PROPOSED

Species at Risk Act
Action Plan Series

Action Plan for the Forked Three-awned Grass (*Aristida basiramea*) in Québec

Forked Three-awned Grass

2014

Canada

Recommended citation:

Environment Canada. 2014. Action Plan for the Forked Three-awned Grass (*Aristida basiramea*) in Québec [Proposed]. *Species at Risk Act* Action Plan Series, Environment Canada, Ottawa, iv + 19 pp.

For copies of the action plan, or for additional information on species at risk, including COSEWIC Status Reports, residence descriptions, recovery strategies, and other related recovery documents, please visit the Species at Risk Public Registry[1].

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Également disponible en français sous le titre :
« Plan d'action pour l'aristide à rameaux basilaires (*Aristida basiramea*) au Québec [Proposition] »

ISBN
Catalogue no.

[1] http://www.registrelep.gc.ca/default_e.cfm

Preface

Federal, provincial and territorial government signatories under the Accord for the Protection of Species at Risk (1996)[2] 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, ch. 29) (SARA), the federal competent ministers are responsible for the preparation of action plans for species listed as Extirpated, Endangered, and Threatened for which recovery has been deemed feasable. They are also required to report on progress five years after the publication of the final document in the SAR Public Registry.

Under SARA, one or more action plan(s) provides the detailed recovery planning that support the strategic direction set out in the recovery strategy for the species. The plan outlines what needs to be done to achieve the population and distribution objectives (previously referred to as recovery goals and objectives) identified in the recovery strategy, including the measures to be taken to address the threats and monitor the recovery of the species, as well as the proposed measures to protect critical habitat that has been identified for the species. The action plan also includes an evaluation of the socio-economic costs of the action plan and the benefits to be derived from its implementation. The action plan is considered one of a series of documents that are linked and should be taken into consideration together. Those being the COSEWIC status report, the recovery strategy, and one or more action plans.

The Minister of the Environment and the Minister responsible for the Parks Canada Agency are the competent ministers under SARA for the Forked Three-awned Grass and have prepared this action plan to implement the recovery strategy, as per section 47 of SARA. To the extent possible, it has been prepared in cooperation with the Government of Quebec (Ministère du Développement durable, de l'Environnement, de la Faune et des Parcs) in accordance with subsection 48(1) of SARA.

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 and actions set out in this action plan and will not be achieved by Environment Canada, the Parks Canada Agency, or any other jurisdiction alone. All Canadians are invited to join in supporting and implementing this action plan for the benefit of the Forked Three-awned Grass and Canadian society as a whole.

Implementation of this action plan is subject to appropriations, priorities and budgetary constraints of the participating jurisdictions and organizations.

[2] http://www.ec.gc.ca/media_archive/press/2001/010919_b_e.htm

Acknowledgements

This action plan was developed by Vincent Carignan and Matthew Wild (Environment Canada, Canadian Wildlife Service – Quebec Region) with the collaboration of Patrice Laliberté (Nature Conservancy of Canada). The following individuals contributed to improving the text: Alain Branchaud and Karine Picard (Environment Canada, Canadian Wildlife Service – Quebec Region); Charles Latour and Marjorie Mercure,[3] and the recovery implementation group for dune environment plants in southern Quebec, consisting of Caroline Bélair and Carine Deland (Nature Conservancy of Canada), André Sabourin (consulting botanist), Patricia Désilets (Ministère du Développement durable, de l'Environnement, de la Faune et des Parcs du Québec) and Jacques Brisson (Université de Montréal). Ken Tuininga, Marie-Claude Archambault, Angela Darwin, Krista Holmes, Rachel deCatanzaro and Madeline Austen (Environment Canada, Canadian Wildlife Service – Ontario Region) were consulted in order to align the Quebec and Ontario action plans as much as possible.

[3] Formerly of Environment Canada, Canadian Wildlife Service – Quebec Region.

Executive Summary

This action plan complements the Recovery Strategy for the Forked Three-awned Grass (*Aristida basiramea*) in Canada, published in 2007. The proposed recovery measures seek to implement the broad strategies and approaches to recovery set out in the recovery strategy for populations and suitable habitat in Quebec. A separate action plan will be prepared for populations and suitable habitat in Ontario.

Given that the critical habitat of the species was not identified in the recovery strategy, this action plan identifies the critical habitat for the Quebec populations. This habitat corresponds to all suitable habitat within sandy deposits and exposed sandstone outcroppings in the areas where the species has been found.

The critical habitat identified in this action plan is located entirely on non-federal land. Proposed measures to protect critical habitat are presented in section 1.3.

A schedule that lays out the implementation priorities for the recovery measures addresses all the general approaches recommended in the recovery strategy for Quebec populations. These measures cover four general strategies: 1) stewardship and management of the species and its suitable habitat, 2) surveys and monitoring, 3) research, and 4) communication and awareness.

A socio-economic cost-benefit evaluation for implementing this action plan is presented. Moderate social and economic impacts and some potential land-use constraints are expected, especially with regard to quarry and sandpit operations. The direct implementation costs are estimated to be close to $1,200,000 for the 2014–2019 period.

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1. Recovery Actions

1.1 Context and Scope of the Action Plan

The Forked Three-awned Grass (*Aristida basiramea*) is an annual grass, 30 to 60 cm high, that grows in tufts (COSEWIC 2002). It is found in sandy, acidic, dry and bare environments, as well as on exposed sandstone outcroppings (Sabourin 2010), but can also grow in roadside ditches and abandoned fields (COSEWIC 2002). The species has been listed as Endangered in Schedule 1 of the *Species at Risk Act* (SARA) since 2005. In Quebec, it has been designated as Threatened pursuant to the *Act respecting threatened or vulnerable species* since 2010, and up-to-date data are available from the Centre de données sur le patrimoine naturel du Québec (CDPNQ).

At the time of publication of the *Recovery Strategy for the Forked Three-awned Grass (*Aristida basiramea*) in Canada* (Jones 2007), five populations of about 120 000 individuals were found: four in Ontario and one in Quebec (Figure 1). More recent surveys (NCC 2008; Sabourin 2010; P. Désilets, personal communication; A. Sabourin, personal communication 2012) indicate that Canada is home to at least 19 populations (3 million individuals), including 11 populations south of Ontario's Georgian Bay and eight[4] in southwestern Quebec (Table 1). This action plan applies only to Quebec populations; Ontario populations are addressed in a different action plan.

[4] CDPNQ (2012) considers that the Cazaville location is home to six different populations as opposed to a single population as mentioned in the recovery strategy. There are also two populations in the Ormstown location, one of which was found in the summer of 2012.

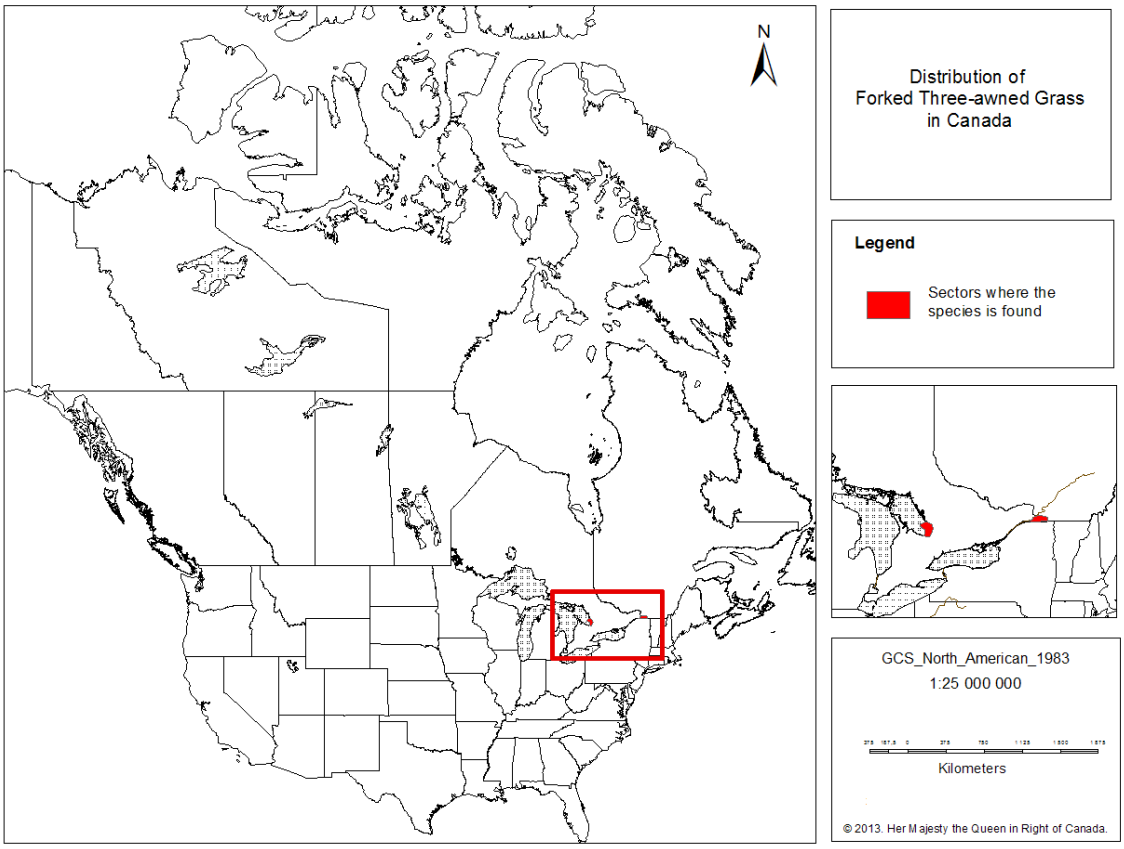

Figure 1. Known distribution range of the Forked Three-awned Grass in Canada.

Table 1. Description of Forked Three-awned Grass populations in Quebec (CDPNQ 2012).

Locality	Population (CDPNQ no.)	Described in Recovery Strategy?	Number of Individuals or Density	Type of Habitat
Cazaville	Saint-Anicet (15103)	Yes	Several thousands	Old quarries, sandy openings and an old field
	Saint-Anicet (15104)	Yes	Several hundreds	Along a trail adjacent to a red pine plantation
	Saint-Anicet (15105)	Yes	Average density	Old sandpits, relatively clear sandy openings
	Saint-Anicet (15106)	Yes	Average density	Old sandpit and sandy wildland, along the sides of trails and roads
	Godmanchester (15107)	Yes	Unknown	Along the road
	Godmanchester (15108)	Yes	Average density	Inactive quarry area and opening along an all-terrain vehicle trail

Ormstown	Ormstown (20263)	No	Over 1000	Sandstone outcroppings along a road
	Ormstown (to be determined)	No	Over 40 000	Sandstone outcroppings along a road and all-terrain vehicle trails

Threats to the Forked Three-awned Grass include sand extraction, garbage dumping, all-terrain vehicle use, plant succession, conifer planting, invasive species, agricultural activities and subdivision development. The limited nature of its habitat and the absence of certain ecological processes (or natural disturbances) are limiting factors.

The objective of the action plan for the Forked Three-awned Grass is to implement the recovery strategy, whose goal is to maintain self-sustaining populations of *Aristida basiramea* in all the areas where this species exists in an indigenous state in Canada. This is in addition to the conservation plan for the Forked Three-awned Grass published by the Government of Quebec, in which six of the seven populations[5] in the province are identified as being priority species conservation targets (Désilets et al. 2012). The Nature Conservancy of Canada has also developed a conservation plan for the Cazaville dunes and the Forked Three-awned Grass, which will be updated in the coming years (NCC 2008).

The recovery strategy provides more details on the strategic direction and approaches for the recovery of the species, as well as on the species and the factors threatening it.

1.2 Critical Habitat

The critical habitat of the Forked Three-awned Grass is identified in this action plan and is considered sufficient to achieve the population and distribution objectives[6] in Quebec.

1.2.1 Identification of the species' critical habitat

The critical habitat of the Forked Three-awned Grass is identified as all suitable habitat within sandy deposits and exposed sandstone outcroppings in areas where the species has been found in Quebec. The biophysical characteristics of the suitable habitat for the species include the following:

1) Dry environments with either superficial sandy deposits[7] (e.g. dry herbaceous prairies, open dunes, clearings, sparce pine stands, uncultivated fields) that mark the Champlain Sea retreat in the postglacial era, or superficial deposits on exposed sandstone outcroppings [8] (e.g. dry, shortgrass prairie, bryophytes and lichen of the genus *Cladina*; Désilets et al. 2012)

[5] The second population in Ormstown had not yet been found when the provincial conservation plan was published.
[6] The previous recovery strategy format uses the term "recovery goal."
[7] PQ07 Beauharnois and Huntingdon survey from the soil database http://www.irda.qc.ca/en/Soil-Survey-Reports
[8] PQ16 Châteauguay survey from the soil database http://www.irda.qc.ca/en/Soil-Survey-Reports

2) Great availability of sunlight at ground level
3) Weak competition from other dry environment plants, particularly invasive species (bare soil averages 33%; Barbeau and Brisson 2004)
4) The presence of associated herbaceous plants, including Poverty Oat-grass (*Danthonia spicata*), Canada Bluegrass (*Poa compressa*), Common Milkweed (*Asclepias syriaca*) and rare thermophilic species at the northern limit of their range, such as Horsemint (*Monarda punctata* var. *villicaulis*), Forked Bluecurls (*Trichostema dichotomum*), Poverty Dropseed (*Sporobolus vaginiflorus* var. *vaginiflorus*) and Rough False Pennyroyal (*Hedeoma hispida*) (for a more exhaustive list of associated species, see Barbeau and Brisson 2004).

As an annual species living in a dynamic environment, Forked Three-awned Grass is subject to constant variations throughout its populations (Jones 2007). It is likely that it maintains its presence in a region not by occupying the same openings recurrently, but by colonizing openings newly created by a variety of disturbances (e.g. blowdowns, fires, droughts, tree harvesting). Thus, all habitat on sandy or sandstone substrates, even those where growth conditions are not currently optimal, could possibly be colonized. Consequently, the boundaries of polygons containing critical habitat were established taking into account the extent of the sand deposits in the Cazaville area and the extent of the rock outcroppings in the Ormstown area. Human-built structures (roads, buildings, etc.) and areas (e.g. mature hardwood forests, peatlands) that lack the biophysical characteristics of the suitable habitat are not designated as critical habitat.

Appendix A presents the geographic location and mapping of the two polygons containing Forked Three-awned Grass critical habitat. The critical habitat includes all the known populations of Forked Three-awned Grass in Quebec and thus the six populations identified as main conservation targets by the Government of Quebec.

1.2.2 Examples of activities likely to result in destruction of critical habitat

Critical habitat destruction is determined on a case-by-case basis. Destruction has occurred if part of the critical habitat was degraded, either permanently or temporarily, to the point where it can no longer meet the species' requirements. Destruction may be the result of one or more activities at a given time or the cumulative effects of one or more activities over a period of time (Government of Canada 2009). Table 2 presents examples of activities that can lead to the destruction of Forked Three-awned Grass critical habitat.

Table 2. Examples of activities likely to destroy the critical habitat (ALDCH) of the Forked Three-awned Grass in Quebec.

Description of Activity	Description of Impacts (biophysical or other characteristics)	ALDCH Scale			Occurrence in Relation to the Boundaries of the Critical Habitat	Type of Effect (direct, cumulative)	Temporal Considerations
		Site	Region	Landscape			
Construction and maintenance of linear structures (e.g. roads, highways, energy corridors, pipelines)	The substrate is covered permanently, drainage conditions are modified, soil disturbance leads to the growth of invasive species.	x	x		Must occur within boundaries	Direct and cumulative	Applicable at all times if effect is permanent. Otherwise, avoid disturbing the habitat in a way that would compromise plant growth.
Construction of housing units or commercial or industrial buildings	The substrate is covered permanently, drainage and light conditions are modified, competition with alien/invasive plants increases (e.g. lawn, landscaping).	x	x	x	Must occur within boundaries	Direct and cumulative	Applies at all times.
Mining (e.g. soil preparation, mineral extraction, using heavy vehicles to transport materials)	Surface extraction: the substrate is removed from the site or modified through disintegration or compaction; drainage conditions are modified. Underground extraction: same effects, but no substrate removal.	x	x		Must occur within boundaries	Direct and cumulative	Applicable at all times if effect is permanent (e.g. extraction to the bedrock). Otherwise, avoid modifying drainage conditions (flooding) during the plant growth period.
Repeated traffic from off-road vehicles (e.g. ATVs) for many consecutive years	The substrate is modified due to disintegration or compaction (repeated traffic over many consecutive years); drainage conditions are modified; soil disturbance leads to the growth of invasive species.	x			Must occur within boundaries	Direct	Applies at all times.
High-density conifer planting	Light conditions at ground level are modified; chemical and mechanical control of subforest vegetation prevents seed production.	x	x		Must occur within boundaries	Direct and cumulative	Applicable at all times if effect is long-term.

Dumping of garbage (e.g. fill soil, construction debris, household garbage, plant debris)	The substrate is covered permanently; drainage or light conditions are modified.	x			Must occur within boundaries	Direct	Applicable at all times if effect is permanent.

1.3 Proposed Measures to Protect Critical Habitat

The critical habitat of the Forked Three-awned Grass is located only on non-federal land in Quebec.

Proposed protection measures for non-federal lands

With regard to the portions of critical habitat on non-federal lands, Environment Canada intends to work with the Government of Quebec to determine whether provincial legislation and regulations provide for critical habitat protection for this species under SARA.

In accordance with its jurisdiction, Environment Canada's approach is to start by looking at provincial legislation and, where necessary, to assess whether provisions or measures under SARA or any other federal legislation can protect these portions of critical habitat.

If it is determined that the critical habitat is not protected or is only partially protected, the progress made toward achieving its protection will be communicated in the Species at Risk Public Registry through the reports referred to in section 63 of SARA.

The implementation of conservation measures is an important complementary strategy for preserving this species' critical habitat. Environment Canada will work with the Government of Quebec, non-governmental organizations and individuals to facilitate the implementation of conservation measures.

1.4 Measures to be Taken and Implementation Schedule

Table 3. Implementation Schedule.

#	Recovery Measures	Priority[9]	Threats or Concerns Addressed	Schedule
General strategy: Stewardship and management of the species and its suitable habitat (includes general approaches 1, 5, 6, 7, 9, 11, 13, 21 and 23 of the recovery strategy[10])				

[9] "Priority" reflects the way in which the action directly contributes to or is an essential precursor to an action that contributes to the recovery of the species.

[10] Note that the priority associated with each measure may differ from that indicated in the recovery strategy given that this action plan applies to Quebec populations only.

	Approach: Implement measures that aim to ensure the maintenance of self-sustaining populations			
1	Collaborate with municipalities and landowners of targeted lots in order to identify conservation measures (e.g. stewardship, zoning) and integrate these measures into land-use planning.	High	All threats	2014–2019
2	Prepare and implement a research program on habitat management techniques in order to reduce or eliminate practices that are incompatible with the recovery of dune environment species in each of the occupied sites and in adjacent areas (e.g. update the Cazaville dunes conservation plan, NCC 2008; also see Laliberté 2008).	High	All threats; absence of some ecological processes	2014–2019
3	Plan stewardship measures for suitable habitat that is not currently colonized.	Average	All threats	2014–2019
4	Every five years, re-evaluate the threats and the intervention priority for each population.	Average	All threats	2014, 2019
5	Collaborate with quarry managers in order to set up an operation plan that ensures the maintenance of species numbers on lots that are being used—or that will or may be used—for sand extraction and dumping of garbage.	Average	Sand extraction; dumping of garbage	2014–2019
6	Collaborate with landowners who use ATVs or who allow ATV owners to drive on their property in order to limit circulation to marked trails. If necessary, the trails could be relocated after a few years of use in order to make the exposed substrate available for colonization by the Forked Three-awned Grass.	Average	Limited habitat; absence of certain ecological processes; plant succession; ATV use	2014–2019
7	Oversee tree planting to align it with the maintenance of Forked Three-awned Grass.	Average	Planting of conifers	2014–2019
General strategy: Surveys and monitoring (includes general approaches 2, 17 and 22 of the recovery strategy)				
	Approach: Develop and implement a standardized survey and monitoring protocol to evaluate the status of populations and habitat			
8	Every five years, visit sites where the Forked Three-awned Grass occurs to evaluate the population trend and determine whether the situation has changed in terms of disturbances, plant cover, and the presence of invasive species and other threats. Input the data in the CDPNQ.	High	All threats	2014, 2019
9	Monitor sites that have undergone recovery actions in order to access their success and any required maintenance (see measure 2).	Average	Limited habitat; absence of certain ecological processes; plant succession	2016–2018

10	Survey potential sites, mainly in the Le Rocher area.	Average	Knowledge gaps	2014–2015
General strategy: Research (includes general approach 21 in the recovery strategy)				
	Approach: Study aspects related to the propagation of individuals			
11	Determine the viability of the seed bank and the dispersion capabilities (population connectivity).	Average	Knowledge gaps	2014–2019
12	Study the historical significance of natural disturbances in the maintenance of the species' habitat.	Low	Knowledge gaps	2014–2019
General strategy: Communication and awareness (includes general approaches 9, 10 and 14 of the recovery strategy)				
	Approach: Develop and implement a communications strategy together with partner agencies and groups interested in the species			
13	Encourage discussions among stakeholders (scientists, recovery teams and implementation groups, non-governmental organizations, levels of government, the general public, private landowners) through yearly meetings, presentations to partners, public information evenings, landowner notebooks, etc.	High	All threats	2014–2019
14	Encourage support from the general public and land-management decision-makers (municipalities, regional county municipalities [RCMs], regional conferences of elected officials) for species conservation through brochures, articles for the general public, websites, an information sign, etc.	Average	All threats	2014–2019

2. Socio-economic Assessment

The *Species at Risk Act* requires that an action plan include an evaluation of the socio-economic costs of the action plan and the benefits to be derived from its implementation (SARA 49(1)(e), 2003). This evaluation addresses only the incremental socio-economic costs of implementing this action plan from a national perspective as well as the social and environmental benefits that would occur if the action plan were implemented in its entirety, recognizing that not all aspects of its implementation are under the jurisdiction of the federal government. It does not address cumulative costs of species recovery in general nor does it attempt a cost-benefit analysis. Its intent is to inform the public and to guide decision making on implementation of the action plan by partners.

The protection and recovery of species at risk can result in both benefits and costs. The Act recognizes that "*wildlife, in all its forms, has value in and of itself and is valued by Canadians for aesthetic, cultural, spiritual, recreational, educational, historical, economic, medical, ecological and scientific reasons*" (SARA 2003). Self-sustaining and healthy ecosystems with their various elements in place, including species at risk,

contribute positively to the livelihoods and the quality of life of all Canadians. A review of the literature confirms that Canadians value the preservation and conservation of species in and of themselves. Actions taken to preserve a species, such as habitat protection and restoration, are also valued. In addition, the more an action contributes to the recovery of a species, the higher the value the public places on such actions (Loomis and White, 1996; DFO., 2008). Furthermore, the conservation of species at risk is an important component of the Government of Canada's commitment to conserving biological diversity under the *International Convention on Biological Diversity*. The Government of Canada has also made a commitment to protect and recover species at risk through the *Accord for the Protection of Species at Risk*. The specific costs and benefits associated with this action plan are described below.

2.1. Impacts

2.1.1. Direct costs

Table 4 breaks down the anticipated direct costs of implementing all the recovery measures proposed in Table 3 based on the four general strategies[11]. These costs are estimated for the period from 2014 to 2019[12] and include property acquisitions and expenditures related to field work (salaries, travel, equipment, actions, etc.).

Table 4. Estimated direct costs of implementing the Forked Three-awned Grass recovery measures, 2014–2019.

General Strategy	Priority	Governments (federal and provincial)	Other Stakeholders
Stewardship and management of the species and its suitable habitat	High	$910,000 (75%)	$215,000 (25%)
Surveys and monitoring	Average	$25,000 (67%)	$12,000 (33%)
Research	Average	$1,000 (25%)	$2,000 (75%)
Communication and awareness	Average	$25,000 (60%)	$10,000 (40%)
		$961,000 (75%)	**$239,000 (25%)**
		$1,200,000	

[11] The presented costs are a compilation of the estimated costs for each of the activities in Table 3. They were determined by consulting the main stakeholders involved in species conservation. Given that the stakeholders often focus their work on several species or, more generally, on habitat, the costs presented may not be entirely attributable to the Forked Three-awned Grass.

[12] According to the terms of section 55 of SARA, progress in achieving the objectives described in the action plan must be evaluated and a report must be produced regarding the plan's implementation and its ecological and socio-economic impacts five years after the plan takes effect.

Modifying certain sand extraction activities in quarries could be beneficial in meeting the needs of the Forked Three-awned Grass. If modifications were implemented through an operation plan, they could result in a decrease in the volume of substrate that can be extracted yearly. Specifically, quarry operators could have to avoid digging all the way down to the bedrock and leave intact a portion of their operational area so that the sandy, dry ecosystem remains. Individuals of the species that are in this area could then possibly recolonize the mined areas and the area that initially remained intact could potentially be mined.

Using a habitat for agricultural or forestry purposes could have several impacts on Forked Three-awned Grass habitat. If modifications to practices were necessary, they could result in reducing the quality of harvested forage crops due to harvesting restrictions during the growth and reproduction period of the Forked Three-awned Grass. The density or height of trees in some planting areas could also have to be lowered to avoid creating too much shade, which could result in decreasing the amount of wood substance produced on a site.

The decrease in revenues caused by use restrictions is not included in Table 4 because of the difficulty of this type of analysis. It is, however, taken into account in the conclusion of this action plan.

2.1.2. Indirect impacts

Indirect impacts involve the potential restrictions, in terms of the non-economic uses of the species or the territory it occupies, associated with the implementation of recovery measures. Notably, the use of all-terrain vehicles should be the subject of stewardship activities. Rather than prohibiting ATV traffic on properties where the species is present, this action plan proposes to concentrate use to a few well-marked trails whose routes could be modified, if necessary, after a few years of use. This measure would contribute to regenerating suitable habitat while allowing landowners to enjoy their property.

2.2. Benefits

Implementation of the recovery measures proposed in this action plan will have favourable repercussions for the Forked Three-awned Grass and other rare species associated with dry environments (see Appendix B). In recent years, surveys have made it possible to identify a dozen species infrequently seen in Quebec that are adapted to these types of habitat (Sabourin 2010). In addition, awareness by landowners and the public of the ecological importance of sandy environments and exposed rock outcroppings that, at first glance, appear to be of little interest will lead to their reclamation. Their protection through stewardship measures, property acquisition and restoration projects will also improve their ecological integrity.

2.3. Conclusion

The socio-economic analysis suggests that implementing all the recovery measures proposed in this action plan will result in moderate socio-economic costs; some potential constraints related to land use are also anticipated, particularly regarding quarry and sandpit operations. The direct costs of implementation are estimated to be close to $1,200,000 for the 2014–2019 period.

3. Measuring Progress

The performance indicators presented in the associated recovery strategy provide a way to define and measure progress toward achieving the population and distribution objectives.

Reporting on *implementation* of the action plan (under s. 55 of SARA) will be done by assessing progress towards implementing the general strategies.

Reporting on the ecological and socio-economic impacts of the action plan (under s. 55 of SARA) will be done by assessing the results of monitoring the recovery of the species and its long term viability, and by assessing the implementation of the action plan.

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APPENDIX A: Polygons Containing Forked Three-awned Grass Critical Habitat in Quebec

Table A-1. Coordinates of the 10x10 km UTM squares containing Forked Three-awned Grass critical habitat in Quebec.

Location	UTM Square ID	Coordinates of the lower left corner of UTM squares containing critical habitat	Area of polygons containing critical habitat (ha)
Cazaville	A1	540000; 4990000	1763.50
	A2	550000; 4990000	484.91
	B1	540000; 4980000	2517.85
	B2	550000; 4980000	1062.21
Ormstown	A3	590000; 5000000	105.55
	A4	600000; 5000000	30.62
	B1	570000; 4990000	62.49
	B2	580000; 4990000	829.63
	B3	590000; 4990000	58.28
	B4	600000; 4990000	74.22
	C1	570000; 4980000	4.63

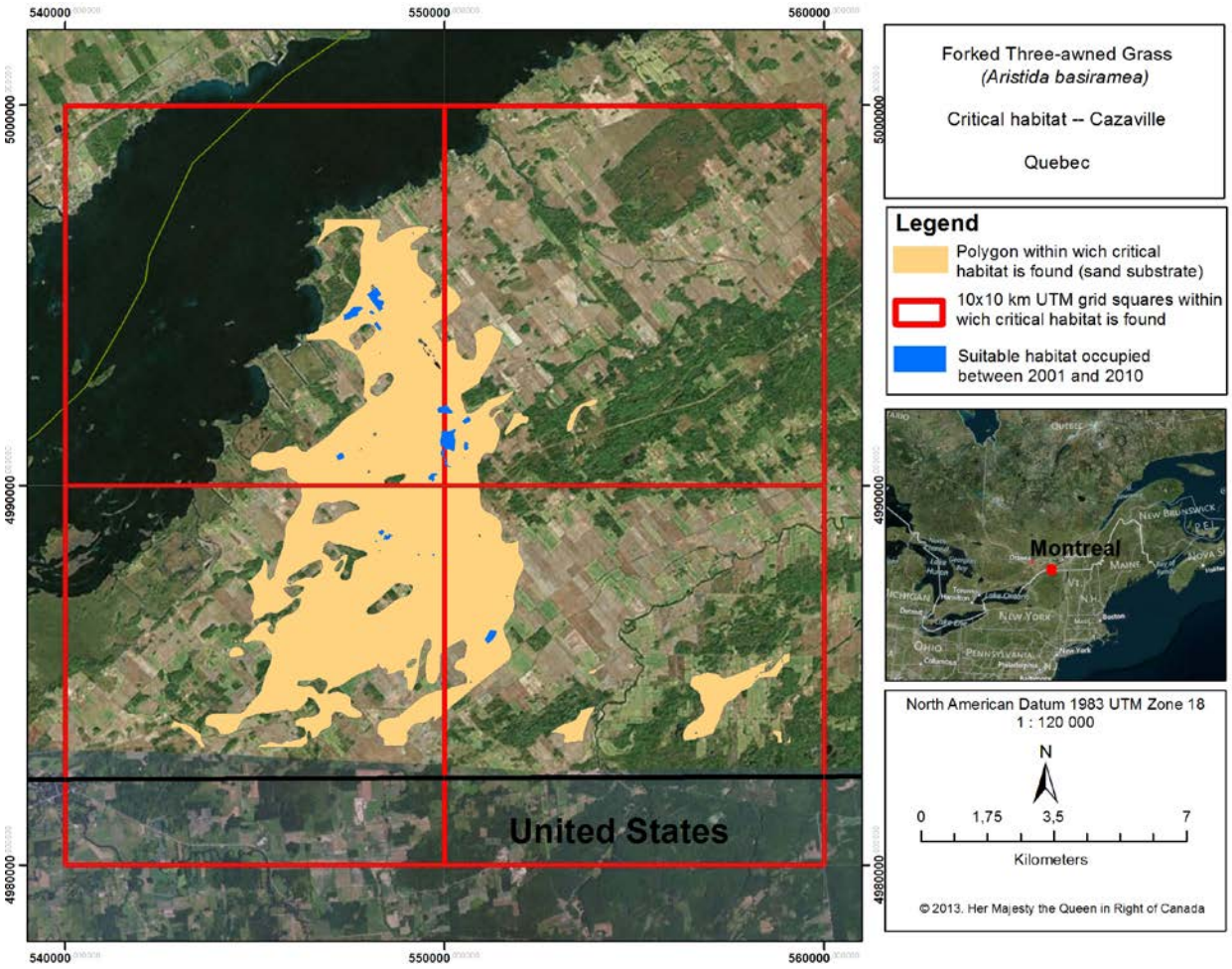

Figure A-1. Polygons containing critical habitat of Forked Three-awned Grass populations in the Cazaville area

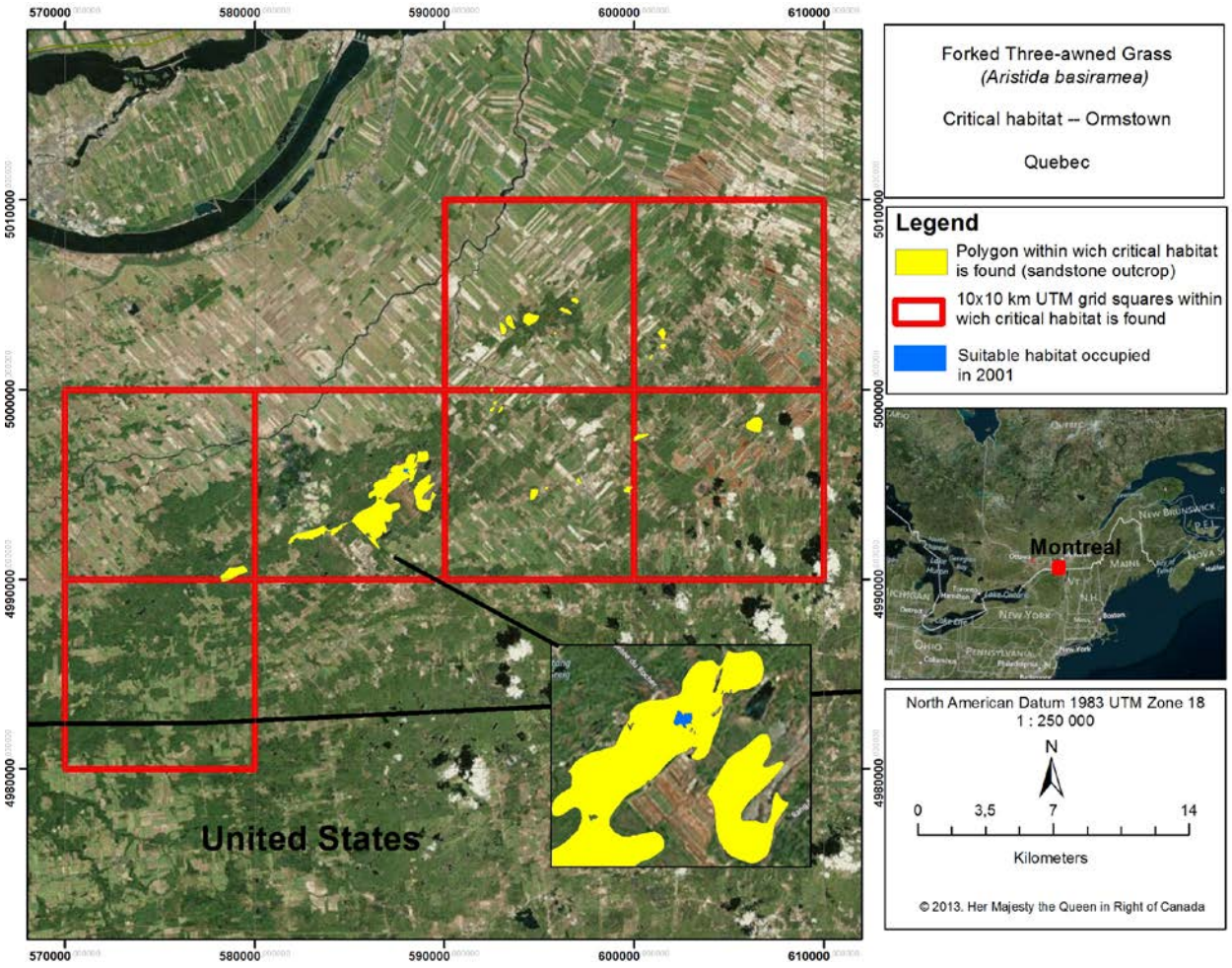

Figure A-2. Polygons containing critical habitat of Forked Three-awned Grass populations in the Ormstown area.

APPENDIX B: 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* 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 and to evaluate whether the outcomes of a recovery planning document could affect any component of the environment or achievement of any of the Federal Sustainable Development Strategy's[13] (FSDS) goals and targets.

Recovery planning is intended to benefit species at risk and biodiversity in general. However, it is recognized that implementation of action plans may 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 upon non-target species or habitats. The results of the SEA are incorporated directly into the action plan itself, but are also summarized below in this statement.

The possibility that the action plan might inadvertently produce negative effects on other species was considered. The SEA made it possible to conclude that this action plan will clearly be favourable to the environment and will not lead to any significant negative effects.

Other species at risk may benefit from the protection granted to the habitat of the Forked Three-awned Grass. Indeed, one of the only two occurrences in Quebec of Horsemint (designated as Threatened in Quebec since 2010 and a COSEWIC candidate species) is found in the same habitat as the Forked Three-awned Grass in Cazaville. Recently, Forked Bluecurls (not currently designated) was discovered in Cazaville's sandy habitat; surveys are needed to specify its distribution (André Sabourin and Caroline Bélair, personal communication). Also found there is the Rough False Pennyroyal, a species that is likely to be designated as threatened or vulnerable in Quebec (CDPNQ 2008). Rare species of plants of the Cyperaceae family were also observed in the habitat of the Forked Three-awned Grass: Houghton's Flat Sedge (*Cyperus houghtonii*), Great Plains Flat Sedge (*C*. *lupulinus* ssp. *macilentus*, likely to be designated threatened or vulnerable in Quebec), and Schweinitz's Sedge (*C. schweinitzii*), of which one of only two known occurrences in Quebec can be found in the dunes of Cazaville (NCC 2008). Other species of great interest are also found in the habitat on the exposed sandstone outcroppings of Très-Saint-Sacrement (Le Rocher area), including Pitch Pine (*Pinus rigida*), a tree designated as Threatened in Quebec, and Poverty Dropseed (*Sporobolus vaginiflorus* var. *vaginiflorus*), very rare in Quebec (S1) and in Canada (N2?) (CDPNQ 2008).

[13] www.ec.gc.ca/dd-sd/default.asp?lang=En&n=F93CD795-1

The potential vegetation control measures to combat plant succession in the absence of natural disturbances—measures that could result from this action plan—will presumably have positive effects on the rare pioneer species that belong to the same plant community as the Forked Three-awned Grass. The Horsemint is already reacting favourably to vegetation clearance in Cazaville (NCC 2008). To mitigate the impact of suggested interventions, efforts will be made to locate the rare species and prevent trampling. Manual labour using chain saws and brush cutters creates small openings and is less damaging for habitat than heavy machinery. Moreover, vegetation control activities will be carried out on limited, selective sections of the critical habitat in a targeted manner so as to maximize biodiversity in a variety of habitats at different stages of succession. Test plots will be monitored to ensure that the rare species that are present are not adversely affected by the work.