PROPOSED

Species at Risk Act
Action Plan Series

Action Plan for the Green-scaled Willow (*Salix chlorolepis*) in Canada

Green-scaled Willow



2014

Canada

Recommended citation:

Environment Canada. 2014. Action Plan for the Green-scaled Willow (*Salix chlorolepis*) in Canada [Proposed]. *Species at Risk Act* Action Plan Series. Environment Canada, Ottawa. iv + 11 p.

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.

Cover illustration: Green-scaled Willow by Frédéric Coursol © 2011

Également disponible en français sous le titre :
« Plan d'action pour le saule à bractées vertes (*Salix chlorolepis*) au Canada [Proposition] »

© Her Majesty the Queen in Right of Canada, represented by the Minister of the Environment, 2014. All rights reserved.
ISBN
Catalogue no.

Content (excluding the illustrations) may be used without permission with appropriate credit to the source.

Preface

The federal, provincial, and territorial government signatories under the Accord for the Protection of Species at Risk (1996)[1] 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 action plans for species listed as Extirpated, Endangered, and Threatened for which recovery has been deemed feasible. They are also required to report on progress five years after the publication of the final document on the SAR Public Registry.

Under SARA, one or more action plan(s) provides the detailed recovery planning that supports 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 in a series of documents that are linked and should be taken into consideration together. Those being the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) status report, the recovery strategy, and one or more action plans.

The Minister of the Environment is the competent minister under SARA for the Green-scaled Willow and has 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 province of Quebec.

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, or any other jurisdiction alone. All Canadians are invited to join in supporting and implementing this action plan for the benefit of the Green-scaled Willow 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.

[1] www.sararegistry.gc.ca/approach/strategy/default_e.cfm

Acknowledgements

This action plan was prepared by François Shaffer with the collaboration of Charles Latour and Vincent Carignan (Environment Canada, Canadian Wildlife Service – Quebec Region), as well as Frédéric Coursol (botanist, Montréal Botanical Garden). The following collaborators provided comments on the action plan: Karine Picard, Sylvain Giguère (Environment Canada, Canadian Wildlife Service – Quebec Region) and Patricia Désilets (Quebec's Ministère du Développement durable, de l'Environnement, de la Faune et des Parcs).

Executive Summary

This action plan complements the Recovery Strategy for the Green-scaled Willow (*Salix chlorolepis*) in Canada (Environment Canada 2011). The proposed recovery measures seek to implement the full complement of broad recovery strategies and approaches set out in the recovery strategy for the entire population and distribution of the Green-scaled Willow.

The critical habitat of the Green-scaled Willow was identified in the recovery strategy and is considered sufficient to achieve the long-term population and distribution objectives. No additional critical habitat is identified in this action plan.

The critical habitat for Green-scaled Willow is located entirely on non-federal land. Proposed measures to protect critical habitat are presented in section 1.4.

The recovery measures proposed for Green-scaled Willow are related to four broad strategies: 1) reducing the two main threats to the species and its habitat; 2) identifying more accurately the species' distribution and population size and trend; 3) identifying more accurately the demographic characteristics of the species; and 4) acquiring the required knowledge on threats by insects, mites and Woodland Caribou. A schedule outlining the priorities for the implementation of these measures has been developed and a socio-economic evaluation has been conducted. The implementation of the recovery measures outlined in this action plan will have moderate, positive socio-economic impacts. The direct costs of implementing the action plan are estimated at $175,250 for the 2014–2019 period.

Table of Contents

Preface i
Acknowledgements ii
Executive Summary iii
Table of Contents iv
1. Recovery Actions 1
1.1 Context and Scope of the Action Plan 1
1.2 Measures to be Taken and Implementation Schedule 2
1.3 Critical Habitat 4
1.3.1 Identification of the species' critical habitat 4
1.4 Proposed Measures to Protect Critical Habitat 4
2. Socio-economic Evaluation 5
2.1 Costs 6
2.1.1 Direct costs 6
2.1.2 Indirect costs 7
2.2 Benefits 7
2.3 Conclusion 9
3. Measuring Progress 9
4. References 9
Appendix A: Effects on the Environment and Other Species 11

1. Recovery Actions

1.1 Context and Scope of the Action Plan

The Green-scaled Willow (*Salix chlorolepis*) is a dwarf shrub usually less than 30 cm tall. It is endemic to Quebec and occurs only on Mont Albert in the Parc national de la Gaspésie (Quebec's Gaspé provincial park) (Labrecque and Lavoie 2002). To date, the species has been recorded on the slopes of 10 glacial cirques at the top of Mont Albert (COSEWIC 2006; CDPNQ 2012). Current data suggest that approximately 300 individuals comprise the total Green-scaled Willow population. However, given that no comprehensive survey has ever been conducted of all potential habitat, limited to Mont Albert and perhaps Mont Olivine, the species' total population and distribution are not precisely known.

The Green-scaled Willow was designated Threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in 2006 and has been listed on Schedule 1 of the *Species at Risk Act* since 2007. In Quebec, the species is designated Threatened and has been protected since 1995 under the province's *Act respecting threatened or vulnerable species*.

The main threats to the Green-scaled Willow are trampling by humans and grazing by Woodland Caribou (*Rangifer tarandus caribou*), Atlantic–Gaspésie population. Other threats include avalanches, herbivory by the Rusty Tussock Moth, attack by mites and aphids and trampling by Woodland Caribou, Atlantic–Gaspésie population. Some of these threats are relatively minor, given that the authorities at the Parc national de la Gaspésie are already controlling a number of them.

The long-term population and distribution objectives for the Green-scaled Willow in Canada are to maintain its population and distribution at current levels.

Critical habitat for Green-scaled Willow is identified in the recovery strategy as being the serpentine rock outcrop of Mont Albert. The area of the outcrop is approximately 2730 ha.

This action plan covers the entire population and distribution of the Green-scaled Willow and all strategies established in the *Recovery Strategy for the Green-scaled Willow in Canada* (Environment Canada 2011).

1.2 Measures to be Taken and Implementation Schedule

Table 1. Implementation schedule

#	Recovery Measure	Priority[2]	Threats or Concerns Addressed	Timeline
Broad strategy: Reduce the two main threats to the species and its habitat				
	Approach: Develop the necessary strategies to reduce the two threats, including a communication and awareness strategy aimed at park users			
1	Check for the presence of disturbance in the subpopulations affected by the two main threats	High	Trampling by humans, grazing by Woodland Caribou	2014
2	Continue the development of a communications and awareness strategy aimed at the users of the Parc national de la Gaspésie	Medium	All	2019
3	Involve skiing and hiking groups in discussions and decisions regarding the protection of this species	Medium	Trampling by humans, avalanches	2019
4	Ensure the survival of the subpopulations by eliminating practices that are inconsistent with the maintenance of the species	High	Trampling by humans, avalanches	2019
5	Provide for ex situ conservation of this endemic species (seed banks, botanical gardens) to ensure long-term perpetuation of the species	High	All	Ongoing
	Approach: Integrate these strategies into the management plans and administrative documents of Gaspésie Provincial Park			
6	Raise awareness among the authorities at the Parc national de la Gaspésie of the importance of taking into account species recovery measures	High	All	2019
7	Facilitate better coordination of search efforts with work done on other rare species present in the Parc national de la Gaspésie, including Woodland Caribou, Atlantic–Gaspésie population	Medium	All	2019
Broad strategy: Identify the species' distribution and population size and trend				
	Approach: Establish monitoring protocols and perform counts of known sub-populations			

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

8	Validate the protocol used by the Parc national de la Gaspésie to count Green-scaled Willow	High	All	2014
9	Conduct a systematic inventory each year for the first five years, in accordance with established standards and protocols, to determine the most appropriate monitoring intervals and verify the protocols. Transfer the inventory results to the Centre de données sur le patrimoine naturel du Québec (CDPNQ)	High	All	2019
	Approach: Conduct research to locate new sub-populations			
10	Check for the presence of Green-scaled Willow on Mont Olivine and within the area of occurrence mapped by CDPNQ on the south and west faces of Mont Albert	High	All	2014
11	Check for the presence of Green-scaled Willow on the slopes of Mont Albert used by skiers	High	Avalanches	2014
	Approach: Delineate the spatial distribution of the various sub-populations			
12	Determine the exact geographic coordinates of individual Green-scaled Willows using GPS and transfer this data to the Centre de données sur le patrimoine naturel du Québec.	High	All	2014
Broad strategy: Identify the demographic characteristics of the species				
	Approach: Identify, design and conduct studies required for specifying the demographic characteristics of the species (existence of seed banks, germination rates, reproduction and mortality rates, viability of sub-populations, interannual variation in seed production)			
13	Identify the viability of the sub-populations and the minimum size of a viable population	Medium	All	2016
14	Study seed viability and longevity in the soil	Medium	All	2017
15	Determine how seed dispersal affects population dynamics	Medium	All	2017
16	Study the interannual variation in Green-scaled Willow seed abundance, seed germination rate, and reproduction and mortality rates	Medium	All	2017
17	Determine whether introgression occurs between Green-scaled Willow and Short-fruit Willow (*Salix brachycarpa*) and determine the extent to which Green-scaled Willow abundance is affected	Medium	All	2017
18	Study the degree of genetic variation within and among sub-populations	Medium	All	2017
19	Develop a protocol for increasing, where necessary, the size of natural sub-populations using transplants	Medium	All	2017

Broad strategy: Acquire the required knowledge on threats by insects, mites and Woodland Caribou				
	Approach: Identify, design and conduct studies required for specifying the species' vulnerability to grazing by caterpillars and to infections by mites and aphids			
20	Identify the studies required to determine the vulnerability of the species to the various insect species	High	Herbivory by Rusty Tussock Moth, attack by mites or aphids	2015
21	Design and conduct the necessary studies to determine the species' vulnerability to the various insect species	High	Herbivory by Rusty Tussock Moth, attack by mites or aphids	2019
	Approach: Identify, design and conduct studies required for specifying the species' vulnerability to trampling and grazing by Woodland Caribou			
22	Identify the studies needed to determine the species' vulnerability to trampling and grazing by Woodland Caribou, Atlantic–Gaspésie sub-population	Medium	Trampling by Woodland Caribou, grazing by Woodland Caribou	2015
23	Design and conduct the studies needed to determine the species' vulnerability to trampling and grazing by Woodland Caribou, Atlantic–Gaspésie population	Medium	Trampling by Woodland Caribou, grazing by Woodland Caribou	2019

1.3 Critical Habitat

1.3.1 Identification of the species' critical habitat

The critical habitat identified in section 7.1 of the recovery strategy (Environment Canada 2011) was sufficient to achieve the population and distribution objectives. As a result, no additional critical habitat is identified in this action plan.

1.4 Proposed Measures to Protect Critical Habitat

The critical habitat for Green-scaled Willow is located on non-federal lands, namely provincial Crown lands in Quebec. It is found entirely within the boundaries of the Parc national de la Gaspésie. Environment Canada intends to work with the Government of Quebec to determine whether provincial acts and regulations constitute protection for the species' critical habitat under SARA.

If it is determined that the critical habitat is not protected in whole or in part, progress towards achieving its protection will be included in the Species at Risk Public Registry via the reports provided for in section 63 of SARA.

The implementation of conservation measures is an important complementary strategy for preserving the critical habitat of this species. Environment Canada will, to the extent possible, work with the Government of Quebec to facilitate the implementation of conservation measures.

2. Socio-economic Evaluation

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*)). This evaluation addresses only the additional socio-economic costs of implementing this action plan from a national perspective as well as the social and environmental benefits that would be derived if the action plan is fully implemented, recognizing that certain aspects of its implementation fall outside the jurisdiction of the federal government. The evaluation does not address the cumulative impacts of the recovery of the species in general, nor does it attempt to conduct a cost-benefit analysis. It is designed to provide information to the public and to inform decision making respecting the implementation of the action plan by the 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*." 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 that action (Loomis and White 1996; Fisheries and Oceans Canada 2008). 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 National Accord for the Protection of Species at Risk. The specific costs and benefits associated with this action plan are described below.

This section evaluates the potential socio-economic costs of the action plan and the possible benefits to be derived from its implementation.

2.1 Costs

2.1.1 Direct costs

The direct costs are a compilation of the estimated costs for each activity listed in Table 1. They were determined by consulting with the main species conservation stakeholders. Given that the stakeholders are often involved in the conservation of a number species or, more generally, in the conservation of habitat, the costs presented cannot be attributed entirely to the Green-scaled Willow.

The action plan for the Green-scaled Willow describes the recovery actions to be implemented to achieve the population and distribution objectives set out in the recovery strategy. The direct costs associated with implementing the recovery actions for a period of five years[3] are evaluated in this section. Total direct costs are estimated at $175,250, which includes salaries, volunteer time, travel, materiel, equipment and other related costs (Table 2). The key organization involved in the conservation of this species is the Parc national de la Gaspésie. The Montréal Botanical Garden also contributes to its conservation.

Table 2. Estimate of the direct costs of recovery implementation for the five-year period

Broad strategy	Priority	Governments (federal and provincial)	Other stakeholders
Reduce the two main threats to the species and its habitat	Urgent	$10,000 (100%)	$0 (0%)
Accurately identify the species' distribution and population size and trend	Urgent	$91,000 (100%)	$0 (0%)
Accurately identify the demographic characteristics of the species	Medium	$29,750 (92%)	$2,500 (*%)
Acquire the required knowledge on threats by insects, mites and Woodland Caribou	Medium	$42,000 (100%)	$0 (0%)
Subtotal		**$172,750 (99%)**	**$2,500 (1%)**
Total		**$175,250**	

[3] As required by section 55 of SARA, five years after the plan is implemented, an assessment must be done on progress towards meeting the objectives outlined in the action plan, and a report issued on its implementation and ecological and socio-economic impacts.

2.1.2 Indirect costs

Indirect costs are the potential costs associated with implementing the action plan that may have an impact on the various stakeholders affected by the management of the Green-scaled Willow and its critical habitat in Canada.

The critical habitat identified in the recovery strategy corresponds to the serpentine rock outcrop of Mont Albert. It is located entirely on provincial Crown lands, within the boundaries of the Parc national de la Gaspésie, which promotes the conservation of natural areas. As a result, the indirect costs resulting from the identification of critical habitat for these sites should not be significant.

The anticipated negative impacts on the habits of groups affected by this action plan are negligible. The experience of outdoor enthusiasts (hikers, skiers) in the Parc national de la Gaspésie will be little affected given that a number of the occurrences of Green-scaled Willow are located at a considerable distance from the trails, reducing the risk of land use conflicts. Because the trails are located in appropriate areas and proper signage is posted, it is possible to allow outdoor enthusiasts to engage in their activities while ensuring the conservation of the species.

2.2 Benefits

Many of the benefits derived from implementing the action plan are non-market benefits. Species have intrinsic value and are appreciated by Canadians for aesthetic, cultural, spiritual, recreational, educational, historical, economic, medical, ecological or scientific reasons. The Government of Canada supports this vision, specifically through its international biodiversity conservation commitments. According to a 1991 survey, 83.3% of Canadians feel it is important or very important to maintain the diversity of wildlife species in Canada by protecting endangered or declining populations (Filion 1993). The importance of nature to Canadians can be expressed in economic terms. In 1996, Canadians spent close to $1.3 billion on wildlife activities and $1.2 billion on contributions to nature-related organizations, sustaining land for conservation and other wildlife-related activities (Leigh et al. 2000).

To ensure the maintenance of biological diversity, the ecosystems with which species are associated must be healthy and whole. These conditions are also important in the delivery of the various ecosystem services. Although it is difficult to assign a value to these benefits, studies conducted around the world have demonstrated that they make a significant contribution to the economy (Barbier and Heal 2006; Almack and Wilson 2010). A meta-analysis by Balmford et al. (2002) estimates that the benefit-to-cost ratio of effective programs for the conservation of wild nature is 100:1. In terms of the individual importance of a species, it varies depending on several factors, including the year, location and ecosystem services considered (Isbell et al. 2011). The significant contribution of biodiversity to the ecological services that ensure the current and future economic and environmental health of Canada would therefore justify the application of the precautionary principle in order to maintain and recover species at risk.

The Green-scaled Willow has intrinsic value and is part of Canada's ecological heritage. As stated in the *Canada Gazette* (2007), Canadians want to preserve species for future generations even if they will never personally see or use them. The endemic nature of this species also gives it scientific value. According to COSEWIC (2006), "the co-occurrence of serpentine and an alpine-tundra habitat is quite rare in northeastern North America, and the green-scaled willow is the evolutionary result of this type of environment."

There is no direct economic (market) value attached to the Green-scaled Willow. Nevertheless, this species is part of the uniqueness of the ecosystem of Mont Albert. A number of studies conducted in the United States show that people are willing to pay to protect alpine ecosystems. According to Martin-Lopez et al. (2008), the annual amount a person is willing to pay to protect this type of ecosystem is $38.67 (2005 US$). In the Canadian context, it is inferred from these studies that there is a monetary value reflecting willingness to pay a certain amount of money every year to take part in protecting alpine wetlands, such as those in which the Green-scaled Willow occurs.

This type of ecosystem is particularly popular with outdoor enthusiasts. Economic studies conducted from 2006 to 2010 in the United States showed that vacationers and residents place considerable value on high alpine peaks (Keske 2010). Findings from an economic valuation study of Colorado's high mountains indicate that visitors are willing to spend significantly more money for a mountain recreation experience and that they are adamently unwilling substitute their unique high-elevation experiences for other natural experiences (Keske, 2010). In Quebec, a few of the highest peaks are in the Gaspé area and, as a symbol of the particular value associated with these ecosystems, the Parc national de la Gaspésie was one of the first two provincial parks established. Tourism activities associated with the outdoors and nature are a significant source of revenues for this region (MRNF 2004). Close to $14 million is estimated to be spent by nature ethusiasts on outdoors activities in the Gaspé Peninsula–Magdalen Islands (MRNF 2004). The own-source revenue generated by the Parc national de la Gaspésie exceeds $5 million a year. Some partners operating services in the park also generate an estimated $1 million in own-source revenue annually (François Boulanger, pers. comm., 2011). The Parc national de la Gaspésie alone receives close to 30 000 visitors a year, translating into an estimated visitor use of 230 000 visitor-days per year (Claude Isabel, pers. comm., Parc national de la Gaspésie, 2011; François Boulanger, pers. comm., Parc national de la Gaspésie, 2011). In short, the uniqueness of these ecosystems, which are rich in endemic species, is part of the visitor experience.

2.3 Conclusion

This action plan will result in direct costs of close to $175,250 over a 5-year period. It includes many short- and long-term environmental, social and economic benefits. It will also contribute in a measurable way to the Federal Sustainable Development Strategy (Environment Canada 2010) and to the efforts of the Parce national de la Gaspésie to ensure sustainable management of ecosystems for the benefit of future generations.

3. Measuring Progress

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

A report will be produced, pursuant to section 55 of the *Species at Risk Act*, assessing the progress achieved in implementing the broad strategies set out in the action plan.

A report on the ecological and socio-economic impacts of the action plan will be produced under section 55 of SARA by assessing the results of the species recovery monitoring and its long-term viability as well as the implementation of the action plan.

4. References

Almack K. and S. Wilson. 2010. Economic value of Toronto's Greenbelt, Canada. The Economics of Ecosystems and Biodiversity. http://www.teebweb.org/.

Balmford, A., A. Bruner, P. Cooper, R. Costanza, S. Farber, R.E. Green, M. Jenkins, P. Jefferiss, V. Jessamy, J. Madden, K. Munro, N. Myers, S. Naeem, J. Paavola, M. Rayment, S. Rosendo, J. Roughgarden, K. Trumper and R.K. Turner. 2002. Economic Reasons for Conserving Wild Nature, Science 297: 950-953.

Barbier, E.B. and G.M. Heal. 2006. Valuing Ecosystem Services, The Economists' Voice: Vol. 3 (3), Article 2. DOI: 10.2202/1553-3832.1118. Available at: http://www.bepress.com/ev/vol3/iss3/art2.

Canada Gazette . 2007. SOR/2007-275 to 307 and SI/2007-114 to 117, Vol. 141, No. 26, p. 2520 to 2919.

Centre de données sur le patrimoine naturel du Québec (CDPNQ). 2012. Extractions du système de données pour le territoire du Parc national de la Gaspésie. Ministère du Développement durable, de l'Environnement et des Parcs, Québec.

COSEWIC. 2006. COSEWIC Assessment and Status Report on the Green-scaled Willow (*Salix chlorolepsis*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 22 p. Available at: http://www.sararegistry.gc.ca/status/status_e.cfm.

Environment Canada. 2010. Planning for a Sustainable Future – A Federal Sustainable Development Strategy for Canada, 89 p. Available at: http://www.ec.gc.ca/dd-sd/default.asp?lang=En&n=16AF9508-1.

Environment Canada. 2011. Recovery Strategy for the Green-scaled Willow (*Salix chlorolepis*) in Canada, *Species at Risk Act* Recovery Strategy Series, Environment Canada, Ottawa, iv + 16 p.

Filion, F.L. 1993. The Importance of Wildlife to Canadians: Highlights of the 1991 Survey. Environment Canada, Ottawa. 60 p.

Fisheries and Oceans Canada. 2008. Estimation of the Economic Benefits of Marine Mammal Recovery in the St. Lawrence Estuary. Policy and Economic Branch, Quebec Region, Quebec City, 2008.

Isbell, F., V. Calcagno, A. Hector, J. Connolly, W.S. Harpole, P.B. Reich, M. Scherer-Lorenzen, B. Schmid, D. Tilman, J. van Ruijven, A. Weigelt, B.J. Wilsey, E.S. Zavaleta and M. Loreau. 2011. High plant diversity is needed to maintain ecosystem services, Nature, Vol. 477, p. 199-202.

Keske, C. 2010. High Mountain Ecosystems: How Much Love Can They Sustain?, Environmental Management, Santosh Sarkar (Ed.), ISBN: 978-953-307-133-6, InTech. Available at: http://www.intechopen.com/download/get/type/pdfs/id/11851.

Labrecque, J. and G. Lavoie. 2002. Les plantes vasculaires menacées ou vulnérables du Québec, gouvernement du Québec, ministère de l'Environnement, Direction du patrimoine écologique et du développement durable, Québec. 200 p.

Leigh, L., E. DuWors, M. Villeneuve, A. Bath, P. Bouchard, P. Boxall, D. Legg, S. Meis, R. Reid and T. Williamson. 2000. The Importance of Nature to Canadians: The Economic Significance of Nature-related Activities. Environment Canada, Ottawa, 49 p.

Loomis, J.B. and D.S. White. 1996. Economic Benefits of Rare and Endangered Species: Summary and Meta-analysis, *Ecological Economics* 18: 197-206.

Martin-Lopez, B., C. Montes and J. Benayas. 2008. Economic Valuation of Biodiversity Conservation: the Meaning of Numbers, Conservation Biology, 22(3): 624–635.

MRNF. 2004. La faune et la nature ÇA COMPTE! La popularité des activités liées à la faune et à la nature. Gaspésie–Îles-de-la-Madeleine. Available at: http://www.mrnf.gouv.qc.ca/faune/statistiques/activites.jsp.

Appendix A: 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 programs 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[4] (FSDS) goals or 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 upon possible impacts on 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 potential for the action plan to inadvertently lead to adverse effects on other species was considered. The SEA concluded that this action plan will clearly benefit the environment and will not entail any significant adverse effects.

The recovery actions set out in this document should have no negative impacts on other non-target indigenous species, natural communities and/or ecological processes. In fact, the recovery actions should be favourable to other plant species that occur in the same habitat as Green-scaled Willow, including Mountain Holly Fern (*Polystichum scopulinum*), a species designated threatened by COSEWIC and listed in Schedule 1 of SARA. It, along with Indian's Dream (*Aspidotis densa*), Serpentine Stitchwort (*Minuartia marcescens*) and Mt. Albert Goldenrod (*Solidago simplex* subsp. *simplex* var. *chlorolepis*), are four threatened species in Quebec (*Act respecting threatened or vulnerable species*) that share the same habitat as Green-scaled Willow on Mont Albert. A number of species likely to be designated threatened or vulnerable in Quebec also occur on Mount Albert (Tardif et al. 2005), including Aleutian Maidenhair (*Adiantum aleuticum*), Swamp Thistle (*Cirsium muticum* var. *monticolum*) and Northern Rough Fescue (*Festuca altaica*).

The Woodland Caribou (Atlantic–Gaspésie population), a species listed as endangered under SARA, uses part of the same type of habitat as the Green-scaled Willow. Trampling or grazing by caribou has been identified as a threat to the Green-scaled Willow. The recovery measures proposed in this action plan should have no negative impacts on Woodland Caribou, since the rareness of the Green-scaled Willow is such that this species must not be an important component of the Woodland Caribou's diet.

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