

Recovery Strategy for the Poweshiek Skipperling (*Oarisma poweshiek*) in Canada

Poweshiek Skipperling



2012

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PREFACE

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

The Minister of Environment is the competent minister for the recovery of the Poweshiek Skipperling and has prepared this strategy, as per section 37 of SARA. It has been prepared in cooperation with the Government of Manitoba.

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

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

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EXECUTIVE SUMMARY

The Poweshiek Skipperling is a relatively small and rare butterfly endemic to the tall-grass prairies of North America. Since European settlement over 99% of North America's tall-grass prairie has been lost, primarily to conversion to agriculture. It is presumed that the distribution of Poweshiek Skipperling has been reduced and fragmented in proportion to the loss of this habitat. The species is known from southeastern Manitoba, eastern Dakotas, western Minnesota, western Iowa, and northern Missouri, with isolated populations in Wisconsin and Michigan. In Canada, the Poweshiek Skipperling has been found only in and around Manitoba's Tall Grass Prairie Preserve (TGPP). Due to this species' declining natural habitat, restricted geographic distribution, and small population size, the Poweshiek Skipperling was listed as Threatened in Canada under the *Species at Risk Act* in July 2005.

Historical and current threats to this species include habitat loss through the conversion of prairie to cultivated or non-native grassland, habitat degradation through overly-frequent or improperly timed prescribed and wild fires, prolonged or chronic over-grazing, succession, and haying. Other potential threats include changes to natural hydrological processes, invasion of exotic species, the use of insecticides and herbicides, and climate change and inclement weather.

Recovery of the Poweshiek Skipperling is deemed biologically and technically feasible. The population and distribution objectives for the Canadian Poweshiek Skipperling are to ensure a self-sustaining population within and surrounding the TGPP in southern Manitoba distributed within an area similar to that found in surveys that occurred in 2002 and 2008-2010 and within any new areas identified by future surveys. To achieve the recovery objectives the following broad strategies have been identified: i) inventory and monitoring; ii) research; iii) habitat management and stewardship; and iv) communication/outreach/education.

Critical habitat for Poweshiek Skipperling has been identified in this recovery strategy within 13 quarter-sections in and adjacent to the TGPP. Within these quarter-sections, critical habitat consists of wet-mesic tall-grass prairie habitat where important adult nectar and larval host plants occur and within which four or more individuals have been observed since 2002.

An action plan for the Poweshiek Skipperling will be completed by 2015, possibly in the form of a multi-species action plan for the TGPP.

RECOVERY FEASIBILITY SUMMARY

Under the *Species at Risk Act* (Section 40), the competent minister is required to determine whether the recovery of a listed species is technically and biologically feasible. Based on the following four criteria outlined by the Government of Canada (2009) for recovering species at risk, the recovery of the Poweshiek Skipperling is considered biologically and technically feasible:

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

Yes. Poweshiek Skipperling individuals capable of reproduction are present in and around the Tall Grass Prairie Preserve in southeastern Manitoba; however, the numbers within this region are extremely low and declining. Based on 2009 surveys, the Canadian population is estimated to be less than 5,000 individuals (Dupont 2010, Westwood 2010). Assuming that no other major threats impact the species or its habitat, the Canadian population is expected to sustain itself.

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

Yes. Currently there is sufficient native tall-grass prairie habitat in and around the Tall Grass Prairie Preserve to maintain the Poweshiek Skipperling at its present population level, at least in the short-term. Currently, the prairie habitat within the Tall Grass Prairie Preserve is not at risk of being converted to other non-prairie land uses. Additionally, there are areas of potential habitat which could be made available through various techniques including habitat restoration and management.

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

Yes. The main threats to the Poweshiek Skipperling, including native prairie habitat loss and degradation, can be mitigated through recovery actions. Because the current population is located largely within a preserve, this habitat is not at risk from future loss. However, overly-frequent and/or poorly-timed prescribed burns and wildfires are threats to this skipper, as is grazing and succession, so habitat management, particularly in the reserve, will need to be monitored and possibly mitigated. There are also some Poweshiek Skipperlings on private prairie lands, thus working with those landowners on management practices will be an important step to conserving this habitat for the Poweshiek Skipperling.

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

Yes. One potential recovery technique is the use of stewardship agreements to conserve Poweshiek Skipperling habitat adjacent to the Tall Grass Prairie Preserve. Stewardship agreements have been used for various conservation projects and have been effective tools for protecting habitat for species at risk. A second potential recovery technique is the implementation of beneficial management practices within the preserve and on adjacent land to maintain the tall-grass prairie habitat required by the Poweshiek Skipperlings.

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1. COSEWIC* SPECIES ASSESSEMENT INFORMATION

Date of Assessment: November 2003

Common Name (population): Poweshiek skipperling

Scientific Name: *Oarisma poweshiek*

COSEWIC Status: Threatened

Reason for designation: This species occurs in Canada in a very small restricted area at 15 locations in a single metapopulation which is an isolated disjunct, with the closest population in the United States being about 100 km to the south. In Canada, the species is dependent on native tall-grass prairie, a habitat that has suffered enormous losses in the past, and its populations have likely undergone similar declines. Although remnant prairie habitat that supports the butterfly is unsuitable for agriculture and most of it is protected in a prairie reserve, past fire management to maintain prairie vegetation has been detrimental to the butterfly. Most of the occupied habitat is protected, but even with appropriate management, its range is so small that the butterfly is vulnerable to catastrophe.

Canadian Occurrence: Manitoba

COSEWIC Status History: Designated Threatened in November 2003.

*COSEWIC – Committee on the Status of Endangered Wildlife in Canada

2. SPECIES STATUS INFORMATION

Globally and in the United States (U.S.) Poweshiek Skipperling (*Oarisma poweshiek*, Parker 1870) is ranked as vulnerable/imperiled (G2G3; NatureServe 2009). The species is ranked critically imperiled (S1) in Iowa and Wisconsin, imperiled to critically imperiled (S1S2) in Michigan, imperiled (S2) in South Dakota, and vulnerable (S3) in Minnesota (NatureServe 2009). The species is currently not ranked in North Dakota (SNR; NatureServe 2009). It is presumed that the Poweshiek Skipperling has been extirpated (SH) from Illinois and Indiana (Selby 2005, NatureServe 2009). In addition, the species is listed as endangered in the state of Wisconsin, threatened in Iowa and Michigan, and a species of concern in Minnesota (Shepard 2005).

In Canada, the Poweshiek Skipperling is listed as Threatened under the federal *Species at Risk Act* but it is not listed by the province of Manitoba (Manitoba Conservation 2010). The species is ranked imperiled (N2) nationally and imperiled (S2) in Manitoba (NatureServe 2009). The species' global population existing in Canada has not been assessed.

3. SPECIES INFORMATION

3.1 Species Description

The Poweshiek Skipperling is a member of the Order Lepidoptera (butterflies and moths), Family Hesperidae (skippers), and subfamily Hesperinae (the “branded” skippers).

The Poweshiek Skipperling has hooked antennae, a slender body, and a characteristic skipping flight pattern (Royer and Marrone 1992a, Selby 2005). It is a small butterfly with a wingspan of 2.4 to 3.0 cm (Layberry et al. 1998). The upper wings are dark brown while the head and leading edges and veins of the forewings are orange (Figure 1; Selby 2005). The undersides of the wings are dark grey with distinctive prominent silvery-outlined veins. There are very few differences between the sexes although females may appear more brightly coloured.



Figure 1. Male Poweshiek skipperling, showing dorsal (left) and ventral (right) views (© Chris McQuarrie and R.P. Webster, from Webster 2003, used with permission).

Poweshiek Skipperling is similar in appearance with Garita Skipper (*Oarisma garita*), a closely related prairie skipper which tends to be smaller, more brightly coloured (Selby 2005), and occurs in drier prairie habitats (Catling and Lafontaine 1986). Nonetheless, worn-out individuals may be difficult to differentiate when on the wing (R. Westwood, pers. obs.) and occasionally individuals have been misidentified.

The Poweshiek Skipperling has one generation per year and the flight period was observed to range from June 18 to August 6 (Klassen et al. 1989, Dupont 2010).

This species’ common name originates from Poweshiek County, Iowa, where the butterfly was first collected. In the literature, the Poweshiek Skipperling is sometimes referred to as the Poweshiek Skipper. The nomenclature used when the species was listed in SARA was followed in this recovery strategy.

3.2 Population and Distribution

Global Range and Status

The historic range of Poweshiek Skipperling likely covered much of the almost continuous tall-grass prairie of north-central North America. Since European settlement much of this area has been converted to cropland or forage, lost to urban or industrial development, invaded by forest cover, or degraded by overgrazing. Today, the Poweshiek Skipperling occurs as a series of highly localized and isolated populations throughout its former range. The species’ current range extends from southeastern Manitoba south through the eastern Dakotas and western Minnesota and Iowa and into northern Missouri, with isolated populations in Wisconsin and Michigan (Figure 2; Layberry et al. 1998, Selby 2005). There have been no recent

Poweshiek Skipperling sightings from Illinois and Indiana and the species is possibly extirpated from these states (NatureServe 2009). Recent surveys in the U.S. have noted drastic and widespread declines throughout the species' range. Significant declines in occurrences and abundance have been reported from the heart of the species' range, such as in Iowa, Minnesota and South Dakota, where Poweshiek Skipperling populations appear to have disappeared from sites known to have supported healthy and stable populations (Selby 2010, Swengel et al. 2010).

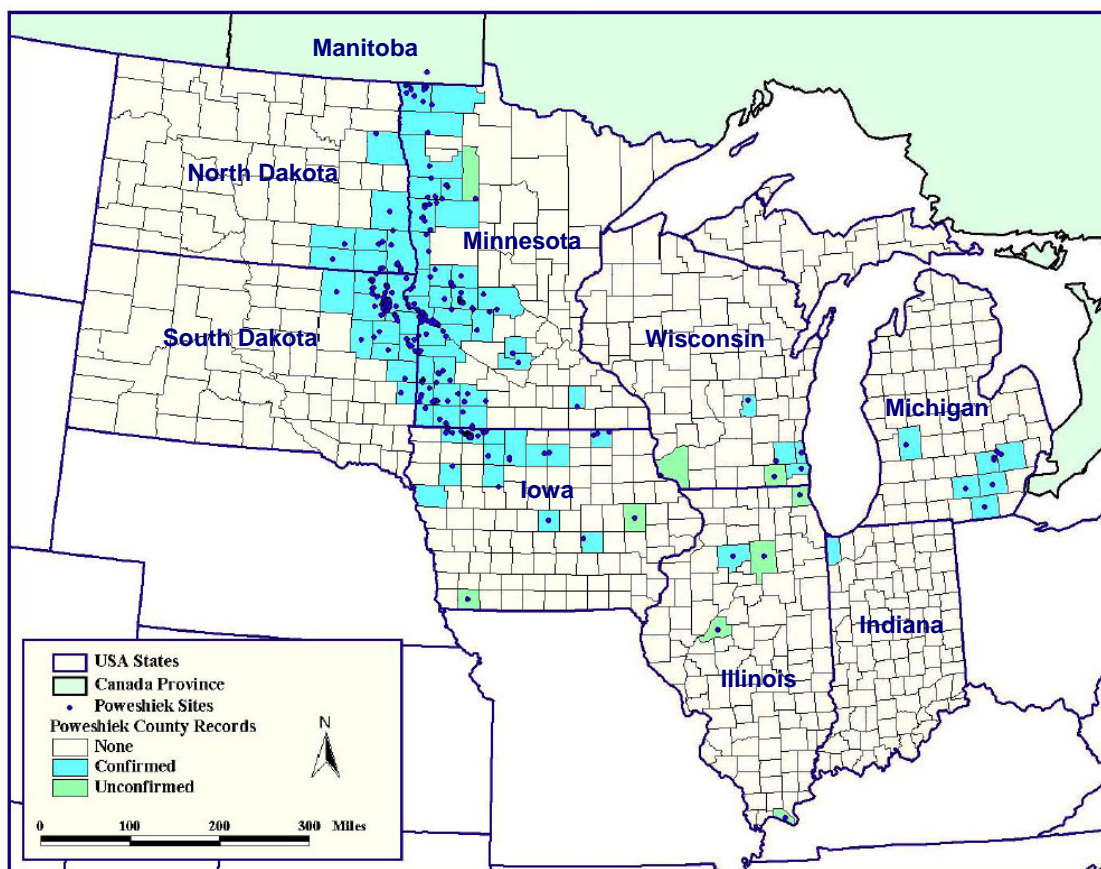


Figure 2. Global range of the Poweshiek Skipperling showing confirmed and unconfirmed occurrences (adopted from Selby 2005, used with permission).

Canadian Range

The Poweshiek Skipperling is known to occur in Canada only in one small region, within and adjacent to the Tall Grass Prairie Preserve (TGPP), which is in the vicinity of Vita, Tolstoi, and Gardenton in southeastern Manitoba, close to the U.S. border (Figure 3). Within this region, the species has been observed in 21 quarter-sections¹ (Figure 4; Appendix A). The total extent of occurrence of Poweshiek Skipperling in Canada is less than 500 km², within which the area of occupancy is about 23 km² (COSEWIC 2003). The closest population in U.S. is approximately 100 km away (COSEWIC 2003).

¹ The Dominion Land Survey system (McKercher and Wolfe 1986) is the grid system used in the Prairie Provinces to describe land locations. One unit of this system, the quarter-section (65 ha), is particularly useful for ownership and management purposes. The quarter-section level is used in this strategy to aid in describing the location of Poweshiek Skipperling critical habitat.

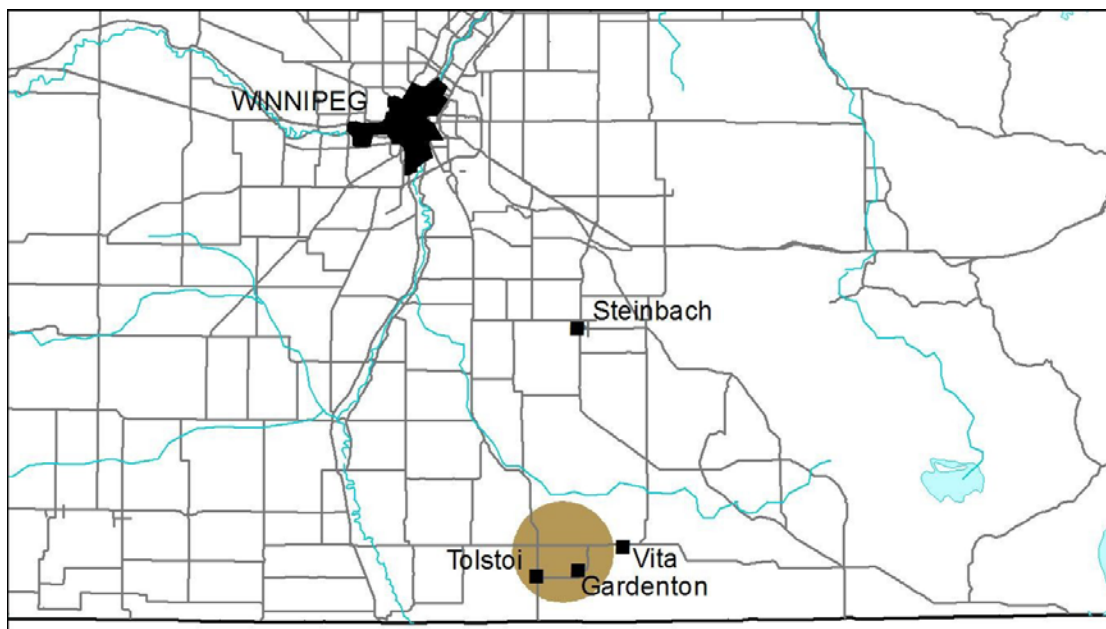


Figure 3. Canadian range of the Poweshiek skipperling, illustrated with brown circle (Environment Canada 2006).

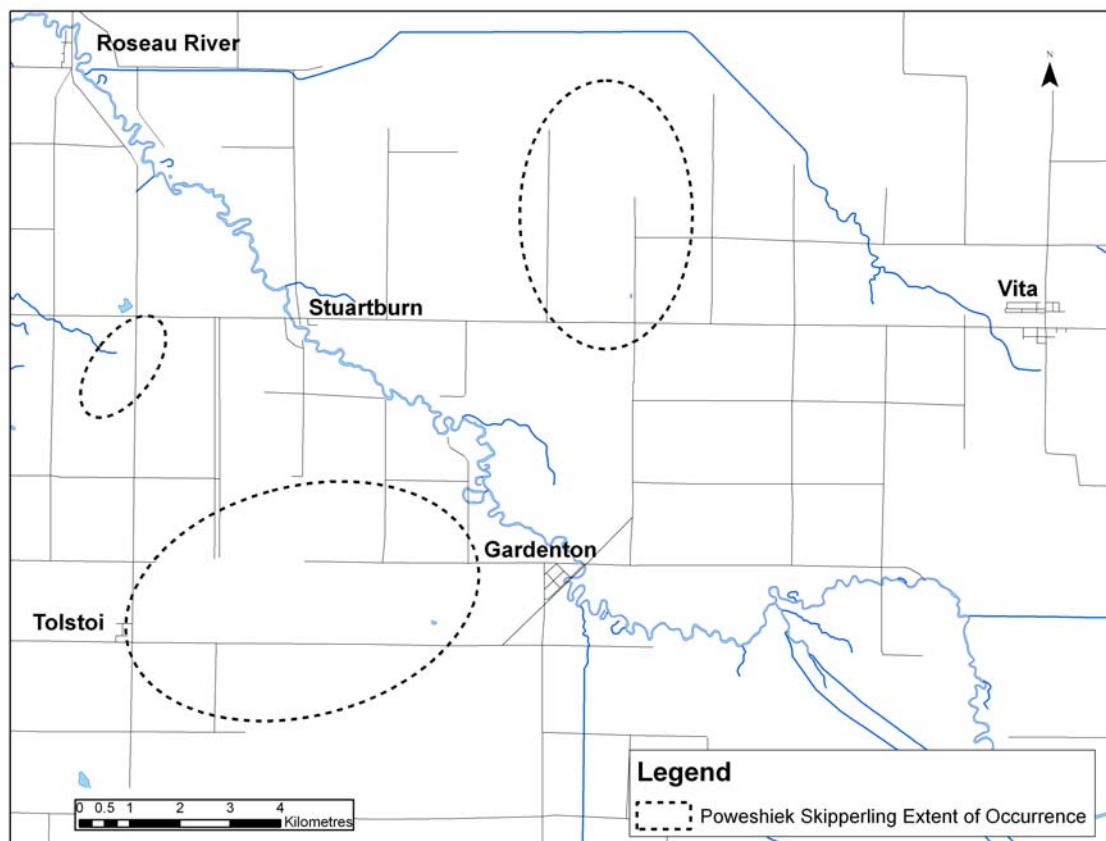


Figure 4. Distribution of Poweshiek Skipperling in south-eastern Manitoba.

Abundance

The global abundance of the Poweshiek Skipperling has been suggested to range between 2,500 and 10,000 individuals (NatureServe 2009), however this is a rough estimate since no detailed population surveys or long-term monitoring have been completed throughout the species' range. Furthermore, Poweshiek Skipperling populations, similar to other Lepidoptera, are prone to dramatic annual regional fluctuations (Royer and Marrone 1992a, R. Westwood unpubl. data). High natural variation and inconsistency in search effort can result in poor population estimates.

In 2002, the Canadian Poweshiek Skipperling population was estimated to range between 5,000 to 10,000 individuals (COSEWIC 2003), but based on more current data this assessment is thought to be an overestimate (R. Westwood unpubl. data). Surveys over the past three years (2008-2010) suggest that the Canadian population is likely less than 5,000 individuals.

There is no quantitative information on historic population fluctuations and trends for the Poweshiek Skipperling. However, based on the dramatic loss of the tall-grass prairie in North America (Samson and Knopf 1994), it is inferred that Poweshiek Skipperling populations have declined in proportion to this habitat loss (Royer and Marrone 1992a, COSEWIC 2003, Selby 2005). Recent surveys within the TGPP indicate a potential local decline with numbers ranging from approximately 300 skippers observed in 2008, to 79 in 2009, to a low of 13 in 2010 (Dupont 2010, Westwood 2010). It is currently unclear if the low numbers observed in 2010 are due to a wild fire in the fall of 2009 that burned a large area of the preserve consisting of the largest and densest Poweshiek Skipperling population (Westwood 2010) or if the recent decline is part of the wide- ranging decline that has been observed throughout the species' U.S. range (Selby 2010).

3.3 Needs of the Poweshiek Skipperling

Habitat and Biological Needs

The Poweshiek Skipperling is a native tall-grass prairie habitat specialist. Throughout its North American range, the species has been observed in a variety of native tall-grass prairie habitats, including fens, grassy lake and stream margins, marshy meadows, and wet-mesic to dry prairie habitats (Holzman 1972, Catling and Lafontaine 1986, Selby 2005). In general, the habitat associated with Poweshiek Skipperling tends to be a transitional zone between aquatic wetland and drier upland and is characterized by the presence of abundant native nectar plants, particularly species belonging to the aster family (Asteraceae), as well as prairie grasses and sedges (Selby 2005). It has been suggested that the observed preference of some Poweshiek Skipperling populations for moist habitats may be in response to the significant habitat loss that has occurred across the tall-grass prairies as well as the species' sensitivity to fire, as wetter areas tend to be less prone to severe fires (Selby 2005).

The Canadian Poweshiek Skipperling population depends on pristine wet-mesic native tall-grass prairie where key adult and larval food resources occur (Catling and Lafontaine 1986, COSEWIC 2003). The Poweshiek Skipperling is susceptible to habitat changes that alter the floral and structural components of its preferred habitat. The sites occupied by the Poweshiek Skipperling range from small (0.4 ha) to large (300 ha) prairie openings scattered among

Bur Oak (*Quercus macrocarpa*), aspen (*Populus* spp.), and American Hazel (*Corylus americana*) groves (Catling and Lafontaine 1986). These sites are characterized by low relief (1-2 metres), and most have alternating lower, periodically wetter, and higher, drier sections, each with their own distinctive plant community (COSEWIC 2003).

Adult Poweshiek Skipperlings are generally associated with the upland, drier sections of the mesic tall-grass prairie (Catling and Lafontaine 1986, COSEWIC 2003, J. Dupont and R. Westwood unpubl. data) which commonly consist of the following plant species:

- Big Bluestem (*Agrostis gerardii*)
- Pale-spike Lobelia (*Lobelia spicata*)
- Prairie Dropseed (*Sporobolus heterolepis*)
- Smooth Camas (*Zigadenus elegans*)
- Alkali Grass (*Solidago rigada*)
- Black-eyed Susan (*Rudbeckia serotina*)
- Blazingstar (*Liatris ligulistylis*).

The lower wetter areas are often dominated by:

- willow (*Salix* spp.)
- sedges (*Carex* spp.)
- Tufted Hair Grass (*Deschampsia caespitosa*)
- Redtop (*Agrotis stolonifera*)
- Mat Muhly (*Muhlenbergia richardsonis*)
- Slender Spike-rush (*Eleocharis elliptica*)
- Baltic Rush (*Juncus balticus*)
- Four-flowered Loosestrife (*Lysimachia quadriflora*)
- Heal-all (*Prunella vulgaris*).

In Manitoba, the Poweshiek Skipperling depends on pristine wet-mesic native tall-grass prairie. The scarcity of this suitable habitat where key nectar and larval host plants occur is the primary biological factor limiting the recovery of the Poweshiek Skipperling in Canada. Furthermore, the species is also limited by its low dispersal and colonization ability (Selby 2005). In mark-recapture experiments in the TGPP, skippers seldom ventured more than 10 – 20 m beyond the boundaries of the occupied sites, even when apparent suitable habitat was nearby (Dupont 2010). Given the poor dispersal capability of this butterfly, it is unlikely that the species would colonize and repopulate distant suitable prairie remnants and thus expand its distribution. Furthermore, if the Canadian population becomes extirpated, natural recolonization from the Minnesota population which is over 100 km away is presumed impossible (COSEWIC 2003).

Adult Food Resources

Access to nectar is important to many species of butterflies, including the Poweshiek Skipperling; nectar is a source of energy and water for adults and allows females to achieve high fecundity (Murphy et al. 1983). Adult Poweshiek Skipperlings use a wide variety of nectar plants with preferences for different species varying across the geographical range (Borkin 1994, 1995 and 1996, Swengel and Swengel 1999, Selby 2005).

In Canada, Black-eyed Susan, Upland White Aster (*Solidago ptarmicoides*), Pale-spike Lobelia, Big Bluestem, Northern Bedstraw (*Galium boreale*), Self-heal (*Prunella vulgaris*), Yarrow (*Achillea millefolium*), Rough-False Sunflower (*Heliopsis helianthoides*), Heart-leaved Alexander (*Zizia aptera*), and Meadow Rue (*Thalictrum pubescens*) are thought to be important nectar plants (Catling and Lafontaine 1986, COSEWIC 2003, Dupont 2010), however whether some species are more important than others remains to be determined. Recent research has shown a strong correlation between Poweshiek Skipperling abundance and Black-eyed Susan presence (Dupont 2010, Westwood 2010), however more studies of adult nectar plant selection are required.

Oviposition Behaviour and Larval Resources

Female Poweshiek Skipperlings lay their eggs on blades of rushes, grasses, and sedges. Grasses used for oviposition include Prairie Dropseed, Little Bluestem (*Schizachyrium scoparium*), Prairie Dock (*Silphium terebinthinaceum*), possibly Indian Grass (*Sorghastrum nutans*), Big Bluestem, and Porcupine Grass (*Stipa spartea*) (Borkin 1994, 1995, 1996, Selby 2005). Eggs have also been observed on Slender Spike-rush and sedges (McCabe and Post 1977, Holzman 1972, Borkin 1995). In Canada, female Poweshiek Skipperlings have been observed laying eggs on a variety of species including Big Bluestem, goldenrods (*Solidago* sp.), Sweet Clover (*Melilotus alba*), and Bur Oak seedlings (J. Dupont pers. comm.).

It has been suggested that Slender Spike-rush may be one of the larval host plants in Canada since the plant was common on the margins of the lower, wetter areas of the prairies where Poweshiek Skipperlings have been observed (Catling and Lafontaine 1986), however, confirmation of this suggestion would require more detailed studies both in Canada and U.S. (Selby 2005, Westwood unpubl. data). It should be noted that the Poweshiek Skipperling may not be very specific in host plant selection, and observed preferences may merely reflect the dominance of an acceptable species at a given site (R. Dana, pers. comm. in Selby 2005). Further research is required to determine if differences in preferred larval food plants reported across the range are based on regional availability or lack of quantitative data (Selby 2005).

4. THREATS

The drastic loss, fragmentation, and degradation of the native tall-grass prairies are the main factors that have contributed to the decline and current vulnerability of Poweshiek Skipperling populations, and these continue to be the primary threats to future populations (*see* Selby 2005 for a list of threats across species range). Because these skippers require non-disturbed native tall-grass prairie habitat, they cannot survive in the modified landscapes that surround prairie remnants.

Conversion of Native Prairie to Cultivated or Non-native Grassland

Across North America extensive portions of the native tall-grass prairie have been converted to cultivated land, including more than 99% of Manitoba's native mixed- and tall-grass prairie (Samson and Knopf 1994). Agricultural and non-native grasslands are completely unsuitable for the Poweshiek Skipperling as their host plants are not present in such habitats (Shepherd 2005).

While the rate of conversion of the tall-grass prairie has declined in the last century, small scale conversion still continues (Hamel *et al.* 2006), adding cumulatively to the historical declines. Although a large portion of the habitat currently supporting the Poweshiek Skipperling in Canada is part of Manitoba's TGPP and conversion of this land to other uses is unlikely to occur under current ownership, many additional sites do occur on property that could potentially be converted, particularly to tame pastures for cattle (J. Dupont pers. comm.). Additionally, pockets of native tall-grass prairie remain to be searched to determine if they support Poweshiek Skipperlings and these sites may be at risk of conversion or degradation.

Prescribed and Wild Fires

Historically, wild fires occurred frequently and randomly across the landscape and have contributed to the ecological integrity of North America's prairies (Leisica and Cooper 1999). These fires were patchy and did not burn an entire habitat occupied by butterflies, thus allowing adults to re-colonize recently burned locations (Swengel 1998a). Periodic disturbances such as prescribed or wild fires can benefit prairie butterflies by limiting invasion by cool season exotic plants and woody vegetation (i.e. succession), increasing the vigour of native plant species (including larval food plants), and increasing the flowering rates of important nectar sources (Panzer 2002, Selby 2005, Vogel *et al.* 2010).

While prescribed burning is an effective management tool to maintain overall tall-grass prairie health, several studies have shown that burning isolated prairie patches can cause local extirpations of prairie specialist species such as the Poweshiek Skipperling, Ottoe Skipper (*Hesperia ottoe*), and the Dakota Skipper (*Hesperia dacotae*) (Schlicht and Saunders 1995, Swengel 1996, 1998b, 2001, Orwig and Schlicht 1999). Negative impacts of fire include direct mortality of larvae during the dormant stage, exposure to extreme winter conditions due to removal of litter, and/or removal of critical resources such as larval or nectar host plants (Selby 2005). Border-to-border burning of one of the best sites for the Poweshiek Skipperling in North Dakota may have caused its extirpation from that site (Schlicht and Saunders 1995).

Within the TGPP, prescribed, rotational, early spring burning has been the major management practice used to prevent succession and maintain the native tall-grass prairie flora, including several species at risk (Moore and Fortney 1994, Westwood 2010). It is currently unclear how prescribed rotational burning, in combination with other management practices, influences the Poweshiek Skipperling population over both the short- and long-term. For example, Swengel (1996) found that the Poweshiek Skipperling is negatively affected by fire, while Swengel and Swengel (1999) observed variability in the response of the Poweshiek Skipperling to burning. At some locations, abundance was higher on burned sites than on idle or hayed sites; in others, abundance was lower. Within the TGPP, 4 to 8-year old burn sites contained the highest Poweshiek Skipperling populations in 2008 and 2009, 10-year old burn sites had few skippers, while sites that burned less than 3 years earlier and which had previously documented skipper populations (Webster 2002) were often devoid of skippers (J. Dupont and R. Westwood unpub. data).

Both prescribed and wild fires pose a significant threat to Poweshiek Skipperling recovery for several reasons. First, the Poweshiek Skipperling Canadian population is extremely small (possibly fewer than 5,000 individuals as of 2010), highly isolated from the U.S. population, and relatively fragmented thus it is more susceptible to impacts of fire particularly since there are only a few extant local populations to re-colonize a post-burn area. Poweshiek Skipperlings have been described as weak fliers and poor dispersers which is likely an impediment to natural recolonization of recently burned areas (Selby 2005). Furthermore, Poweshiek Skipperling larvae overwinter within the duff layer which can be removed by fire, leaving them vulnerable to the effects of fire during this period (Selby 2005).

In general, for conservation of prairie butterfly specialist species, less invasive management practices such as haying, mowing, or light cattle grazing have been reported to be more favourable than rotational prescribed burning (Swengel 1998a, Swengel and Swengel 2001, Swengel and Swengel 2007). The threat of prescribed burning to Poweshiek Skipperling can be reduced by following guidelines such as those provided by Moffat and McPhillips (1993) and Swengel (2001). It has been recommended that the areal extent of burning be no more than 20% of the habitat in any year and that fire frequency be no more than once every five years to allow for full recovery of the population between burns (Swengel 1996, Vogel 2010). The creation of never-burned refugia in fire-managed landscapes has been recommended to be a valuable tool for conservation of rare prairie specialist species (Swengel and Swengel 2007). Studies to examine the effect of prescribed burning on both the short and long-term recovery rates and abundance of the northern Poweshiek Skipperling population are currently underway within the TGPP (Westwood 2010).

Prolonged/ Chronic Over-grazing

Prairie butterfly specialist species appear to be susceptible to the effects of prolonged or chronic over-grazing (McCabe and Post 1977, Royer and Marrone 1992 a, b, Royer and Royer 1998). Livestock could directly impact and conceivably eliminate a local population by consuming the plants where eggs and larvae are concentrated or eliminating critical resources such as adult nectar and larval host plants. Over-grazing can reduce water quality, change soil structure, and alter vegetation structure and community composition (Hamel *et al.* 2006) leading to habitat changes unfavourable to the species. Thus, grazing by livestock may reduce habitat quality and functionality if grazing intensity, frequency, and duration are excessively high. In the U.S., Poweshiek Skipperling populations were found to be considerably less abundant in prairies that had been grazed than in those that were idle or hayed (Swengel and Swengel 1999). Dana (1997) further observed that in areas with long-term over-grazing, exotic grasses such as Kentucky Bluegrass (*Poa pratensis*) and Smooth Brome (*Bromus inermis*) became the major or dominant species while native species richness and diversity declined. In the TGPP, Poweshiek Skipperlings were absent in heavily grazed sites while moderately grazed sites that had not burned within 5 years supported low skipperling numbers (Dupont 2010).

Grazing, however, is not always detrimental, and some light, rotational grazing in tall-grass prairie may be beneficial by preventing succession and maintaining vegetation structure (Dana 1997). Light grazing is not considered to be a threat to the long-term survival of Poweshiek Skipperlings if there are some adjacent ungrazed habitats available (Selby 2005).

Succession

Prairies that lack periodic disturbances such as grazing, mowing, or fires can undergo succession to woody shrubs, accumulate litter, have reduced densities of nectar flowers, and may be at increased risk of exotic species invasion (McCabe 1981, Dana 1991, Dana 1997). Because of the possible detrimental effects of prescribed burning on Poweshiek Skipperlings in the TGPP and the potential threats to the native flora and fauna as a result of not managing the prairie, one solution for preventing succession may be to mow late in the summer or fall or to use rotational, early spring burning on a reduced scale (COSEWIC 2003). McCabe (1981) studied the Dakota Skipper in North Dakota and suggested that mowing in October would not cause any apparent negative impacts on the tall-grass prairie flora or fauna. Management of succession in the TGPP in a way that does not threaten the Poweshiek Skipperling will require further research.

Haying

Haying may be detrimental or beneficial to Poweshiek Skipperling populations, depending on when it is done. In the U.S., Swengel and Swengel (1999) found that the abundance of Poweshiek Skipperlings did not differ among sites that were idle and sites that were hayed. However, if haying is completed before or during the flight period, the critical nectar sources are eliminated and exotic grasses such as Kentucky Bluegrass are favoured (McCabe 1981, Royer and Marrone 1992b, Dana 1997, Swengel 2001). These changes can eliminate specialist prairie skippers from the prairie.

In contrast, late-season (September into October) mowing reduces these adverse effects and may even be beneficial to some prairie specialists (McCabe 1981, Swengel and Swengel 1999, Swengel 2001). In three U.S. states, the Dakota Skipper, another tall-grass prairie butterfly, was found to be considerably more abundant in prairies that had been hayed in the fall than in those that were left idle, grazed or burned (Swengel and Swengel 1999). Poweshiek Skipperling populations were as abundant in hayed sites as in unmanaged sites, suggesting that the long-term benefit of haying for this species may be to prevent succession and promote the long-term maintenance of the native prairie flora. Haying in late summer or fall may prevent or reduce prairie succession, similar to burning, but with less detrimental impact on the Poweshiek Skipperling population (McCabe 1981).

Additional Threats

Several additional threats such as changes to natural hydrological processes, invasion of exotic species, the use of pesticides, climate change and inclement weather have been identified as potential threats to the Canadian Poweshiek Skipperling (Selby 2005, COSEWIC 2006). These threats are unsubstantiated such that the impact on the Canadian population is currently unknown and further studies are required.

Changes to natural hydrological processes have been identified in this recovery strategy as a potential threat to the Canadian Poweshiek Skipperling population. Poweshiek Skipperlings, like many tall-grass prairie species (e.g. Western Prairie Fringed Orchid [*Platanthera praeclara*]), are adapted to seasonal flooding that is common due to the low relief and poor drainage of the area. A variety of mechanisms such as channelization of natural rivers or streams, drainage ditches networks, and berms have been adopted in the region to rapidly divert or

impound overland flow and reduce river flooding (Hamel et al. 2006). The creation and maintenance of drainage infrastructures can dramatically alter the natural flow of surface water making some areas drier and less mesic. Over time this may cause localized shifts in vegetation structure and species abundance. Hamel et al. (2006) identified changes to natural hydrological processes as a future threat to the tall-grass and lake plain wetland ecosystems. In Manitoba, large scale stream straightening, land drainage, and impoundment projects continue to occur (Hamel et al. 2006).

The invasion of exotic plant species is a possible threat to Poweshiek Skipperling (Selby 2005, COSEWIC 2006), although the magnitude of this threat is unknown. Leafy Spurge (*Euphorbia esula*), Purple Loosestrife (*Lythrum salicaria*), Kentucky Bluegrass, Crested Wheatgrass (*Agropyron cristatum*), Sweet clover (*Melilotus* spp.) and Smooth Brome, have been identified as serious threats to the remnant native prairie habitats of North America (Selby 2005). Once exotic species invade a site, they can eventually replace the native plants required by the Poweshiek Skipperling, making the habitat unsuitable. Purple Loosestrife is known to occur within the TGPP but mostly within ditches that are unsuitable habitats for Poweshiek Skipperling (J. Dupont pers. comm. 2010).

Spraying of insecticides to control agricultural pest species can indirectly kill non-target insects including skippers (Royer and Marrone 1992b). In addition, chemical control of weeds such as Leafy Spurge can also eliminate important skipper nectar sources and may have caused the extirpation of the Dakota Skipper from several sites in North Dakota (Royer and Marrone 1992b). It is not known how much of a threat pest control poses to tall-grass prairie habitats and Poweshiek Skipperlings in Manitoba.

Because the Canadian Poweshiek Skipperling occurs as a small and localized population, it is vulnerable to extreme weather conditions such as harsh winters, late frosts, unusually cool and wet growing seasons, or drought that could potentially eliminate an entire population (Selby 2005). It has been shown that inclement weather can have a large effect on butterfly population numbers (Pollard and Yates 1993). In addition, changes in weather and climate could lead to shifts in plant communities and phenology, which in turn could affect the skipper's survival and reproduction if nectar sources are not available during the critical adult flight period.

5. POPULATION AND DISTRIBUTION OBJECTIVES

Currently, Poweshiek Skipperlings occur in and adjacent to the TGPP in southeastern Manitoba with an estimated current population of fewer than 5,000 individuals. Due to the high natural annual variation in population size experienced by most Lepidoptera, a numerical population objective would be of little practical value for conservation planning. Thus, establishing distribution objectives is a more meaningful approach for recovery planning purposes for this species.

The population and distribution objectives for the Canadian Poweshiek Skipperling are to ensure a self-sustaining population within and surrounding the TGPP in southern Manitoba distributed within an area similar to that found in surveys that occurred in 2002 and 2008-2010 and within any new areas identified by future surveys.

It is important to note that based on the current distribution of wet-mesic native tall-grass prairie in Canada, there is no reasonable expectation that the Poweshiek Skipperling could become abundant and common in Canada.

6. BROAD STRATEGIES AND APPROACHES TO RECOVERY

6.1 Actions Already Completed or Currently Underway

Surveys for Poweshiek Skipperling and other rare skippers have been carried out in the last ten years in and around the TGPP, Manitoba Interlake region, and southwestern Manitoba (COSEWIC 2003, Morden 2006, Webster 2007, Bates 2007, Dupont 2010, Westwood 2010). Poweshiek Skipperlings were common in the TGPP during these surveys but were not encountered in the Interlake area or southwestern Manitoba. Habitat conditions in the TGPP have been assessed for the Dakota Skipper, a species that historically occurred in the preserve (Morden 2006, Bates 2007). The overall floristic composition, vegetative species richness, diversity, and relative abundance, as well as the occurrence of associated butterfly species were assessed as an overall measure of habitat health (R. Westwood unpubl. data). This work provided considerable information on the vegetative composition of the main sites where Poweshiek Skipperlings occur in the TGPP.

Currently, several Poweshiek Skipperling studies are underway within the TGPP, specifically to evaluate the effects of burning and grazing regimes on skipperling habitat and abundance, and to examine dispersal and habitat utilization (Dupont 2010, Westwood 2010).

6.2 Strategic Direction for Recovery

Table 1. Recovery Planning Table. Priorities are defined as: High = top priority action; Medium = needed to evaluate and guide conservation actions; Low = action would be beneficial to the understanding of the species but not a priority.

Threat or Limitation	Priority	General Description of Research and Management Approaches
Broad Strategy: Inventory and Monitoring		
All	High	<ul style="list-style-type: none"> Obtain accurate baseline data on distribution, population size, and associated trends of Poweshiek Skipperling in Canada. Continue to monitor population in order to determine factors that may affect population declines.
Broad Strategy: Research		
Prescribed & wild fires, Prolonged/chronic overgrazing/ Succession/Haying	High	<ul style="list-style-type: none"> Identify important habitat characteristics for the Poweshiek Skipperling, including key larval/adult host plants and soil/vegetation properties. Conduct studies to determine the effects and timing of different prairie management practices (e.g. fire, grazing, haying) on Poweshiek Skipperling survival and abundance.
Broad Strategy: Habitat Management and Stewardship		
Conversion of native prairie/Prescribed & wild fires, Prolonged/chronic overgrazing/ Succession/Haying	High Medium	<ul style="list-style-type: none"> Develop effective conservation guidelines and best management practices for Poweshiek Skipperling. Deliver stewardship initiatives to protect valuable yet currently unprotected habitat.
Broad Strategy: Communication/Outreach/Education		
Conversion of native prairie/Prescribed & wild fires, Prolonged/chronic overgrazing/ Succession/Haying	Low	<ul style="list-style-type: none"> Increase public knowledge of native prairie butterflies and the tall-grass prairie ecosystem. Promote to local landowners, land management practices that benefit Poweshiek Skipperling and the conservation of the tall-grass prairie ecosystem.

6.3 Narrative to Support Recovery Planning Table

Inventory and Monitoring

More intensive surveys are required to better estimate population size and trends of Poweshiek Skipperlings in Canada as well as determine the exact distribution. Although some preliminary and approximate population estimates have been made by R. Webster (COSEWIC 2003) and Dupont (2010), these estimates are based on incomplete surveys. Thus, future surveys should be extended to unsurveyed parcels of lands within and around the TGPP as well as additional potential skipperling sites such as Gardenton Community Pasture, Stuartburn Wildlife Management Area, and other significant tall-grass prairie remnants in southern Manitoba. Continuing to monitor the population within the TGPP can help determine if the recent decline in numbers of skipperlings is part of a natural cycle or perhaps is a function of a wide range decline reported throughout the species range. Monitoring of the Poweshiek Skipperling population is also required to assess the efficacy of various land management practices and conservation efforts.

Research

There are numerous knowledge gaps on the life history of the Poweshiek Skipperling, specifically for the Canadian northern population. A better understanding of the life history requirements for each developmental stage is required to effectively survey and monitor the population. Important habitat characteristics need to be identified for the Poweshiek Skipperling, including preferred larval and adult host plants. This knowledge may potentially help identify additional suitable unoccupied habitat that could be conserved to allow natural population expansion or for potential future reintroductions. Research should also focus on effects of different management practices (i.e., prescribed burning, haying, grazing) on survival, productivity, viability, and dispersal.

When possible, Canadian researchers should collaborate with researchers in the U.S., particularly those in North Dakota and Minnesota, in an effort to coordinate research and recovery actions. It would likely be difficult to address all of the above knowledge gaps, including survival, reproductive success, population viability, dispersal, and factors affecting population fluctuations with a single Canadian population, and therefore there should be a strong focus on collaboration with U.S. researchers.

Habitat Management and Stewardship

Beneficial management practices that maintain the integrity of the tall-grass prairie vegetation without negatively impacting Poweshiek Skipperling need to be developed and implemented. Specific conservation guidelines have recently been developed for the Poweshiek Skipperling in the U.S. and are summarized by Selby (2005). All currently used land management practices (i.e., prescribed burning, haying and grazing) should be evaluated and monitored as to their effects on different life stages of Poweshiek Skipperling and the whole habitat. Overall, the current land management practice at occupied sites should be assessed and effective conservation guidelines for Poweshiek Skipperling must be researched, developed and implemented.

Because some of the Poweshiek Skipperlings are found on lands that are not managed for conservation purposes, a stewardship approach that promotes the voluntary cooperation of relevant landowners and managers should be implemented. This may include stewardship agreements, conservation easements, or land covenants, and following best management practices.

Communication / Outreach / Education

Education and communication efforts are needed to ensure that the recovery needs of the Poweshiek Skipperling are recognized during land use planning. A communication plan should be developed to increase public and key stakeholder awareness of the Poweshiek Skipperling. Such an outreach program could be developed in a way that considers other Lepidoptera and tall-grass prairie specialist species concurrently, in an effort to use outreach resources in the most effective manner.

7. CRITICAL HABITAT

7.1 Identification of the Species' Critical Habitat

Critical habitat is defined in SARA (Subsection 2(1)) 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.*”

Quarter-sections that contain Poweshiek Skipperling critical habitat were identified based on the following two criteria:

- 1) A minimum of four adults have been observed in the quarter-section in any given year since 2002 when the first survey of this species occurred; and
- 2) The site is wet-mesic tall-grass prairie habitat consisting of relevant nectar source plants for adults and host plants for larvae.

Critical habitat for the Poweshiek Skipperling has been partially identified in this strategy in 13 quarter-sections (Appendix B). Quarter-sections that contain portions of critical habitat are listed in Appendix C. This area encompasses 62% of the known quarter-sections where Poweshiek Skipperling has been observed or collected and contains an estimated 99% of the known Poweshiek Skipperling population recorded to date in Canada. Within these quarter-sections critical habitat is identified as the wet-mesic tall-grass prairie where important plant species occur (*see* section 3.3 for species needs). Critical habitat for the Poweshiek Skipperling excludes unsuitable habitat such as shrub land, forests, marshes, water bodies, and existing anthropogenic features such as roads, trails, fences and structures.

The critical habitat identified in this document is necessary for Poweshiek Skipperling survival and recovery in Canada. However, further work is required to identify additional critical habitat necessary to support the population and distribution objectives for recovery of the species. Studies to identify additional critical habitat are outlined in Section 7.2. Additional critical habitat will be identified in an action plan as new information becomes available.

7.2 Schedule of Studies to Identify Critical Habitat

As there may be other properties within and near the TGPP and in southern Manitoba which may have additional habitat and skipperlings, further surveys are needed to assess these sites. A greater understanding is also needed about which plants are used by adults and larvae. This information will help better define the species' critical habitat attributes and aid in the identification of additional critical habitat.

Table 2. Schedule of studies needed to identify additional critical habitat for the Poweshiek Skipperling.

Description of Activity	Rationale	Timeline
Inventory and monitor occupied and potentially occupied habitat.	<ul style="list-style-type: none"> • Develop habitat suitability models based on habitat attributes at known sites and use such models to identify additional potential suitable sites to survey. • Survey identified sites to determine species presence or absence; if species is present, determine occupancy and population size for at least 3 years. 	2011 – 2014
Conduct research to quantify habitat requirements and use.	<ul style="list-style-type: none"> • Identification of habitat requirements for adults, larvae, and host plants. • Identification of optimal patch size, and clarification of dispersal capabilities. 	2011 – 2014

7.3 Activities Likely to Result in Destruction of Critical Habitat

Destruction is determined on a case by case basis. Destruction would result if part of the critical habitat were degraded, either permanently or temporarily, such that it would not serve its function when needed by the species. Destruction may result from a single or multiple activities at one point in time or from the cumulative effects of one or more activities over time (Government of Canada 2009).

Activities that are likely to result in destruction of critical habitat include, but are not limited to:

- 1) **Conversion of prairie habitat to cropland or non-native grassland.** Poweshiek Skipperling requires wet-mesic tall-grass native prairie habitat; the species cannot survive in any other habitat types where key larval and nectar plants do not occur. Conversion of the identified critical habitat to cropland is a possibility, and many cropland parcels exist immediately adjacent to and within the TGPP. Future seed varieties or emerging crop demands may also increase the chances of this threat occurring. Conversion of native prairie to non-native grassland for grazing or haying could also occur in the area, and this would be considered destruction of critical habitat.
- 2) **Excessive frequency, intensity and scale of prescribed burns.** Rotational prescribed fires used to manage succession within the tall-grass prairie may cause local extirpation of Poweshiek Skipperling if the intensity, frequency, and scale are excessively high. Based on research conducted on fire-sensitive butterfly species (Swengel 1996) and current Poweshiek Skipperling management recommendations (Westwood 2010), rotational prescribed fires should be carried out at an interval that will allow for full recovery of the population between burns. Based on best available current information, a five-year interval between burns is recommended. This recommendation is subject to change as better information becomes available.

- 3) **Changes to natural hydrological processes.** Intentional flooding, land drainage, stream straightening and/or water impoundment projects can dramatically alter the natural flow of surface water (and possibly ground water) across the landscape resulting in a habitat unavailable or unsuitable (i.e. too wet or too dry) for skippers. Soil moisture has a direct impact on the composition and abundance of larval and host plants. Thus, any projects that result in the modification of natural hydrology in the area to the extent that the habitat would not serve its function when needed by the species are considered destruction of Poweshiek Skipperling critical habitat.
- 4) **Over-grazing.** Prolonged and intensive livestock grazing of an area may remove critical larval and adult plant host plants thereby destroying critical habitat. Prolonged over-grazing may degrade habitat to a point where the vegetation structure and community is no longer compatible with the habitat requirements of the Poweshiek Skipperling.
- 5) **Improper grassland management.** Succession can result in reduced abundance and productivity of larval and adult host plants and with time in the alteration and loss of Poweshiek Skipperling critical habitat. As such, land management activities that encourage the process of succession are considered destruction of critical habitat.
- 6) **Deliberate introduction or promotion of invasive species.** Invasive species can alter soil moisture and outcompete important Poweshiek Skipperling larval and hosts plants. Once established these plants can displace the hosts plants and effectively destroy the critical habitat. Examples of deliberate introduction include intentional dumping or spreading of feed bales containing viable seed of invasive alien species, or seeding invasive alien species onto a disturbed area within critical habitat where the invasive alien species did not already occur.

8. MEASURING PROGRESS

The performance indicator presented below proposes a means of determining and measuring the progress towards achieving the population and distribution objectives. The specific progress made towards the implementation of the recovery strategy will be measured against indicators set out in the subsequent action plan.

- A self-sustaining population of Poweshiek Skipperling has been maintained at the 2002 and 2008-2010 distribution, including any new areas that are identified by future surveys.

9. STATEMENT ON ACTION PLANS

An action plan for the Poweshiek Skipperling will be completed by December 2015. A multiple species action plan approach for recovery of the numerous species associated with the tall-grass prairie ecosystem may be warranted to address common threats and management needs in this particular situation.

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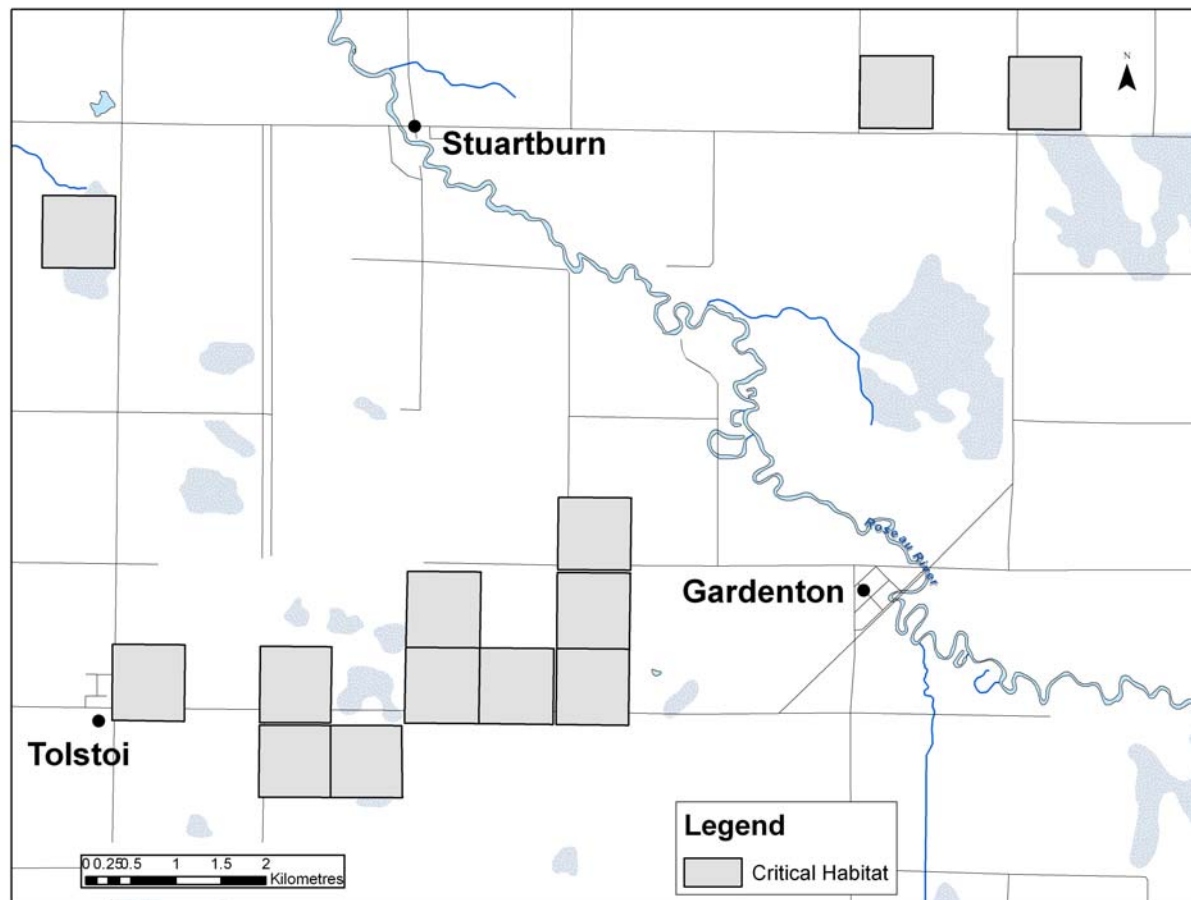
APPENDIX A – MANITOBA TALL GRASS PRAIRIE PRESERVE

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, Nature Manitoba (formerly 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 given some level of protection. These lands are managed to conserve the current biodiversity 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 tall-grass prairie species at risk. A variety of management techniques are outlined in the plan, along with implementation and evaluation guidelines.

APPENDIX B – LOCATION OF QUARTER-SECTIONS CONTAINING POWESHIEK SKIPPERLING CRITICAL HABITAT IN MANITOBA



Note: Critical habitat exists within the quarter-sections labelled as 'Critical Habitat', as described in Section 7.1 – Identification of the Species' Critical Habitat.

APPENDIX C – QUARTER-SECTIONS CONTAINING POWESHIEK SKIPPERLING CRITICAL HABITAT IN MANITOBA

Province	Quarter	Section	Township	Range	Meridian	Ownership
Manitoba	NW	30	1	6	E1	Non-federal
Manitoba	NE	30	1	6	E1	Non-federal
Manitoba	SW	31	1	6	E1	Non-federal
Manitoba	SE	32	1	6	E1	Non-federal
Manitoba	SW	32	1	6	E1	Non-federal
Manitoba	NW	32	1	6	E1	Non-federal
Manitoba	SW	33	1	6	E1	Non-federal
Manitoba	NW	33	1	6	E1	Non-federal
Manitoba	SW	36	1	5	E1	Non-federal
Manitoba	SW	4	2	6	E1	Non-federal
Manitoba	SE	14	2	5	E1	Non-federal
Manitoba	SW	23	2	6	E1	Non-federal
Manitoba	SW	24	2	6	E1	Non-federal

APPENDIX D – EFFECTS ON THE ENVIRONMENT AND OTHER SPECIES

Poweshiek Skipperlings are obligate residents of the native tall-grass prairie; the conservation of this skipper will assist in preserving remnants of this rare ecosystem. A total of six plant, three invertebrate, five bird, and one amphibian species considered to be at risk federally or provincially have been observed in the area centered around the Rural Municipalities of Stuartburn and Franklin in southeastern Manitoba. A total of 21 butterfly species have also been found within the Tall Grass Prairie Preserve during Poweshiek Skipperling surveys (COSEWIC 2003).

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

Species Name	SARA Designation	Manitoba ESA Designation
Vascular Plants		
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
Invertebrates		
Dakota Skipper (<i>Hesperia dacotae</i>)	Threatened	Threatened
Poweshiek Skipperling (<i>Oarisma poweshiek</i>)	Threatened	Not Listed
Monarch (<i>Danaus plexippus</i>)	Special Concern	Not Listed
Birds		
Yellow Rail (<i>Coturnicops noveboracensis</i>)	Special Concern	Candidate for listing
Common Nighthawk (<i>Chordeiles minor</i>)	Threatened	Not Listed
Least Bittern (<i>Ixobrychus exilis</i>)	Threatened	Not Listed
Bobolink (<i>Dolichonyx oryzivorus</i>)	Candidate for listing	Not Listed
Golden-winged Warbler (<i>Vermivora chrysoptera</i>)	Threatened	Not Listed
Amphibians		
Northern Leopard Frog (<i>Lithobates pipiens</i>), prairie population	Special Concern	Not Listed