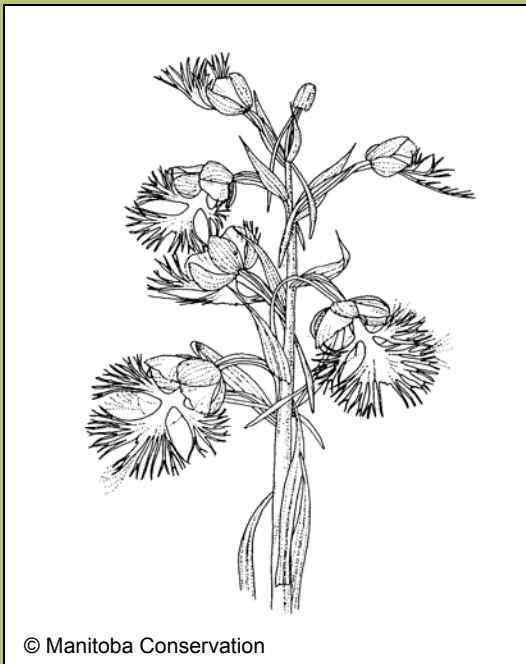


# Recovery Strategy for the Western Prairie Fringed-orchid (*Platanthera praeclara*) in Canada

## Western Prairie Fringed-orchid



July 2006



## **About the *Species at Risk Act* Recovery Strategy Series**

### **What is the *Species at Risk Act* (SARA)?**

SARA is the Act developed by the federal government as a key contribution to the common national effort to protect and conserve species at risk in Canada. SARA came into force in 2003, and one of its purposes is “*to provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity.*”

### **What is recovery?**

In the context of species at risk conservation, **recovery** 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 the species’ persistence in the wild. A species will be considered **recovered** when its long-term persistence in the wild has been secured.

### **What is a recovery strategy?**

A recovery strategy is a planning document that identifies what needs to be done to arrest or reverse the decline of a species. It sets goals and objectives and identifies the main areas of activities to be undertaken. Detailed planning is done at the action plan stage.

Recovery strategy development is a commitment of all provinces and territories and of three federal agencies — Environment Canada, Parks Canada Agency, and Fisheries and Oceans Canada — under the Accord for the Protection of Species at Risk. Sections 37–46 of SARA ([http://www.sararegistry.gc.ca/the\\_act/default\\_e.cfm](http://www.sararegistry.gc.ca/the_act/default_e.cfm)) outline both the required content and the process for developing recovery strategies published in this series.

Depending on the status of the species and when it was assessed, a recovery strategy has to be developed within one to two years after the species is added to the List of Wildlife Species at Risk. Three to four years is allowed for those species that were automatically listed when SARA came into force.

### **What’s next?**

In most cases, one or more action plans will be developed to define and guide implementation of the recovery strategy. Nevertheless, directions set in the recovery strategy are sufficient to begin involving communities, land users, and conservationists in recovery implementation. Cost-effective measures to prevent the reduction or loss of the species should not be postponed for lack of full scientific certainty.

### **The series**

This series presents the recovery strategies prepared or adopted by the federal government under SARA. New documents will be added regularly as species get listed and as strategies are updated.

### **To learn more**

To learn more about the *Species at Risk Act* and recovery initiatives, please consult the SARA Public Registry (<http://www.sararegistry.gc.ca/>) and the Web site of the Recovery Secretariat ([http://www.speciesatrisk.gc.ca/recovery/default\\_e.cfm](http://www.speciesatrisk.gc.ca/recovery/default_e.cfm)).

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(*Platanthera praeclara*) in Canada [Proposed]**

**July 2006**



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Additional copies can be downloaded from the SARA Public Registry (<http://www.sararegistry.gc.ca/>).

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## **DECLARATION**

Environment Canada has developed its recovery strategy for the western prairie fringed-orchid, as required by the *Species at Risk Act*. This proposed recovery strategy has been prepared in cooperation with jurisdictions responsible for the species, as described in the Preface.

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. In the spirit of the Accord for the Protection of Species at Risk, the Minister of the Environment invites all Canadians to join Environment Canada in supporting and implementing this strategy for the benefit of the western prairie fringed-orchid and Canadian society as a whole. Environment Canada will endeavour to support implementation of this strategy, given available resources and varying species at risk conservation priorities. The Minister will report on progress within five years.

This strategy will be complemented by one or more action plans that will provide details on specific recovery measures to be taken to support conservation of the species. The Minister will take steps to ensure that, to the extent possible, Canadians directly affected by these measures will be consulted.

## **RESPONSIBLE JURISDICTIONS**

Manitoba Conservation  
Environment Canada

## **AUTHOR**

This strategy was prepared by Jason Greenall (Manitoba Conservation).

## **ACKNOWLEDGMENTS**

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## **STRATEGIC ENVIRONMENTAL ASSESSMENT**

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.

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.

This recovery strategy will clearly benefit the environment by promoting the recovery of the western prairie fringed-orchid. The potential for the recovery strategy to inadvertently lead to adverse effects on other species was considered. The SEA concluded that this strategy will clearly benefit the environment and will not entail any significant adverse effects. Refer to the following sections of the document in particular: 1.3 Species' Needs; and 2.8 Effects on Non-target Species.

## RESIDENCE

SARA defines residence as: *a dwelling-place, such as a den, nest or other similar area or place, that is occupied or habitually occupied by one or more individuals during all or part of their life cycles, including breeding, rearing, staging, wintering, feeding or hibernating* [Subsection 2(1)].

Residence descriptions, or the rationale for why the residence concept does not apply to a given species, are posted on the SARA public registry:

[http://www.sararegistry.gc.ca/plans/residence\\_e.cfm](http://www.sararegistry.gc.ca/plans/residence_e.cfm)

## PREFACE

The western prairie fringed-orchid was listed as Endangered under the Species at Risk Act (SARA) in June 2003. SARA (Section 37) requires the competent minister to prepare recovery strategies for listed extirpated, endangered, or threatened species. Manitoba Conservation led the development of this recovery strategy in cooperation and consultation with the Canadian Wildlife Service – Prairie and Northern Region, Environment Canada. This recovery strategy took into consideration the information from the update COSEWIC status report (Punter in press). The responsible jurisdictions reviewed and cooperated in the development of this strategy. The proposed strategy meets SARA requirements in terms of content and process (Sections 39–41).

## EXECUTIVE SUMMARY

- The western prairie fringed-orchid was designated as Endangered in Canada in April 1993, and its status was reconfirmed in May 2000. Its Canadian range consists of one extant population in southeastern Manitoba. This population is the largest in the world.
- The western prairie fringed-orchid is a tall, showy orchid that inhabits open areas of wet tallgrass prairie and fen habitats.
- Significant threats to the western prairie fringed-orchid include habitat loss and degradation, exclusion by other plants, and illegal removal of plants.
- The recovery goal for the western prairie fringed-orchid is to maintain the persistence and viability of Canada's only metapopulation. This will be accomplished through the prevention of further habitat loss and degradation and the management of habitat in ways that benefit the western prairie fringed-orchid and its pollinators.
- Four objectives have been identified for the recovery of the western prairie fringed-orchid: (1) to monitor the population trends of the western prairie fringed-orchid on an ongoing basis, establishing additional monitoring protocols as required; (2) to identify and implement beneficial management practices to reduce threats and to help sustain or potentially increase the population of the western prairie fringed-orchid; (3) to develop a comprehensive applied research strategy to address knowledge gaps; and (4) to increase landowner and key stakeholder awareness of the western prairie fringed-orchid and its needs to the point where stewardship and beneficial management practices are being implemented.
- A partial identification of critical habitat has been proposed and includes lands supporting the western prairie fringed-orchid that are part of Manitoba's Tall Grass Prairie Preserve. These lands make up a total of 24 quarter-sections of land. The total proposed area designated as critical habitat at this time is 1489 ha (3680 acres). Approximately 73% of the total area of occupancy in Canada is found on lands designated as proposed critical habitat (based on the mapped "patches" of the western prairie fringed-orchid). Based on 2005 observations, 83% of flowering plants observed are found on proposed critical habitat.
- Additional critical habitat may be identified by December 2009 as part of an action plan, pending the completion of a schedule of studies and actions to identify critical habitat.
- A multiple-species approach to recovery action, involving stakeholders from the Manitoba Tall Grass Prairie Preserve, is proposed.

## TABLE OF CONTENTS

DECLARATION.....	i
RESPONSIBLE JURISDICTIONS .....	i
AUTHOR .....	i
ACKNOWLEDGMENTS.....	i
STRATEGIC ENVIRONMENTAL ASSESSMENT .....	i
RESIDENCE .....	ii
PREFACE .....	ii
EXECUTIVE SUMMARY.....	iii
Species ASSESSMENT Information FROM COSEWIC.....	1
1. BACKGROUND .....	1
1.1 Description .....	1
1.2 Distribution and Abundance .....	2
1.3 Species' Needs .....	4
1.3.1 Biological .....	4
1.3.2 Habitat .....	5
1.3.3 Limiting Factors .....	6
1.4 Protection.....	6
1.5 Threats.....	6
1.5.1 Habitat Loss and Degradation .....	6
1.5.2 Exclusion by Other Plants.....	8
1.5.3 Genetic Isolation .....	8
1.5.4 Illegal Removal of Plants .....	8
1.6 Actions Already Completed or Under Way.....	8
1.7 Knowledge Gaps.....	9
2. RECOVERY .....	9
2.1 Recovery Feasibility.....	9
2.2 Recovery Goal .....	9
2.2.1 Population and Distribution Objectives .....	10
2.3 Recovery Objectives .....	10
2.4 Broad Strategies to be Taken to Address Threats .....	11
2.5 Recommended Research and Management Activities .....	12
2.6 Critical Habitat.....	15
2.6.1 Identification of Critical Habitat (proposed) .....	15
2.6.2 Activities likely to result in destruction of critical habitat.....	16
2.6.3 Schedule of Studies and Actions to Identify Critical Habitat.....	16
2.7 Existing Approaches to Habitat Protection.....	16
2.8 Effects on Non-target Species .....	17
2.9 Evaluation of Success.....	17
2.10 Recovery Action Plan Development.....	18
2.10.1 Proposed structure of recovery action group .....	18
2.10.2 Multiple-species Approach to Recovery Action.....	18
2.10.3 Action Plan Timeline .....	18
3. REFERENCES.....	19



APPENDIX A. Manitoba Tall Grass Prairie Preserve ..... 21  
APPENDIX B. Species At Risk in Southeastern Manitoba ..... 22

## SPECIES ASSESSMENT INFORMATION FROM COSEWIC

**Date of Assessment:** May 2000

**Common Name:** Western Prairie Fringed-orchid

**Scientific Name:** *Platanthera praeclara*

**COSEWIC Status:** Endangered

**Reason for designation:** A globally rare orchid occurring in tallgrass prairie remnants in southeastern Manitoba with widely fluctuating population numbers and varied threats to the species and its habitat.

**Canadian Occurrence:** Manitoba

**COSEWIC Status History:** Designated Endangered in April 1993. Status re-examined and confirmed in May 2000. Last assessment based on an update status report.

### 1. BACKGROUND

The following information was extracted from the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) status report (Collicutt 1993) and the COSEWIC status update report (Punter in press), supplemented with new field survey data from 1999 to 2005 (C. Borkowsky, pers. comm.) and other sources as indicated.

#### 1.1 Description

The western prairie fringed-orchid (also known as the western prairie fringed orchid) (*Platanthera praeclara*) is a perennial wildflower found in calcareous prairies and wet meadows.

The species is perennial, with thick fleshy roots and a tuber. Flowering plants reach a height of 40–88 cm, with 5–7 leaves per stem. Its flowers are arranged in a spike, 5–15 cm long and 5–9 cm wide, with 4–33 creamy white flowers (Figure 1). The flowers are very showy, with two fan-shaped petals on top and one large petal on the bottom. The bottom petal is deeply divided into three lobes, which are further incised to form a fringe. Flowers are fragrant at night to attract insect pollinators. Peak flowering typically occurs from late June to mid-July. Punter (in press) provides a detailed description of the species and its phenology.

The known history of this species in Canada is short. The first published report of the species was by Catling and Brownell (1987), who collected a specimen of what was then thought to be *Platanthera leucophaea* in the Vita, Manitoba, area on July 26, 1984. Local residents recall seeing the species much earlier than 1984, and orchid enthusiast Bud Ewacha (pers. comm.) reports having seen the species prior to this time, but no other long-term information exists.

Sheviak and Bowles (1986) then split *P. leucophaea* into two species, with all records west of the Missouri River being reassigned to the new species, western prairie fringed-orchid (*Platanthera praeclara* Sheviak and Bowles).

## 1.2 Distribution and Abundance

The western prairie fringed-orchid occurs from Manitoba south to Oklahoma, east to Iowa, and west to central Nebraska (Figure 2). It is ranked G2 by NatureServe (2005) and is rare throughout its entire range in central North America (Table 1).

In Canada, there is one extant metapopulation — defined by Punter (in press) as a population of at least 3000 individuals — of the western prairie fringed-orchid, found west of Vita, Manitoba, in the Rural Municipality of Stuartburn (Figure 3). The Manitoba metapopulation is the largest of any for the species and represents approximately 50% of the global population.



Figure 1. Western prairie fringed-orchid inflorescence.

**Table 1. NatureServe conservation status ranks (national, provincial, or state) for the western prairie fringed-orchid (NatureServe 2005) and maximum observed number of flowering plants observed there.**

Jurisdiction	NatureServe rank	Maximum observed number of flowering plants <sup>a</sup>
<i>Canada</i>	N1	
Manitoba	S1	23 530
<i>United States</i>	N2	
Iowa	S2	1 100
Kansas	S1	54
Minnesota	S1	13 166
Missouri	S1	279
Nebraska	S2	2 102
North Dakota	S2	12 911
Oklahoma	S1	Not seen since prior to 1979
South Dakota	SH	Believed extirpated

<sup>a</sup> In Manitoba, the maximum number of flowering plants observed was in a single season (2003) (C. Borkowsky, pers. comm.). Population figures from the United States are the maximum number of flowering plants observed at each site, from 1979 to the present (P. Delpey, pers. comm.).

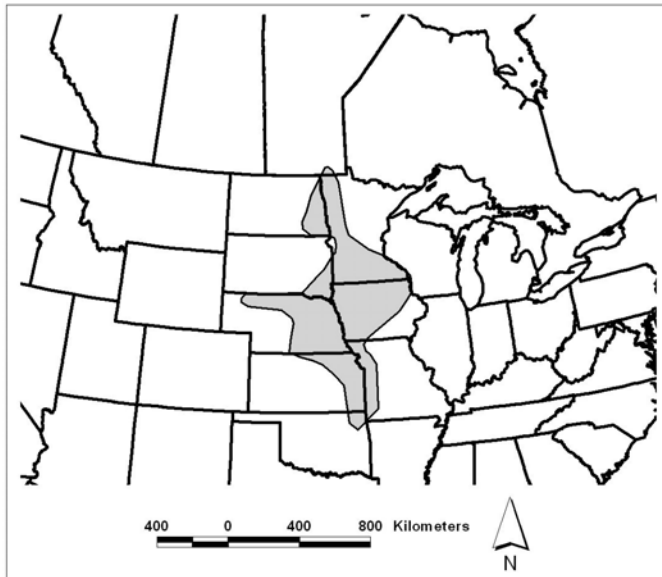


Figure 2. Global range of the western prairie fringed-orchid (derived from Flora of North America Editorial Committee 2003)

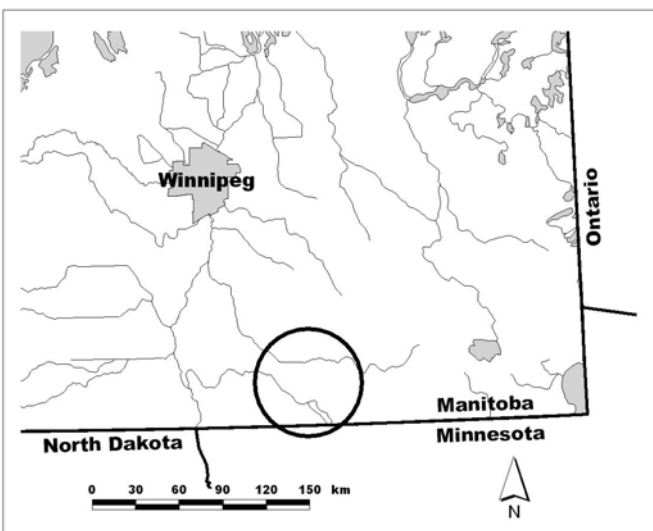


Figure 3. Generalized Canadian range of the western prairie fringed-orchid (information provided by Manitoba Conservation Data Centre 006).

The western prairie fringed-orchid has an area of occupancy in Canada of approximately 670 ha, based on mapping of known patches of the species (Manitoba Conservation Data Centre 2006). The Canadian range of the western prairie fringed-orchid makes up about 0.5% of the global range (Figure 2), although the vast majority of the global range has been altered by anthropogenic activity and no longer provides suitable habitat.

Surveys of the number of flowering plants have been conducted in Manitoba since 1992 (Figure 4). The number of flowering plants fluctuates widely from one year to the next (Punter in press), with a low of 1818 in 1995 to a high of 23 530 in 2003. In any given year, many more plants remain in a vegetative stage, with 1–3 leaves (Punter in press). The difficulty in locating vegetative plants makes counts of flowering plants the easiest way to monitor population status. However, the large fluctuations in numbers of flowering plants from year to year make it difficult to discern any upward or downward trend in the Canadian population.

In the United States, where information on the species dates back to the 19th century, there is a long list of sites where the species has either been extirpated or not observed for more than 30 years (U.S. Fish and Wildlife Service 1996). The significant declines throughout its range are attributed to conversion of habitat to cropland, overgrazing, intensive hay mowing, drainage, and fire suppression (U.S. Fish and Wildlife Service 1996).

In Canada, the relatively short documented history of the western prairie fringed-orchid makes it difficult to describe similar declines in extent of occurrence or population size. The species has never been observed outside of its current distribution in Canada, and monitoring of flowering plants has taken place only since 1992. While there have been documented cases of habitat conversion that resulted in the loss of western prairie fringed-orchid habitat and plants (Collicutt 1993; Punter in press), these losses took place in the same general area where plants are still found. The area in which plants have been observed increased slightly over the last 10 years, as a few additional patches of plants have been located, but this is more likely to be attributable to increased search effort from year to year, rather than to an expanding range.

The western prairie fringed-orchid is listed as Endangered by regulation under Manitoba's *Endangered Species Act*. It is listed as Threatened under the U.S. *Endangered Species Act* and is listed under three state *Endangered Species Acts* (Endangered in Minnesota, Threatened in Iowa and Nebraska).

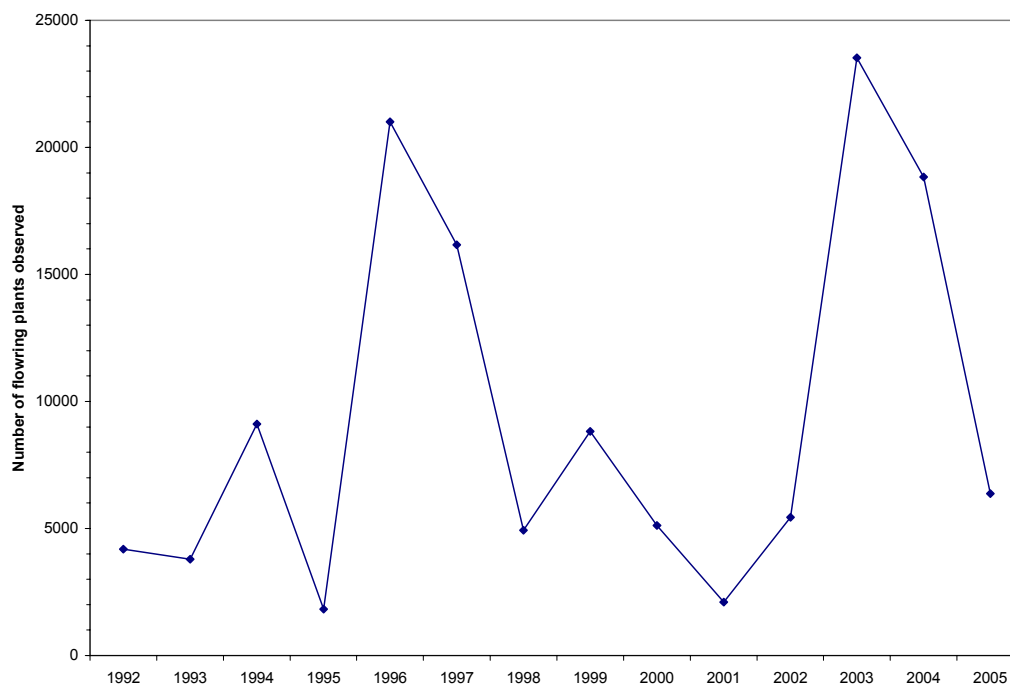


Figure 4. Number of flowering western prairie fringed-orchids observed in Manitoba, 1992–2005.

## 1.3 Species' Needs

### 1.3.1 Biological

Two pollinator species for the western prairie fringed-orchid have been observed in Manitoba: the wild cherry sphinx (*Sphinx drupiferarum*) and the galium sphinx (*Hyles gallii*) (Westwood and Borkowsky 2004). In Manitoba, peak flying activity for the two moths does not overlap completely with peak flowering activity for the western prairie fringed-orchid. This may

contribute to low levels of pollination and seed production (Westwood and Borkowsky 2004). Additional moth species have been observed as pollinators in the United States, but it appears that most of these species are unable to survive in Canada (C. Borkowsky, pers. comm.). The leafy spurge hawkmoth (*Hyles euphorbiae*) was recently documented as a pollinator of the western prairie fringed-orchid in North Dakota (Ralston *et al.* in press). This moth is a non-native species from Europe, introduced as a biocontrol for leafy spurge. It has been observed in southwestern and south-central Manitoba and in time may expand its range to include southeastern Manitoba.

The needs of the pollinator species at all stages in their life cycles should be considered when managing for the western prairie fringed-orchid or other tallgrass prairie species. Mixed aspen forest habitat is required by both moth species for their larval stages; host plants are chokecherry or pincherry (*Prunus* spp.) for the wild cherry sphinx and bedstraws (*Galium* spp.) for the galium sphinx (C. Borkowsky, pers. comm.).

### 1.3.2 Habitat

The western prairie fringed-orchid is found on wet to mesic tallgrass prairies, sedge meadows, and wet brush prairies. Punter (in press) provides a detailed list of associated species.

The Vita area is underlain by highly calcareous glacial till, with a ridge and swale topography (Punter in press). Soils are wet to mesic, imperfectly drained, extremely calcareous, Dark Gray Chernozemic sandy loams to loams. Lands supporting the western prairie fringed-orchid are generally too wet and stony for cultivation.

Encroachment of trees and shrubs such as trembling aspen (*Populus tremuloides*) on upland ridges and bog birch (*Betula pumila*), shrubby cinquefoil (*Dasiphora fruticosa*), and willow species (*Salix* spp.) in wetter swales is common in the absence of disturbances such as fire (Punter in press). Landowners use grazing, haying, and spring burning as tools to control woody species encroachment. These habitat management techniques could have positive or negative effects on recruitment and survival of the western prairie fringed-orchid, depending on frequency, intensity, and timing (U.S. Fish and Wildlife Service 1996). A variety of management regimes have been assessed in the United States, with varying results (U.S. Fish and Wildlife Service 1996). The highly variable abundance of the species from one year to the next, even in the absence of management techniques, may make it difficult to assess the success of various management techniques. The western prairie fringed-orchid Recovery Team in the United States recommended that additional research be undertaken to document the influence of various management techniques in all parts of the species' range (U.S. Fish and Wildlife Service 1996).

Hydrology is an important factor in determining the suitability of orchid habitat. Generally, the water table is high during the spring and summer in areas where the western prairie fringed-orchid occurs. Wolken *et al.* (2001) observed plants growing in swales with no standing water and in swales with as much as 80 cm of standing water in the same year and found that swales containing orchids had significantly higher surface soil moisture and water depths than swales that did not contain orchids.

### 1.3.3 Limiting Factors

The western prairie fringed-orchid is at the northern limit of its range in southeastern Manitoba. Populations at the limits of a species' range often occupy poorer habitat and are more fragmented, less dense, and more variable than those at the core of its range (Channell and Lomolino 2000; Vucetich and Waite 2003). Peripheral populations are therefore more vulnerable to extinction due to low immigration rate, disrupted pollinator relationships, and other density-related factors. Genetic diversity is sometimes, but not always, lower in peripheral populations, although these populations may possess unique genetic characteristics (Vucetich and Waite 2003). Pollination is a potential limiting factor, particularly at the periphery of the range, where both plant and pollinator populations may be fragmented.

The period of peak orchid flowering does not overlap completely with the period of peak flight activity for the two species of sphinx moth that have been observed pollinating the western prairie fringed-orchid in Manitoba (C. Borkowsky, pers. comm.). The diversity of orchid pollinators also appears to be lower in Manitoba than farther south in the species' range. This may lead to lower rates of seed production than elsewhere in its range, although seed set is arguably low for the species range-wide and may simply be a characteristic of the species.

Manitoba's cooler climate, compared with that of other places in the species' range, is almost certainly a factor that limits seed production in some years. Punter (in press) notes that frost damage to flowers has been observed in two of the last 10 years and also suggests that low temperatures at flowering time may reduce the flight activity of insect pollinators, resulting in a reduced seed set.

## 1.4 Protection

The western prairie fringed-orchid has been listed as Endangered under Schedule 1 of the federal *Species at Risk Act* since June 2003. It was also listed as Endangered by regulation in 1996 under *The Endangered Species Act* in Manitoba, which specifically prohibits acts that “*destroy, disturb or interfere with the habitat of an endangered species.*”

## 1.5 Threats

The following list of threats to the western prairie fringed-orchid is summarized from Punter (in press) unless otherwise stated and can be viewed in more detail in that report. Broad strategies to address these threats are outlined in section 2.4 and in Table 2.

### 1.5.1 Habitat Loss and Degradation

#### *Habitat Conversion*

Range-wide, the most significant threats to the western prairie fringed-orchid are considered to be human activities that permanently alter its habitat (U.S. Fish and Wildlife Service 1996; Punter in press). Conversion of native prairie habitat to cropland, tame pasture, or hayland has

resulted in significant decreases in abundance of the western prairie fringed-orchid in the United States. However, habitat conversion as a factor in the decline of this species is less well documented in Canada, as described in section 1.2. Although some examples of habitat conversion have been documented in the last 10–15 years (Collicutt 1993; Punter in press), much of the land supporting the western prairie fringed-orchid today is already part of the Manitoba Tall Grass Prairie Preserve (Appendix A), and conversion is now an unlikely threat for most of the population.

### *Agricultural Impacts*

Intensive long-term grazing may affect plants by trampling or herbivory. Pasture “enhancement” through introduction of tame forage grasses could result in increased competition.

Haying in mid- or late summer, prior to seed set, may remove the inflorescence and photosynthetic tissue, weakening the plant and reducing seed production.

A relatively new potential threat to the western prairie fringed-orchid is the application of liquid hog manure to lands supporting populations of the orchid or on lands near orchid populations, since overapplication or improper application of hog manure can lead to transport of nutrients into the groundwater through leaching or overland flow (Saskatchewan Soil Conservation Association undated). Changes in species composition due to nutrient additions are well documented in the scientific literature. Wedin and Tilman (1996) observed a greater than 50% decrease in species richness after 12 years of nitrogen addition to Minnesota grasslands, with native C4 (warm season) grass species declining in favour of weedy C3 (cool season) grass species. Little is known, however, about the specific effects, if any, of nutrient loading as a result of manure application on the western prairie fringed-orchid. It is possible that higher nutrient levels may simply not be tolerated by the orchid, or the orchid could be outcompeted by other plants for nutrients, light, or water as nutrient levels and species composition change. To date, however, no research has been conducted to answer these specific questions on this potential threat.

### *Alterations to Hydrology*

Deepening of roadside ditches and construction of drains to remove surface water from agricultural land have the potential to lower the water table of the area, to the detriment of the western prairie fringed-orchid and its habitat. The presence of the western prairie fringed-orchid may be dependent on the moisture content of the topmost 10 cm of soil in swales (Wolken *et al.* 2001). A decrease in flowering and an increase in mortality observed in the United States during an extreme drought led the Western Prairie Fringed-orchid Recovery Team there to state that hydrological alterations resulting in a drawdown of the water table near the root zone of the orchid could have serious adverse impacts (U.S. Fish and Wildlife Service 1996).



## *Roadway Maintenance*

Undeveloped road allowances and ditches adjacent to roads support a limited number of plants in most years. Road maintenance activities such as mowing, herbicide use, and ditch clearing and deepening have resulted in the loss of some plants.

### **1.5.2 Exclusion by Other Plants**

#### *Woody Species Encroachment*

Encroachment by woody vegetation is a threat to the western prairie fringed-orchid and other shade-intolerant grassland species.

#### *Invasion of Non-Native Plants*

Non-native plants could displace the western prairie fringed-orchid and other native plant species through competition. Invasive plants such as leafy spurge (*Euphorbia esula*), St. John's wort (*Hypericum perforatum*), smooth brome (*Bromus inermis*), Kentucky bluegrass (*Poa pratensis*) and clovers (*Trifolium* spp.) are present at the Tall Grass Prairie Preserve and have the potential to affect the western prairie fringed-orchid. Wolken *et al.* (2001) identified both Kentucky bluegrass and leafy spurge as threats to orchid habitat, with both species observed growing within swales that also contained the western prairie fringed-orchid.

### **1.5.3 Genetic Isolation**

The Canadian metapopulation of the western prairie fringed-orchid is about 45 km from the nearest orchid population in Minnesota. This appears to be beyond the feeding flight range of pollinator species. This genetic isolation creates the potential for genetic drift and inbreeding.

### **1.5.4 Illegal Removal of Plants**

Because the western prairie fringed-orchid is an extremely showy plant, digging or picking of the orchid, especially near roads, is a threat. Evidence of illegal removal of plants (i.e., holes where plants have been dug up) has been observed.

## **1.6 Actions Already Completed or Under Way**

In 1995, the Canadian Nature Federation's Endangered Plants and Invertebrates in Canada Program produced a National Recovery Plan for the Western Prairie Fringed-orchid (Davis 1995). The plan focused largely on actions required for recovery. Although never formally adopted by the governments of Manitoba and Canada, many of these actions have been undertaken at the Manitoba Tall Grass Prairie Preserve (Appendix A). Specifically:

- More than 3000 ha (5,000 acres) of land supporting tallgrass prairie and other native plant communities have been purchased and protected by the various partners in the Preserve. Many of the largest patches of plants are found on Preserve land — more than 80% of flowering plants observed in 2005 were found there.

- Preserve lands are managed to conserve the native flora and fauna using a variety of techniques, such as burning, haying, rotational grazing, and exotic species control.
- Long-term monitoring has been undertaken.
- A number of research projects have been undertaken to better understand the relationship between the western prairie-fringed orchid and its insect pollinators.
- Extension activities have been undertaken to educate both locals and ecotourists, including a school program, interpretive trails and signage, guided tours, and a yearly Prairie Day.

## **1.7 Knowledge Gaps**

Knowledge gaps that, if filled, would assist with recovery of the western prairie fringed-orchid include:

- the ability to accurately determine (or estimate) total population size and thereby set quantitative population objectives for recovery;
- standardized guidelines for inventory and monitoring of existing populations;
- knowledge of the full extent of population and distribution (e.g., undiscovered populations, particularly on private land);
- the impacts of isolation and population size on population viability;
- the extent of factors affecting survival and reproductive success (e.g., habitat, weather, pathogens, grazers, invasive species, woody species encroachment, pollinators, grazing regimes, burning regimes, hydrological regimes, and nutrient loading); and
- a model for the potential impact of climate change.

## **2. RECOVERY**

### **2.1 Recovery Feasibility**

The recovery of the western prairie fringed-orchid in Canada is feasible because 1) individuals capable of reproduction are available; 2) sufficient suitable habitat is available or could be made available through habitat management; 3) significant threats to the species can be mitigated; and 4) the techniques for effective recovery appear achievable.

### **2.2 Recovery Goal**

The western prairie fringed-orchid has always been rare in Canada, with Canada's only known population occurring in a small area in southeastern Manitoba. There is little potential for this species to be downlisted from Endangered based on its limited distribution. Nevertheless, it appears feasible to maintain this species in the area of Manitoba where it is currently found.

The recovery goal for the western prairie fringed-orchid is to maintain the persistence and viability of Canada's only metapopulation.

### 2.2.1 Population and Distribution Objectives

Setting quantitative objectives for the recovery of this species based on conserving an absolute number or percentage of individuals is extremely difficult, because the total number of plants in existence is difficult to assess. Plants go through several stages before flowering, from a very small protocorm in the year(s) immediately following germination to a vegetative plant with 1–3 leaves. Plants may grow vegetatively for several years before flowering and then revert to a vegetative state the following year. Monitoring in the Tall Grass Prairie Preserve found that between 40% and 95% of plants were vegetative (Punter in press). Vegetative plants are shorter than flowering plants and much more difficult to enumerate. The easiest method of monitoring population numbers from year to year is to count flowering plants. However, the number of flowering plants can fluctuate by an order of magnitude from one year to the next (Figure 4). This makes it difficult to set quantitative population goals in terms of number of plants. Furthermore, with counts of flowering plants dating back to only 1992, it is impossible to know whether flowering plant counts made to date reflect the full range of natural variability in the Canadian population. Monitoring plots in which flowering and vegetative plants are counted may be the only way to detect an increase or decrease in the population.

Hence, the population and distribution objective for recovery of the western prairie fringed-orchid is:

- to ensure the long-term survival of the western prairie fringed-orchid by maintaining the population at its current size (within its natural range of variability as observed between 1992 and 2005) and by maintaining the population's current distribution and area of occupancy.

### 2.3 Recovery Objectives

*Objective 1:* Monitor the population trends of the western prairie fringed-orchid on an ongoing basis, establishing additional monitoring protocols as required.

The population must be monitored to determine population trends. Counts of flowering plants can continue to serve as an indicator of population size. Additionally, a standardized protocol for monitoring other parameters, such as seed production and recruitment, may be required. The monitoring protocol should be designed to detect population changes due to factors such as hydrological change, vegetation succession, invasion of exotic species, and habitat management.

*Objective 2:* On an ongoing basis, identify and implement beneficial management practices to reduce threats and to help sustain or potentially increase the population of the western prairie fringed-orchid.

As new information becomes available regarding beneficial management practices for the western prairie fringed-orchid, it will be incorporated into

management planning for the Manitoba Tall Grass Prairie Preserve and forwarded on to other landowners and stakeholders in conjunction with Objective 4.

*Objective 3:* By 2007, develop a comprehensive applied research strategy to address knowledge gaps. Basic biological attributes of the western prairie fringed-orchid require further research to guide protection and restoration efforts. Research should focus on population demographics, factors affecting seed production, including pollination biology, vegetation management techniques, and the effects of threats such as hydrological change and nutrient loading on the species and its habitat. A comprehensive list of required research can guide researchers and funding agencies to fill knowledge gaps.

*Objective 4:* By December 2009, increase landowner and key stakeholder awareness of the western prairie fringed-orchid and its needs to the point where stewardship and beneficial management practices are being implemented.

Education and communication efforts are needed to ensure that western prairie fringed-orchid populations are recognized during land use planning. Stewardship with private landowners and with provincial and municipal governments is also needed.

## **2.4 Broad Strategies to be Taken to Address Threats**

In general, threats will be addressed through habitat protection, habitat management, research, and efforts to increase public awareness (Table 2). A summary of strategies by threat, as outlined in section 1.5, follows.

### *Habitat Loss and Degradation*

These threats will be addressed directly through protection of habitat through stewardship and conservation agreements. In addition, education and communication materials on the western prairie fringed-orchid and its habitat requirements will be developed and circulated among municipalities, landowners, and the general public.

### *Exclusion by Other Plants*

These threats will be addressed through the implementation or continued implementation of beneficial management practices, which could include prescribed burning, focused herbicide application, and managed grazing and/or mowing regimes. Additional research may be required to determine the most beneficial frequency, intensity, and timing of these practices.

### *Low Reproductive Success*

Research into issues related to reproduction (pollination, seed set, and germination rates) and population genetics is needed to determine the role that these threats may play in limiting population growth. The results can then be used to direct recovery action as needed.

### *Illegal Removal of Plants*

Communication with orchid societies, landowners, and the general public will provide information on the threat that illegal collection poses to the western prairie fringed-orchid, as well as penalties associated with illegal collection and possession.

## **2.5 Recommended Research and Management Activities**

A general description of the research and management activities that are recommended to meet the recovery objectives and address the identified threats is outlined in Table 2. The future action plan will provide more detailed information on these activities and their respective implementation schedules.

**Table 2. Recommended research and management activities to effect recovery of the western prairie fringed-orchid in Canada.**

Priority	Recovery objectives	Broad strategy	Threat(s) addressed	Recommended activities	Outcomes
High	2	Habitat protection	<ul style="list-style-type: none"> <li>Habitat loss and degradation</li> <li>Illegal removal of plants</li> </ul>	<ul style="list-style-type: none"> <li>Maintain protection at currently protected sites.</li> <li>Prioritize additional sites for protection based on level of threat and population size.</li> <li>Determine strategies for protection.</li> <li>Implement protection strategies in order of urgency.</li> </ul>	<ul style="list-style-type: none"> <li>Additional habitat considered protected from future loss.</li> <li>Reduced risk to the species.</li> </ul>
Urgent	2	Habitat management	<ul style="list-style-type: none"> <li>Habitat loss and degradation</li> <li>Exclusion by other plants</li> </ul>	<ul style="list-style-type: none"> <li>Maintain successful habitat management strategies at identified sites.</li> <li>Prioritize sites for urgency of active management.</li> <li>Determine suitable management strategy for each site, and implement management strategies in order of urgency.</li> </ul>	<ul style="list-style-type: none"> <li>Habitat managed to conserve and/or enhance populations of the western prairie fringed-orchid.</li> <li>Reduced risk to the species.</li> </ul>
Urgent	2 and 3	Research	<ul style="list-style-type: none"> <li>Habitat loss and degradation</li> <li>Exclusion by other plants</li> <li>Low reproductive success</li> </ul>	<ul style="list-style-type: none"> <li>Prioritize knowledge gaps, and promote/conduct research to address gaps in order of urgency.</li> <li>Determine population viability.</li> <li>Determine beneficial management practices.</li> <li>Identify the extent to which particular factors impact population sustainability or growth.</li> </ul>	<ul style="list-style-type: none"> <li>List of priority research projects that can be used to attract researchers and funding.</li> <li>Improved understanding of the species' biology and its beneficial management practices to guide stewardship.</li> <li>Improved definition of what constitutes critical habitat and its destruction.</li> </ul>
High	1	Population monitoring	<ul style="list-style-type: none"> <li>Habitat loss and degradation</li> <li>Exclusion by other plants</li> <li>Low reproductive success</li> <li>Illegal removal of plants</li> </ul>	<ul style="list-style-type: none"> <li>Develop and implement standardized monitoring protocols.</li> <li>Monitor known populations.</li> <li>Survey additional areas for new populations.</li> <li>Concurrently monitor factors that may be affecting population size.</li> </ul>	<ul style="list-style-type: none"> <li>Data on species' status.</li> <li>Ability to assess changes in species' abundance that can be attributed to changes in external factors (threats).</li> </ul>

<b>Priority</b>	<b>Recovery objectives</b>	<b>Broad strategy</b>	<b>Threat(s) addressed</b>	<b>Recommended activities</b>	<b>Outcomes</b>
Necessary	2 and 4	Increased awareness	<ul style="list-style-type: none"> <li>• Habitat loss and degradation</li> <li>• Exclusion by other plants</li> <li>• Illegal removal of plants</li> </ul>	<ul style="list-style-type: none"> <li>• Identify and prioritize target audiences (e.g., landowners, municipalities, maintenance crews, orchid societies, etc.).</li> <li>• Develop a communication plan that effectively conveys information to the target audience (e.g., web pages, interpretation programs, fact sheets, etc.).</li> </ul>	<ul style="list-style-type: none"> <li>• Improved communication leading to heightened awareness, goodwill, and cooperation.</li> <li>• Enhanced ecotourism benefits for local communities.</li> <li>• Reduced risk to the species.</li> </ul>

## 2.6 Critical Habitat

Critical habitat is defined in the *Species at Risk Act* as “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” (National Recovery Working Group 2005). In other words, critical habitat is the quantity of habitat needed to reach the recovery goal. Identification of critical habitat is the result of an analytical process that takes into account the available suitable habitat and potential or restorable habitat, the long-term recovery goal, and the population objective.

### 2.6.1 Identification of Critical Habitat (proposed)

This strategy proposes a partial identification of critical habitat. Additional information on the species’ biology, demographics, population viability, and threats is needed to make further biological decisions in order to complete the critical habitat identification for the western prairie fringed-orchid. The identification of critical habitat for the western prairie fringed-orchid will be completed by December 2009, as part of an action plan (see section 2.6.3, Schedule of Studies and Actions to Identify Critical Habitat).

Proposed critical habitat for the western prairie fringed-orchid in Canada consists of portions of the following 24 quarter-sections<sup>1</sup> within the Manitoba Tall Grass Prairie Preserve on which the western prairie fringed-orchid is known to occur: NW-36-002-06 E, NE-36-002-06 E, SW-36-002-06 E, NE-35-002-06 E, SE-35-002-06 E, NW-31-002-07 E, NE-27-002-06 E, SE-27-002-06 E, NE-26-002-06 E, NW-26-002-06 E, SE-26-002-06 E, SW-25-002-06 E, SE-24-002-06 E, SW-24-002-06 E, NE-23-002-06 E, NW-22-002-06 E, NE-22-002-06 E, SE-18-002-07 E, SW-18-002-07 E, NW-14-002-06 E, NE-13-002-06 E, NW-13-002-06 E, NW-07-002-07 E, and SE-02-003-06 E. Approximately 73% of the total area of occupancy in Canada is found on these lands designated as proposed critical habitat (based on the mapped “patches” of the western prairie fringed-orchid). Based on 2005 observations, 83% of flowering plants observed are found on proposed critical habitat. Additional information is required on population size and persistence of the western prairie fringed-orchid at other locations before these locations may be considered for identification as critical habitat in a revised recovery strategy or subsequent action plan.

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<sup>1</sup> Quarter section descriptions are based on the Dominion Land Survey System, whereby most of western Canada is legally divided into townships based on longitudinal meridians and latitudinal base lines; each township is given a township number and range number. Townships are approximately 9.7 km x 9.7 km (6 miles x 6 miles) and are further divided into thirty-six sections, each about 1.6 km x 1.6 km (1 mile x 1 mile). In turn, each section is divided into four quarter sections: southeast, southwest, northwest and northeast and are 0.8 km x 0.8 km (half-mile x half-mile). For example, the full legal description of quarter section NW-36-002-06-E is the Northwest Quarter of Section 36, Township 002, Range 06, east of the First Meridian (see McKercher and Wolf 1986, or Wikipedia 2006 for more information).



### **2.6.2 Activities likely to result in destruction of critical habitat**

Destruction of critical habitat for the western prairie fringed-orchid is any alteration to the topography, geology, soil conditions, vegetation, chemical composition of air or water, surface water or groundwater hydrology, or microclimate of such a magnitude, intensity, or duration that it significantly reduces the capacity of the critical habitat to contribute to the survival or recovery of this species at risk.

Some examples of activities that may result in destruction of critical habitat include, but are not limited to, cultivation, destructive grazing regimes, anthropogenic development, including roads or buildings, application of harmful herbicides, deleterious alteration of hydrological regimes, actions that result in the long-term reduction of sun exposure, such as shading from trees or buildings, promotion of encroachment by woody species, and promotion of invasive exotic species (see section 1.5, Threats). In contrast, properly managed fire, grazing, and/or mowing regimes and exotic species control may be necessary and beneficial for the persistence of the species.

### **2.6.3 Schedule of Studies and Actions to Identify Critical Habitat**

All lands known to be inhabited by the western prairie fringed-orchid and not already designated as critical habitat will receive consideration for designation as critical habitat. This includes private land as well as Crown-owned ditches and road allowances.

The following studies and actions will assist in identifying new areas as candidates for critical habitat designation or provide additional information on the species and its habitat to assist in decision-making regarding critical habitat:

- On an ongoing basis, search for additional sites for the western prairie fringed-orchid on land containing habitat that has attributes similar to those of known sites.
- By December 2009, determine whether activities taking place on land surrounding occupied western prairie fringed-orchid habitat are having measurable positive or negative effects on the western prairie fringed-orchid. If so, assess whether these lands could constitute additional critical habitat.
- By December 2009, determine whether anthropogenically created habitat (i.e., ditches and undeveloped road allowances) that supports the western prairie fringed-orchid is critical to the survival of the species and thus meets the definition of critical habitat.

Additional studies or actions may be identified as useful during the action plan development.

## **2.7 Existing Approaches to Habitat Protection**

The habitat supporting Canadian populations of the western prairie fringed-orchid is considered to be Manitoba's best remaining tallgrass prairie habitat. As such, it has been the target of considerable attention from conservation agencies that have joined forces to create and manage the Manitoba Tall Grass Prairie Preserve. Appendix A provides a summary of the Preserve's organization and function.

Lands in the Tall Grass Prairie Preserve are managed to maintain tallgrass prairie habitat through a variety of approaches that may include prescribed burning, grazing, haying, and control of exotic species. These measures serve to maintain tallgrass prairie habitat and control woody species encroachment, but they are not necessarily targeted at any one species, such as the western prairie fringed-orchid or other co-occurring species at risk (see section 2.10.2).

## **2.8 Effects on Non-target Species**

Land management practices that include disturbances such as fire, mowing, and/or grazing are natural components of prairie ecosystems and tend to promote a diversity of plants and animals (Samson and Knopf 1994). In general, these actions tend to reduce the abundance of competitively dominant species while promoting the persistence of species tolerant of those disturbances. However, decisions on the timing and frequency of such practices need to take into consideration impacts on populations of a variety of species at risk. See section 2.10.2 for suggestions on how to address the needs of multiple species at risk in the area.

Actions to reduce or remove invasive woody plants — for example, controlling the encroachment of shrubs such as bog birch, shrubby cinquefoil, and willow species through burning or mowing — will have a direct impact on populations of those shrub species and an indirect impact on any species that depend upon those woody plants for their survival. To the extent possible, land management decisions should be made with the well-being of all species in mind. Actions to reduce or remove invasive exotic species will also have a direct impact on those species; however, this is usually desirable and beneficial to an ecosystem.

## **2.9 Evaluation of Success**

The implementation of approaches identified within this recovery strategy to maintain the distribution and abundance of the western prairie fringed-orchid will be considered successful if the following evaluation criteria are met:

- Monitoring of western prairie fringed-orchid sites demonstrates that populations are stable or increasing.
- Sites containing populations of the western prairie fringed-orchid have been documented and appropriate agencies and landowners notified, resulting in either direct (through purchase or development of a conservation agreement) or indirect (stewardship) increases in the proportion of western prairie fringed-orchid habitat conserved.
- Identification of threats to the persistence of western prairie fringed-orchid populations and habitat (on a site-by-site basis) has resulted in the development and implementation of measures that eliminate, reduce, or mitigate threats, to provide for the continued existence of western prairie fringed-orchid populations and habitat.
- A comprehensive communications strategy has been developed that incorporates evaluation criteria to assess the enhanced level of awareness of the western prairie fringed-orchid.
- Identified high-priority research approaches have been initiated, and the acquired knowledge has been incorporated into an adaptive management program.

## **2.10 Recovery Action Plan Development**

### **2.10.1 Proposed structure of recovery action group**

Currently, neither a recovery team nor a recovery action group has been formally created. However, the significant amount of conservation activity already undertaken at the Tall Grass Prairie Preserve to conserve this and other native prairie species is notable. Recovery action is well under way, even if not formally recognized as such to date.

It is therefore proposed that a close working relationship be formalized with the Manitoba Tall Grass Prairie Preserve, including its non-government landowners, field staff, and the management and local advisory committees. This is likely to include representation on the recovery team and recovery action group for some or all interested individuals and organizations.

Other interested individuals and organizations that could be invited to participate and contribute to recovery action include local government officials, landowners, representatives of local producer groups, orchid conservation groups, and plant biologists.

A good working relationship exists between staff of Manitoba Conservation and staff of sister agencies in the United States, such as the Minnesota Department of Natural Resources, where a great deal of expertise on this species has been accumulated. Input from American conservation partners will be pursued.

### **2.10.2 Multiple-species Approach to Recovery Action**

A number of other federally and provincially listed species at risk are also found in the same general area of Manitoba, including small white lady's-slipper (*Cypripedium candidum*), western silvery aster (*Symphyotrichum sericeum*), Dakota skipper (*Hesperia dacotae*), and Powesheik skipperling (*Oarisma powesheik*), among others (Appendix B). Most of these species are not as geographically limited in Manitoba as the western prairie fringed-orchid. However, for populations of these species at risk found in and around the Rural Municipalities of Stuartburn and Franklin, a multiple-species approach to recovery action is warranted, to ensure that management considerations of all species at risk are accounted for and, if necessary, weighed against each other.

### **2.10.3 Action Plan Timeline**

An action plan for the western prairie fringed-orchid and/or a multiple-species action plan for all listed species at risk in the area will be completed by December 2009. Action plan(s) will be completed by Manitoba with guidance from this recovery strategy. Steps to achieve recovery objectives will be ongoing in the interim.

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## **APPENDIX A. MANITOBA TALL GRASS PRAIRIE PRESERVE**

The Manitoba Tall Grass Prairie Preserve is a partnership between non-government conservation organizations, provincial and federal governments, and local residents of southeastern Manitoba. Partners include Manitoba Conservation, Manitoba Naturalists Society, Manitoba Habitat Heritage Corporation, Environment Canada, the Manitoba Tall Grass Prairie Preserve Local Advisory Committee, and Nature Conservancy Canada. Since its inception in 1988, more than 3000 ha (5,000 acres) of native prairie, wetland, and forest habitat have been purchased and are now protected in perpetuity. These lands are managed to conserve the biodiversity found there through a variety of techniques that may include prescribed burning, haying, or mowing, all of which serve to maintain native plant communities and control exotic species and woody species encroachment.

A Management Committee made up of representatives from each organization is responsible for day-to-day management issues, including recommending programs and strategic priorities for the Preserve; developing and implementing an annual work plan concerning the management of the Preserve; implementing a long-term comprehensive management plan for the Preserve; facilitating the pursuit of funding arrangements for ongoing management of the Preserve; endorsing proposals and funding arrangements for projects that contribute to the vision and long-term goals and objectives of the Preserve; and annually evaluating the effectiveness of programs and activities for the Preserve and recommending appropriate adjustments to programs and activities to ensure progress towards long-term objectives of the Preserve.

Management decisions are based upon an approved management plan (Moore and Fortney 1994). One of the eight specific objectives in the management plan is to develop measures to protect and enhance tallgrass prairie species at risk. A variety of management techniques are outlined in the plan, along with implementation and evaluation guidelines.

## APPENDIX B. SPECIES AT RISK IN SOUTHEASTERN MANITOBA

Six plant, two invertebrate, and one bird species considered to be at risk have been observed in an area centred around the Rural Municipalities of Stuartburn and Franklin in southeastern Manitoba. Although several of the species have wider provincial and national distributions, a multiple-species approach for recovery action may be warranted to address common threats and management needs in this particular area.

Additional information on the range and status of each of these species can be found at the Government of Canada's SARA Registry (<http://www.sararegistry.gc.ca>) and/or the Government of Manitoba's Species at Risk web site ([http://www.gov.mb.ca/conservation/wildlife/managing/species\\_at\\_risk.html](http://www.gov.mb.ca/conservation/wildlife/managing/species_at_risk.html)).

**Table A1. Species designated as at risk under Canada's *Species at Risk Act* (SARA) or Manitoba's *Endangered Species Act* (ESA) in southeastern Manitoba.**

Species name	SARA designation	Manitoba ESA designation
<b>Vascular plants</b>		
Western prairie fringed-orchid ( <i>Platanthera praeclara</i> )	Endangered	Endangered
Small white lady's-slipper ( <i>Cypripedium candidum</i> )	Endangered	Endangered
Western silvery aster ( <i>Symphyotrichum sericeum</i> )	Threatened	Threatened
Riddell's goldenrod ( <i>Solidago riddellii</i> )	Special concern	Threatened
Great Plains ladies'-tresses ( <i>Spiranthes magnicamporum</i> )	Not assessed	Endangered
Culver's root ( <i>Veronicastrum virginicum</i> )	Not assessed	Threatened
<b>Invertebrates</b>		
Dakota skipper ( <i>Hesperia dacotae</i> )	Threatened	Threatened
Powesheik skipperling ( <i>Oarisma powesheik</i> )	Threatened	Special concern
<b>Birds</b>		
Yellow Rail ( <i>Coturnicops noveboracensis</i> )	Special concern	Candidate for listing