Species at Risk Act
Action Plan Series

Multi-species Action Plan for Grasslands National Park of Canada

2016

Canada

Recommended citation:

Parks Canada Agency. 2016. Multi-species Action Plan for Grasslands National Park of Canada. *Species at Risk Act* Action Plan Series. Parks Canada Agency, Ottawa. iv + 57 pp.

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

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Également disponible en français sous le titre
Plan d'action visant des espèces multiples dans le parc national du Canada des Prairies.

ISBN: 978-0-660-05599-2
Catalogue no.: CW69-21/20-2016E-PDF

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

Recommendation and Approval Statement

The Parks Canada Agency led the development of this federal action plan. The Vice President Operations, upon recommendation of the relevant Field Unit Superintendent, hereby approves this document indicating that the relevant Species at Risk Act *requirements related to action plan development have been fulfilled in accordance with the* Act.

Recommended by: JUNE 8, 2016

Kevin Moore
Field Unit Superintendent, Saskatchewan South Field Unit, Parks Canada Agency

Approved by:

Carol Sheedy
Vice President Operations, Parks Canada Agency

Preface

The federal, provincial, and territorial government signatories under the Accord for the Protection of Species at Risk (1996)[2] agreed to establish complementary legislation and programs that provide for effective protection of species at risk throughout Canada. Under the *Species at Risk Act* (S.C. 2002, c.29) (SARA), the federal competent ministers are responsible for the preparation of action plans for species listed as Extirpated, Endangered, and Threatened for which recovery has been deemed feasible. They are also required to report on progress five years after the publication of the final document on the Species At Risk Public Registry.

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

The Minister responsible for the Parks Canada Agency (the Minister of the Environment and Climate Change) is the competent minister under SARA for the species found in Grasslands National Park of Canada, Fort Walsh National Historic Site and Cypress Hill Massacre National Historic Site and has prepared this action plan to implement the recovery strategies as they apply to the park, as per section 47 of SARA. It has been prepared in cooperation with Environment and Climate Change Canada, Saskatchewan Environment, Saskatchewan Agriculture, Department of Fisheries and Oceans, Wood Mountain Lakota First Nation, and the Metis Nation of Saskatchewan as per section 48(1) of SARA.

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

Acknowledgments

Special thanks go out to all of those who contributed to the content of this plan and especially those who participated in the site analysis workshop in January 2014 and contributed their time, expertise and information.

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

Executive Summary

The *Multi-species Action Plan for Grasslands National Park of Canada* applies to lands and waters occurring within the boundaries of Grasslands National Park of Canada (GNP) and to Fort Walsh and the Cypress Hill Massacre National Historic Sites. The plan meets the requirements for action plans set out in the *Species At Risk Act* (SARA s.47) for species requiring an action plan and that regularly occur at this site. Measures described in this plan will also provide benefits for other species of conservation concern that regularly occur at GNP and the national historic sites.

Where it has been determined that the sites can conduct management activities to help recover and/or manage a species, site-specific objectives are identified in this plan and represent the site's contribution to objectives presented in federal recovery strategies and management plans. Species at risk, their residences, and their critical habitat are protected by existing regulations and management regimes in national parks and national historic sites as well as by SARA. Additional measures that will contribute to the survival and recovery of the species at the sites are described in this plan. These measures were identified based on threats and actions outlined in federal and provincial status assessments and recovery documents, as well as knowledge of the status and needs of each species at each site. Population monitoring measures are also identified for the species for which management activities at the sites can contribute to recovery.

Critical habitat was identified either in full or in part in Recovery Strategies for Black-footed Ferret, Burrowing Owl, Eastern Yellow-bellied Racer, Greater Sage-grouse, Greater Short-horned Lizard, and Sprague's Pipit. New or additional critical habitat has been identified in this action plan for Eastern Yellow-bellied Racer, Greater Short-horned Lizard, Mormon Metalmark, Mountain Plover, Prairie Loggerhead Shrike, Sprague's Pipit, and Swift Fox. Measures used for protection of critical habitat are described.

Measures proposed in this action plan will have limited socio-economic impact and place no restrictions on land use outside of GNP or the national historic sites. Direct costs of implementing this action plan will be borne by Parks Canada dependent on appropriate funding. Indirect costs are expected to be minimal, while benefits will include positive impacts on ecological integrity, greater awareness and appreciation of the value of biodiversity to Canadians, and opportunities for engagement of local communities and Indigenous groups.

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1. Context

Grasslands National Park of Canada, established in 1981, is the only national park to represent the mixed grass prairie ecosystem in Canada. Erosion by glacial melt-water formed many of the park's characteristic features. The West Block centers on the Frenchman River Valley and the East Block features the Badlands of Rock Creek and the Wood Mountain Uplands. The landscape is unique with a harsh, semi-arid climate where grasses are the dominant plant form in the park. Where there is more moisture in coulees and valley floor, shrubs and trees can establish. Historically, grazing has always been on the landscape, and is required for ecosystem function. The park and surrounding area include the northern range extent for many species at risk and are home to Canada's only Black-tailed Prairie Dog colonies. Extirpated species such as the Black-footed Ferret, Swift Fox, and Plains Bison have been reintroduced at this site. The Fort Walsh and Cypress Hills Massacre National Historic Sites are located approximately 170 km north-west of Grasslands National Park and encompass approximately 525 hectares. Species at risk observed at these historic sites include Sprague's Pipit, Little Brown Myotis, and Northern Leopard Frog.

Maintenance and restoration of ecological integrity is the first priority of national parks (*Canada National Parks Act* s.8(2)). Species at risk, their residences, and their habitat are therefore protected by existing national park regulations and management regimes. In addition, the *Species at Risk Act* (SARA) prohibitions protecting individuals and residences apply automatically when a species is listed, and all critical habitat in national parks and national historic sites must be legally protected within 180 days of being identified.

This Grasslands National Park action plan complements the larger Action Plan for Multiple Species at Risk in Southwestern Saskatchewan: South of the Divide – 2016 [Proposed] (SoD) developed by Environment and Climate Change Canada and the Province of Saskatchewan (Environment and Climate Change Canada, 2016). This SoD Action Plan encompasses the Saskatchewan portion of the Milk River drainage basin excluding Grasslands National Park, Fort Walsh and Cypress Hills Massacre National Historic Sites. Together the Federal Government and the Government of Saskatchewan are working to ensure unified wildlife conservation in this area of southwest Saskatchewan.

Recovery measures for species at risk are integrated within the framework of Parks Canada's ongoing ecological integrity programs. Parks Canada's ecological integrity programs make contributions to the recovery of species at risk by providing inventory and monitoring data, and through the implementation of habitat restoration projects and other conservation measures. The species-directed measures outlined in this plan will in turn contribute to maintaining and improving the ecological integrity of the site by improving the conservation status of native species and their habitat and maintaining biodiversity.

A number of federal and provincial recovery strategies and plans, management plans, and action plans have been prepared for species considered in this action plan. Along with status assessments, those documents provide guidance for the recovery of individual species, including strategic directions, recovery objectives, critical habitat, and threats. This action plan was developed and will be implemented in a manner that is consistent with those recovery documents, and should be viewed as part of this body of linked strategies and plans.

1.1 Scope of the Action Plan

The geographic scope of this action plan includes all federally owned lands and waters within Grasslands National Park of Canada (GNP; Figure 1), in addition to Fort Walsh and Cypress Hills Massacre National Historic Sites. This multi-species action plan has been written specifically for GNP and the national historic sites because the Parks Canada Agency (PCA) is legally responsible for species at risk on PCA lands and waters, has the ability to take direct conservation action, and deals with different threats, legislation, and management priorities than areas outside the sites.

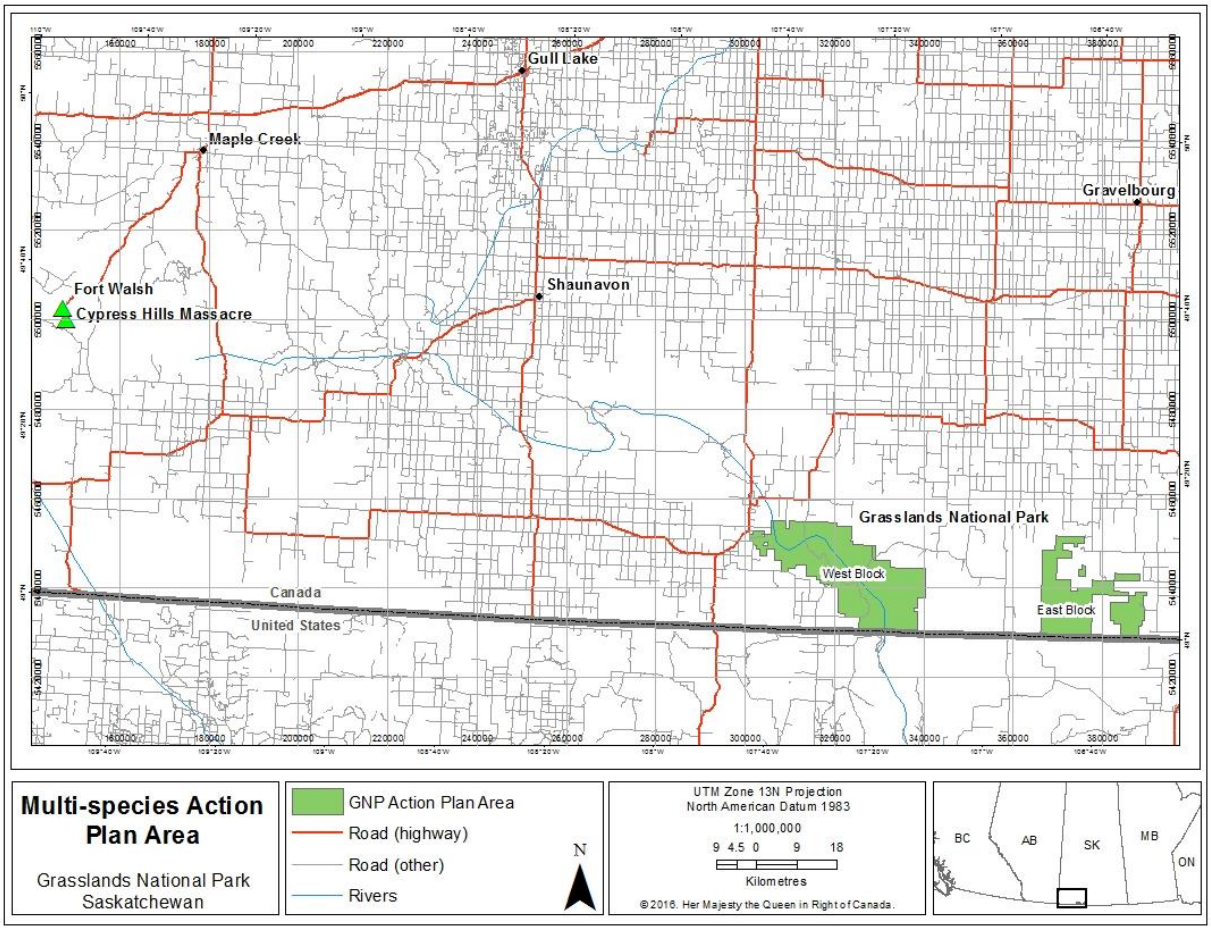

Figure 1. Geographic scope for the *Multi-species Action Plan for Grasslands National Park of Canada*. The areas shaded in green show the geographic scope of this action plan.

This action plan addresses SARA-listed species that regularly occur in GNP and the national historic sites which require an action plan under SARA (s.47), as well as other species of conservation concern (Table 1). This approach both responds to the legislated requirements of the SARA and provides the Parks Canada Agency with a comprehensive plan for species conservation and recovery at these sites. The plan will be amended as required to meet SARA requirements for action planning.

Table 1. Species at risk included in the action plan for GNP.

Species	Scientific Name	COSEWIC Status	SARA Schedule 1 Status
Black-footed Ferret	*Mustela nigripes*	Extirpated	Extirpated
Burrowing Owl	*Athene cunicularia*	Endangered	Endangered
Chestnut-collared Longspur	*Calcarius ornatus*	Threatened	Threatened
Common Nighthawk	*Chordeiles minor*	Threatened	Threatened
Eastern Yellow-bellied Racer	*Coluber constrictor flaviventris*	Threatened	Threatened
Ferruginous Hawk	*Buteo regalis*	Threatened	Threatened
Greater Sage-grouse	*Centrocercus urophasianus urophasianus*	Endangered	Endangered
Greater Short-horned Lizard	*Phrynosoma hernandesi*	Endangered	Endangered
Little Brown *Myotis*	*Myotis lucifugus*	Endangered	Endangered
Mormon Metalmark	*Apodemia mormo*	Special Concern	Threatened
Mountain Plover	*Charadrius montanus*	Endangered	Endangered
Prairie Loggerhead Shrike	*Lanius ludovicianus excubitorides*	Threatened	Threatened
Sprague's Pipit	*Anthus spragueii*	Threatened	Threatened
Swift Fox	*Vulpes velox*	Threatened	Threatened
Black-tailed Prairie Dog	*Cynomys ludovicianus*	Threatened	Special Concern
Long-billed Curlew	*Numenius americanus*	Special Concern	Special Concern
McCown's Longspur	*Rhynchophanes mccownii*	Special Concern	Special Concern
Northern Leopard Frog	*Lithobates pipiens*	Special Concern	Special Concern
Short-eared Owl	*Asio flammeus*	Special Concern	Special Concern
Barn Swallow	*Hirundo rustica*	Threatened	Not listed
Plains Bison	*Bison bison bison*	Threatened	Not listed
Plains Minnow	*Hybognathus placitus*	Threatened	Not listed

2. Site-based Population and Distribution Objectives

The potential for PCA to undertake management actions at the site that will contribute to the recovery of each species was assessed. Site-specific population and distribution objectives were developed (Appendix A) to identify the contribution that the site can make towards achieving the national objectives presented in federal recovery strategies and management plans. Because they are directly linked to the site-based population

and distribution objectives, monitoring activities are reported in Appendix A rather than in the tables of recovery measures (Appendices B & C). If there is little opportunity for the site to contribute to the recovery of a species, site-specific objectives and conservation actions may be limited to protection measures in place under the *Canada National Parks Act* and SARA, population monitoring, habitat maintenance and restoration through the existing management regimes at the sites. For many species, population and distribution objectives for GNP are not meaningful at the scale of this action plan for various reasons, including: 1) threats cannot be controlled in the park or do not exist in the park; 2) species is only transient; 3) population within the site is a very small part of the Canadian distribution or is unknown or unconfirmed.

3. Conservation and Recovery Measures

Grasslands National Park (GNP) is an important representation of increasingly rare native prairie and as such is the only national prairie park in Canada. Ecological impacts of past settlement include the introduction of invasive alien plant species, altered hydrological, grazing, and fire regimes and the extirpation of several species. However, GNP has worked with ranchers, partners, and volunteers to improve the ecological health of the park as well as increase opportunities to support the recovery of many of the key species. GNP is a relatively new park, established in 1981, and the visitor base is slowly increasing. An increase in visitation can create challenges for species at risk recovery, so the park is developing opportunities to engage and connect with Canadians and get them involved in species recovery and draw upon citizen science, volunteers, and partnerships. Academic interest in the park has always been strong and this continues to ensure a consistent source of high quality research which supports more robust management and restoration efforts. These relationships provide opportunities for collaboration to advance integrated management as well as conservation and recovery implementation projects. Visitor facilities are in their infancy and are being developed to provide meaningful experiences while protecting park habitats and species.

This action planning process identified measures to achieve the site-based population and distribution objectives, along with measures required to protect the species and learn more about them. The process of determining which measures will be conducted by the Park (Appendix B) and which measures will be encouraged through partnerships or when additional resources come available (Appendix C) involved a prioritization process. The process primarily considered ecological effectiveness of measures, and also included consideration of opportunities to increase the value of visitor experience to the park, opportunities to increase awareness through external relations, and budgetary opportunities and constraints. Wherever possible, Parks Canada is taking an ecosystem approach, prioritizing actions that benefit numerous species at once to effectively and efficiently protect and recover species at risk.

Five themes emerge from these measures: 1) best management practices; 2) habitat restoration; 3) population management; 4) re-introductions and translocations and; 5) partnerships, outreach, and engagement for species at risk recovery.

Best Management Practices

GNP is developing and implementing best management practices/processes (BMPs) to mitigate, minimize and/or avoid potential impacts of activities on species at risk such as Greater Sage-grouse and it's identified critical habitat. Prescribed fire and grazing management strategies are two key practices that maintain important natural processes that are integral to ecosystem health and native prairie integrity. These practices maintain and enhance songbird and avian species at risk habitat for Burrowing Owls and Greater Sage-grouse as well as for many mammalian species. Beneficial grazing practices using cattle or bison optimize Greater Sage-grouse habitat attributes particularly in nesting and brood rearing critical habitat. BMPs for sage-grouse friendly fencing employ methods such as fence marking, fence removal and/or replacement of old fences with sage-grouse friendly fencing in priority habitats in an effort to improve sage-grouse survival and decrease fence mediated mortality. Finally a traffic management strategy is being developed for the Ecotour Road to reduce road mortality of a variety of species, particularly snakes.

Habitat Restoration

Restoration, enhancement, and protection of habitats and populations are key activities for the conservation and recovery of species at risk. GNP is undertaking both habitat restoration and enhancement techniques with assessments of ecological and life history parameters within the current and future boundaries of GNP.

GNP is targeting habitat enhancement and restoration for three species at risk: Greater Sage-grouse, Black-tailed Prairie Dogs, and Greater Short-horned Lizards. The majority of habitat conservation gains will be achieved through removal of invasive species, targeted grazing in terms of length and intensity, using prescribed fire, selective mowing, and planting native species. Work will continue on projects such as habitat mapping which will create an inventory of existing and potential habitats for Black-tailed Prairie Dogs and Greater Sage-grouse, to inform habitat enhancement and restoration. Active partnerships with universities, the Calgary Zoo, and the Saskatchewan Research Council are facilitating trials on the ground to determine the most effective methods of habitat restoration for all life stages of sage-grouse and colony expansion for Black-tailed Prairie Dogs. Work continues to mitigate invasive plant species encroachment on Greater Short-horned Lizard habitat. Many other species, particularly songbirds, will benefit from the habitat enhancement and restoration work and the use of fire and grazing in a systematic, repeatable manner.

Population management

Black-tailed Prairie Dogs are a keystone species in GNP which support many other species of animals including species at risk such as Burrowing Owls which nest in the Black-tailed Prairie Dog colonies. Black-tailed Prairie Dog population levels have varied due to multiple factors, including the presence of sylvatic plague. Management of this disease is conducted through partnerships as part of a larger initiative, including dusting prairie dog colonies and trials with the sylvatic plague vaccine developed by the United States Geological Survey's National Wildlife Health Center. Numbers of Black-tailed Prairie Dogs have fluctuated sporadically, declining generally over the last decade, and

are showing a slightly increasing trend over the past 2 years. Population and individual-level research is contributing to understanding the threats and appropriate solutions. Investigations into the genetic composition of the only Canadian population of Black-tailed Prairie Dogs will assess whether Canadian prairie dogs are genetically isolated from populations in the United States, to help inform future population management decisions.

The entire Saskatchewan population of the endangered Greater Short-horned Lizards is found in GNP and the surrounding area. Genetic assessments of this population are underway in an effort to determine if the isolated pockets of lizards in the East Block are genetically different from those in the West Block and Alberta.

Re-introductions and Translocations

GNP has been very involved in re-introductions of species at risk with Black-footed Ferrets, Swift Fox and Plains Bison. Currently, the focus is on facilitating the restoration of the Black-tailed Prairie Dog population, with the additional intention of supporting a small Black-footed Ferret population. Scientific research is being conducted at both the individual and population levels. Partnerships are a central part of these initiatives. Plains Bison have done extremely well at GNP and are considered a national conservation herd. Future plans include assessing the feasibility of herd expansion into the newly acquired GNP lands. GNP is a recognized leader in reintroductions and translocations in an effort to enhance ecological restoration and integrity. Future plans could include translocations of captive-reared Greater Sage-grouse into the restored and enhanced critical habitat for this species. Additionally, new techniques for translocations will be piloted for Greater Short-horned Lizard in an effort to determine the best ways to introduce these animals into suitable habitat where natural dispersal has been cut off or impeded by threats such as invasive yellow sweet clover.

Partnerships for Species At Risk Recovery

Research and monitoring is needed to fill gaps in the knowledge base necessary to build programs for some species at risk. Many of these measures have partnerships in place or will require partnerships and/or additional funding. GNP will benefit from the opportunity to work with the academic community and citizen scientist programs. Some examples of successful citizen science and volunteer programs are Black-footed Ferret, Greater Short-horned Lizard, and Mormon Metalmark surveys, as well as fence marking for sage-grouse friendly fences. Volunteer programs for native prairie restoration are being developed to assist with the restoration and enhancement of sage-grouse critical habitat. GNP collaborates with partners including academic institutions, zoo partners and international experts in an effort to increase and stabilize the sage-grouse population, understand and restore the Black-tailed Prairie Dog and Black-footed Ferret ecosystem, investigate genetic relationships among different populations of species at risk, experiment with grazing prescriptions, develop habitat models for species at risk, and work with local ranchers through stewardship agreements, and grazing leases. There has been considerable academic interest in the species and ecosystems of GNP. These relationships provide a consistent source of high quality research that supports management and restoration efforts. A variety of partner opportunities exist for

collaborative work which advances conservation and recovery for species at risk. In addition, this multi-species action plan complements the SoD Action Plan developed by Environment and Climate Change Canada and the Province of Saskatchewan. This SoD Action Plan encompasses the Saskatchewan portion of the Milk River drainage basin excluding Grasslands National Park. Together the Federal Government and the Government of Saskatchewan are working to ensure unified wildlife conservation in this area of southwest Saskatchewan.

4. Critical Habitat

Critical habitat is "the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species' critical habitat in the recovery strategy or in an action plan for the species" (SARA s.2(1)). At the time of writing of this document it was possible to identify additional critical habitat in GNP for Eastern Yellow-bellied Racer, Greater Short-horned Lizard, Mormon Metalmark, Mountain Plover, Prairie Loggerhead Shrike, Sprague's Pipit and Swift Fox. Critical habitat has already been identified in GNP in recovery strategies for many species, and more will be identified in the future when possible. Where critical habitat identification is not complete, it will be identified in an upcoming or revised action plan or revised recovery strategy; refer to the schedule of studies in relevant recovery strategies for further details. Activities likely to cause destruction of critical habitat are determined on a case-by-case basis, and should be assessed as such. Much of this section is quoted from the SoD Action Plan (Environment and Climate Change Canada, 2016).

4.1 Identification of Critical Habitat for Eastern Yellow-bellied Racer

4.1.1. Biophysical Attributes

Because of a lack of knowledge regarding Eastern Yellow- bellied Racer habitat requirements, only active dens are identified as critical habitat in Canada at this time. Seven active hibernacula were identified as critical habitat in the Recovery Strategy for the Eastern Yellow-bellied Racer (*Coluber constrictor flaviventris*) in Canada (2010b) and two additional dens are being added to that identification through this action plan. Additional critical habitat may be identified in the future as new information is obtained.

As described in the Recovery Strategy (Parks Canada Agency 2010), the biophysical attributes of critical habitat include the following:

- mammal burrows, rock crevices or ledges, caves, or deep holes in soft hillside soil that provide fracturing, humidity, cover and thermal conditions required for suitable hibernation sites.
- soft soil or burrows in which to lay eggs.
- dense vegetation (mixed-grass prairie and sagebrush thickets) to maintain concealment from predators and suitable prey.
- large rocks for cover or basking.

The total area of critical habitat identified in this Action Plan comprises of 154 ha within GNP (Figure 2).

4.1.2. Examples of Activities Likely to Result in Destruction of Critical Habitat

Examples of activities that are likely to result in destruction of Eastern Yellow-bellied Racer critical habitat include, but are not limited to, the following:

1. Activities that cause in filling-in or flooding of a hibernaculum, resulting in collapse, blocking the entrance, or changing thermal conditions (slope, aspect, position and surface albedo), such that the hibernaculum can no longer be used.

   Examples may include:
   - Soil, gravel or rock in-filling of hibernaculum and its entrance.
   - Intentional flooding.

2. Excessive trampling resulting in the collapse of the hibernaculum or compaction of soil, reducing the suitability of the hibernaculum or the surrounding area which may contain egg laying sites.

   Examples may include:
   - Intensive livestock grazing that causes collapse of the hibernaculum opening or soil compaction at egg-laying sites.
   - Industrial activities that cause collapse of the hibernaculum or soil compaction.
   - Four-wheel-vehicle use that causes collapse of the hibernaculum or trampling of egg-laying sites.

3. Activities that result in the loss of mixed-grass prairie or sagebrush thickets or permanently change the composition and structure of vegetation, leading to reduction of cover and soil stability such that the Eastern Yellow-bellied Racer's ability to detect predators and prey is compromised.

   Examples may include:
   - Agricultural activities that convert prairie to cropland.
   - Unsustainable grazing practices that cause severe reductions in vegetation structure or composition.
   - Industrial activities that remove native prairie through the development of new trails, roads, and infrastructure.

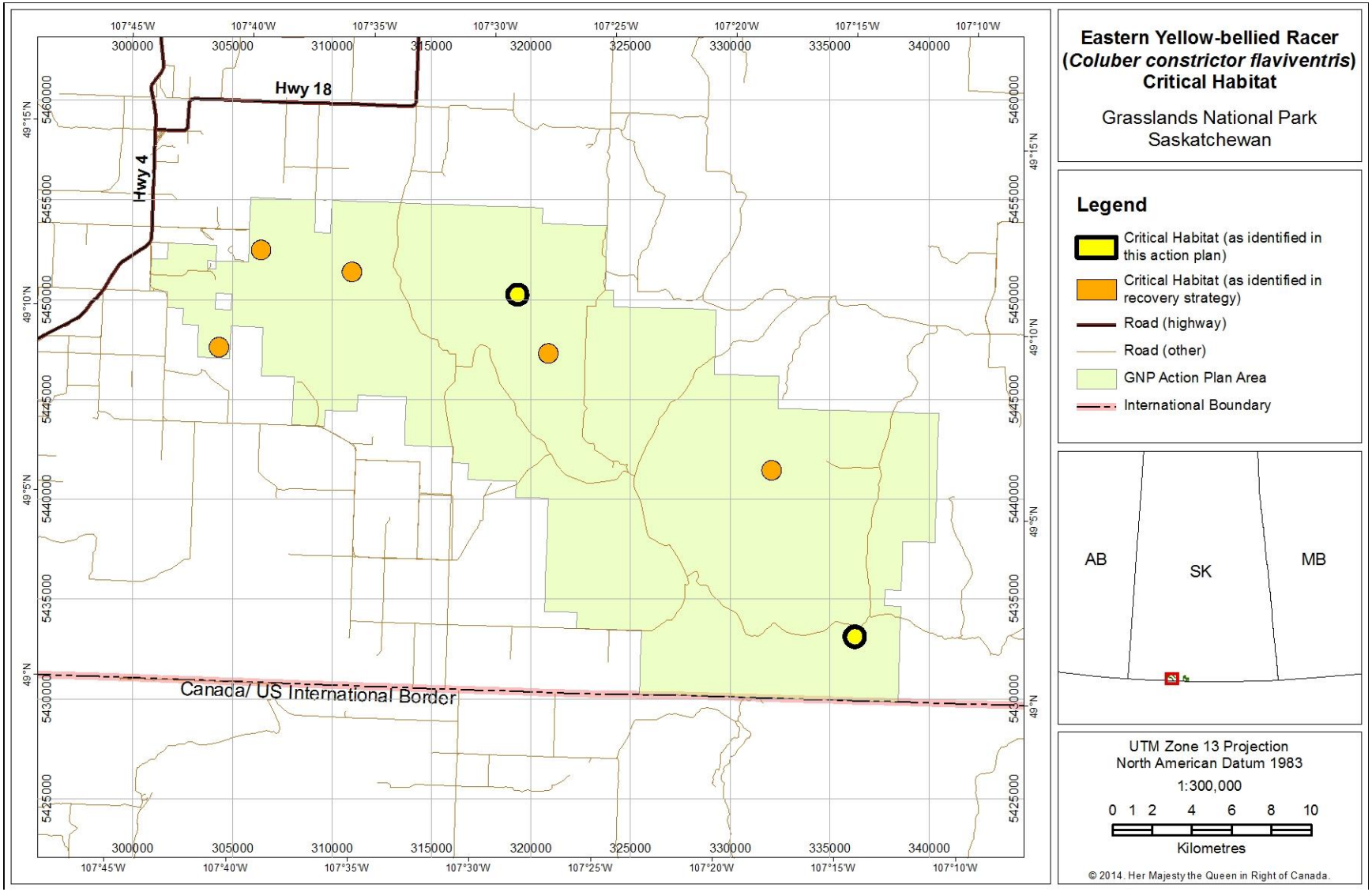

Figure 2. Location and extent of critical habitat for Eastern Yellow-bellied Racer critical habitat in this action plan. For details on critical habitat identified in this action plan (shaded yellow), refer to section 4.1. For details on previously identified critical habitat (shaded orange), refer to the species' Recovery Strategy (Parks Canada 2010b).

4.2 Identification of Critical Habitat for the Greater Short-horned Lizard

4.2.1. Biophysical Attributes

Partial critical habitat for the Greater Short-Horned Lizard has previously been identified in the Recovery Strategy (Environment Canada 2015), and additional critical habitat is identified in this action plan (Welsh et al. 2015). Although more critical habitat will have to be identified in order to fully provide for the recovery of the species.

As described in the Recovery Strategy (Environment Canada 2015), the biophysical attributes of critical habitat include the following:

- badland or coulee terrain dominated by exposed substrates with loose soils suitable for shallow burrowing during the active season and deeper burrowing in winter, and minimal vegetation cover which provides thermal shelter in the active season; and

- upland grassland within 100 m of edges of badland or coulee terrain to provide for local movements of Greater Short-horned Lizards for mate searching during the breeding season, for dispersal of Greater Short-horned Lizards among some patches of badland or coulee terrain, and for some limited foraging.

The total area of critical habitat identified in this action plan for Greater Short-horned Lizard comprises of 1,260 ha within the West Block of GNP (Figure 3). Critical habitat for the East Block of GNP was identified in the Recovery Strategy (Environment Canada 2015).

4.2.2. Examples of Activities Likely to Result in Destruction of Critical Habitat

Examples of activities that are likely to result in destruction of critical habitat include, but are not limited to (Quoted from Environment Canada 2015):

1. *Compression, covering, inversion, flooding or excavation/extraction of soil*. Greater Short-horned Lizards often burrow at night and hibernate immediately below the soil surface. Alterations to the soil surface, as described above, may negatively affect their ability to avoid predators, access night-time cover, or overwinter successfully. As low overwinter survival could limit recovery of this species, it is important to avoid activities that negatively influence hibernation. Examples of compression include the creation or expansion of permanent/temporary structures, trails, roads, repeated motorized traffic, and activity that concentrates livestock and alters current patterns of grazing pressure such as spreading bales, building new corrals, adding more salting stations, or adding more water troughs. Examples of covering the soil include the creation or expansion of permanent/temporary structures, spreading of solid waste materials, or roadbed construction. Examples of soil inversion and/or excavation / extraction include new or expanded cultivation, sand and gravel extraction pits, dugouts, road construction, pipeline installation, and stripping of soil for new well

pads or fireguards. Flooding from irrigation or dams, which is prolonged or permanent, will eliminate terrestrial habitat for the Greater Short-horned Lizard.

2. *Removal or alteration of vegetation structure*.
Greater Short-horned Lizards rely on sparse vegetation to provide the necessary prey base as well as thermal patchiness necessary for effective thermoregulation. Alteration of vegetation structure by planting or otherwise encouraging the proliferation of non-native plants may destroy critical habitat by impeding movement and dispersal of Greater Short-horned Lizards or by creating excessive shade which hampers effective thermoregulation by Greater Short-horned Lizards. Those activities may also change nutrient availability, encouraging future succession of non-native plant species, which may also influence the prey base. Removal of excessive amounts of vegetation by activities such as the creation of new industrial infrastructure, road development, high-intensity, prolonged grazing and the creation of new dams and irrigation projects may destroy critical habitat by removing essential cover needed for shading and avoidance of predators as well as vegetation needed to support prey species.

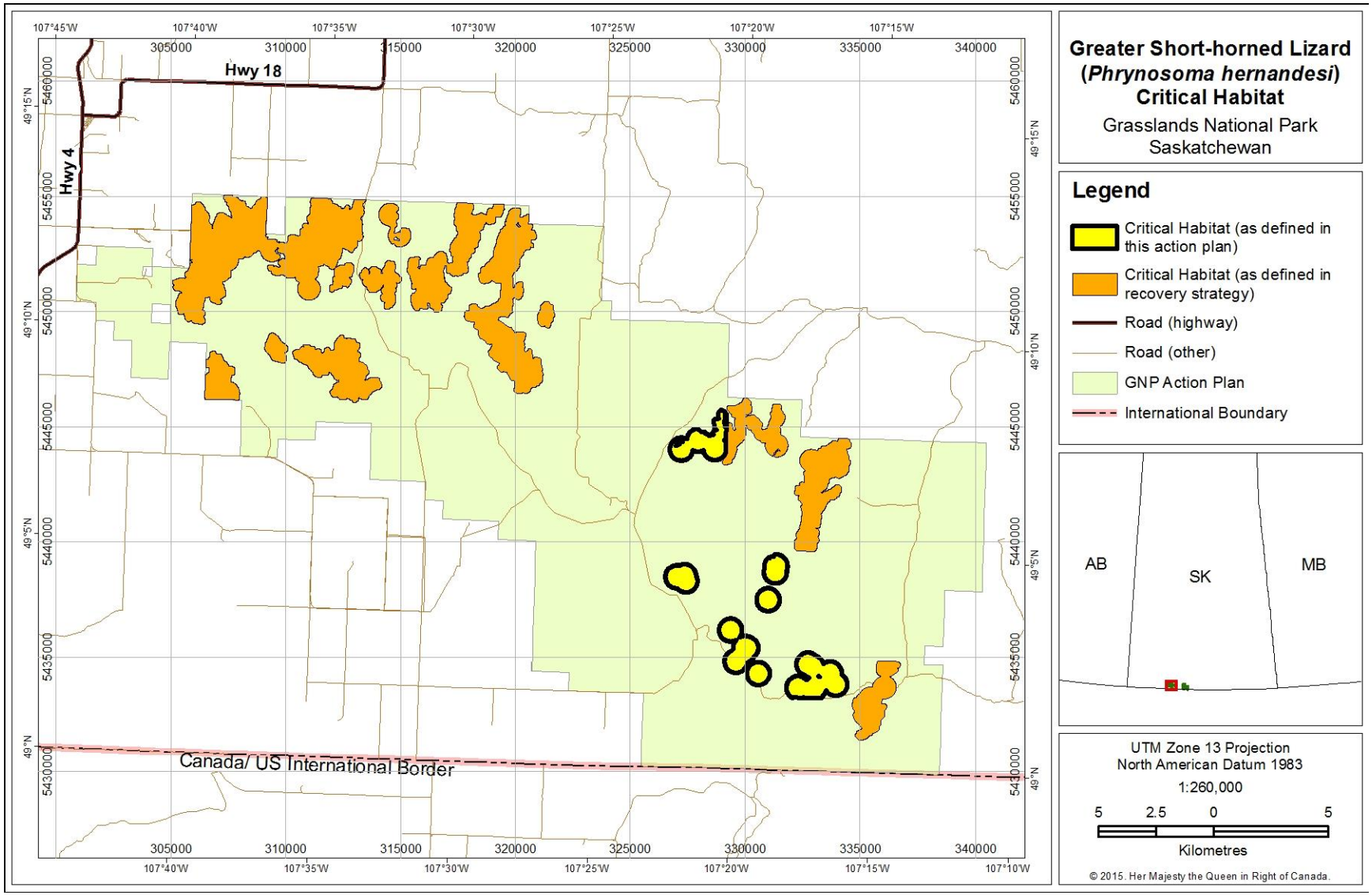

Figure 3. Location and extent of critical habitat for Greater Short-horned Lizard critical habitat in this action plan. For details on critical habitat identified in this action plan (shaded yellow), refer to section 4.2. For details on previously identified critical habitat (shaded orange), refer to the species' Recovery Strategy (Environment Canada 2015).

4.3 Identification of Critical Habitat for Mormon Metalmark

4.3.1. Biophysical Attributes

Critical habitat for Mormon Metalmark has not been previously identified in the Recovery Strategy due to lack of data (Pruss et al. 2008a). Since the posting of the final Recovery Strategy, sufficient data has been gathered and habitat criteria developed to allow identification of critical habitat in this Action Plan. Additional critical habitat will have to be identified in order to fully provide for the recovery of the species.

In this Action Plan critical habitat was identified by walking and mapping the perimeters of a subset of known branched Umbrella Plant (*Eriogonum pauciflorum*) colonies where butterflies were observed. When single point locations were noted for butterfly colonies, a 222 m radius was used as the average colony size from a subset of colonies that were measured exactly for the size at the perimeter by walking the colony boundary..

Biophysical attributes of critical habitat include but are not limited to:

- badland areas on eroded barren, sandy or gravelly soils; and
- partially weathered shale and clay where moderate to high densities of branched umbrella plants and Rubber Rabbit-brush (*Ericameria nauseosus*) are found.

Mormon Metalmark critical habitat identified in this Action Plan comprises of 3,383 ha total across both West (Figure 4) and East (Figure 5) Blocks of GNP. The critical habitat is primarily located along the clay and eroded hills of the Frenchman River Valley in the West Block.

4.3.2. Examples of Activities Likely to Result in Destruction of Critical Habitat

Examples of activities that may result in destruction of Mormon Metalmark critical habitat include, but are not limited to, the following:

1. Activities that remove or cause long term destruction to larval and adult nectar host plants, rendering the area inhospitable for Mormon Metalmarks to complete their life cycle. This butterfly has highly specific host plant requirements: adults are known to feed only on Branched Umbrella-plant and Rubber Rabbit-brush, while larva feed only on Branched Umbrella-plant. Thus any mechanism that removes or results in direct mortality of these plants could negatively affect the survival of this butterfly and has the potential to cause local extirpation (Pruss et al. 2008a).

   Examples may include:
   - Trampling of host plants by livestock through the establishment of winter feeding sites, salt blocks, or calving sites.
   - Activities that result in the removal or destruction of host plants and native vegetation through the development of new trails, roads and infrastructure.
   - Application of herbicides in a manner that results in direct mortality of host plants.

2. Activities that remove or compact soil such that the host plants cannot survive or become re-established in the altered habitat or that Mormon Metalmark larvae or pupae may not be able to complete their life cycles. Because the seeds and adult plants of the Branched Umbrella Plants and Rubber Rabbit-brush are adapted to eroded barren, sandy or gravelly soils, removal or compaction of soil can result in direct mortality to host plants, destruction of the seed bank, and impairment of the ability of host plants to propagate.

   Examples include:
   - Soil or gravel extraction
   - Activities that trample and/or compact the soils, increasing erosion or disturbance

3. Activities that alter the vegetation composition such that the density of the host plants is reduced and the area cannot be used by Mormon Metalmark.

   Examples include:
   - Farming or ranching practices that result in the deliberate introduction or promotion of invasive plant species that will out-compete the native vegetation and host plants. Such examples include the deliberate dumping or spreading of feed bales containing viable seed of invasive alien species, or seeding invasive alien species that did not occur in the past
   - Construction of new trails or roads that have the potential to introduce and spread invasive species through the disturbance of the habitat and the transportation of mud that contains invasive seeds

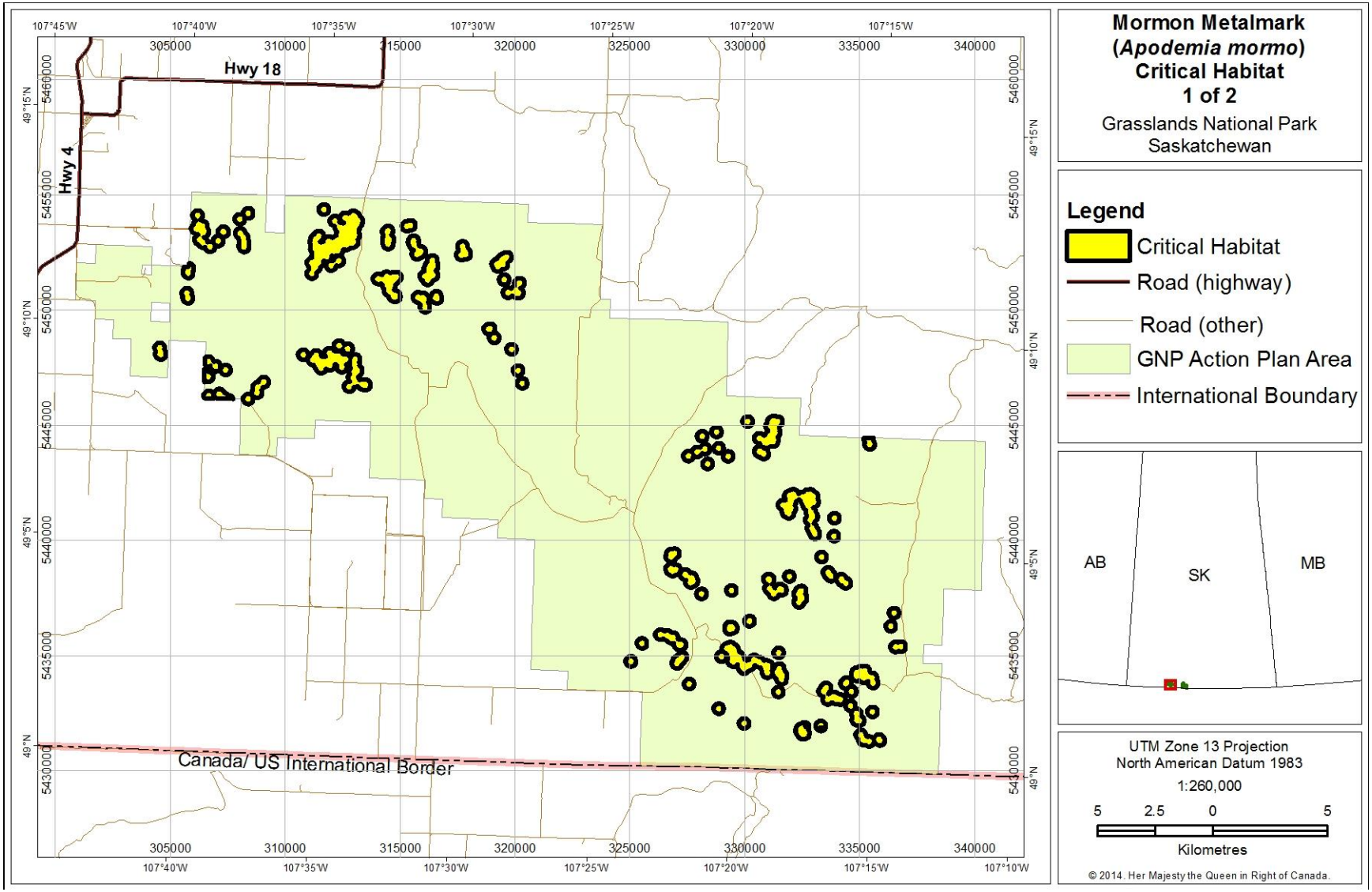

Figure 4. Location and extent of critical habitat for Mormon Metalmark critical habitat in the West Block of Grasslands National Park. For details on critical habitat identified in this action plan, refer to section 4.3.

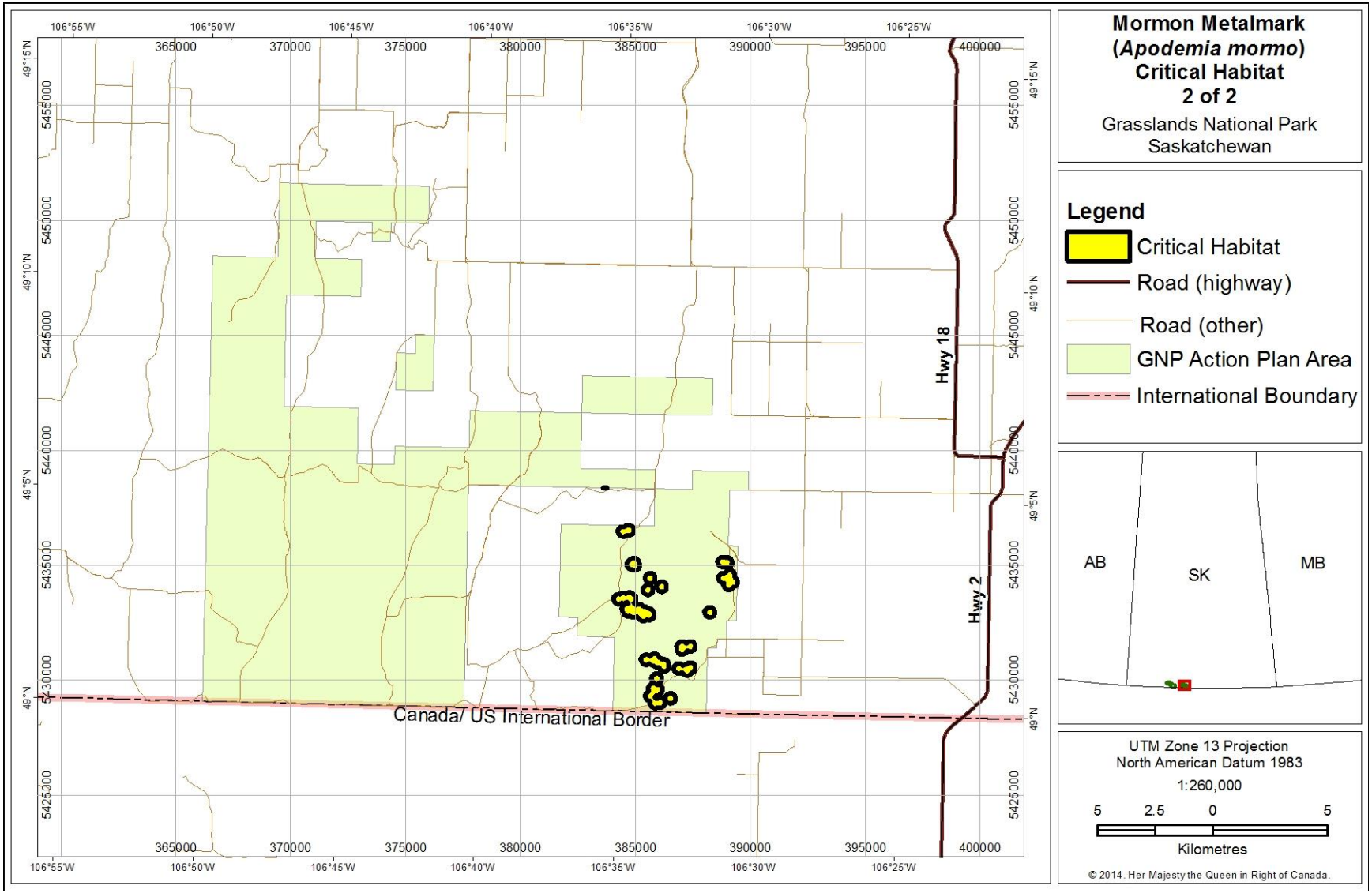

Figure 5. Location and extent of critical habitat for Mormon Metalmark critical habitat in the East Block of Grasslands National Park. For details on critical habitat identified in this action plan, refer to section 4.3.

4.4 Identification of Critical Habitat for Mountain Plover

4.4.1. Biophysical Attributes

Critical habitat for Mountain Plover has not been previously identified in the Recovery Strategy due to lack of data (Environment Canada 2006). Since the posting of the final Recovery Strategy, sufficient data has been gathered and habitat criteria developed to allow identification of critical habitat in this Action Plan. Additional critical habitat may have to be identified in order to fully provide for the recovery of the species.

The national recovery objective for Mountain Plover is to maintain this species' recent Canadian abundance and distribution (Environment Canada 2006). Historical and current abundance data is lacking due to low population density, likely because the species occurs at the northern edge of its range, coupled with the difficulty in observing individuals. However, it can be assumed that at a minimum the GNP distribution must be maintained in order to contribute to meeting the national recovery objective. Therefore, all available habitat likely to be used by breeding Mountain Plovers was identified as critical.

In this Action Plan, Mountain Plover critical habitat includes the occurrence of Black-tailed Prairie Dog colonies as high quality habitat. Prairie dog colonies represent a highly suitable and much preferred habitat type for Mountain Plover (Knowles and Stoner 1982, Dinsmore et al. 2005, Childers and Dinsmore 2008, Tipton et al. 2009). The majority of breeding or potentially breeding Mountain Plovers in Saskatchewan have been on prairie dog colonies. Colonies also support the highest rate of chick survival when compared with other habitats (Dreitz 2009). Given the species' preference for prairie dog colonies, and the ease with which this species can be missed in surveys, all colonies are considered high quality breeding habitat in which the likelihood of species occurrence is high.

Mountain Plovers may also breed outside of prairie dog colonies, which are limited in their distribution and extent in southwestern Saskatchewan (Knapton et al. 2006). In order to maintain the species' distribution, it is important to also include probable breeding sites. Therefore, identification of critical habitat is also based on reliable or probable breeding occurrence data plus a 500 m radius around the occurrence. The 500 m radius zone is based on observed movements of breeding individuals from nest sites and is expected to provide the area needed for completing nesting and brood-rearing activities (Graul 1975, Knopf and Rupert 1995, Dreitz et al. 2005). The following two criteria were used to identify critical habitat:

- Breeding occurrence (e.g. territorial pairs, nests, eggs, or fledged young) or probable breeding occurrence (e.g. individuals in suitable habitat at the appropriate time of year) has been precisely documented with an accurate geographic referencing system or accurate mapping, and
- Suitable nesting habitat still exists in the areas.

The biophysical attributes of Mountain Plover critical habitat are as follows (Graul 1975, Knowles and Stoner 1982, Knopf and Rupert 1995, Dechant et al. 1998, Environment Canada 2006):

- occurrence of Black-tailed Prairie Dogs and their associated colony habitat characteristics; and/or
- a combination of the following:
    - large tract of open native prairie (≥80 ha)
    - native prairie management units that are moderate to heavily grazed (mixed- or short-grass that is usually less than 10 cm high)
    - presence of bare ground (between 30% and 70%)
    - high horizontal visibility (open areas with a slope less than 5%)
    - limited woody vegetation
    - limited invasion by exotic grasses.

The critical habitat identified in this Action Plan represents all the known habitat used by the Mountain Plover in the GNP area and is therefore deemed sufficient for ensuring that the GNP area contributes meaningfully to national population and distribution objectives of the species.

The total area of critical habitat identified in this Action Plan comprises 1,150 ha of prairie dog colony within the West Block of GNP (Figure 6).

4.4.2. Examples of Activities Likely to Result in Destruction of Critical Habitat

Examples of activities that may result in destruction of Mountain Plover critical habitat include, but are not limited to:

1. Activities that remove and/or convert native prairie, rendering it inhospitable to Mountain Plovers or limiting their ability to forage, breed, nest and rear young.

   Examples may include:
   - Conversion of native prairie to annual cropland or tame forage.
   - Extraction of gravel.
   - Construction of new infrastructure such as roads, wells, large diameter pipelines, and large building complexes.
   - Deliberate flooding or filling.

2. Activities that fragment large tracts of native prairie, thereby increasing predation pressure and reducing reproductive success.

   Examples include:
   - Construction of new permanent fire breaks and roads

3. Activities that destroy the extent and function of Black-tailed Prairie Dog colonies.

Examples may include:

- Deliberate killing or removal of Black-tailed Prairie Dogs such that the colonies are reduced in size or abandoned, allowing vegetation to become thick and tall in areas where it was bare and sparse. Mountain Plovers will not use such areas for breeding.

4. Activities that promote or enhance vegetation growth, both native and non-native, such that the area becomes unsuitable for nesting or foraging. Such areas are also known to be more attractive to predators such as foxes and squirrels that are known to feed on plover eggs.

   Examples may include:

   - Deliberate planting of forbs, shrubs or trees, or introducing invasive species that will out-compete native vegetation.

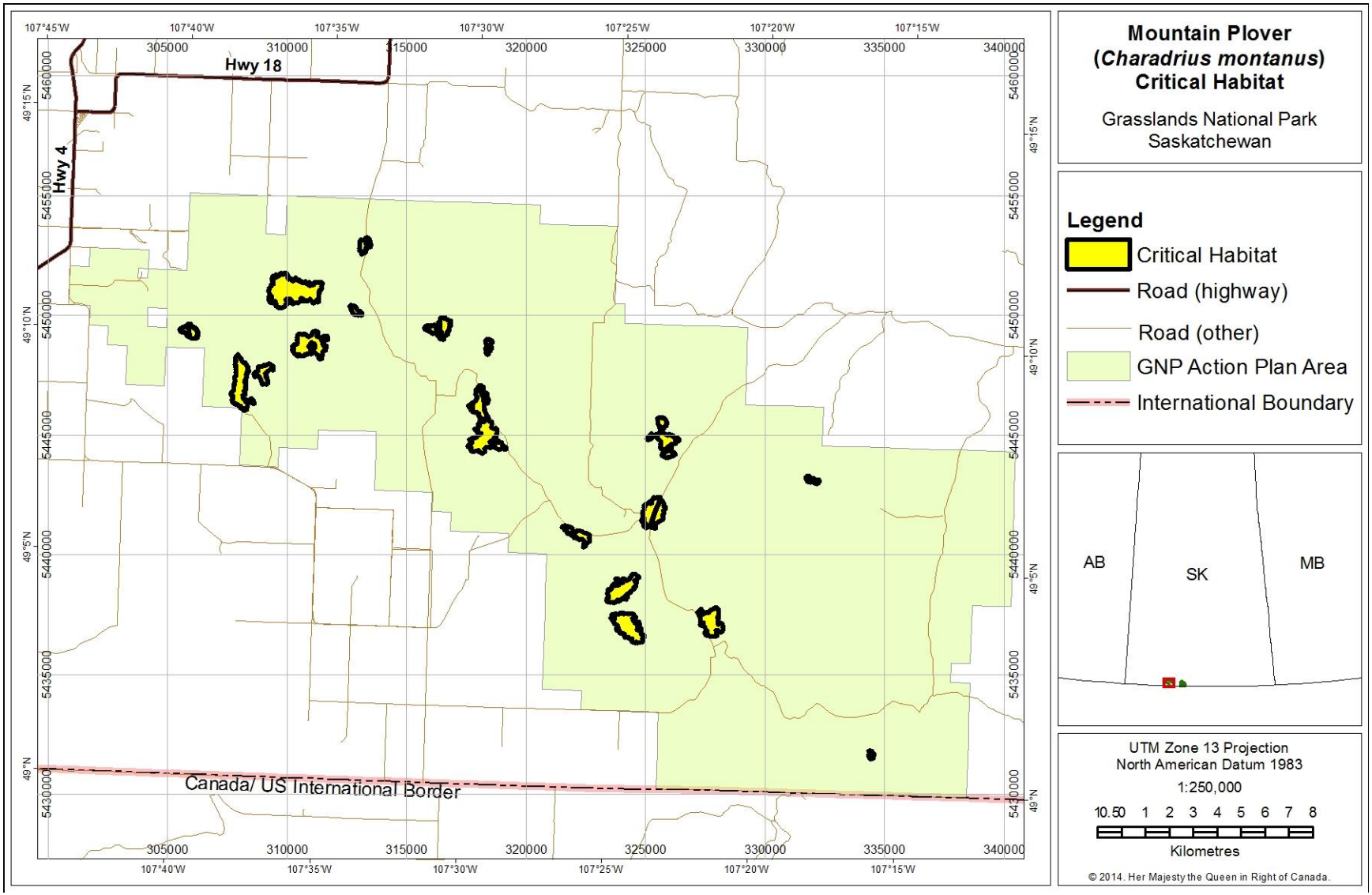

Figure 6. Location and extent of critical habitat for Mountain Plover critical habitat in the West Block of Grasslands National Park. For details on critical habitat identified in this action plan, refer to section 4.4.

4.5 Identification of Critical Habitat for Prairie Loggerhead Shrike

4.5.1. Biophysical Attributes

Partial critical habitat for the Prairie Loggerhead Shrike has previously been identified in the Recovery Strategy (Environment Canada 2014c), although additional critical habitat will have to be identified in order to fully provide for the recovery of the species.

The Prairie Loggerhead Shrike occurs in two different habitat types in the GNP area and across species' range. The first is where tall shrubs occur in farmland. The second is where tall shrubs are interspersed within large contiguous areas of natural grassland. While this species shows the distinctive behavior of impaling prey items on sharp objects, and may use thorny bushes for this purpose, the essential role of tall shrubs is in providing nesting habitat and perching locations.

The Recovery Strategy calls for maintaining the recent prairie distribution and regional population levels (Environment Canada 2014c). Within the GNP area, at a very minimum the distribution must be maintained in order to contribute to meeting the national recovery objective. Therefore, all natural grassland habitat known to be used by Loggerhead Shrikes and meeting the established criteria was identified as critical.

In this Action Plan, critical habitat within natural grassland habitats was determined following the two criteria described in the Recovery Strategy (Environment Canada 2014c). These criteria are based on expert opinion, which constitutes the best available information at this time, but may be refined in the future as better information becomes available:

- Large contiguous areas of natural grassland within 400 m of well-dispersed tall shrubs, 2 to 3 m in height and low in density (less than 30% cover, variable among sites);
- Shrike density at least 0.5 apparent breeding pairs / km^2, based on 2003-2010 surveys.

Critical habitat was identified using high-resolution satellite imagery to manually create a minimum-area polygon bounding tall shrubs used for nesting with the addition of a 400 m radius area of grassland. The 400 m radius zone is based on observed movements of shrikes from nest sites, and is expected to provide foraging habitat for shrikes nesting along the periphery of the area of tall shrubs. Most of this area of critical habitat is estimated to have < 5% tall shrub cover, which is within the above criteria.

The total area of critical habitat identified in this Action Plan comprises 7,427 ha within GNP. This is in natural grassland, and is located along the glacial meltwater channel of the Frenchman River (Figure 7).

4.5.2. Examples of Activities Likely to Result in Destruction of Critical Habitat

Examples of activities that may result in destruction of Prairie Loggerhead Shrike critical habitat include, but are not limited to:

1. Significant reduction of shrub coverage and prevention of shrub growth. These activities can destroy critical habitat because they eliminate nesting and/or perching habitat, thereby reducing the probability that shrike population levels will be maintained across the range.

   Such activities include but are not limited to:
   - repeated annual burning or mechanical removal of tall shrub patches;
   - alteration of hydrological regimes of riparian areas;
   - alteration by any other means.

2. Conversion of large areas of natural grasslands to cropland, infrastructure or buildings. This may reduce the quality of habitat to the extent that it is avoided by shrikes or can no longer support a sufficient prey base for foraging.

   Examples of such activities include, but are not limited to:
   - conversion of grassland to cropland;
   - development of human infrastructure such as homes, other buildings, roads, fire breaks and industrial infrastructure.

3. Excessive grazing to the extent that prey availability is significantly reduced in grassland foraging areas, or that nesting and perching sites in tall shrubs are reduced due to excessive mechanical damage from livestock. These effects can reduce shrike productivity, thereby reducing the probability that shrike population levels will be maintained across the range.

Insufficient information is available to provide thresholds of activity levels that would result in destruction of critical habitat. Alterations or proposed alterations to shrub and grassland cover within critical habitat will have to be assessed on a case-by-case basis in order to determine whether they qualify as destruction of such habitat.

Any given single action may or may not result in the destruction of critical habitat; however, when considered in the context of all current and future actions, the cumulative impacts of such actions may result in the destruction of critical habitat.

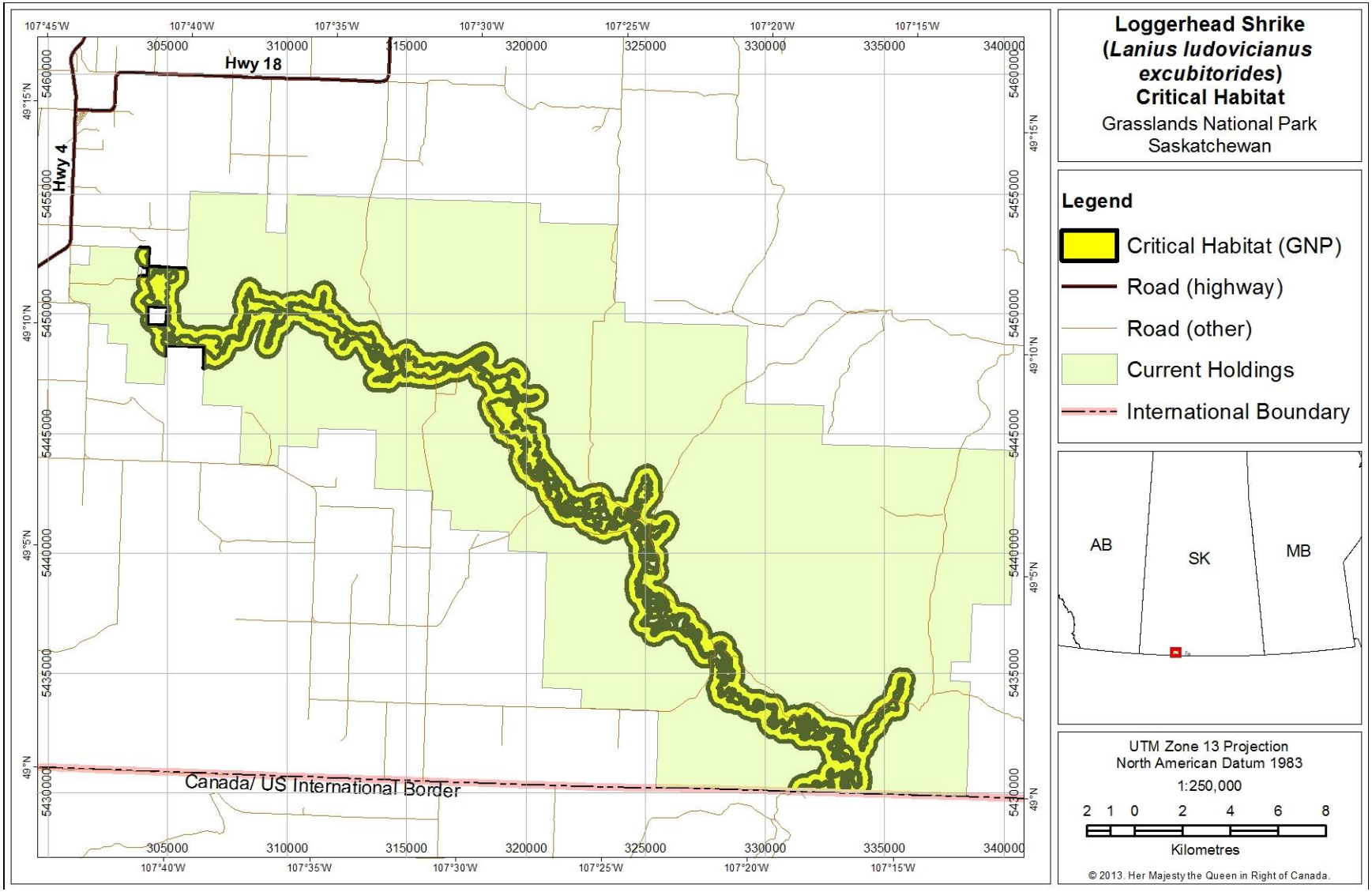

Figure 7. Location and extent of critical habitat for Prairie Loggerhead Shrike critical habitat in the West Block of Grasslands National Park. For details on critical habitat identified in this action plan, refer to section 4.5.

4.6 Identification of Critical Habitat for Sprague's Pipit

4.6.1. Biophysical Attributes

Partial critical habitat for Sprague's Pipit has previously been identified in the Recovery Strategy (Environment Canada 2012a). The new critical habitat identified in this Action Plan replaces the critical habitat identified in the recovery strategy for GNP, although more will have to be identified outside of the GNP area in order to fully provide for the recovery of the species.

As described in the Recovery Strategy (Environment Canada 2012a), the biophysical attributes of critical habitat include the characteristics listed below. However, it is not currently possible to provide the specific amounts or levels of all of these required by Sprague's Pipit.

- open areas of upland native prairie ≥ 65 ha (160 ac).
- native prairie management units in fair to excellent range condition.
- limited woody vegetation.
- limited invasion by exotic grasses.
- flat to gently rolling topography.

In this Action Plan, Sprague's Pipit critical habitat was determined using the approach outlined in the South of the Divide (SoD) Action Plan (Environment and Climate Change Canada in prep.). In summary, "Approach 2" was used as described in the Recovery Strategy (Environment Canada 2012a), and was guided by a spatially explicit predictive model based on pipit occurrence data collected from 2002-2011 as well as remotely-sensed habitat data. The models were based on 1,153 randomly selected sites where territorial Sprague's Pipits occurred, and a further 3,997 randomly selected sites that were used to characterize the habitat generally available in the SoD area. Reliance on predictive models was necessary because surveys and observations are widely scattered and tend to sample only a small proportion of a given area. Use of predictive models is a precautionary approach that allows one to determine the potential suitability of sites that were not sampled but can reasonably be expected to be inhabited by pipits. Models were validated using independent data sets, which demonstrated that the final model correctly predicted 90% of known pipit locations. The predictive model was ground-truthed in the park and the critical habitat polygons were adjusted accordingly.

Critical habitat for Sprague's Pipit identified in this Action Plan comprises 51,955 ha total across the West (Figure 8) and East (Figure 9) Blocks of GNP.

4.6.2. Examples of Activities Likely to Result in Destruction of Critical Habitat

Sprague's Pipit critical habitat may be destroyed by anthropogenic activities that have the following effects (see Dale 1983, Davis et al. 1999, Davis and Duncan 1999, Davis 2005, Linnen 2008, Dale et al. 2009):

- loss of native vegetation or disturbance of soil substrate.
- degradation of native prairie to poor range condition.
- excessive increase in bare ground.
- intentional planting of woody vegetation.

- introduction of exotic plant species such as Crested Wheatgrass (*Agropyron cristatum*), Smooth Brome (*Bromus inermis*), Alfalfa (*Medicago* spp.), Sweet Clover (*Melilotus* spp.), and Leafy Spurge (*Euphorbia esula*).
- covering of critical habitat with new anthropogenic structures.

Examples of activities that may result in destruction of Sprague's Pipit critical habitat include, but are not limited to:

1. **Removal, cultivation and/or conversion of native prairie to annual cropland or non-native grassland**. Sprague's Pipits require native grassland habitat. The species is not found breeding in any type of annual cropland and is less abundant in non-native compared to native grasslands (Robbins and Dale 1999, Davis et al. 1999, Davis and Duncan 1999, Madden et al. 2000). Pipit abundance has been shown to decrease on native pastures with increasing amounts of non-native grassland in the landscape (B. Dale pers. comm., Davis et al. 2013). Furthermore, reproductive success and juvenile survival have been found to be lower in non-native than native grassland habitat (Davis unpubl. data, Fisher and Davis 2011).

2. **Construction of roads**. Roads (paved, gravel or dirt surfaces of > 2 m width with ditches or raised road bed) destroy and fragment native grassland habitat, facilitate invasion of native grassland by exotic plant species, concentrate activities of certain predators and increase the chance of pipits colliding with vehicles. As a possible consequence of these effects, abundance of pipits has been found to be lower along roads than along trails (Sutter et al. 2000).

3. **Intentional flooding of upland habitat**. Water impoundment and creation of wetlands in upland native prairie cause the terrestrial vegetation to be unavailable to pipits for nesting and foraging. Pipit abundance has been found to increase with increasing distance from wetlands (Koper et al. 2009), suggesting that the presence of wetlands negatively affects habitat suitability beyond the wetland itself.

4. **High-intensity prolonged grazing**. Livestock grazing may reduce habitat quality if intensity, frequency, and duration of grazing are excessively high. Prolonged over-grazing over a number of years may degrade habitat to a point where the vegetation structure and community is no longer compatible with the habitat requirements of the species. Rangeland classified as "Poor" range condition (Abouguendia 1990) is not suitable for pipits (Davis et al. 2014) and is likely difficult to recover without substantial resources and time (Abouguendia 1990).

5. **Construction of new infrastructure** (e.g. buildings, oil and gas wells, pipelines, waste and water storage facilities). Anthropogenic structures placed on native grassland exclude pipits from using the habitat directly associated with the structure. Occurrence of pipits is negatively affected by well density (Dale et. al.2009) and individual wells are avoided by pipits, with exclusion zones extending up to 60 m from natural gas wells (Kalyn-Bogard 2011).

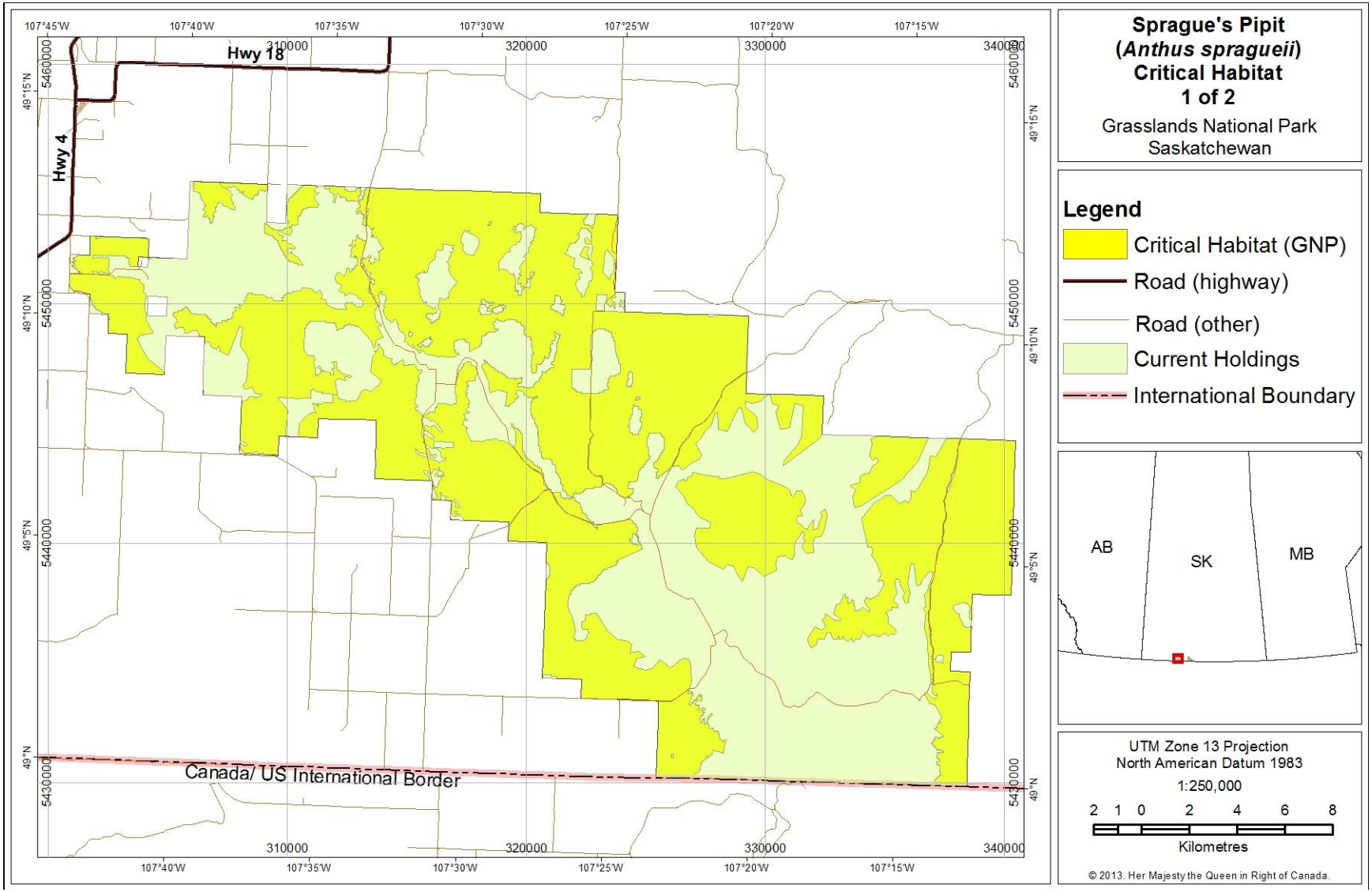

Figure 8. Location and extent of critical habitat for Sprague's Pipit critical habitat in the West Block of Grasslands National Park. For details on critical habitat identified in this action plan, refer to section 4.6.

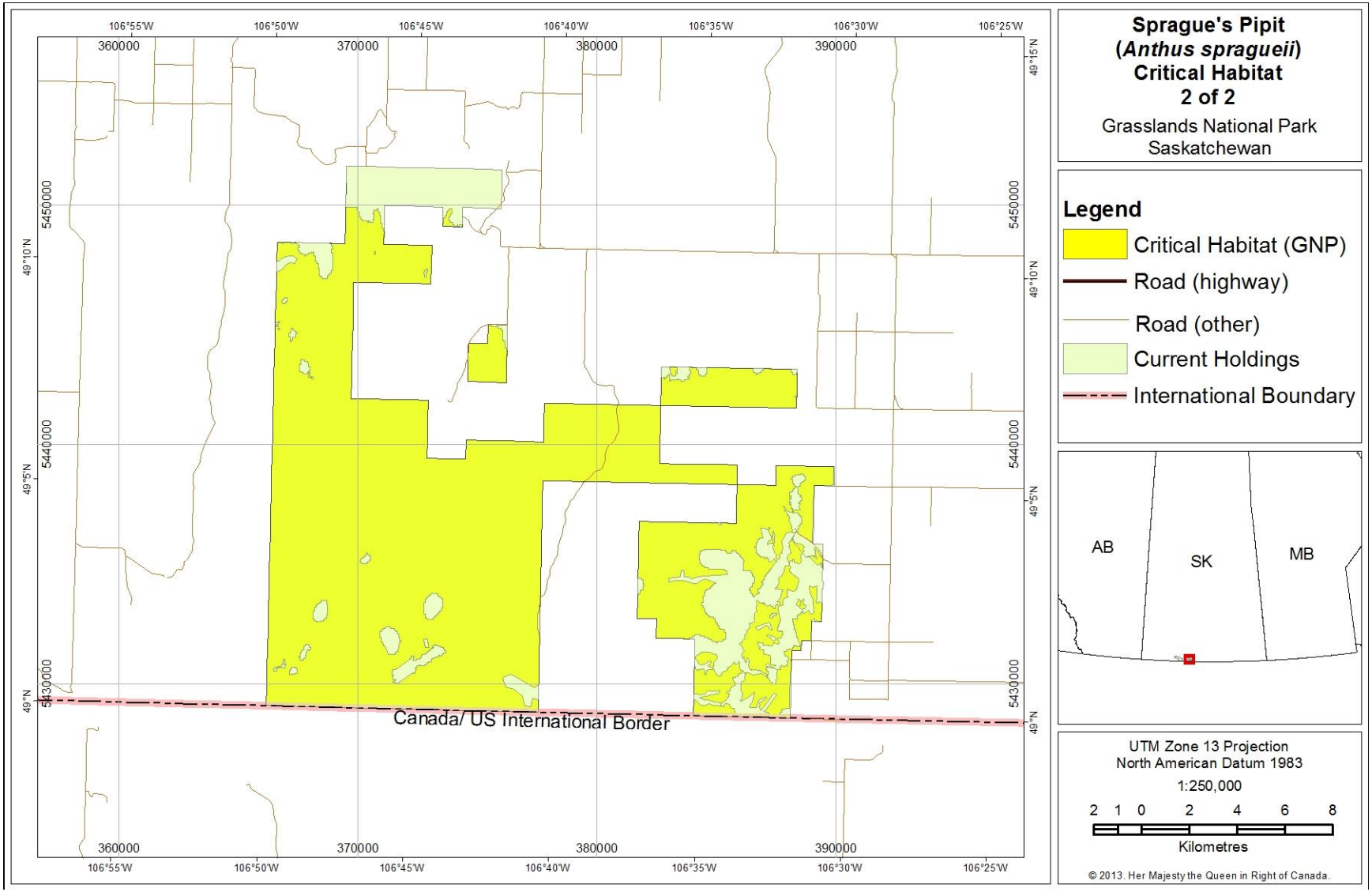

Figure 9. Location and extent of critical habitat for Sprague's Pipit critical habitat in the East Block of Grasslands National Park. For details on critical habitat identified in this action plan, refer to section 4.6.

4.7 Identification of Critical Habitat for Swift Fox

4.7.1. Biophysical Attributes

Critical habitat has been identified based on a range-wide analysis of the amount, locations, and attributes of the currently occupied range of Swift Fox in Canada. However, recent estimates of the Canadian Swift Fox population are lower than the long term recovery goal for this species (COSEWIC 2009, Pruss et al. 2008b). Therefore, any suitable habitats in which the species currently occurs, or is reasonably expected to occur based on best available information, necessarily represents critical habitat for survival or recovery of the species in Canada.

Information and methods used to identify critical habitat

The locations and attributes of critical habitat were identified using the best available information, including the output from a habitat modeling study, other scientific information about habitat requirements of the species, and field data collected by provinces, universities, non-profit organizations, and federal departments.

A predictive model for Swift Fox occurrence was created following the preliminary approach of Moehrenschlager et al. (2007a). Development of the new model by Parks Canada, in collaboration with Moehrenschlager of the Calgary Zoo, included modifications and refinements from the original version. Critical habitat is identified as those areas within the current range of the species in which the combination of habitat attributes is at least as favourable for Swift Fox as the majority of locations where Swift Fox occurrences were documented.

Fourteen summer landscape-scale habitat variables were analysed within 3 km of Swift Fox captures during the last (2005-06) winter live trap survey. These results indicated that Swift Fox avoid selecting habitats that have a high proportion of cropland, high average wetness, high standard deviation in wetness, and high average slope within 3 km. This habitat selection is consistent with the species known affinity for intact, dry prairie habitats that are relatively homogeneous with gradually sloping hills (Pruss 1999, Moehrenschlager et al. 2007a).

The predictive model for Swift Fox occurrence was tested by comparing its predictions against other Swift Fox survey results from three previous winter surveys. For all datasets assessed (1996-97, 2000-2001, 2008-2009), the model was found to strongly discriminate sites where Swift Foxes had (versus had not) been detected by live trapping and baited camera stations. Evaluation of the spatial map of predicted Swift Fox occurrence indicated 53% (approx. 8765 km^2) of the total area of the species range provides habitat attributes that are suitable to contain 89% of Swift Fox occurrences. It is the subset of these areas in Grasslands National Park that are identified as critical habitat for Swift Fox in this Action Plan (Figures 10 and 11).

The biophysical attributes of Swift Fox critical habitat are as follows (Pruss 1999, Moehrenschlager et al. 2007a, COSEWIC 2009):

- Large tracts of intact (i.e. native) prairie.

- Short (< 25 cm high), sparse and relatively homogeneous vegetation.
- Level or low variation in terrain roughness (gently sloping terrain or few topographic features such as canyons, steep hills, or coulees).
- Dry, well-drained soils.
- High density of burrows created by fossorial mammals.
- Limited cropland.
- Limited invasive species.
- Adequate availability of prey items (small mammals and insects).

Existing, non-suitable habitats comprised of urban areas, annual cropland, roads and water bodies that occur within the mapped boundaries of critical habitat do not constitute critical habitat. Suitability of habitat for Swift Fox is identified according to habitat attributes measured within a radius of 3 km from capture locations representing the relatively large areas that breeding Swift Foxes utilize. As such, the zone of influence for potential activities that may affect critical habitat extends 3 km from the boundaries of critical habitat polygons. Horizontal accuracy of the mapped critical habitat polygon boundaries is estimated at 37 m.

4.7.2. Examples of Activities Likely to Result in Destruction of Critical Habitat

The habitat model showed that activities within 3 km of Swift Fox occurrences could have an impact on habitat suitability. Therefore, certain activities outside of the identified critical habitat could still negatively impact that habitat. Examples of activities likely to result in the destruction of critical habitat may include but are not limited to:

1. **Activities that remove or convert intact prairie to annual cropland or tame pasture, rendering the habitat inhospitable to Swift Fox, or limiting their ability to forage, breed, disperse, burrow or rear young**. Swift Fox prefer large tracts of intact prairie, while avoiding cropland or highly fragmented areas (Carbyn 1998, Moehrenschlager et al. 2007a, COSEWIC 2009). Activities that remove or convert intact prairie may reduce prey and burrow availability, increase risk of predation, increase interspecific competition with Coyotes and Red Foxes, and reduce gene flow among populations. This can result in extirpation at the local scale, which may impede metapopulation dynamics (Hanski and Ovaskainen 2002, DeWoody et al. 2005, Babak and He 2009, Schwalm 2012).

   Examples include:
   - Agricultural activities that plough or cultivate intact prairie, either as a one-time or annual activity, or change it to non-native grasses.
   - Industrial activities that fragment large tracts of intact prairie through the development of new trails, roads and infrastructure. Large-scale oil-field developments have been found to reduce carrying capacity of the San Joaquin Kit Fox (*Vulpes macrotis*) (Warrick and Cypher 1998). Swift Foxes are negatively associated with habitat edges, roads, and a lack of habitat homogeneity (Moehrenschlager et al. 2007a). Increased number of roads

also produces increased levels of traffic and subsequent road mortality, which can impact population dynamics.
- Gravel extraction.
- Construction of new permanent fireguards.

2. **Activities that fill in, destroy or lead to a reduction in the number of prairie dens, holes or burrows that Swift Foxes rely on, compromising the ability of individuals to use them for shelter from weather extremes, rearing young, or refuge from predators** (Egoscue 1979, Russell 1983, Herrero et al. 1986, Pruss 1999, Harrison and Whittaker-Hoagland 2003)**.** The Swift Fox is the most burrow-dependent canid; it relies on a number of burrows and dens that are used throughout the year. Although Swift Foxes are thought to be able to dig their own burrows, they often modify burrows dug by other species such as American Badgers (*Taxidea taxus*), prairie dogs (*Cynomys* spp.), and ground squirrels (*Spermophilus* spp.) (Herrero et al. 1986, Pruss 1999).

   Examples include:
   - Deliberate destruction of dens, holes or burrows that Swift Fox rely on by filling them in with dirt or collapsing them.
   - Activities that flood or change the hydrology of an area such that dens, holes or burrows that Swift Fox rely on, become too wet or are inundated by water.

3. **Activities that permanently change vegetation composition and structure, leading to inability of Swift Fox to detect predators and prey, as well as increase predation risks and interspecific competition**. Swift Foxes are known to avoid densely vegetated habitats. Trees can be used as perches for raptors while dense, tall vegetation can attract predators and competitors such as Coyotes and Red Foxes.

   One example is:
   - The deliberate planting of trees and shrubs.

4. **Activities that reduce prey abundance such that foraging opportunities and food delivery to young are decreased, leading to starvation, den abandonment, or disappearance of individuals from area.** The Swift Fox diet is primarily comprised of grasshoppers (suborder Caelifera), beetles (order Coleoptera), and ground squirrels (Hines and Case 1991, Pruss 1994). A reduction in mammalian prey (microtine) populations has been found to negatively impact the closely related San Joaquin Kit Fox (White and Ralls 1993, White et al. 1996, Moehrenschlager et al. 2007b).

   One example is:
   - The misuse of pesticides or any other activity that reduces prey abundance to the point where Swift Fox populations decline in the long-term or are extirpated from the area.

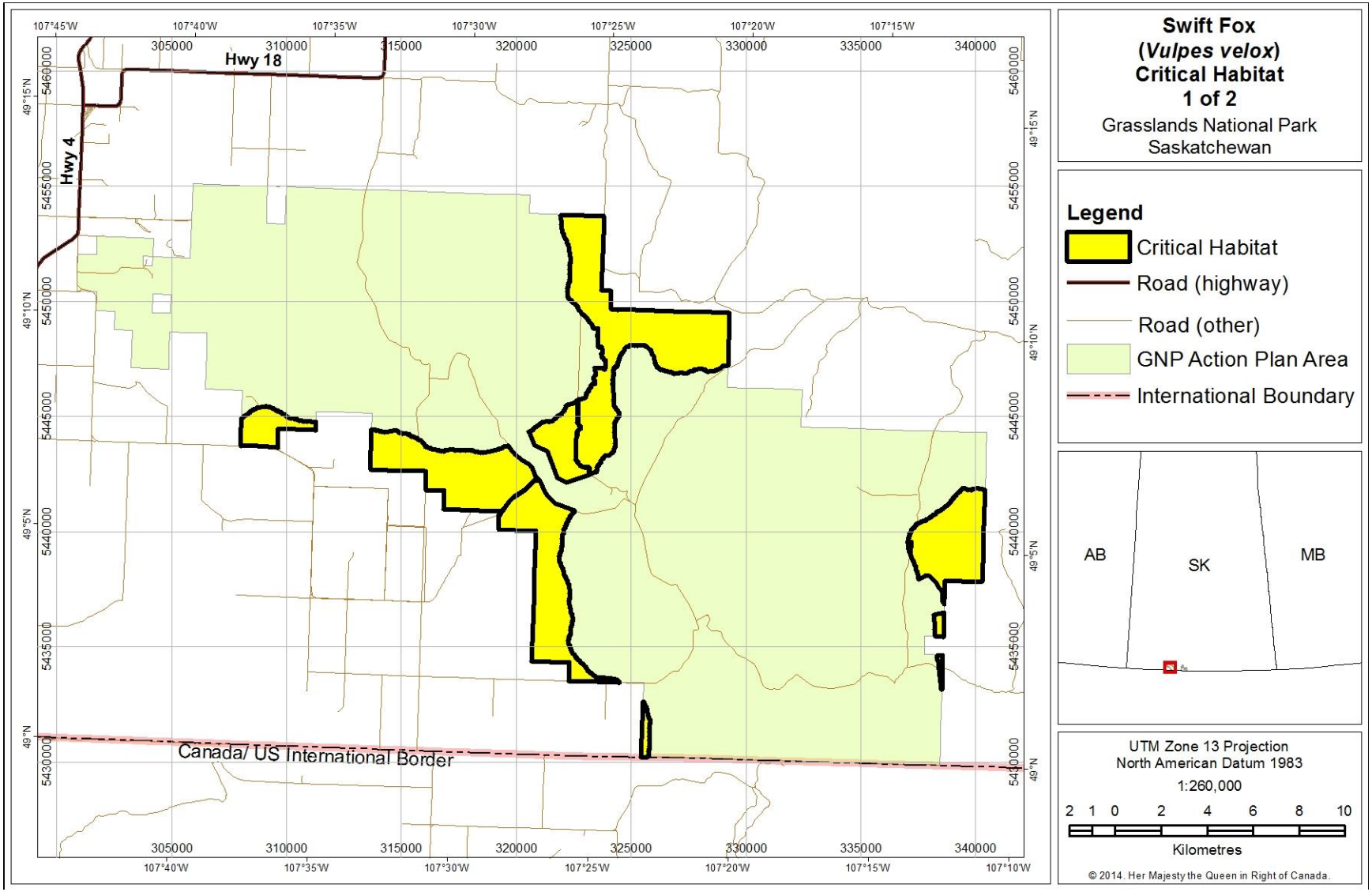

Figure 10. Location and extent of critical habitat for Swift Fox critical habitat in the West Block of Grasslands National Park. For details on critical habitat identified in this action plan, refer to section 4.7.

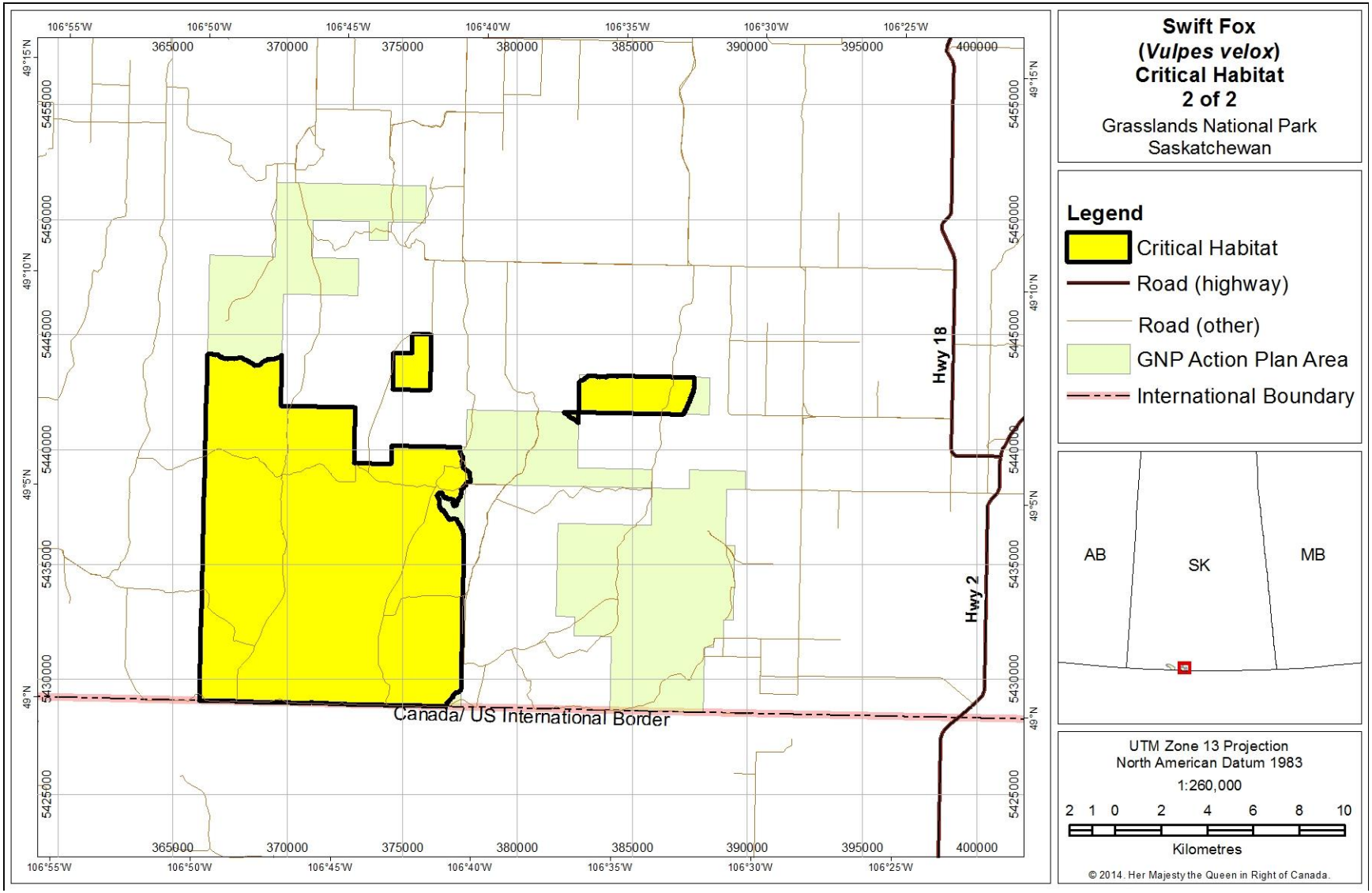

Figure 11. Location and extent of critical habitat for Swift Fox critical habitat in the East Block of Grasslands National Park. For details on critical habitat identified in this action plan, refer to section 4.7.

4.8 Proposed Measures to Protect Critical Habitat

Critical habitat identified in this action plan and in other recovery documents within GNP will be legally protected from destruction under section 58(1) of the SARA or through Orders made under subsections 58(4) and 58(5).

5. Evaluation of Socio-Economic Costs and of Benefits

The Species at Risk Act requires the responsible federal minister to undertake *"an evaluation of the socio-economic costs of the action plan and the benefits to be derived from its implementation."*

5.1. Costs

The total cost to implement the action plan will be borne by Parks Canada out of applicable appropriations. No major socio-economic costs to partners, stakeholders or Indigenous groups are expected as a result of this action plan. Additional resources or partnerships will be sought to support the measures outlined in Appendix C.

Many of the proposed measures will be integrated into the operational management of the site. These costs to the government will be covered by prioritization of appropriate funds at the site and thereby will not result in additional costs to society.

The action plan applies only to lands and waters in GNP and the national historic sites, and does not bring any restrictions to land use outside the site. As such, this action plan will place no socio-economic costs on the public. However, minor restrictions may be placed on visitor activities on park lands and waters to protect and recover species at risk.

5.2. Benefits

Measures presented in this action plan for GNP and the national historic sites will contribute to meeting recovery strategy objectives for threatened and endangered species, and will also contribute to meeting management objectives for species of special concern. These measures are expected to have an overall positive impact on ecological integrity and enhance opportunities for appreciation of the site and the species by visitors and the general public. This action plan includes measures that could result in benefits to Canadians, such as positive impacts on biodiversity and the value individuals place on preserving biodiversity (Federal, Provincial, Territorial Governments of Canada, 2014).

The proposed measures seek a balanced approach to reducing or eliminating threats to species at risk populations and habitats, and include protection of individuals and their habitat (e.g., restrictions to human activities, such as area closures, within areas occupied by the species, combined with ongoing research and monitoring), potential species re-establishment, and increasing public awareness and stewardship (e.g., signage, visitor programs, and highlights in communication media). Another good example is road closures during lekking periods for Greater Sage-grouse.

Potential economic benefits of the recovery of the species at risk found at this site cannot be easily quantified, as many of the values derived from wildlife are non-market commodities that are difficult to appraise in financial terms. Wildlife, in all its forms, has value in and of itself, and is valued by Canadians for aesthetic, cultural, spiritual, recreational, educational, historical, economic, medical, ecological and scientific reasons. The conservation of wildlife at risk is an important component of the Government of Canada's commitment to conserving biological diversity, and is important to Canada's current and future economic and natural wealth.

Implementing this action plan is expected to have positive benefits for park visitors, local residents and Indigenous groups. Community knowledge is often taken into consideration in species at risk management in GNP. Some activities in the plan may create opportunities for local residents to become involved in the recovery of species at risk and for cooperation and community partnerships in SAR recovery. Benefits should be relatively evenly distributed across individuals in local communities, and opportunities for involvement will be available to all local residents. These include opportunities to learn about and take part in the recovery of culturally important species at risk, opportunities for visitors and local communities to be involved in conservation issues, opportunities for integration of Indigenous Traditional Knowledge into conservation issues in GNP, and greater awareness of Indigenous values and culture among local residents and visitors to the parks. In doing so the plan supports the goals under the Species at Risk Act "*the traditional knowledge of the aboriginal peoples of Canada should be considered in the assessment of which species may be at risk and in developing and implementing recovery measures*".

6. Measuring Progress

Reporting on implementation of the action plan (under s. 55 of SARA) will be done by assessing progress towards implementing the measures. Reporting on the ecological and socio-economic impacts of the action plan will be done by assessing progress towards meeting the site-based population and distribution objectives.

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Appendix A: Species information, objectives and monitoring plans for species at risk in GNP.

Species	National objectives	Site-based population & distribution objectives	Population Trend in GNP[3]	Population monitoring[4]	General information and broad park approach
Black-footed Ferret	Establish a wild population of Black-footed Ferrets in Canada that has at least an 80% probability of persisting for 20 years (i.e. less than 20 % probability of extinction in 20 years)	1) Increase the amount of ferret/prairie dog habitat to 900 ha by 2019 and 1200 ha by 2025 2) Reintroduce ferrets when there are a minimum of 10 prairie dogs per hectare of colony (in addition to meeting objective 1 above) to meet the breeding requirements of ferrets.	declining	1) Map colony perimeters every 2 years. 2) After future reintroductions have a 2 week spotlighting/live trapping survey every summer-fall	Actively manage to increase prairie dog population through plague mitigation and/or sylvatic plague vaccine baits and colony expansion (mowing edges, fire and grazing regimes, translocations to abandoned colonies and establish new colonies on disturbed sites).
Black-tailed Prairie Dog	Prevent the Canadian population from becoming threatened or endangered by ensuring the population maintains at least 90% probability of persistence in 100 years.	1. Average area of colony = 900 ha by 2019 and 1200 ha by 2025 2. Average density in unadjusted visual counts of greater than or equal to 10 animals/ha	1. declining 2. declining	1. Map colony perimeters every 2 years 2. Estimate density with visual counts on sample plots every year	Actively manage to increase prairie dog population through plague mitigation and/or sylvatic plague vaccine baits and colony expansion (mowing edges, fire and grazing regimes, translocations to abandoned colonies and establish new colonies on disturbed sites). Improve understanding of ecology of individuals (reproductive and mortality factors).
Burrowing Owl	Reverse the population decline in Canada and maintain a self-perpetuating, well-	Maintain the number of nesting pairs in the range of 20 to 40 pairs on prairie dog towns.	Highly variable (with consistent declines in	Record the number of nesting pairs observed initiating a nest during May, as well as	Maintain the prairie dog ecosystem. Actively manage to reduce accidental mortality and visitor or researcher disturbance.

[3] Population trend is from 2009-2014.
[4] Where population and distribution objectives have been established for GNP, monitoring is designed to directly measure success in achieving those goals.

Species	National objectives	Site-based population & distribution objectives	Population Trend in GNP[3]	Population monitoring[4]	General information and broad park approach
	distributed population of at least 3000 breeding pairs within the four western provinces		the last few years)	the number of young successfully fledged in July.	Fire/grazing management may improve habitat on non-prairie dog colony areas and development of new prairie dog towns.
Chestnut-collared Longspur	N/A	Maintain >47 Chestnut-collared Longspurs per 100 ha	Unknown	Conduct point counts at least once every 2 years in critical habitat managed for optimal habitat conditions.	Improve habitat conditions with managed grazing and prescribed fire.
Eastern Yellow-bellied Racer	Maintain the species' distribution in Canada	Maintain occupancy at known hibernacula and any newly-discovered hibernacula	Unknown	Opportunistically record sightings (including road kill) and confirm continued occupancy of over-wintering hibernacula at least once every 5 years.	Manage visitors around hibernacula. Use speed management education programs and signage to reduce road kill. Perform survey once per five years.
Greater Sage-grouse	1) The immediate objective is to stop the decline of the adult sage-grouse population in Canada 2) The short term objective is to reverse the population decline and increase the number of active leks in both Alberta and Saskatchewan. 3) The long-term objective is to achieve a stable or increasing sage-grouse population with: at least 1095 adult sage-grouse among 16 or more active leks in Alberta and: at least 1500 adult sage-	1) (a) Immediate objective (next 5 years) to prevent the extirpation of sage-grouse from GNP; (b) restoration of 25 ha/yr of sage-grouse habitat 2) Short term (6-10+ years): demonstrate increasing trend in the number of lekking males 3) Long term (20+ years): Increase the numbers of mating areas to 6 - 8 leks and the total population to 300 to 400 individual birds (100 to 133 males).	Significant decline	Annual spring lek counts on active leks and revisit inactive leks opportunistically.	Restore and/or enhance silver sage brush habitat within areas of sage-grouse current or historical range in GNP. Optimize grazing regime to improve nest success and chick survival. Reduce accidental mortality by removing fences and/or installing fence markers. Manage human disturbance around leks by following EPO prohibitions. Maintain partnerships for reintroductions and/or egg collection for a captive population.

Species	National objectives	Site-based population & distribution objectives	Population Trend in GNP[3]	Population monitoring[4]	General information and broad park approach
	grouse among 20 or more active leks in Saskatchewan				
Greater Short-horned Lizard	To maintain populations in all of the 8 critical habitat polygons within the currently known areas of occupancy of the species plus any new populations discovered in the future.	Maintain occupancy on known occupied habitat and any newly-discovered occupied habitat	Unknown (possibly decreasing)	Confirm continued occupancy and assess habitat quality by annually visiting a minimum of 5-10 occupied patches spatially distributed across the park. Rotate between all known occupied locations. Assess habitat and remove invasive species when possible.	Monitoring and habitat management can be combined. Ongoing surveys are required to determine whether changes in the Greater Short-horned Lizard populations are experiencing a negative trend.
Little Brown *Myotis*	N/A	Maintain occupancy in the park	Unknown	Conduct ultrasonic surveys using bat detectors, and survey known roosting sites in the park for bats once a year.	Monitor known roosting sites (e.g. buildings, wells) for bats and ensure sites remain occupied. Use bat detectors to survey for bats in the park.
Sprague's Pipit	Increase and maintain population size and distribution of the Sprague's Pipit at or above mean abundance levels experienced during the 1980-89 time period throughout the pipit's historic range in Canada. Prevent further loss and degradation of native prairie within the historic range of the species.	Maintain >45 Sprague's Pipits per 100 ha	Stable	Conduct point counts at least once every 2 years in critical habitat managed for optimal habitat conditions.	GNP currently has some of the highest recorded densities of this species, and maintaining these densities is an important role for the park. Variation in grazing intensities will shift optimal habitats but total available CH will likely remain unchanged.

Species	National objectives	Site-based population & distribution objectives	Population Trend in GNP[3]	Population monitoring[4]	General information and broad park approach
Barn Swallow, Common Nighthawk, Ferruginous Hawk, Long-billed Curlew, McCown's Longspur, Mormon Metalmark, Mountain Plover, Northern Leopard Frog, Plains Minnow, Prairie Loggerhead Shrike, Short-eared Owl, Swift Fox		No objective established: because no threats known in park or no known GNP management actions can contribute to conservation within the park at this time; or GNP is of limited importance to the species' national recovery.	Unknown	Record incidental observations.	The park will continue to protect individuals and protect suitable habitat on park lands and support partners where feasible on recovery and protection of these species. Additionally, GNP will work with partners to conduct opportunistic surveys for under-surveyed species in the park and adjust management approaches appropriately when new populations are found.

Appendix B: Conservation and recovery measures that will be conducted by GNP and/or partners.

Species	Measure #	Measure	Desired Outcome	Threat or recovery measure addressed[5]	Timeline
Black-tailed Prairie Dog	BTPD 1 Led By GNP	Habitat Mapping and Decision Support Tool Development: conduct habitat inventory and mapping activities to determine the most suitable areas for optimal prairie dog and sage-grouse habitat. This information will be used to support future habitat restoration activities.	To develop a detailed habitat map for multiple species at risk to provide support for decision making when identifying potential restoration areas.	Habitat loss or degradation	2015-2017
Black-tailed Prairie Dog	BTPD 2 Led By GNP	Plague Mitigation: implement the sylvatic plague mitigation plan.	To adaptively manage the risk of plague, and ensure at least a 90% probability of persistence of BTPD.	Sylvatic plague	Ongoing

[5] Threat or recovery measures as per most recent versions of relevant recovery documents found in References section.

Species	Measure #	Measure	Desired Outcome	Threat or recovery measure addressed[5]	Timeline
Black-tailed Prairie Dog	BTPD 3 Led by Partner	Individual Level Research: support research partnerships to provide fine resolution information at an individual level to better understand demographic factors (reproductive success, recruitment and mortality) contributing to the decline of prairie dogs in Grasslands National Park (focussed research on one or more colonies in the park).	Within 5 years have an interim data set that will support the development of life tables for this population.	All threats. Assists in understanding causal factors contributing to reduced reproduction and recruitment which have resulted in a declining population trend for this species.	Ongoing
Black-tailed Prairie Dog	BTPD 4 Led by Partner	Population Level Research: support research partnerships to better understand the population level factors that may be contributing to the current decline of prairie dogs and the long-term viability of this population.	To better understand the prairie dog population long-term viability in the park.	All threats	Ongoing
Greater Sage-grouse	SAGR 1 Led by GNP	Sage-grouse Friendly Fencing: employ methods such as fence marking, fence removal and/or sage-grouse friendly fencing in priority habitats to improve sage-grouse survival in Grasslands.	To reduce risk of sage-grouse mortality related to fence infrastructure in the park.	Vertical structures, increased predation pressure, and collisions with infrastructure	2015-2019

Species	Measure #	Measure	Desired Outcome	Threat or recovery measure addressed[5]	Timeline
Greater Sage-grouse	SAGR 2 Led by Partner	Habitat Assessment, Mapping and Decision Support Tool: conduct habitat assessment and mapping activities to determine the most suitable areas for optimal nesting and brood rearing sage-grouse habitat. This information will be used as an indicator of sage-grouse habitat health and support future habitat restoration activities.	A detailed habitat map and decision support tool for multiple species at risk to inform key priority sites for restoration.	Habitat loss or degradation	2015-2017
Greater Sage-grouse	SAGR 3 Led by Partner	Habitat Restoration: implement habitat restoration activities at sites identified as priority areas by the Decision Support Tool, which have the potential to be optimal nesting and/or brood rearing habitat for sage-grouse, which are in the vicinity of existing high quality sage-grouse habitat.	To increase the amount of nesting and brood rearing habitat in the vicinity of lekking areas at identified priority sites.	Habitat loss or degradation	2015-2019
Greater Sage-grouse	SAGR 4 Led by GNP	Best Management Practices: implement best management practices/processes to mitigate, minimize and/or avoid potential impacts of activities on sage-grouse and identified critical habitat (as per the Emergency Protection Order and Recovery Strategy).	To minimize potential adverse effects of activities on sage-grouse and their habitat.	All threats	Ongoing
Greater Sage-grouse	SAGR 5 Led by GNP	Beneficial Grazing Practices: Implement beneficial grazing practices/prescriptions to optimize sage-grouse habitat attributes in nesting and brood rearing critical habitat areas.	To make the habitat attributes in priority nesting and brood rearing critical habitat areas optimal for sage-grouse.	Habitat loss and degradation	2015-2020

Species	Measure #	Measure	Desired Outcome	Threat or recovery measure addressed[5]	Timeline
Plains Bison	PB 1 Led by GNP	Maintain Conservation Herd Status: maintain the population in conservation herd status through implementation of bison management plans and practices (disease free, genetically pure, 50% sex ratio, IUCN guidelines).	A bison population within a target range of 300 to 350 animals within the reintroduction area, while maintaining a conservation herd status.	N/A	Ongoing
Plains Bison	PB 2 Led by GNP	Investigate Bison Habitat Use: develop fine scale habitat maps using the results from telemetry bison collars to better understand the habitat use of the bison population and their extent of occurrence in the bison reintroduction area, within the context of multi-species at risk management.	A bison population within a target range of 300 to 350 animals within the reintroduction area that are utilizing the full extent of this area.	N/A	Ongoing
Sprague's Pipit, Chestnut-collared Longspur	SPPI 1/ CCLO 1 Led by GNP	Implement Prescribed Fire/Grazing Management Strategies: Implement prescribed burning/grazing management strategies in a manner that maintains and/or enhances songbird and avian species habitat.	To maximize optimal habitats for Upland Grassland songbirds (Sprague's Pipits and Chestnut-collared Longspur).	Habitat loss or degradation	Ongoing

Species	Measure #	Measure	Desired Outcome	Threat or recovery measure addressed[5]	Timeline
Eastern Yellow-bellied Racer	EYBR 1 Led by GNP	Traffic Management Strategy: develop and implement a traffic management strategy for the Ecotour Road to reduce road mortality.	To reduce the road mortality of important SAR species in GNP.	Road mortality	2017
Black-footed Ferret	BFF 1 Led by GNP	Ferret Persistence and Reintroduction: continue to evaluate the persistence of ferrets in the park and maintain the potential for future ferret reintroductions (linked to key recovery activities for prairie dogs in the park).	Maintain the potential for future ferret reintroductions	Release Black-footed Ferrets in Canada	Ongoing
Greater Short-horned Lizard	GSHL 1 Led by Partner	Investigate GSHL genetic relationships: Explore the genetics between AB and SK lizards and at a finer scale between GNP East and West blocks. (Threat: assumption that populations are all the same genetically and could lose rare genetic diversity if they are not the same).	Understanding of the amount of genetic diversity of GSHL between the East and West Blocks of GNP.	All threats	2018
Greater Short-horned Lizard	GSHL 2 Led by Partner	Identify new populations in previously unsurveyed areas in the East Block and newly acquired lands in the West Block.	Comprehensive identification of populations and critical habitat in GNP.	Survey areas of unknown occupancy where habitat appears suitable to increase knowledge of areas of occupancy.	2016

Species	Measure #	Measure	Desired Outcome	Threat or recovery measure addressed[5]	Timeline
Mormon Metalmark	MOMO 1 Led by Partner	Ground truth the MOMO predictive critical habitat model: 1) Use ground-truthed data from summers 2013 and 2014 to refine the predictive MOMO habitat model. 2) Determine differences between occupied and unoccupied MOMO habitat which will assist in the creation of a more robust habitat model so that unoccupied habitat is not considered critical habitat.	Refined critical habitat model for Mormon Metalmark.	Assess and map all potential Mormon Metalmark habitat in the known range of the Prairie population and determine whether it is currently occupied.	1) 2017 2) 2020
Little Brown *Myotis*	LBMY 1 Led by GNP	Investigate site use: Identify structures in the park being used by LBMY and ensure their continued occupancy. If buildings being used by bats are to be decommissioned, alternate structures (i.e. bat houses) will be provided if necessary. If bat houses are mounted on poles, then anti-perch mechanisms will have to be installed on top as well. If bat boxes are not used by any bat populations, then they will be removed in a reasonable time frame.	To maintain occupancy of LBMY in GNP and ensure suitable roosting and maternity sites are available.	N/A	Ongoing
All	ALL 1 Led by GNP	Invasive Species Management: prevent expansion or reduce the current distribution of invasive species that impair the quality of species at risk habitat.	To reduce the risk that invasive species have on key species at risk habitats.	Invasive species	Ongoing

Appendix C: Other conservation and recovery measures that will be encouraged through partnerships or when additional resources become available.

Species	Measure #	Measure	Desired Outcome	Threat or recovery measure addressed[6]
Black-tailed Prairie Dog	BTPD 5	Habitat Enhancement: conduct habitat enhancement activities (e.g. fire, grazing, mowing, etc.) to maintain a favourable habitat condition for prairie dog occupation on the perimeter of colonies and on areas within colonies that become abandoned. Use habitat mapping and decision tool to prioritise areas for enhancement.	To prevent abandoned areas from becoming unsuitable for prairie dog recolonisation. Ensure suitable habitat is available for prairie dogs to re-establish on previously occupied colonies over the next 5 years.	Habitat loss or degradation
Black-tailed Prairie Dog	BTPD 6	Habitat Restoration: facilitate the establishment of new colonies and the expansion of existing prairie dog colonies once the prairie dog population reaches its long-term average (using range of methods such as: fire/grazing/revegetation/ translocation). Use habitat mapping and decision tool to prioritise areas for restoration.	Expand prairie dog occupancy at existing occupied prairie dog colonies by 10% through Measure # BTPD 5, and an additional 20% increase through BTPD 6 in new areas through the establishment of new colonies of suitable habitat within 15 years.	Habitat loss or degradation

[6] Threat or recovery measures as per most recent versions of relevant recovery documents found in References section.

Species	Measure #	Measure	Desired Outcome	Threat or recovery measure addressed[6]
Black-tailed Prairie Dog	BTPD 7	Population Genetic Assessment: to determine the genetic makeup of prairie dog populations in the geographic region (including Canada and Northern Montana) and assess the potential for founder populations that could be genetically compatible to Grasslands.	To have collected information on which populations in the geographic region may be genetically compatible to the Grasslands population.	All threats. Identification of genetically suitable translocation populations in the event that the declining trend of GNP prairie dogs persists. Ensures that candidate populations for translocations are genetically compatible with the prairie dogs in GNP in the event that the GNP populations need augmentation. Translocation is preferable to captive breeding.
Black-tailed Prairie Dog	BTPD 8	Captive Breeding/ Translocation Partnerships: support partnerships to determine the feasibility of a captive breeding and/or translocation program for prairie dogs (support the establishment of an offsite or translocation source population if required to preserve genetic diversity and as a method to supplement the population at Grasslands).	To determine the feasibility of captive breeding and translocation for prairie dogs in GNP.	All threats
Greater Sage-grouse	SAGR 6	Collaborate with Partners to Increase/Stabilize the Sage-grouse Population: Collaborate with partners such as the Calgary Zoo to support methods (i.e. captive breeding or rearing, egg collection, augmentation and translocation efforts) to stabilize/increase the population of sage-grouse in GNP over the next 5 years.	To establish a captive bred population that can be used to augment and stabilize/increase the GNP population over the next 5 years.	Small population size

Species	Measure #	Measure	Desired Outcome	Threat or recovery measure addressed[6]
Greater Sage-grouse	SAGR 7	Investigate the role predators play in the decline of sage-grouse.	To better understand the factors contributing to the predation of sage-grouse and implement actions to reduce predation, where feasible	Increased predation pressure
Greater Sage-grouse	SAGR 8	Shelterbelt/Outbuilding Decommissioning/modification: Decommission old shelterbelts and unused outbuildings, as opportunities arise, that may provide artificial predator roosts, attract other non-native species (raccoons, Ring-necked pheasants, etc.) near critical habitat areas, or cause habitat avoidance by sage-grouse.	To increase habitat suitability and reduce the mortality of sage-grouse from predation related to roosting and cover areas.	Increased predation pressure. Vertical structures.
Greater Sage-grouse	SAGR 9	Population Research: support research that investigates reproduction, recruitment and mortality factors which may be a factor in the decline of sage-grouse in the park (for example chick survival seems to be a limiting factor, predation considerations, etc.)	Methods implemented to reduce mortality factors and improve recruitment.	All threats

Species	Measure #	Measure	Desired Outcome	Threat or recovery measure addressed[6]
Plains Bison	PB 3	Feasibility of Herd Expansion: investigate the potential to expand the area that bison occupy in the park (Dixon/Walkers and East Block).	Determine the feasibility of expanding the bison range and increasing the total bison population in the park. (Goal of establishing a population of 1000 bison as per IUCN guidelines).	N/A
Eastern Yellow-bellied Racer	EYBR 2	Develop Habitat Model: Develop a habitat model for EYBR to identify migration corridors, and key summer habitat areas.	To identify additional EYBR habitats through a habitat model and use it to further reduce road mortality. Partner with ERVE to develop road signage	Habitat loss, road mortality, human disturbance of individuals.
Burrowing Owl	BUOW 1	Improve Burrowing Owl Survival and Reproductive Success: Seek partnerships to investigate the feasibility of implementing practical approaches to improve the reproductive performance, survival, and site fidelity of Burrowing Owls in GNP. Also implement mitigations to minimize visitor or researcher disturbance of nesting owls, and conduct supplemental feeding when necessary.	To improve BUOW reproduction, survival, and site fidelity.	All threats

Species	Measure #	Measure	Desired Outcome	Threat or recovery measure addressed[6]
Greater Short-horned Lizard	GSHL 3	Determine Wintering Site Requirements: Identify wintering site requirements to assist in evaluating potential effects of climate change (inclement or extreme weather conditions are a threat to GSHL in the current Recovery Strategy).	Understanding of the vulnerability of GSHL during the winter hibernation period. This life stage (overwintering) is thought to contribute to high GSHL mortality.	Investigate wintering site requirements to assist in evaluating potential effects of climate change.
Greater Short-horned Lizard	GSHL 4	Investigate Dispersal and Connectivity between habitats: Examine movement and dispersal patterns for all age classes to identify habitat characteristics required to maintain connectivity among habitat patches.	Understanding of the movement and dispersal patterns of GSHL and habitat connectivity.	Examine movement and dispersal patterns for all age classes to identify habitat characteristics required to maintain connectivity among habitat patches. Current threat is invasive weed growth in dispersal/connectivity corridors.

Appendix D: Effects On The Environment And Other Species

A strategic environmental assessment (SEA) is conducted on all SARA recovery planning documents, in accordance with the *Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals*. The purpose of a SEA is to incorporate environmental considerations into the development of public policies, plans, and program proposals to support environmentally sound decision-making and to evaluate whether the outcomes of a recovery planning document could affect any component of the environment or achievement of any of the Federal Sustainable Development Strategy's[7] goals and targets.

Recovery planning is intended to benefit species at risk and biodiversity in general. However, it is recognized that recovery measures may also inadvertently lead to environmental effects beyond the intended benefits. The planning process, which is based on national guidelines, directly incorporates consideration of all environmental effects, with a particular focus on possible impacts upon non-target species or habitats. The results of the SEA are incorporated directly into the plan itself, and are summarized below.

Overall, it is anticipated that implementation of this action plan will have a beneficial impact on non-target species, ecological processes, and the environment in GNP and the national historic sites. This plan puts into practice recovery goals presented in recovery strategies already developed for some of the species at risk in this plan, which were subject to SEAs during the development of those documents. Further, this action plan was developed to benefit all species at risk that regularly occur in GNP and the national historic sites; all of these species were considered in the planning process, any potential secondary effects were considered and mitigated, and where appropriate, measures were designed to benefit multiple species. The planning process was also guided by priorities identified in the park's ecological integrity monitoring program and the park's management plan (Parks Canada, 2010a). Consequently activities outlined in this plan address key management priorities aimed at improving the broader ecological health of both sites. The greatest potential for negative environmental effects comes from mitigating the effects of sylvatic plague on prairie dog ecosystems within the park. The pesticide dusted in the prairie dog burrows is toxic to insects, some of which are endemic to the burrows. However, sylvatic plague can be so devastating to prairie dogs that the intermittent destruction of some of the insects in the burrows using a pesticide may be the only way to save any of the ecosystem. A full plague management plan and corresponding environmental assessment were completed in 2010. Finally, this action plan outlines stewardship measures, educational programs, and awareness initiatives that will involve visitors, local residents, Indigenous organizations, and the general public. This will lead to greater appreciation, understanding, and action towards the conservation and recovery of species at risk in general.

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