E. Snyder 2014).

Although the population located at the Regional Municipality of Niagara is also reproducing, it is unknown whether it has been propagating sexually through seeds or asexually through spreading rhizomes. Nevertheless, the species is known to produce a high number of seeds (a large plant may produce several thousand seeds), most of which are viable (Spooner et al. 1985; Kujawski et al. 1997).

⁹ A plant stem that grows horizontally under or along the ground and often sends out roots and shoots. New plants develop from the shoots.

2. Sufficient suitable habitat is available to support the species or could be made available through habitat management or restoration.

Unknown. Virginia Mallow seems to have specific habitat requirements: i.e., open to partly-shaded habitats created by periodic flooding in moist riparian areas and in floodplains (Thomas 1979; Bickerton 2011). These habitats, in an undisturbed state, are exceptionally rare in the Carolinian zone of Ontario and within the species' range in the United States; thus habitat availability is likely a limiting factor for the species' natural occurrence (Thomas 1979; Spooner et al. 1985; COSEWIC 2010; NatureServe 2013a). However, the species can thrive in disturbed areas, such as railroad banks and roadsides, and while there appear to be many suitably disturbed habitats within the species' range in Ontario, they remain unoccupied, indicating that other as-yet-unidentified factors (e.g., habitat, biological or otherwise) may be limiting the species (COSEWIC 2010; Bickerton 2011). Recent decommissioning of a dam at one occupied site in Ontario resulted in an increase in Virginia Mallow's abundance and distribution; plants have colonized habitat created after the dam's removal (Bickerton 2011; Zammit pers. comm. 2013) indicating it may be possible to improve/restore habitat at some sites.

3. The primary threats to the species or its habitat (including threats outside Canada) can be avoided or mitigated.

Yes. The primary threats to the species are habitat destruction, invasive species and site maintenance activities. The species' occurrence is associated with open areas and riverine terraces and floodplains (Spooner et al. 1985; Bickerton 2011). It is likely possible to mitigate or avoid further destruction of those habitats through restoration of former wetland areas (e.g., reestablishing natural drainage patterns) and conservation of the existing ones. Though difficult to eradicate, invasive species, particularly non-native Common Reed (*Phragmites australis*) can often be controlled offering benefits to other species that co-exist with the Virginia Mallow. Occupied sites that undergo maintenance (e.g., mowing and vegetation clearing, herbicide application) can be managed through stewardship initiatives to identify best management practices to protect plants and through education of those responsible for site maintenance activities.

4. Recovery techniques exist to achieve the population and distribution objectives or can be expected to be developed within a reasonable timeframe.

Yes. Recovery techniques to improve habitat and control invasive species currently exist or could be developed within a reasonable timeframe. One of the populations (Haldimand County) occurs in a Conservation Area which is already managed to provide a healthy and sustainable natural environment by protecting natural areas and biodiversity. Some work to control non-native Common Reed at this site was performed in 2010 (Bickerton 2011); the mechanical cutting of non-native Common Reed occurred near the smallest and most vulnerable patches of

the Virginia Mallow (Zammit pers. comm. 2013). It is difficult to conclude whether the control work has benefitted the Virginia Mallow populations as both the Virginia Mallow and non-native Common Reed have increased at the site (Zammit pers. comm. 2013).

Incentives to promote protection at the Regional Municipality of Niagara site could be explored, such as land securement and conservation easements. Best management practices for site maintenance and invasive species control could be promoted as a part of these incentives.

In addition, research and monitoring techniques exist to fill key knowledge gaps identified for the species; these techniques could be employed to promote a better understanding of the species' ecology and populations in Ontario that in turn could support meeting the population and distribution objective.

As the Virginia Mallow populations in Ontario occur at the northern edge of the species' North American range and the vast majority of its continental distribution and population occurs further south in the United States, it is important to note that population changes at the continental level may have a significant effect on recovery feasibility in Canada (e.g., ability to obtain seeds or individuals adapted to local conditions to sustain the population should it be required). The species is restricted to two sites within the Carolinian Zone in southwestern Ontario. Due to the Virginia Mallow's naturally limited distribution in Canada, it will likely always be vulnerable to anthropogenic and natural stressors.

3. Threats

The *Recovery Strategy for the Virginia Mallow (Sida hermaphrodita) in Ontario* identifies threats that are currently a concern for the Virginia Mallow populations in Ontario. Other factors/activities also have the potential to threaten the Virginia Mallow or its habitat when they occur at or near the known populations.

The Virginia Mallow occurs in open, moist, sunny to partly-shaded riparian areas, floodplains and bottomlands, usually associated with periodic flooding (Thomas 1979; COSEWIC 2010; Bickerton 2011). Alteration to drainage patterns and water levels that reduces or eliminates the periodic flooding required could threaten the quality and availability of suitable habitat for the Virginia Mallow. Related to this potential threat, substantial alteration of adjacent water bodies or local surface or ground water levels is identified as a generally not compatible activity in the *Habitat Protection Summary for Virginia Mallow* (OMNR 2012) and is hence included here as an additional potential threat to the species and its habitat.

4. Population and Distribution Objectives

The provincial *Recovery Strategy for the Virginia Mallow (Sida hermaphrodita) in Ontario* contains the following recovery goal:

- The goal of this recovery strategy is to protect and maintain all extant populations of Virginia Mallow in southern Ontario and to ensure the species' long-term persistence within its current range.

The Government Response Statement for the province of Ontario lists the following goal for the recovery of the Virginia Mallow in Ontario:

- The government's goal for the recovery of Virginia Mallow is to protect and maintain all existing populations of Virginia Mallow in southern Ontario and to ensure the species' long-term persistence within its current range.

Environment Canada supports the provincial recovery goal of protecting and maintaining the Virginia Mallow in Ontario. To meet the requirements and processes set out in SARA, Environment Canada has refined this recovery goal into a population and distribution objective for the species. The population and distribution objective established by Environment Canada for the Virginia Mallow is to:

- Maintain the current abundance and distribution of all existing populations of Virginia Mallow in Canada.

Although the number of populations is extremely limited in Ontario, both populations are regarded as naturally occurring (Spooner et al. 1985). Of the two Ontario populations, one has recently increased in abundance and the other population remained stable over a three year period (Bickerton 2011). However, on-going monitoring would be required to determine accurate population trends to detect changes in abundance. Until further information is available on minimum viable population size (see government-supported action #6 in Part 3) to gain a better understanding of what is required to ensure the species' long-term persistence, the priority for recovery of the Virginia Mallow is to monitor the population and implement best management practices for the control of non-native Common Reed (Bickerton 2011 and see Part 3).

Although the Virginia Mallow is not grown extensively in North America, horticultural specimens have been planted in landscaped gardens and parks. Virginia Mallow plants that did not originate from plants native to Ontario or were planted for purposes other than species recovery, ecological restoration/rehabilitation or habitat creation, are not considered as existing populations (or portions thereof) in the above objective.

5. Broad Strategies and General Approaches to Meet Objectives

The government-led and government-supported action tables from *Virginia Mallow: Ontario Government Response Statement* (Part 3) are adopted as the broad strategies and general approaches to meet the population and distribution objective. Environment Canada is not adopting the Approaches to Recovery identified in section 2.0 of the *Recovery Strategy for the Virginia Mallow (Sida hermaphrodita) in Ontario* (Part 2).

6. Critical Habitat

6.1 Identification of the Species' Critical Habitat

Section 41 (1)(c) of SARA requires that recovery strategies include an identification of the species' critical habitat, to the extent possible, as well as examples of activities that are likely to result in its destruction. Under SARA, critical habitat is "the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species' critical habitat in the recovery strategy or in an action plan for the species".

Identification of critical habitat is not a component of the provincial recovery strategy under the Province of Ontario's ESA. However, following the completion of the provincial recovery strategy for this species, a provincial habitat regulation was developed and put into effect July 2012. A habitat regulation is a legal instrument that prescribes an area that will be protected¹⁰ as the habitat of the species by the Province of Ontario. The habitat regulation identifies the geographic areas within which the habitat for the species is prescribed and the regulation may apply, and explains how the boundaries of regulated habitat are determined (based on biophysical and other attributes). The regulation is dynamic and automatically in effect whenever the conditions described in the regulation are met.

Environment Canada adopts the description of Virginia Mallow habitat under section 29.2 of Ontario Regulation 242/08¹¹ made under the provincial ESA as the critical habitat in the federal recovery strategy. The area defined under Ontario's habitat regulation contains the biophysical attributes required by the Virginia Mallow to carry out its life processes. To meet specific requirements of SARA, the biophysical attributes of critical habitat are provided below.

The areas prescribed under **Ontario Regulation 242/08 – Virginia Mallow habitat** are described as follows:

29.2 (1) For the purpose of clause (a) of the definition of "habitat" in subsection 2 (1) of the Act [ESA], the areas described in subsection (2) that are located in the following geographic townships are prescribed as the habitat of the Virginia Mallow:

- 1. The geographic townships of Cayuga and Oneida, within the County of Haldimand.*
- 2. The geographic townships of Clinton and Grimsby, within The Regional Municipality of Niagara. O. Reg. 122/12, s. 4.*

¹⁰ Under the federal *Species at Risk Act* (SARA), there are specific requirements and processes set out regarding the protection of critical habitat. Protection of critical habitat under SARA will be assessed following publication of the final federal recovery strategy.

¹¹ http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_080242_e.htm#BK26

(2) Subsection (1) applies to the following areas:

1. If Virginia Mallow exists in an area belonging to a vegetation type identified under the land classification system for southern Ontario and the vegetation type occurs naturally in Ontario, the entire area so classified.
2. If Virginia Mallow exists in an area other than an area described in paragraph 1, the area within 50 metres of a Virginia Mallow that provides suitable conditions for Virginia Mallow to carry on its life processes. O. Reg. 122/12, s. 4.

Vegetation types are defined using the Ecological Land Classification (ELC) for Southern Ontario (Lee et al. 1998), as described in the provincial Habitat Protection Summary (OMNR 2012). The ELC framework provides a standardized approach to the interpretation and delineation of dynamic ecosystem boundaries. The ELC approach classifies habitats not only by vegetation community but also considers hydrology and topography, and as such encompasses the biophysical attributes of the habitat for Virginia Mallow. In addition, ELC terminology and methods are familiar to many land managers and conservation practitioners who have adopted this tool as the standard approach for Ontario.

Virginia Mallow is a species of riparian areas, floodplains and bottomlands which often experience periodic flooding (Bickerton 2011). The biophysical attributes of critical habitat (based on the provincial recovery strategy (Part 2) and COSEWIC 2010) include the characteristics described below.

- Forb Mineral Meadow Marsh (MAM2-10), Cultural Meadow (CUM) and Cultural Thicket (CUT) as defined using the ELC for Southern Ontario (Lee et al. 1998) which possess the following characteristics:
 - open sunny to partly-shaded
 - wide range of soil textures and pH values with a medium to high organic content
 - typical vegetation at the occupied Meadow Marsh site (i.e., Halimand County) includes: Broad-leaved Cattail (*Typha latifolia*), non-native Common Reed, Purple Loosestrife (*Lythrum salicaria*), Jewelweed (*Impatiens capensis*), Teasel (*Dipsacus fullonum*), bulrushes (*Scirpus* spp.) and rushes (*Juncus* spp.). Riparian vegetation is also present, dominated by Black Walnut (*Juglans nigra*), Red-osier Dogwood (*Cornus stolonifera*) and Staghorn Sumac (*Thus typhina*).
 - typical vegetation at the occupied Cultural Meadow/Cultural Thicket site (i.e., Regional Municipality of Niagara) includes: Teasel (*Dipsacus fullonum*), Queen Anne's Lace (*Daucus carota*), Grey Dogwood (*Cornus racemosa*), Staghorn Sumac and goldenrods (*Solidago* spp.).

Through this recovery strategy, the areas prescribed as habitat for the Virginia Mallow under section 29.2 of Ontario Regulation 242/08 become critical habitat identified under SARA at the geographic townships listed in section 29.2 (1). Since the regulation is

dynamic and automatically in effect whenever the conditions described in the regulation are met, if any new locations of Virginia Mallow are confirmed within the geographic areas listed under subsection (1) of the regulation (see Figure 1), the habitat regulation under the ESA applies. Refer to the *Habitat Protection Summary for Virginia Mallow* (OMNR 2012) for further details on the provincial habitat regulation and its application. Should new occurrences of Virginia Mallow be identified that meet the criteria above, the additional critical habitat will be identified in an updated recovery strategy or a subsequent action plan.

In applying the critical habitat criteria above to best available data (as of April 2014), critical habitat is currently found at the two known extant populations of the Virginia Mallow in Canada, totalling approximately 49 ha¹² (Figure 2; see also Table 1). The critical habitat identified is considered sufficient to meet the population and distribution objective for the Virginia Mallow. Critical habitat is not identified for plants that did not originate from Virginia Mallow plants native to Ontario or were planted for purposes other than species recovery, ecological restoration/rehabilitation or habitat creation.

Critical habitat for the Virginia Mallow is presented using a 1 x 1 km UTM grid. This 1 X 1 km UTM grid is part of a standardized grid system that indicates the general geographic areas containing critical habitat which can be used for land use planning and/or environmental assessment purposes. The areas of critical habitat within each grid square occur where the description of critical habitat is met. More detailed information on regulated habitat may be requested on a need-to-know basis from the Ontario Ministry of Natural Resources and Forestry. More detailed information on critical habitat may be requested on a need-to-know basis by contacting Environment Canada – Canadian Wildlife Service at RecoveryPlanning_PL@ec.gc.ca.

¹² This is the maximum extent of critical habitat based on habitat boundaries that can be delineated from high resolution aerial photography and/or a 50m buffer around a Virginia Mallow observation. Actual critical habitat occurs only in those areas described in subsection 2 of the provincial regulation for Virginia Mallow habitat, and therefore the actual area could be less than this and would require field verification to determine the precise amount.

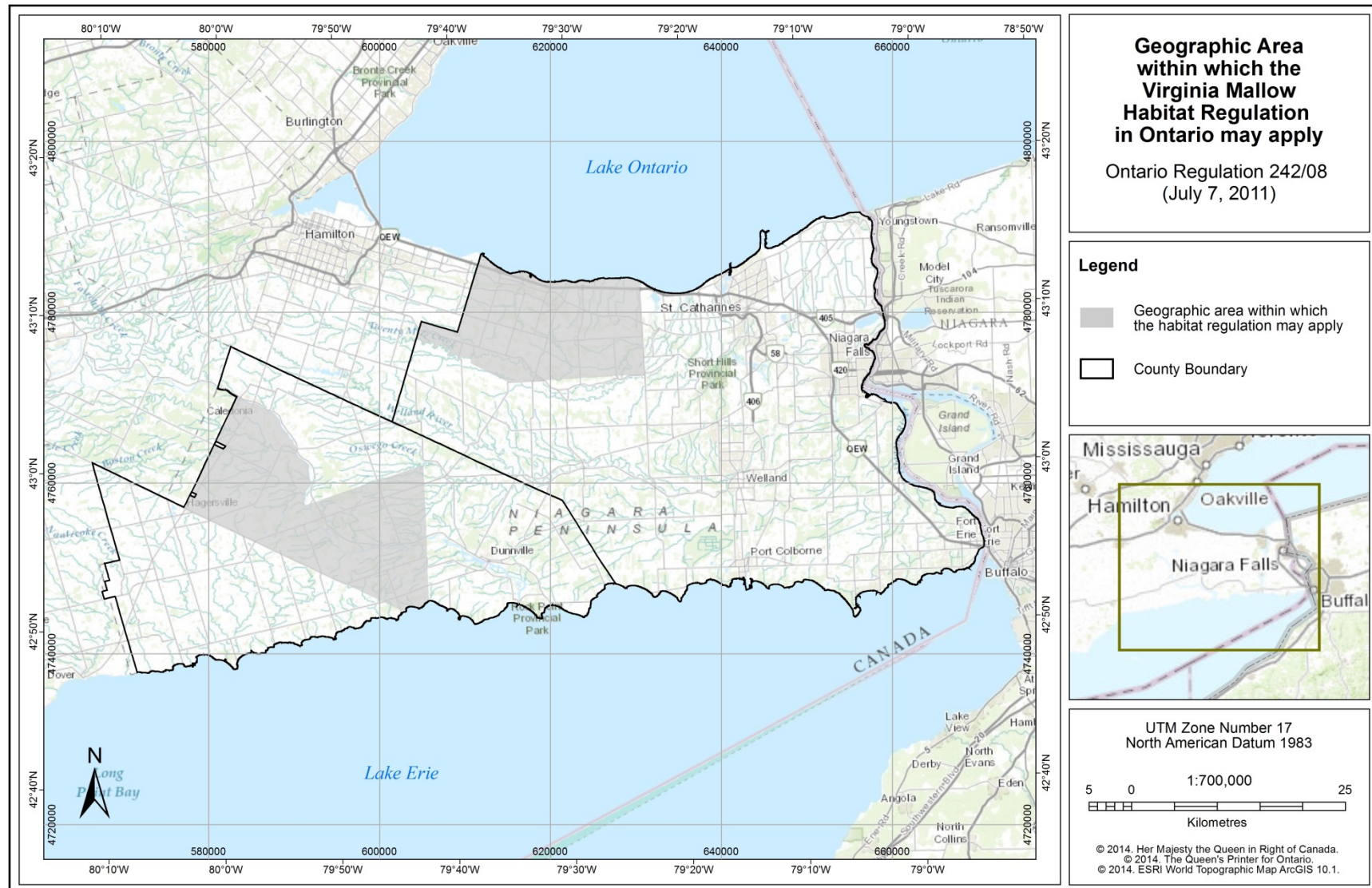


Figure 1. The geographic areas within which the habitat regulation for the Virginia Mallow may apply if the habitat meets the conditions described in section 29.2 of Ontario Regulation 242/08 under the provincial ESA.

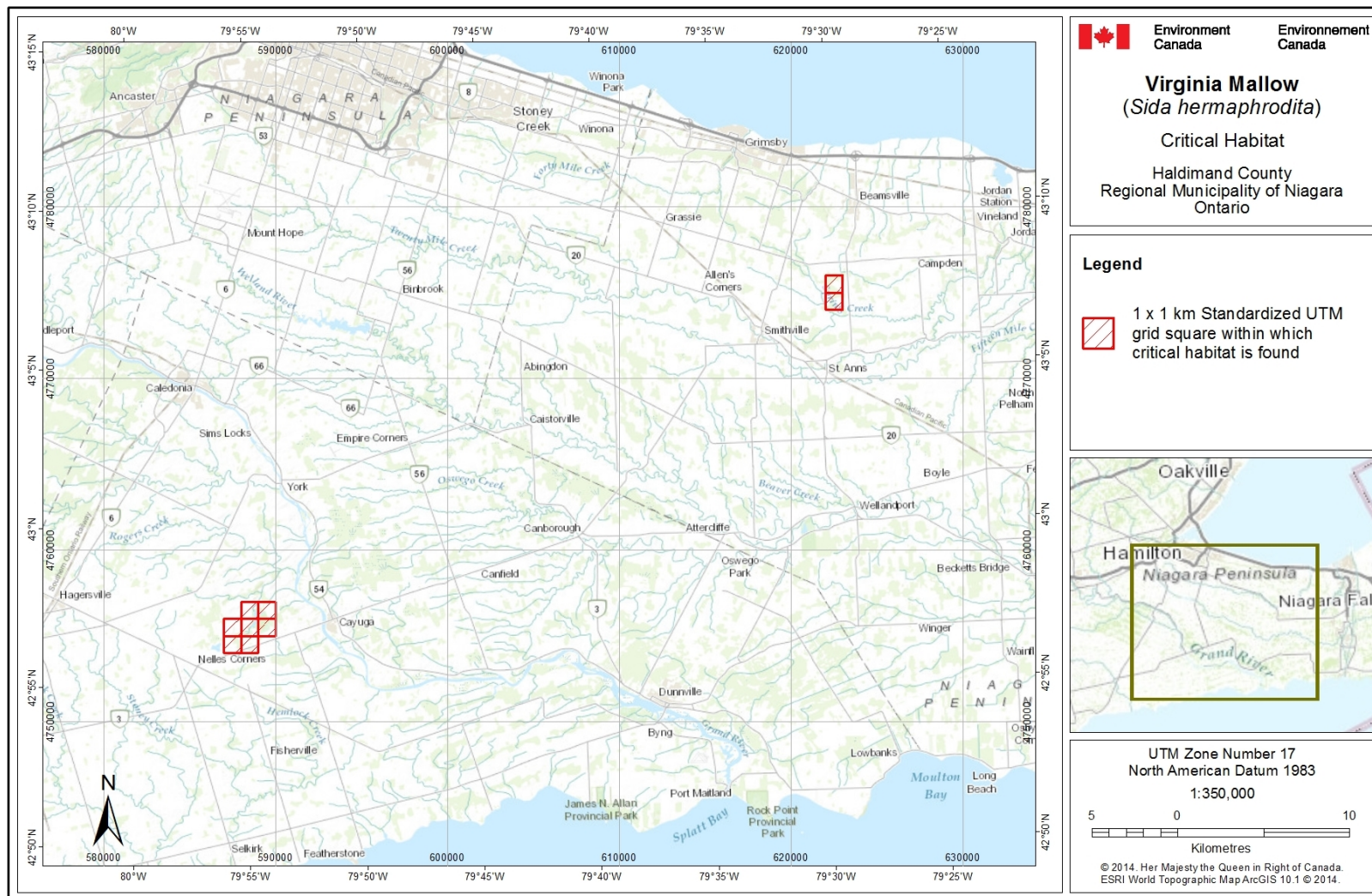


Figure 2. Grid squares that contain critical habitat for the Virginia Mallow in Canada, current to April 2014. Critical habitat for the Virginia Mallow occurs within these 1 x 1 km standardized UTM grid squares (red hatched outline), where the description of critical habitat is met.

Table 1. Grid squares that contain critical habitat for the Virginia Mallow in Canada, current to April 2014. Critical habitat for the Virginia Mallow occurs within these 1 x 1 km standardized UTM grid squares where the description of critical habitat is met.

Local population	1 x 1 km UTM Grid Square ID ¹	UTM Grid Coordinates ²		Estimated area of critical habitat (ha) ³	Land Tenure ⁴
		Easting	Northing		
1	17NH85_85	588000	4755000	43	Non-federal
	17NH85_86	588000	4756000		
	17NH85_95	589000	4755000		
	17NH85_96	589000	4756000		
	17NH85_74	587000	4754000		
	17NH85_75	587000	4755000		
	17NH85_84	588000	4754000		
2	17PH27_25	622000	4775000	6	Non-federal
	17PH27_24	622000	4774000		
			Total	~ 49	

¹Based on the standard UTM Military Grid Reference System (see <http://www.nrcan.gc.ca/earth-sciences/geography-boundary/mapping/topographic-mapping/10098>), where the first two digits represent the UTM Zone, the following two letters indicate the 100 x 100 km standardized UTM grid followed by two digits to represent the 10 x 10 km standardized UTM grid containing all or a portion of the critical habitat unit. This unique alphanumeric code is based on the methodology produced from the Breeding Bird Atlases of Canada (See <http://www.bsc-eoc.org/> for more information on breeding bird atlases).

²The listed coordinates are a cartographic representation of where critical habitat can be found, presented as the southwest corner of the 10 x 10 km standardized UTM grid square containing all or a portion of the critical habitat. The coordinates may not fall within critical habitat and are provided as a general location only.

³The area presented is a maximum extent of the area that contains critical habitat (rounded to the nearest 1 ha); the exact area of critical habitat would require field verification.

⁴Land tenure is provided as an approximation of the types of land ownership that exist where critical habitat has been identified and should be used for guidance purposes only. Accurate land tenure will require cross referencing critical habitat boundaries with surveyed land parcel information.

6.2 Activities Likely to Result in the Destruction of Critical Habitat

Understanding what constitutes destruction of critical habitat is necessary for the protection and management of critical habitat. Destruction is determined on a case by case basis. Destruction would result if part of the critical habitat was degraded, either permanently or temporarily, such that it would not serve its function when needed by the species. Destruction may result from a single activity or multiple activities at one point in time or from the cumulative effects of one or more activities over time (Government of Canada 2009). It should be noted that not all activities that occur in or near critical habitat are likely to cause its destruction.

Activities described in Table 2 include those likely to cause destruction of critical habitat for the species; however, destructive activities are not limited to those listed.

Table 2. Activities Likely to Destroy Critical Habitat of Virginia Mallow

Description of Activity	Description of Effect in Relation to Function Loss	Details of Effect
Construction of houses, other structures or roads, including removal of soils (e.g., expanding quarry operations)	<p>Results in the direct loss of critical habitat which the species relies upon for basic survival, successful seed germination and seedling establishment. In addition, construction of houses, other structures and roads, can alter natural drainage patterns that maintain suitable habitat for the Virginia Mallow.</p> <p>Direct removal of soil/substrate would render the habitat unsuitable for the Virginia Mallow by removing the biophysical attributes required by the species and may also alter natural drainage patterns (e.g., surface water drainage patterns).</p>	<p>If this activity were to occur within the bounds of critical habitat, effects would be direct and cumulative, at any time of the year, and would be highly likely to result in the destruction of critical habitat. Even the removal of a portion of the critical habitat could compromise the long-term sustainability of the population. Conversion of land outside of the bounds of critical habitat that alters the natural drainage patterns that maintain habitat for the Virginia Mallow may also result in the destruction of critical habitat.</p> <p>Use restricted to the surface of existing roadways/access roads and recreational trails would not result in the destruction of critical habitat.</p>
Alteration of natural drainage patterns and moisture levels (e.g., changes to local surface or ground water levels and alteration of adjacent water bodies) through activities such as dam installment or road construction	<p>Construction of roads and other infrastructure can impact drainage patterns and moisture levels within critical habitat. Alteration of drainage patterns and moisture levels can result in the destruction of critical habitat making the habitat unsuitable as Virginia Mallow habitat requires periodic flooding to maintain its suitability.</p> <p>In addition, changes to moisture levels and drainage patterns may allow for other species (including invasive species) to establish and create shaded conditions. These species may also compete with the Virginia Mallow for light, space and nutrients.</p>	Effects are direct and cumulative. This activity may occur within or outside the bounds of critical habitat, and may occur at any time of the year, to cause its destruction.

Introduction of invasive exotic plant species (e.g., non-native Common Reed)	Exotic species may render the habitat unsuitable for the Virginia Mallow by creating shaded conditions. Exotic species may compete with the Virginia Mallow for resources, such as light, space and nutrients, leading to a reduction in population size and possibly local extinctions.	Effects are direct and cumulative and may occur at any time of the year. This activity can occur within and nearby (e.g., spread of invasives into critical habitat) the Virginia Mallow's critical habitat to cause its destruction.
Site maintenance activities (e.g., spraying of herbicide, slashing or removal of vegetation)	<p>Site maintenance activities might prevent establishment of new plants by altering soil conditions through herbicide application(s) or, if heavy equipment is used, result in soil compaction, such that seeds cannot germinate or plants establish.</p> <p>Transportation of seeds on site maintenance equipment might result in the introduction of invasive exotic plant species. Disturbing native ground cover might also increase the ability of invasive plants to colonize areas within the Virginia Mallow critical habitat.</p>	<p>Effects are direct and cumulative and may occur at any time of the year. This activity must occur within the Virginia Mallow's critical habitat to cause its destruction (e.g., leaching of chemicals into critical habitat or spread of invasives into critical habitat).</p> <p>Pruning of shrubs or trees and removal of individual shrubs or trees for maintenance purposes that do not compact soil, alter soil conditions or allow for the establishment of invasive species would not result in the destruction of critical habitat.</p>

There are cases where an activity noted as having potential to destroy critical habitat may also improve or create habitat for the Virginia Mallow. For example, mowing may damage existing plants or prevent the establishment of new plants; however, late-season mowing (avoiding Virginia Mallow plants), to control woody shrubs and saplings, and vegetation removal may improve site conditions for the Virginia Mallow by providing open conditions with reduced competition from other plants. The same concept may be extended to herbicide application if performed at certain times of the year in an appropriate manner by a qualified individual for the purposes of habitat restoration/improvement.

7. Measuring Progress

The performance indicators presented below provide a way to define and measure progress toward achieving the population and distribution objectives. Every five years, success of recovery strategy implementation will be measured against the following performance indicators:

- the current abundance and distribution of all existing populations of Virginia Mallow in Canada have been maintained.

8. Statement on Action Plans

One or more action plans will be completed for the Virginia Mallow and posted on the Species at Risk Public Registry by December 2022.

9. Effects on the Environment and Other Species

A strategic environmental assessment (SEA) is conducted on all SARA recovery planning documents, in accordance with the [*Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals*](#)¹³. The purpose of a SEA is to incorporate environmental considerations into the development of public policies, plans, and program proposals to support environmentally sound decision-making.

Recovery planning is intended to benefit species at risk and biodiversity in general. However, it is recognized that strategies may also inadvertently lead to environmental effects beyond the intended benefits. The planning process based on national guidelines directly incorporates consideration of all environmental effects, with a particular focus on possible impacts on non-target species or habitats. The results of the SEA are incorporated directly into the strategy itself, but are also summarized below in this statement. This recovery strategy directly contributes to the goals and targets of the Federal Sustainability Development Strategy for Canada (FSDS). Specifically, it will help to restore populations of wildlife to healthy levels and maintain productive and resilient ecosystems with the capacity to recover and adapt (Goals 5 and 6 of the FSDS).

¹³ <http://www.ceaa.gc.ca/default.asp?lang=En&n=B3186435-1>

Virginia Mallow populations are located within the Carolinian Zone in Ontario's extreme southwest. The Carolinian Zone is one of the richest natural areas in Canada, containing a high diversity of habitat types, such as deciduous forest, prairie, alvar, shoreline and aquatic habitats, which are home for more than 125 species at risk (Kanter 2005). This area corresponds to less than 1% of Canada's land mass, and it is home for 25% of the country's human population. Many species at risk occur in Carolinian Zone's wetland habitats; management and protection actions that benefit the Virginia Mallow are expected to contribute to the diversity of Carolinian Zone ecosystem as a whole and benefit many of the species that inhabit this area.

Several studies have demonstrated that non-native Common Reed is a fast-growing invasive species, which causes severe damage by decreasing biodiversity and destroying habitat for other species, particularly in wet or moist habitats (Ontario Ministry of Natural Resources 2011). Non-native Common Reed is considered a threat for many species, including species at risk such as Virginia Mallow, Bent Spike-Rush, Pink Milkwort and Fowler's Toad. Contribution towards the control of non-native Common Reed as part of habitat management for the Virginia Mallow in open riparian habitats will benefit other species by promoting biodiversity and improving overall habitat conditions (Benoit and Askins 1999; Bickerton 2011; Ontario Ministry of Natural Resources 2011; Greenberg and Green 2013; Perez et al. 2013).

Some management activities, including prescribed burns and herbicides used to control invasive species, such as non-native Common Reed, have the potential to harm some species, at least in the short term. The ecological risks of such activities must be considered individually before undertaking them, in order to reduce possible negative effects. For example, the timing of management activities can be controlled (e.g., prescribed burning in the early spring or other suitable time periods) to minimize effects on amphibians, reptiles and/or insects.

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APPENDIX A: CONSERVATION RANKS OF VIRGINIA MALLOW (*Sida hermaphrodita*) IN CANADA AND THE UNITED STATES

Virginia Mallow (<i>Sida hermaphrodita</i>)				
Global (G) Rank	National (N) Rank (Canada)	Sub-national (S) Rank (Canada)	National (N) Rank (United States)	Sub-national (S) Rank (United States)
G3	N1	Ontario (S1)	N3	District of Columbia (SX) Indiana (S1) Kentucky (S2) Maryland (S1) Massachusetts (SNA) Michigan (SU) New Jersey (SNA) New York (SNA) Ohio (S3) Pennsylvania (S2) Tennessee (SH) Virginia (S1) West Virginia (S2)

Rank Definitions (NatureServe 2013a)

G3: Vulnerable - At moderate risk of extinction or elimination due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.

N1/S1: Critically Imperilled - At very high risk of extirpation in the jurisdiction (i.e., N - nation, or S - state/province) due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.

S2: Imperilled - At high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.

N3/S3: Vulnerable - At moderate risk of extirpation in the jurisdiction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.

SH: Possibly Extirpated - Known from only historical records but still some hope of rediscovery. There is evidence that the species or ecosystem may no longer be present in the jurisdiction, but not enough to state this with certainty. Examples of such evidence include (1) that a species has not been documented in approximately 20-40 years despite some searching and/or some evidence of significant habitat loss or degradation; (2) that a species or ecosystem has been searched for unsuccessfully, but not thoroughly enough to presume that it is no longer present in the jurisdiction.

SNA: Not Applicable - A conservation status rank is not applicable because the species or ecosystem is not a suitable target for conservation activities.

SU: Unrankable - Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

SX: Presumed Extirpated - Species or ecosystem is believed to be extirpated from the jurisdiction. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered. [Equivalent to "Regionally Extinct" in IUCN Red List terminology]

PART 2 - *Recovery Strategy for the Virginia Mallow (Sida hermaphrodita) in Ontario*, prepared by Holly J. Bickerton for the Ontario Ministry of Natural Resources

Virginia Mallow

(*Sida hermaphrodita*) in Ontario

Ontario Recovery Strategy Series

Recovery strategy prepared under the *Endangered Species Act, 2007*

February 2011

Natural. Valued. Protected.

About the Ontario Recovery Strategy Series

This series presents the collection of recovery strategies that are prepared or adopted as advice to the Province of Ontario on the recommended approach to recover species at risk. The Province ensures the preparation of recovery strategies to meet its commitments to recover species at risk under the Endangered Species Act, 2007 (ESA, 2007) and the Accord for the Protection of Species at Risk in Canada.

What is recovery?

Recovery of species at risk is the process by which the decline of an endangered, threatened, or extirpated species is arrested or reversed, and threats are removed or reduced to improve the likelihood of a species' persistence in the wild.

What is a recovery strategy?

Under the ESA, 2007, a recovery strategy provides the best available scientific knowledge on what is required to achieve recovery of a species. A recovery strategy outlines the habitat needs and the threats to the survival and recovery of the species. It also makes recommendations on the objectives for protection and recovery, the approaches to achieve those objectives, and the area that should be considered in the development of a habitat regulation. Sections 11 to 15 of the ESA, 2007 outline the required content and timelines for developing recovery strategies published in this series.

Recovery strategies are required to be prepared for endangered and threatened species within one or two years respectively of the species being added to the Species at Risk in Ontario list. There is a transition period of five years (until June 30, 2013) to develop recovery strategies for those species listed as endangered or threatened in the schedules of the ESA, 2007. Recovery strategies are required to be prepared for extirpated species only if reintroduction is considered feasible.

What's next?

Nine months after the completion of a recovery strategy a government response statement will be published which summarizes the actions that the Government of Ontario intends to take in response to the strategy. The implementation of recovery strategies depends on the continued cooperation and actions of government agencies, individuals, communities, land users, and conservationists.

For more information

To learn more about species at risk recovery in Ontario, please visit the Ministry of Natural Resources Species at Risk webpage at: www.ontario.ca/speciesatrisk

RECOMMENDED CITATION

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Cette publication hautement spécialisée Recovery strategies prepared under the Endangered Species Act, 2007, n'est disponible qu'en anglais en vertu du Règlement 411/97 qui en exempte l'application de la Loi sur les services en français. Pour obtenir de l'aide en français, veuillez communiquer avec Pamela Wesley au ministère des Richesses naturelles au 705-755-5217.

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DECLARATION

The recovery strategy for the Virginia Mallow was developed in accordance with the requirements of the *Endangered Species Act, 2007* (ESA). This recovery strategy has been prepared as advice to the Government of Ontario, other responsible jurisdictions and the many different constituencies that may be involved in recovering the species.

The recovery strategy does not necessarily represent the views of all of the individuals who provided advice or contributed to its preparation, or the official positions of the organizations with which the individuals are associated.

The goals, objectives and recovery approaches identified in the strategy are based on the best available knowledge and are subject to revision as new information becomes available. Implementation of this strategy is subject to appropriations, priorities and budgetary constraints of the participating jurisdictions and organizations.

Success in the recovery of this species depends on the commitment and cooperation of many different constituencies that will be involved in implementing the directions set out in this strategy.

RESPONSIBLE JURISDICTIONS

Ontario Ministry of Natural Resources
Environment Canada – Canadian Wildlife Service, Ontario

EXECUTIVE SUMMARY

Virginia Mallow (*Sida hermaphrodita*) is a tall, distinctive, perennial herb in the mallow family (Malvaceae). The species ranges across eastern North America and is globally rare (G3). It is considered extremely rare within the Great Lakes watershed at the northern edge of its range. There are only two populations known in Canada, both occurring in Ontario where the species has been listed as endangered under Ontario's *Endangered Species Act, 2007*. One lies in Haldimand County within a Conservation Area and is managed by the Grand River Conservation Authority. Another occurs within a licensed quarry and along a gas pipeline corridor in Niagara Region. There have been no documented declines at either location: the population has increased recently within Haldimand County, and is believed to be stable at the Niagara Region site.

Virginia Mallow grows in moist riparian areas and in floodplains. It grows in full sun and partial shade, and appears to be tolerant of a wide range of physical and chemical soil conditions. The species has been cultivated in the past and is most often found in disturbed habitats, such as along roadsides and other corridors. Seeds are thought to be dispersed by water. Although some populations throughout the species' range were likely adventive, both Ontario populations are believed to be native.

Virginia Mallow is limited by a narrow habitat preference for riparian and floodplain habitats, which have been developed and altered across eastern North America. In Ontario, dominant threats to Virginia Mallow in Ontario are habitat destruction, competition from non-native invasive species (e.g., European Common Reed) and site maintenance.

The recovery goal for this species is to protect and maintain all extant populations of Virginia Mallow in southern Ontario and to ensure the species' long-term persistence within its current range. Protection and recovery objectives are: to protect extant populations of Virginia Mallow; to regularly assess and report on the species' status at all sites and search suitable habitat for additional populations; to manage sites to reduce threats, and to address knowledge gaps, especially at the northern edge of the species' range. A table outlining specific approaches to achieve the objectives and recovery goal is included in this report.

It is recommended that the area prescribed as habitat in a regulation for Virginia Mallow include the contiguous Ecological Land Classification (ELC) ecosite polygon(s) (Lee et al. 1998) within which the species is found. If a population (including sub-populations) occupies more than one ecosite type, then all contiguous ecosite polygons should be included. Ecosites that are anthropogenic in origin (e.g., cultural meadows and thickets) may be prescribed as habitat. It is recommended that habitat be mapped for all sub-populations of this species, especially if this process engages landowners and land managers in the conservation of the species.

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1.0 BACKGROUND INFORMATION

1.1 Species Assessment and Classification

COMMON NAME: Virginia Mallow

SCIENTIFIC NAME: *Sida hermaphrodita*

SARO List Classification: Endangered

SARO List History: Endangered (March 2010)

COSEWIC Assessment History: Endangered (April 2010)

SARA Schedule 1: n/a

CONSERVATION STATUS RANKINGS:

GRANK: G3

NRANK: N1

SRANK: S1

The glossary provides definitions for the abbreviations above.

1.2 Species Description and Biology

Species Description

Virginia Mallow (*Sida hermaphrodita*) is a tall herbaceous perennial that can reach a height of one to three metres. The leaves, which are arranged alternately along the stem, have three to seven pointed, irregularly toothed lobes that resemble maple leaves. The central lobe of each leaf is characteristically elongated. Stems of Virginia Mallow plants may have small star-shaped hairs when young, but become smooth as they age (Gleason and Cronquist 1991). White flowers bloom in stalked clusters from the upper leaf axils (Spooner et al. 1985). The flowers are “perfect” (i.e., have both male and female parts) and have five petals, each about eight mm long (Gleason and Cronquist 1991). Detailed species descriptions, taxonomic keys, and technical illustrations can be found in Gleason and Cronquist (1991) and Holmgren (1998).

This species is unusual and distinctive within the mallow family (Malvaceae) and the genus *Sida*. There are no similar species growing in Canada with which this species might easily be confused.

Species Biology

All scientific publications identified below describe studies of American populations of Virginia Mallow. No research on the species’ biology published to date has been carried out on Canadian populations, and it is possible that significant differences may exist in the Canadian populations at the northern limit of the species’ range. However, the

research below is outlined because it represents the best available scientific study to date on Virginia Mallow.

At sites in Ohio and West Virginia, the perennial shoots of Virginia Mallow emerge from the soil in late April or early May, from buds at the base of the previous year's stems (Spooner et al. 1985). Plants can also produce large numbers of rhizomes, and many populations appear to be clonal. This makes the number of individuals in a population difficult to discern (COSEWIC in press).

In the American populations studied, plants began flowering in early August and continued until a hard frost (Spooner et al. 1985). No information on pollinators of this species could be found. However, flowers of the closely related Glade Mallow (*Napaea dioica*) were pollinated mostly by insects in the orders Hymenoptera (ants, bees, and wasps), Diptera (flies) and Hemiptera (true bugs) (Iltis 1963).

Fruiting generally occurs in September and October (NatureServe 2009). Large Virginia Mallow plants, at least those from studied populations in Ohio and West Virginia, may produce several thousand seeds, and germination studies have shown that most of these are viable (Spooner et al. 1985). However, pre-treatment of the hard seeds by mechanical scarification or soaking in hot water is required to increase germination rates in cultivation (Kujawski et al. 1997). New plants have also been successfully propagated from rhizomes (Kujawski et al. 1997).

Seeds are released throughout the winter and it is suspected that they are dispersed by water, perhaps in the spring. The age at which plants first flower in their natural habitat is not known, but garden-grown plants have produced seeds in their first year (Spooner et al. 1985). Generation time in nature is also not well understood, but cultivated plants can live up to 15 years (Krzaczek et al. 2006 cited in COSEWIC in press).

1.3 Distribution, Abundance and Population Trends

Virginia Mallow is known from two locations in Ontario: one within a Conservation Area in Haldimand County, and the other from a quarry and adjacent hydro corridor in the Niagara Region (Figure 1). The two locations are approximately 35 km apart. The actual area occupied by the species is less than one square kilometre. There are no documented declines at either population. Unless otherwise referenced, the population information below was obtained from the COSEWIC status report (in press).



Figure 1. Known distribution of Virginia Mallow in Ontario (M. Thompson-Black 2009).

Due to the clonal nature of the species and the difficulty in identifying individuals, stem counts were used to assess abundance at both Ontario sites. The population in Haldimand County appears to have increased between field visits in 2001 and 2010. In 2001, only one sub-population was known, with a total population estimated at 83 stems. Two sub-populations were documented in 2008, with an estimated total stem count of 2300 stems. In July 2010, ecologists from the GRCA estimated the total size of the Haldimand County population by counting the number of stems within individual patches. At least 24 individual patches were identified, ranging from a few stems to greater than 1000 stems. The estimated total population size is over 5000 stems (T. Zammit, pers. comm. 2010).

The recent increase in population may be due to the 2006 decommissioning of a reservoir at the site. The former reservoir was dewatered in order to restore a coldwater stream running through the property, and this may have created new habitat for Virginia Mallow to colonize (T. Zammit pers. comm. 2010). Most sub-populations occur within a large wetland and it is possible that other small sub-populations are also present.

The second population in Niagara Region is much smaller, totaling 210 stems in two sub-populations. Trends are not possible to assess, since stem counts were not made during the earlier 2001 site visit. However, the number of clumps remained constant, and the population as a whole appeared to be stable. This population occurs partly within a licensed quarry and along a pipeline corridor.

Virginia Mallow is also rare and local throughout its North American range (NatureServe 2009). The species' distribution is centred in the Appalachian Mountains and ranges west to the Mississippi watershed, east to the Atlantic, and north to the Great Lakes watershed, where natural populations are considered "extremely rare" (Spooner et al. 1985; also see COSEWIC in press). Although the species can be locally common along floodplains in Ohio, West Virginia and Kentucky, many American populations throughout the range are being lost to development, flood control, and maintenance (e.g., mowing, herbicide use) (NatureServe 2009).

Virginia Mallow has been cultivated in North American gardens since the 18th century (Iltis 1963). Some populations throughout the species' range are believed to have been introduced (NatureServe 2009). Although botanical opinion has been divided on the origin of Virginia Mallow in Canada (see, for example, Brouillet et al., 2006; NatureServe 2009), both Ontario populations are believed to be native.

1.4 Habitat Needs

Virginia Mallow is a species of riparian areas, floodplains and bottomlands. Although it prefers open, sunny settings, the species is also found in partial shade (Thomas 1979; NatureServe 2009). Periodic flooding occurs at many sites (Thomas 1979). Throughout its range, Virginia Mallow occurs in many disturbed habitats, such as along railroad banks, roadsides and infrastructure corridors, especially where these intersect a floodplain or riparian area (NatureServe 2009). Because Virginia Mallow appears to require disturbance due to periodic flooding within openings along floodplains, NatureServe (2009) characterizes the species as having a "very narrow habitat specificity."

Soils do not appear to limit the distribution of this species, which grows in a wide range of soil textures (silt loam, sandy clay loam, clay loam) and pH values (5.4 to 7.5), with a medium to high organic content (Spooner et al. 1985). Thomas (1979) found at his American study sites that soil structure was loose, allowing for good aeration. Given its tolerance for disturbance and for a wide range of soil conditions, it is not entirely clear why Virginia Mallow is absent from many apparently suitable habitats.

The dominant vegetation at both Ontario sites has been generally described in COSEWIC (in press) and further described by ecologists at the GRCA. Most plants in the Haldimand County population occur within a Forb Mineral Meadow Marsh (MAM 2-10) marsh dominated by Broad-leaved Cattail (*Typha latifolia*), European Common Reed (*Phragmites australis* ssp. *australis*), Purple Loosestrife (*Lythrum salicaria*),

Jewelweed (*Impatiens capensis*), Teasel (*Dipsacus fullonum*) Bulrushes (*Scirpus* spp.) and Rushes (*Juncus* spp.) (T. Zammit, pers.comm., 2010). Riparian vegetation is also present at the site and is dominated by Black Walnut (*Juglans nigra*), Red-osier Dogwood (*Cornus stolonifera*) and Staghorn Sumac (*Rhus typhina*). The habitat at this site appears relatively natural, although much of the population occurs next to the outflow of a reservoir, indicating that the area has been disturbed in the past.

The second Ontario population occurs in a much more disturbed area, on shallow soils over limestone. One sub-population occurs along a rarely used quarry access road. The second sub-population occurs along a gas pipeline corridor dominated by open meadow species such as Teasel (*Dipsacus fullonum*), Queen Anne's Lace (*Daucus carota*), Grey Dogwood (*Cornus racemosa*), Staghorn Sumac and goldenrods (*Solidago* spp.) (COSEWIC in press). The shallow limestone offers poor drainage and the area is thought to be moist to wet in spring, but dry though the balance of the season.

1.5 Limiting Factors

To some degree, Virginia Mallow is limited by its narrow habitat preference for increasingly rare riparian and floodplain habitats within the heavily developed Carolinian zone in Canada and the United States. Other biological factors that were previously thought to limit the species (i.e., low germination rates and specific soil requirements) have now been largely dismissed (Spooner et al. 1985; Kujawski et al. 1997). However, because Virginia Mallow often does not occupy apparently suitable habitat, it is possible that other limiting factors may be identified in the future.

1.6 Threats to Survival and Recovery

Habitat destruction

Habitat destruction is probably the primary threat to this species. Historically, riverine terraces and floodplains have been developed for both housing and agriculture, and altered to control flooding. In 2008, the area next to one Ontario sub-population was being prepared for aggregate extraction: clearing and topsoil removal had occurred within five metres of plants. However, the Virginia Mallow plants at this quarry site occur next to an access road (possibly along a road allowance) where no quarrying is planned, and are not believed to be under immediate threat (M. Thompson-Black pers.comm. 2010).

Invasive species

Invasive species threaten Virginia Mallow throughout its range. At the Haldimand County site, European Common Reed has increased in abundance with the lowering of water levels related to the decommissioning of the former dam and may be competing with Virginia Mallow for light, space and nutrients. Although it does not occupy the same area as Virginia Mallow at the moment, it is believed to be spreading (T. Zammit pers.comm. 2010). Purple Loosestrife (*Lythrum salicaria*) was found in 2010 to be more

common within the former reservoir than previously thought. However, it does not appear to be affecting Virginia Mallow plants.

Site maintenance

Site maintenance may threaten the species at both Ontario populations. The population in Haldimand County occurs next to a grassy picnic area that is maintained by the GRCA, and mowing occurs to the base of plants (COSEWIC in press). It is possible that this damages existing plants or prevents further establishment of new plants. Regular maintenance (slashing, cutting of vegetation) along the gas pipeline corridor may also be detrimental to the species, especially if herbicides are used to keep vegetation low (COSEWIC in press). However, some populations in the United States flourish in regularly disturbed areas, especially where late-season mowing controls woody shrubs and saplings, allowing Virginia Mallow to set seed (NatureServe 2009).

Although Virginia Mallow has been popular as a garden plant in the past (Iltis 1963), collection is not believed to pose a threat to the species.

1.7 Knowledge Gaps

Population and Habitat Status

Sites have been surveyed sporadically only since 2001, and a longer-term understanding of both populations would be beneficial. The suitability of habitat on adjacent properties is also unknown, and it is considered likely that there may be additional populations downstream from the Haldimand County site (M. Thompson-Black pers. comm. 2010). Current threats at the Niagara region quarry site require clarification.

Description of Ontario Habitat

Vegetation communities for the two extant Ontario sites have not been described to the ecosite level using the Ecological Land Classification (ELC) methods (Lee et al. 1998). This information would be useful for consideration in developing a habitat regulation for the species under the ESA.

Species Ecology

Several fundamental ecological questions remain regarding this globally rare species. For example, the demographics of Virginia Mallow (age of plants at first flowering, generation time) are not well understood. The minimum viable population size has not been identified, and it is not known whether Ontario populations are likely to persist indefinitely. Little published information on the pollination biology (e.g. pollinators, self-fertilization studies) of the species could be found. Because many areas of apparently suitable habitat remain unoccupied by this species, as-yet unidentified ecological factors may be limiting its establishment. Research on the species at the northern edge of Virginia Mallow's range in the Great Lakes basin would be especially beneficial, and could assist in population management and recovery.

1.8 Recovery Actions Completed or Underway

Staff from the Ministry of Natural Resources (MNR) have completed surveys and informal monitoring at the Haldimand County site (K. Beriault pers. comm. 2010). Ecologists at the GRCA also monitor this population and completed population surveys of Virginia Mallow in July 2010.

In summer 2010, the GRCA also began controlling European Common Reed in the former reservoir by cutting stems before flowering. The success of this method will be monitored in the future. Conservation Authority staff are also in the process of developing an invasive species strategy for this and other key properties in the watershed (T. Zammit pers. comm. 2010).

2.0 RECOVERY

2.1 Recovery Goal

The goal of this recovery strategy is to protect and maintain all extant populations of Virginia Mallow in southern Ontario and to ensure the species' long-term persistence within its current range.

2.2 Protection and Recovery Objectives

Table 1. Protection and recovery objectives

No.	Protection or Recovery Objective
1	Protect extant populations of Virginia Mallow.
2	Regularly assess and report on the species' status at all known sites, and search suitable habitat for additional populations.
3	Manage sites to reduce threats.
4	Address knowledge gaps, especially at the northern edge of the species' range.

2.3 Approaches to Recovery

Table 2. Approaches to recovery of the Virginia Mallow in Ontario

Relative Priority	Relative Timeframe	Recovery Theme	Approach to Recovery	Threats or Knowledge Gaps Addressed
1. Protect extant populations of Virginia Mallow.				
Critical	Short-term	Protection	1.1 Define the extent of existing populations and clarify land ownership and management	<ul style="list-style-type: none"> • All threats • Description of Ontario habitat
Necessary	Short-term	Protection	1.2 With landowners, consider options for long-term protection at both sites (e.g., easements or securement for private lands, additional designations or zoning on public lands if considered necessary)	<ul style="list-style-type: none"> • Habitat destruction
Necessary Beneficial	Short-term	Protection, Education and Outreach	1.3 Develop a habitat regulation for Virginia Mallow under the ESA <ul style="list-style-type: none"> – Work with landowners to identify and map habitat at both sites using Ecological Land Classification Methods 	<ul style="list-style-type: none"> • Habitat destruction • Description of Ontario habitat
2. Regularly assess and report on the species' status at all sites.				

Recovery Strategy for the Virginia Mallow in Ontario

Relative Priority	Relative Timeframe	Recovery Theme	Approach to Recovery	Threats or Knowledge Gaps Addressed
<i>Necessary</i>	<i>Ongoing</i>	Inventory, Monitoring and Assessment	2.1 Monitor extant sites: – Develop a standard monitoring approach (methods, timing) and complete regular monitoring	• Population and habitat status
<i>Beneficial</i>	<i>Long-term</i>	Education and Outreach	2.2 Inform adjacent landowners, naturalists and local consultants of the species' presence to increase the likelihood of reports of new populations.	• Population and habitat status
<i>Beneficial</i>	<i>Ongoing</i>	Inventory, Monitoring and Assessment	2.3 Identify areas of potentially suitable habitat and complete surveys	• Population and habitat status
3. Manage sites to reduce threats.				
Critical	Long-term	Management	3.1 Control invasive species that threaten Virginia Mallow – Develop and implement invasive species management plans for Haldimand County site – Control and monitor European Common Reed at the Haldimand County site – Control other invasive species if necessary	• Invasive species
Critical	Long-term	Management, Education and Outreach, Research	3.2 Manage sites to protect populations – Clarify landownership and land management for both Niagara sub-populations – Work with landowners and land managers at both sites to identify current site management practices, and develop guidelines to protect plants at all sites – Monitor population(s) following any changes to site management and adapt methods if necessary	• Site management
4. Address knowledge gaps, especially at the northern edge of the species' range.				

Recovery Strategy for the Virginia Mallow in Ontario

Relative Priority	Relative Timeframe	Recovery Theme	Approach to Recovery	Threats or Knowledge Gaps Addressed
Necessary	Long-term	Research	4.1 Undertake research to address many remaining questions regarding the species' ecology: <ul style="list-style-type: none"> – Species demographics – Minimum viable population requirements – Genetic structure and risk of inbreeding depression (if any) – Limiting factors 	<ul style="list-style-type: none"> • Species Ecology

Supporting Narrative

Population enhancement and site restoration at the two known Virginia Mallow populations is not currently considered necessary. Although the number of populations is extremely limited, both are regarded as naturally occurring. Of the two Ontario populations, one has recently increased, and the other appears to be stable (COSEWIC in press, T. Zammit, pers.comm.. 2010).

It is not known whether the current number of plants at the two Ontario populations will be sufficient to permit the Virginia Mallow's long-term viability (see Knowledge Gaps). However, until further information is available on minimum viable population size, the priority for recovery of Virginia Mallow is to protect and monitor extant sites.

2.4 Area for Consideration in Developing a Habitat Regulation

Under the ESA, a recovery strategy must include a recommendation to the Minister of Natural Resources on the area that should be considered in developing a habitat regulation. A habitat regulation is a legal instrument that prescribes an area that will be protected as the habitat of the species. The recommendation provided below by the author will be one of many sources considered by the Minister when developing the habitat regulation for this species.

It is recommended that the area prescribed as habitat in a regulation for Virginia Mallow include the contiguous Ecological Land Classification (ELC) ecosite polygon(s) (Lee et al. 1998) within which natural populations of the species are found. If a population (including sub-populations) occupies more than one ecosite type, then all contiguous ecosite polygons should be included. Basing the prescribed area on the surrounding vegetation community (rather than on an arbitrary distance from the population) is preferred, as it will help to maintain the ecological conditions required for the persistence and long-term sustainability of Virginia Mallow. However, it is recommended that this ecosite approach to identifying habitat be tested prior to regulation.

Because Virginia Mallow may establish in disturbed areas, ecosites that are anthropogenic in origin (e.g., Cultural Meadows and Cultural Thickets) may also be included in a habitat regulation.

Areas containing Virginia Mallow plants that are believed to be horticultural specimens (i.e., those planted in landscaped gardens) should not be prescribed as habitat in a regulation.

GLOSSARY

Carolinian Zone¹: The forest zone found in the most southerly parts of Ontario (immediately north of Lake Erie). It is characterized by deciduous trees, and harbours many species at or close to their northern distribution limits.

Clonal²: a group of genetically identical individuals, derived from a single parent as a result of asexual reproduction (e.g. spreading rhizomes in plants)

Committee on the Status of Endangered Wildlife in Canada (COSEWIC): The committee responsible for assessing and classifying species at risk in Canada.

Committee on the Status of Species at Risk in Ontario (COSSARO): The committee established under section 3 of the *Endangered Species Act, 2007* that is responsible for assessing and classifying species at risk in Ontario.

Conservation status rank: A rank assigned to a species or ecological community that primarily conveys the degree of rarity of the species or community at the global (G), national (N) or subnational (S) level. These ranks, termed G-rank, N-rank and S-rank, are not legal designations. The conservation status of a species or ecosystem is designated by a number from 1 to 5, preceded by the letter G, N or S reflecting the appropriate geographic scale of the assessment. The numbers mean the following:

- 1 = critically imperilled
- 2 = imperilled
- 3 = vulnerable
- 4 = apparently secure
- 5 = secure

Endangered Species Act, 2007 (ESA): The provincial legislation that provides protection to species at risk in Ontario.

Perfect flower²: A flower having both stamens (male parts) and carpels (female parts).

Rhizome²: A horizontal underground stem.

Species at Risk Act (SARA): The federal legislation that provides protection to species at risk in Canada. This act establishes Schedule 1 as the legal list of wildlife species at risk to which the SARA provisions apply. Schedules 2 and 3 contain lists of species that at the time the act came into force needed to be reassessed. After species on Schedule 2 and 3 are reassessed and found to be at risk, they undergo the SARA listing process to be included in Schedule 1.

¹ Source: Wake, W. (1997)

² Source: Raven et al. (1992) (some definitions with minor modifications)

Species at Risk in Ontario (SARO) List: The regulation made under section 7 of the *Endangered Species Act, 2007* that provides the official status classification of species at risk in Ontario. This list was first published in 2004 as a policy and became a regulation in 2008.

Scarification²: the process of cutting or softening a seed coat to hasten germination.

² Source: Raven et al. (1992) (some definitions with minor modifications)

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PART 3 - *Virginia Mallow: Ontario Government Response Statement*, prepared by the Ontario Ministry of Natural Resources

Virginia Mallow

Ontario Government Response Statement



Photo: Melinda Thompson-Black

PROTECTING AND RECOVERING SPECIES AT RISK IN ONTARIO

Species at risk recovery is a key part of protecting Ontario's biodiversity. Biodiversity – the variety of living organisms on Earth – provides us with clean air and water, food, fibre, medicine and other resources that we need to survive.

The *Endangered Species Act, 2007* (ESA) is the Government of Ontario's legislative commitment to protecting and recovering species at risk and their habitats. As soon as a species is listed as extirpated, endangered or threatened under the ESA, it is automatically protected from harm or harassment. Also, immediately upon listing, the habitats of endangered and threatened species are protected from damage or destruction.

Under the ESA, the Ministry of Natural Resources (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.

GOVERNMENT RESPONSE STATEMENTS

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 recovery strategy for Virginia Mallow was completed on February 18, 2011 (http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/STDPROD_075655.html).

The response statement is the government's policy response to the scientific advice provided in the recovery strategy. In addition to the strategy, input on the response statement was requested from stakeholders, other jurisdictions, Aboriginal communities and members of the public. The statement reflects the best available traditional, local and scientific knowledge at this time 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.

Virginia Mallow is a perennial flowering herb that can reach 1-3 m in height. Flowers are made up of five white petals (about 8 mm long) that grow in a clustered formation.

MOVING FORWARD TO PROTECT AND RECOVER VIRGINIA MALLOW

Virginia Mallow 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 that habitat without authorization. Such authorization would require that conditions established by the Ministry be met.

Virginia Mallow only occurs in Ontario within a Conservation Area in Haldimand County and at a quarry and adjacent hydro corridor in the Niagara Region. Dominant threats to Virginia Mallow in Ontario are habitat destruction, competition from non-native invasive species (e.g., European Common Reed) and site maintenance.

The government's goal for the recovery of Virginia Mallow is to protect and maintain all existing populations of Virginia Mallow in southern Ontario and to ensure the species' long-term persistence within its current range.

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 Virginia Mallow, the government will directly undertake the following actions:

- Educate other agencies and authorities involved in planning and environmental assessment processes on the protection requirements under the ESA.
- Encourage the submission of Virginia Mallow observation 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.
- Protect Virginia Mallow and its habitat through the ESA. Develop and enforce a regulation identifying the specific habitat of the species.
- Support conservation, agency, municipal and industry partners to undertake activities to protect and recover Virginia Mallow. Support will be provided through funding, agreements, permits (including conditions) and advisory services.
- Establish and communicate annual priority actions for government support across multiple species in order to encourage collaboration and reduce duplication of efforts.

GOVERNMENT-SUPPORTED ACTIONS

The government endorses the following actions as being necessary for the protection and recovery of Virginia Mallow. Actions identified as “high” will be given priority consideration for funding or for authorizations under the ESA. The government will focus its support on these high-priority actions over the next five years.

Focus Area:	Protection and Management
Objective:	Protect and reduce threats to extant populations of Virginia Mallow and its habitat.
	Actions: <ol style="list-style-type: none">1. (HIGH) Implement the Ministry’s best management practices for the control of European Common Reed within sensitive habitats.2. Develop and provide information to land owners and land managers to increase awareness on the protection of the species and potential stewardship opportunities.3. As opportunities arise, support the securement of lands that contain Virginia Mallow populations through existing land securement and stewardship programs.
Focus Area:	Inventory and Monitoring
Objective:	Regularly assess all known sites and search suitable habitat for additional populations.
	Actions: <ol style="list-style-type: none">4. (HIGH) Develop and implement a standard monitoring program to detect changes in the species’ distribution and abundance.5. Conduct surveys in areas of potentially suitable habitat to determine if there are any additional populations of this species.
Focus Area:	Research
Objective:	Improve knowledge of Virginia Mallow ecology.
	Actions: <ol style="list-style-type: none">6. Undertake research related to species demographics, genetics, minimum viable population requirements, and factors that may be limiting the species’ recovery.

IMPLEMENTING ACTIONS

Financial support for the implementation of actions may be available through the Species at Risk Stewardship Fund, Species at Risk Farm Incentive Program or Community Fisheries and Wildlife Involvement 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 the Virginia Mallow.

ACKNOWLEDGEMENT

We would like to thank all those who participated in the development of the "Recovery Strategy for the Virginia Mallow 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 MNR district office

Contact the Natural Resources Information Centre

1-800-667-1940

TTY 1-866-686-6072

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