

Recovery Strategy for the Henslow's Sparrow (*Ammodramus henslowii*) in Canada

Henslow's Sparrow



2010



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About the *Species at Risk Act* Recovery Strategy Series

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

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

What is recovery?

In the context of species at risk conservation, **recovery** is the process by which the decline of an endangered, threatened, or extirpated species is arrested or reversed and threats are removed or reduced to improve the likelihood of the species’ persistence in the wild. A species will be considered **recovered** when its long-term persistence in the wild has been secured.

What is a recovery strategy?

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

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

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

What’s next?

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

The series

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

To learn more

To learn more about the *Species at Risk Act* and recovery initiatives, please consult the Species at Risk (SAR) Public Registry.

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DECLARATION

Environment Canada has developed its recovery strategy for the Henslow's Sparrow as required by the *Species at Risk Act*. This recovery strategy has been prepared in cooperation with jurisdictions responsible for the species.

Success in the recovery of this species depends on the commitment and cooperation of many different constituencies that will be involved in implementing the directions set out in this strategy and will not be achieved by Environment Canada or any other jurisdiction alone. In the spirit of the Accord for the Protection of Species at Risk, the Minister of the Environment invites all Canadians to join Environment Canada in supporting and implementing this strategy for the benefit of Henslow's Sparrow and Canadian society as a whole. Environment Canada will endeavour to support implementation of this strategy, given available resources and varying species at risk conservation priorities. The Minister will report on progress within five years.

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

CONTRIBUTORS

This recovery strategy was prepared by Jennie L. Pearce (Pearce & Associates Ecological Research), David A. Kirk (Aquila Applied Ecologists), and Ken Tuininga (Environment Canada, Canadian Wildlife Service – Ontario).

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STRATEGIC ENVIRONMENTAL ASSESSMENT STATEMENT

A strategic environmental assessment (SEA) is conducted on all SARA recovery planning documents, in accordance with the *Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals*. The purpose of a SEA is to incorporate environmental considerations into the development of public policies, plans, and program proposals to support environmentally sound decision-making.

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

This recovery strategy will clearly benefit the environment by promoting the recovery of the Henslow's Sparrow. The potential for the strategy to inadvertently lead to adverse effects on other species was considered. The SEA concluded that this strategy will clearly benefit the environment and will not entail any significant adverse effects. Refer to the following sections of the document in particular: 1.3 Needs of Henslow's Sparrow; 2.3 Approaches Recommended to Meet the Objectives; and 2.6 Effects on Other Species.

RESIDENCE

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

Residence descriptions, or the rationale for why the residence concept does not apply to a given species, are posted on the SAR Public Registry:
www.sararegistry.gc.ca/sar/recovery/residence_e.cfm.

PREFACE

Henslow's Sparrow was officially assessed by the Committee on the Status of Wildlife in Canada (COSEWIC) as endangered in April 1993, and its status was confirmed in November 2000. It is also a migratory bird protected under the *Migratory Birds Convention Act, 1994* and is under the management jurisdiction of the federal government. The *Species at Risk Act* (SARA, Section 37) requires the competent minister to prepare recovery strategies for listed extirpated, endangered, or threatened species. Environment Canada, Canadian Wildlife Service – Ontario led the development of this recovery strategy, which is an update of the National Recovery Plan for Henslow's Sparrow (Austen *et al.* 1997), in cooperation with the Province of Ontario. The Province of Ontario reviewed and provided support to post this recovery strategy. This recovery strategy was posted as proposed on the Species at Risk Public Registry for a 60-day comment period in 2006. Comments were received and are addressed as appropriate in this final version.

EXECUTIVE SUMMARY

Henslow's Sparrow is a small grassland sparrow that is restricted to southern Ontario in Canada and is assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as an endangered species. It is listed under the federal *Species at Risk Act* (SARA) as endangered. It is also listed as endangered on the Species at Risk in Ontario List under the *Endangered Species Act, 2007*. In Canada, its population was an estimated 50 breeding pairs in the early 1980s, but in the 2001-2005 Ontario Breeding Bird Atlas breeding evidence was documented at only nine locations. This species also has a scattered and localized distribution in the northeastern United States, where its population has also been declining in many states. Henslow's Sparrow has undergone a continental-scale average annual decline of 8.7% since 1966.

The loss and degradation of both breeding and wintering habitat have been identified as key threats and limiting factors for this species throughout its range. Its decline appears to closely track the loss of grassland and old-field habitats on the breeding grounds due to industrial and residential development and changes to agricultural practices. Changes to fire management of pine savanna on the wintering grounds have also resulted in loss and degradation of habitat.

There are unknowns regarding the feasibility of recovery of Henslow's Sparrow. In keeping with the precautionary principle, this recovery strategy has been prepared as per section 41(1) of SARA as would be done when recovery is determined to be feasible. This recovery strategy addresses the unknowns surrounding feasibility of recovery. The population and distribution objectives for Henslow's Sparrow over the next 5 years are to establish and secure at least one large patch (greater than 50 ha) of suitable grassland habitat and achieve at least one stable breeding population of 5-10 pairs. These objectives will be achieved primarily through habitat rehabilitation and management, in conjunction with recovery efforts for other grassland, prairie, and wetland species. A grassland patch greater than 50 ha in size is recommended. Little research is available on this species in Canada; consequently, much of the information presented is based on United States research. Grassland management methods used in the United States provide a model for Canada, and recovery of the Canadian population should be undertaken in close collaboration with managers in the United States.

The 2001–2005 Ontario Breeding Bird Atlas documented breeding evidence at only nine locations and breeding was not confirmed for any of the records. Individual reports since 2005 and surveys in 2007 and 2008 have also not resulted in any confirmed breeding records. Henslow's Sparrows tend to exhibit ephemeral site occupancy and given Ontario's low population numbers, there are no known locations where regular sightings of this species occur. Critical habitat can not be identified in this recovery strategy since there is not enough information currently available. The recovery strategy also summarizes available information on successful recovery efforts for Henslow's Sparrow in the United States. The recovery strategy provides direction for the next five years. One or more action plans pertaining to the Henslow's Sparrow will be developed by 2013.

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SPECIES ASSESSMENT INFORMATION FROM COSEWIC

Date of Assessment: November 2000

Common Name: Henslow's Sparrow

Scientific Name: *Ammodramus henslowii*

COSEWIC Status: Endangered

Reason for designation: This species has disappeared from most of its former limited range in Canada. There are now fewer than 10 pairs remaining in the country. Habitat loss and degradation have largely induced the population decline.

Canadian Occurrence: ON

COSEWIC Status History: Designated Threatened in April 1984. Status re-examined and designated Endangered in April 1993. Status re-examined and confirmed in November 2000.

1. BACKGROUND

1.1 Description

Henslow's Sparrow is a small (13 cm, 10–15 g) grassland sparrow. The head is pale olive-green and has two black stripes on the top, separated by a pale median stripe. The feathers on the back are black edged with white, creating a scaled appearance. The rump, wings, and tail are chestnut coloured, with black in the middle of the feathers, and the breast, sides, and flank are buff with black streaks. Adult males and females look alike, but young Henslow's Sparrows can be distinguished from adults by the lack of streaking on the buff underparts. This is a very secretive species; it is rarely seen and difficult to flush. It is most easily detected when males sing during the breeding season. The song is an insect-like “*tsi-lick*.”

1.2 Populations and Distribution

1.2.1 Global Breeding Distribution

Henslow's Sparrow breeds in the northeastern United States, from eastern South Dakota, Minnesota, New York, and central New England south to Kansas, Missouri, Kentucky, North Carolina, and eastern Texas. In Canada, it has been known to breed in southern Ontario and southwestern Québec (Figure 1). Throughout this range, it has a very scattered and localized distribution. Less than 9% of the global range occurs in Canada (NatureServe 2006).

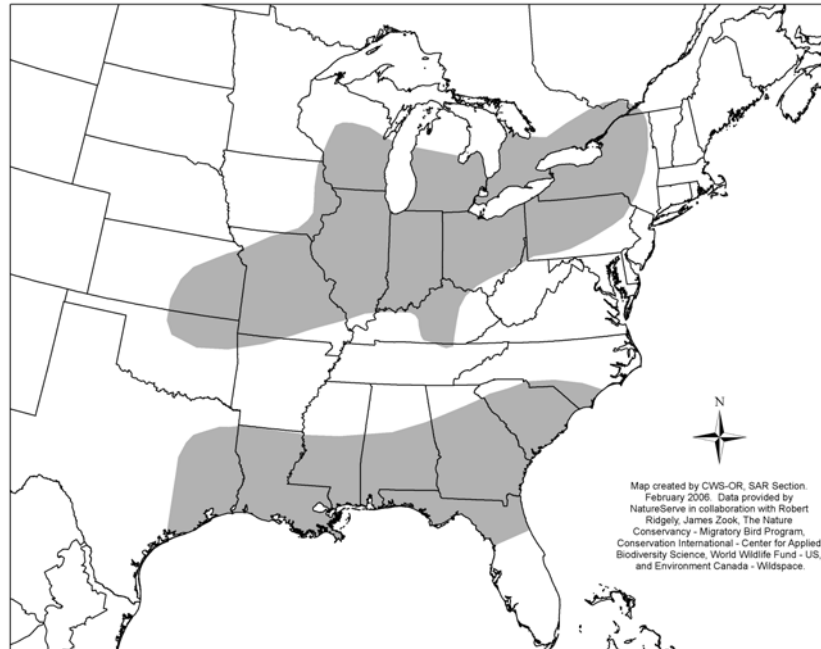


Figure 1. North American distribution of Henslow's Sparrow.

1.2.2 Canadian Breeding Distribution

Henslow's Sparrow was recorded during the breeding season in southwestern Québec (e.g., Hull, Eccles-Hill, Montreal) between 1943–1950 and 1965–1968, but it has not been recorded breeding there since 1968 (Godfrey 1972; Knapton 1982) and is now considered only a vagrant (Gauthier and Aubry 1996). For this reason, Henslow's Sparrow is not listed as a species at risk in Québec.

In Ontario, the historical range of Henslow's Sparrow is considered to be southern Ontario, north to Barrie and Ottawa and east to at least Morrisburg. However, the breeding range has contracted substantially since the 1950s. In the early 1980s, Knapton (1982, 1986) found the main concentration of breeding pairs to be in the southern part of Hastings, Lennox-Addington, Frontenac, and Prince Edward counties. In the early 1990s, a thorough search for the birds revealed only a single singing male (Austen 1994). Several singing males were found in 1999 and again in 2000, on a site restored for Henslow's Sparrow in 1998 in Prince Edward County. At least seven singing males were heard on occasion in the Regional Municipality of Halton in 2000 (M. Austen pers. comm.). Breeding evidence (6 possible and 3 probable records) was documented in a total of nine locations in Ontario during the 2001–2005 Ontario Breeding Bird Atlas surveys, but breeding was not confirmed for any of the records (Figure 2).

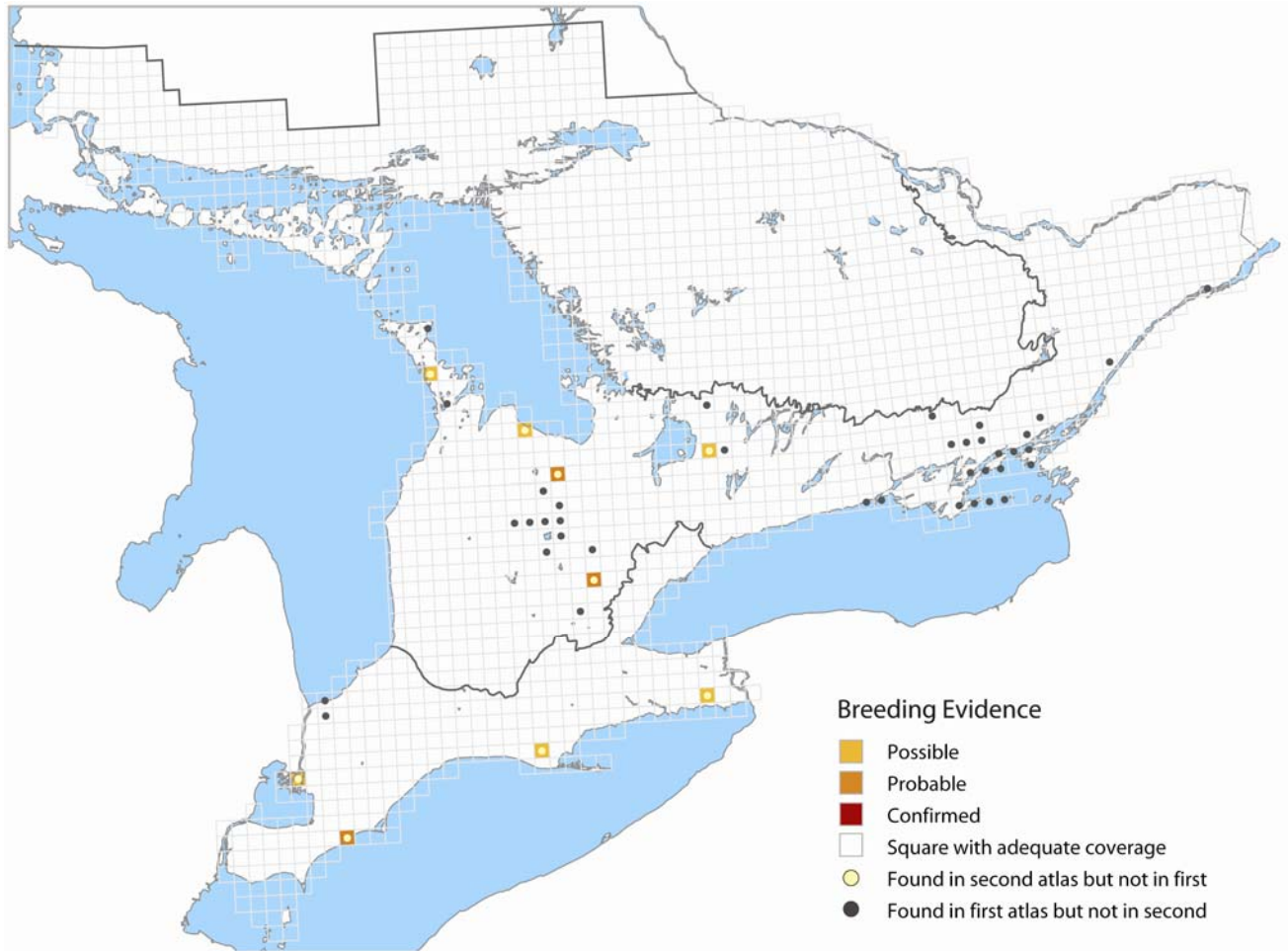


Figure 2. Breeding distribution of Henslow's Sparrow in Ontario from 1981 to 1985 and from 2001 to 2005 (Cadman et al. 2007). Squares are 10x10km.

1.2.3 Winter Distribution

Henslow's Sparrow is a short-distance migrant, wintering primarily in the southeastern United States. The winter range is not well known, but is believed to include eastern Texas, southern Louisiana, southern Mississippi, southern Alabama, Florida, southern Georgia, eastern South Carolina, and southeastern North Carolina.

The species is difficult to detect during migration, and so migration patterns, pathways, and behaviour are poorly understood.

1.2.4 Population Size and Trends

The continental population of Henslow's Sparrow has experienced a significant decline during the period 1966–2004, averaging an 8.7% annual decline. Breeding Bird Survey data suggest that Henslow's Sparrow populations have declined in Michigan, northeastern Ohio, Wisconsin, eastern New York and eastern Pennsylvania. Data from other states in the north-central United States are insufficient to allow meaningful trends to be calculated, although Breeding Bird Atlas

data suggest that population trends in these states are variable. For example, in Illinois, the establishment of large areas of grassland through the Conservation Reserve Program has resulted in a 10-fold increase in Henslow's Sparrow numbers in recent years (Herkert 2005). In western Pennsylvania, reclaimed surface mines have created an estimated core area of 35 373 ha of grassland habitat where at least 4884 Henslow's Sparrows were present in 2001 (Mattice *et al.* 2005). Despite this increase in suitable habitat, Henslow's Sparrow range in Pennsylvania appears to have remained relatively stable between 1984 and 2004 (Pennsylvania Breeding Bird Atlas 2006).

The State of New York noted a significant decline in Henslow's Sparrow throughout its range in surveys conducted between 1980–1985 and 2000–2004 (New York State Department of Environment and Conservation 2005). Currently, the largest area of suitable habitat appears to be concentrated in Jefferson County, in the vicinity of Fort Drum Military Reserve, where the population has also been declining (C. Norment pers. comm.). In this county, 151 fields were surveyed for Henslow's Sparrow in 1997, and 18 (12%) were occupied by a total of 47 male birds; by 2005, only four male Henslow's Sparrows were recorded at a total of 3 of 156 fields (2%) (C. Norment, pers. comm.).

In Michigan in 2005, 20 singing males were recorded in the southern part of the Lower Peninsula, and one singing male was recorded in the northern part of the Lower Peninsula; no singing males were recorded in the Upper Peninsula of Michigan (J. Gibson pers. comm.). The decline of Henslow's Sparrow in Michigan since the 1970s may correspond with the more intensive use of grasslands occurring there in the mid-1970s (R. Adams pers. comm.).

The first Ontario Breeding Bird Atlas (1981–1985) reported Henslow's Sparrow in only 38 squares, and confirmed breeding was reported in only three of these (Cadman *et al.* 1987). A nesting pair was also found on Walpole Island First Nation in 1986. In the early 1980s in Ontario, it was estimated that there were fewer than 50 pairs remaining in the southern part of Hastings, Lennox-Addington, Frontenac, and Prince Edward counties (Knapton 1987). In the early 1990s, a thorough search for the birds in these areas revealed only a single singing male. The results of surveys in 1992 and 1993 suggested that there were probably fewer than 10 pairs nesting in Ontario at that time (Austen 1994). Although no records were confirmed, breeding evidence was documented in nine locations in the 2001–2005 Ontario Breeding Bird Atlas and suggests that at least one breeding territory may exist in Ontario each year. The conservation status for Henslow's Sparrow across its range is outlined in Table 1.

Table 1. Conservation Status

Status	Jurisdiction
N1 (critically imperiled nationally)	Canada (N1B)
N3 (vulnerable to extirpation nationally or extinction)	United States (N3B N4N)
S1 (critically imperiled in the province/state)	Ontario (S1B), Arkansas (S1B, S2N), Maryland (S1S2B), Minnesota (S1B), Massachusetts, Nebraska, New Jersey (S1B), Tennessee (S1B), Vermont (S1B), Virginia (S1B), West Virginia (S1B)
S2 (imperiled in the province/state)	Alabama (S2N), District of Columbia (S2S3N), Illinois, Michigan (S2S3), North Carolina (S2B, S1N), Oklahoma, Texas (S2S3N, SXB), Wisconsin (S2S3B)
S3 (vulnerable to extirpation in the province/state)	Georgia, Indiana (S3B), Iowa (S3B), Kansas (S3B), Kentucky (S3B), Louisiana (S3N), Missouri, New York (S3B)
S4 (apparently secure)	Ohio, Pennsylvania (S4B)
SNA (conservation rank not applicable)	Mississippi, South Carolina
SUB (unrankable due to lack of information or conflicting information)	South Dakota
SNR (not yet assessed)	Quebec, Florida (SNRN)
SX (presumed extirpated)	Rhode Island
SHB (historical breeding)	Connecticut (SHB, SHN), Delaware (SHB, S1N), New Hampshire

Source: NatureServe (2006)

1.3 Needs of Henslow's Sparrow

1.3.1 Habitat and Biological Needs

Biological Needs

Birds arrive on the breeding grounds in Ontario in late April and early May. Males begin singing as soon as they arrive on the breeding grounds, with the frequency and vigour of this song increasing until mid-May (Herkert *et al.* 2002). Singing begins approximately one half hour before sunrise and stops approximately one half hour after sunset, with singing intensity greatest at dawn and dusk.

Males defend their territory; territories may be clustered to form a loose colony (Wiens 1969; Cully and Michaels 2000). In Michigan, the average territory size was 0.3 ha (Robins 1971); in Wisconsin, the average territory size is larger (0.7 ha \pm 0.26 SD, n = 4; Wiens 1969); and in Pennsylvania, the territories on reclaimed surface mines are often smaller (0.18 ha \pm 0.05 SD, n = 22; Piehler 1987). Henslow's Sparrows are generally monogamous. Females build the nest in about 5–6 days (Hyde 1939). The cup-shaped nest is constructed of dead vegetation (typically grass) and placed at the base of grass clumps, resting on litter usually 2.5 cm to several

centimetres above the ground (Robins 1967,1971). The nest is generally not fastened to the standing vegetation. A new nest is constructed for each nesting attempt (Robins 1971). Typically, 4–5 eggs (range 2–5 eggs) are laid, one per day. Incubation over a 10- to 12-day period is performed by the female, as is brooding. Young are tended by both parents and fledge at 9–10 days. In Michigan, two clutches may be raised in a single year; it is not known whether Henslow's Sparrows are double-brooded in Ontario. Birds leave the breeding grounds in Ontario during September or early October. Very low numbers of banded birds are recaptured in successive years at active colonies (Herkert *et al.* 2002), suggesting either low site fidelity by individual sparrows or high mortality. However, colonies will remain active year after year if suitable habitat is available.

Breeding Habitat

Henslow's Sparrows occupy open fields. They are believed to have originally been adapted to the tallgrass prairie community (Knapton 1982), wet fields, and marshes. Many of these grassland and prairie habitats in both the United States and Canada have been converted to agricultural lands, developed, or degraded through intense grazing pressure (Smith 1992); others have grown in with woody species in the absence of fire. Less than 1% of Canada's tallgrass prairie remains; tallgrass prairie remnants are in southern Manitoba and Ontario (Morgan *et al.* 1995). Today, Henslow's Sparrows in Ontario are mainly recorded inhabiting pastureland and uncut and abandoned hayfields.

The key elements of the breeding habitat, based upon studies from the United States and Ontario, are summarized below. Henslow's Sparrow has highly specific habitat requirements on the breeding (and wintering) grounds. However, as population density in an area increases, a wider range of habitat elements may be selected and the importance of the following features may decline (J.R. Herkert pers. comm.).

Tall, dense grass cover – In Ontario, colonies have been located in abandoned fields, ungrazed or lightly grazed pasture, fallow hayfields with high clover and alfalfa content, grassy swales in open rolling farmland, wet meadows, or, infrequently, mowed fields (Cuddy 1984). The key feature of these habitats has been a high percentage of cover and a moderate to high density of grasses and sedges. The dense vegetation is typically over 30 cm tall. Herkert (1998) reviewed the habitat associations of Henslow's Sparrow and found that their abundance was positively related to maximum herbaceous vegetation height and maximum vegetation density and negatively correlated with the amount of bare ground.

Thick thatch layer – A thick mat of dead plant material from previous years' vegetation is generally found in the ground layer. In Kansas (Zimmerman 1988), Wisconsin (Wiens 1969), and Illinois (Herkert 1994a), occupied areas had a higher density of standing dead vegetation than unoccupied areas. Areas with high litter depth readings (Wiens 1969; Winter 1999) and greater litter coverage (Wiens 1969; Kahl *et al.* 1985) appear to be favoured and may be associated with greater nest success (Winter 1999). However, Henslow's Sparrows were negatively correlated with this feature in Missouri (Skinner *et al.* 1984).

Lack of emergent vegetation – Henslow's Sparrows appear to avoid sites with hills or treelines nearby and sites with posts, fence lines, wires, or trees (Wiens 1969). They will also avoid grassland with numerous emergent shrubs or trees. Long, unbroken views to the horizon may be essential (Peterson 1983). In New York, Henslow's Sparrow territories had fewer than 10 woody stems (average height 0.5 m) per 250 m² and shrub cover <1% (Krebs 2002). In Kansas, Henslow's Sparrow habitat had significantly lower tree (>4 m tall) densities (mean 0.54 trees/ha) than random sites (6.67 trees/ha; Cully and Michaels 2000).

Large areas of grassland habitat – Henslow's Sparrow was described as an area-sensitive species in Illinois; grassland size had a significant positive influence on the probability of occurrence for Henslow's Sparrow, and a grassland fragment of 55 ha was required for the probability of occurrence to equal 50% of its maximum value (Herkert 1994b). The average size of an occupied grassland patch was 421 ha (Herkert 1994a). J.R. Herkert (pers. comm.) suggests that as population density increases and birds become more common, breeding birds are increasingly found in smaller fields; however, large tracts of grassland may be required for birds to establish and maintain active colonies when densities are low.

Restored grasslands should be greater than 50 ha in size, preferably greater than 100 ha. Smaller grasslands are generally dominated by generalist species and less likely to support viable populations of area-sensitive species such as Henslow's Sparrow (Herkert 1998). However, small fragments surrounded by other grassland habitat and near large grassy areas may also provide suitable habitat, but support lower densities (Winter and Faaborg 1999). A rotational system of management, where management (e.g., mowing, burning, grazing) is applied to small sections of the grassland on a regular rotating schedule, may be most appropriate and would best be facilitated in large grasslands. Management units should be approximately 30 ha in size (Herkert 1998).

Low-lying wet areas – In Ontario, a number of historical locations contained, or were adjacent to, low-lying areas that were seasonally flooded during the spring. Canada Blue-joint (*Calamagrostis canadensis*) or Reed Canary Grass (*Phalaris arundinacea*) were common in these habitats (Cuddy 1984). In Michigan, Henslow's Sparrow occupied habitat with an intermediate moisture range; very wet or very dry areas were avoided (Robins 1971). J.R. Herkert (pers. comm.) states that of 11 grassland fields studied for 11 years in Illinois, the field containing the most stable population between years was also the wettest; he speculates that this native prairie field contained habitat with the most stable vegetation structure from year to year (even after fire) and that this stability was attributable to the wetness of the location. At Fort Drum Military Reserve in New York, Henslow's Sparrow breeding pairs appeared to select microhabitats with standing water (C. Norment pers. comm.).

Migration Habitat

Because Henslow's Sparrows are believed to migrate singly or in small groups at night over a short period (1–2 weeks), migrating individuals are rarely observed. They have been found in grassland habitats, adjacent to grassland habitats in hedgerows, and at the edges of shrubby areas.

Winter Habitat

Little is known about habitat selection on the wintering grounds. Typical habitat appears to be open Longleaf Pine (*Pinus palustris*) savannas that have a dense ground cover; fire intervals are important for maintaining appropriate forest structure (Chandler and Woodrey 1995; McNair 1998; Plentovich *et al.* 1999; Fuller *et al.* 2005; Johnson *et al.* 2005; Thatcher *et al.* 2005).

1.4 Threats

Threats to the survival of Henslow's Sparrow are presented in order of significance.

1.4.1 Loss/Degradation of Breeding Habitat

The decline of Henslow's Sparrows in the United States and Canada appears to track the loss of grassland or old-field habitats on the breeding grounds (Knapton 1986; Hands *et al.* 1989; McPeck 1991; Peterjohn and Rice 1991; Smith 1992). Industrial and residential development and changes in agricultural practices are the key factors involved in habitat loss and decline. Changes to agricultural practices that degrade habitat include row crop production, fodder and grain production, the continual use of fields with no fallow periods, earlier and more frequent cutting of hay crops, overgrazing, and afforestation. Natural events, such as succession of grassy fields to shrub and forest or flooding of low-lying areas, also alter habitat. Henslow's Sparrow requires large patches of suitable habitat, and so fragmentation of habitat through changing land use practices also threatens habitat. Recent Henslow's Sparrow population increases in some areas of the United States (a 10-fold increase in Illinois) appear to be associated with the creation of undisturbed grassland habitat by the Conservation Reserve Program (Herkert 1997; Herkert *et al.* 2002), suggesting that habitat creation could reverse the negative population trend for this species over time.

1.4.2 Loss of Wintering Habitat

The typical wintering habitat, Longleaf Pine savannas, is threatened by many of the same processes that threaten breeding habitat. Primary threats include changes due to a decreasing frequency of fire, habitat degradation, or habitat loss through drainage, urbanization, and conversion to agriculture or pine plantations (Herkert *et al.* 2002). For example, in Mississippi, pine savannas managed on a three- to four-year fire cycle appear to provide suitable wintering habitat for Henslow's Sparrow (Chandler and Woodrey 1995); however, few sparrows are recorded when fire intervals are longer.

1.4.3 Catastrophic Disturbance

The small population size and clumped breeding distribution due to both the limited availability of suitable habitat and the semi-colonial breeding behaviour of Henslow's Sparrows suggest that localized catastrophic disasters, such as poorly managed or uncontrolled fire, incompatible agricultural practices, and extreme weather events, would pose a threat to the species.

Localized catastrophic events (e.g., intense storms and hurricanes) on the wintering grounds may also pose a threat to the species. Currently, insufficient information is known about the winter distribution of Henslow's Sparrow to enable an assessment of its vulnerability.

1.4.4 Low Adult and Juvenile Survival

Few birds banded at breeding sites have returned to those same sites the following year (Robins 1967; Hands *et al.* 1989; Skipper 1998, Herkert *et al.* 2002), suggesting that adult or juvenile mortality may be high before or during migration or on the wintering grounds. However, Henslow's Sparrow may also not be faithful to individual breeding locations due to the unpredictable nature of its habitat (Hands *et al.* 1989), and so the lack of banded birds returning does not prove a high level of mortality. Increased levels of monitoring are required to confirm this.

1.4.5 Threats to Breeding Productivity

Very little information is available on either nest success rates or predation rates for Henslow's Sparrow. In Michigan, Robins (1971) found that six of 11 nests (55%) had at least one young and that all young were successfully raised in only one of those 11 nests (9.1%). From 46 eggs, 17 young were produced (37%; Robins 1971). Because nests are placed so close to the ground, mammals such as skunks, weasels, raccoons, and snakes are expected to be important nest predators (Robins 1971; Smith 1992; Winter 1999; Winter *et al.* 2000). Predation may be higher in small grassland fragments, particularly grassland habitats close to woody cover. Predation rates on artificial ground nests in tallgrass prairie fragments were examined in Missouri. Nests close to woody vegetation (<60 m) experienced a 28.7% predation rate, compared with a 7.9% predation rate for nests farther away (Burger *et al.* 1994). For Henslow's Sparrow, nest success was lower in areas less than 50 m from a shrubby edge, presumably because of predation (Winter *et al.* 2000).

Nests in Michigan and Ontario are infrequently parasitized by Brown-headed Cowbirds (*Molothrus ater*) (Robins 1971; Peck and James 1987). In Ontario, one of 12 nests examined had been parasitized by cowbirds (Peck and James 1987), representing a parasitism rate of 8.3%. In Oklahoma and Missouri, parasitized nests that successfully fledged young fledged both Henslow's Sparrow and cowbird young (Winter 1999; Reinking *et al.* 2000).

Competition for habitat, particularly with other sparrows, may limit breeding success. Aggressive interactions between Henslow's Sparrow and Bobolinks (*Dolichonyx oryzivorus*), Savannah Sparrows (*Passerculus sandwichensis*), Grasshopper Sparrows (*Ammodramus savannarum*), and Red-winged Blackbirds (*Agelaius phoeniceus*) have been observed (Wiens 1969; Robins 1971). Savannah and Grasshopper sparrows in particular have a high degree of habitat overlap with Henslow's Sparrow (Hands *et al.* 1989; Smith 1992; Smith and Smith 1992), although Henslow's Sparrow appears to have a larger area requirement (Smith and Smith 1992) and requires taller, denser grassland habitat.

The most significant threat to breeding productivity may be habitat disturbance early in the breeding season from agricultural activities such as grazing and mowing. If these activities do not prevent territory establishment, they may delay the onset of breeding until vegetation height and density are sufficient to provide breeding habitat; as a minimum, grass tussocks are required (Winter 1999). Mowing during the breeding season will result in a high rate of nestling and fledgling mortality and is incompatible with Henslow's Sparrow persistence. However, mowing later in the summer may be acceptable. For example, in New York, hayfields that were mown in September, leaving unmown strips or habitat in a checkerboard pattern, provided suitable habitat for Henslow's Sparrow the following spring (S. Lazazzero pers. comm.).

1.5 Actions Already Completed or Under Way

In 1995, a draft habitat management plan for Henslow's Sparrow was prepared (Enright 1995). This plan provides broad guidelines on habitat area size and shape, grass mixtures to plant, and prescribed burn, grazing, haying, and woody vegetation management. The management plan proposed to restore approximately 1000 ha of grassland habitat in South Cayuga, Ontario, predominantly on land owned by the Ontario Ministry of Natural Resources.

In 1998, an adaptive habitat management project was initiated at Ostrander Point in Prince Edward County. Approximately one third of the area identified for treatment was mowed and cleared of brush. In 1999, bird surveys were conducted to determine if the mowing and clearing of brush had had a positive impact on Henslow's Sparrow. Several singing males were heard in 1999 and again in 2000, indicating that with careful habitat management, this species may again breed at this site (Environment Canada 2006).

While no habitat stewardship projects in Ontario have focused exclusively on Henslow's Sparrow, a few habitat securement projects which may benefit the species were completed between 2000 and 2006, and habitat restoration projects that could also benefit the species were completed or are underway in Alderville First Nation, Pelee Island, and Bronte Creek Provincial Park, among other locations.

1.6 Additional Information Requirements about the Species

In addition to information gaps related to the identification of critical habitat, there is currently inadequate information available on:

- the size, status, and distribution of the Henslow's Sparrow population in Ontario;
- productivity and factors affecting productivity;
- management techniques to maintain or enhance habitat for Henslow's Sparrow in Ontario;
- sources of the birds that immigrate into Ontario from the United States;
- migration and wintering habitat needs and the location of each for the Canadian population; and
- significance of habitat threats on migration and wintering areas to the Canadian population.

2. RECOVERY

2.1 Rationale for Recovery Feasibility

Based on the following criteria, there are unknowns regarding the feasibility of recovery of Henslow's Sparrow. In keeping with the precautionary principle, this recovery strategy has been prepared as per section 41(1) of the *Species at Risk Act* as would be done when recovery is determined to be feasible. This recovery strategy addresses the unknowns surrounding the feasibility of recovery.

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

Yes. However, emigration from the United States is necessary to maintain the species in Canada. Hence, its recovery in Canada will depend on population trends and recovery activities in the United States. Currently, individual male Henslow's Sparrows are recorded in Ontario each year. The difficulty of detecting unpaired female Henslow's Sparrows precludes an estimate of their availability in Ontario. Source populations exist in southern Indiana, southern Illinois, New York, southern Ohio, Pennsylvania, and Michigan. Increasing population density in Illinois, southern Ohio, and Pennsylvania may allow Henslow's Sparrow to expand to adjacent states, thus supplementing populations within New York and Michigan.

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

Yes. Sufficient habitat could be made available since the potential to rehabilitate and maintain suitable habitat is high. Henslow's Sparrow has shown the capacity to expand into new areas once suitable habitat is available. For example, populations in Pennsylvania increased in the 1980s due to the increased availability of suitable habitat on reclaimed surface mines (Reid 1992; Mattice *et al.* 2005).

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

Unknown. While some threats may be minimized or avoided, others such as changing agricultural practices on private lands and managing to maintain early successional habitat may be more difficult since maintaining grassland habitat in a forest biome is challenging. Securing breeding habitat in Ontario and utilizing appropriate management would help mitigate threats to habitat. Long-term protection and management of rehabilitated habitat might best be achieved on public land. However, collaboration with landholders to encourage compatible land management on adjacent lands would allow for a wider range of habitat values to be provided in the landscape, thereby benefiting a wider array of species. However, work with the United States will be necessary to fill some of the remaining knowledge gaps, such as loss of wintering habitat in the United States, low adult and juvenile dispersal, factors affecting productivity, and sources of birds that immigrate into Ontario from the United States, which may limit recovery of the species in Canada.

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

Yes. Habitat restoration techniques used in the United States provide a model for success. Establishment of at least one population in Ontario would help recover the species. If it were possible to establish more than one population it would help mitigate against catastrophic disturbance. However, it is unknown whether using these restoration techniques alone will ensure Henslow's Sparrow breed at a particular site in Ontario.

As the small number of Henslow's Sparrows in Canada occur at the northern part of its continental range, and the vast majority of its continental distribution and population occur further south in the United States, it is important to note that population changes at the continental level may have a significant effect on recovery feasibility in Canada. As the continental population of the Henslow's Sparrow is experiencing an ongoing downward population trend, its range may contract away from the current periphery, and individuals may immigrate towards the centre of the range. In such a case, despite best efforts described in this strategy to ensure that sufficient suitable habitat is available and key threats are mitigated, the numbers of Henslow's Sparrow in Canada may continue to decline.

2.2 Population and Distribution Objectives

2.2.1 Population and Distribution Objectives

The population and distribution objectives over the next five years are to establish and secure at least one large patch (greater than 50 ha) of suitable grassland habitat and to achieve at least one stable breeding population of 5-10 pairs.

2.2.2 Rationale for Objectives

Establishing at least one stable breeding population of 5-10 pairs is expected to be achievable provided emigration from populations in the United States continues to occur and large patches of habitat are available in Ontario. In the early 1980s, the Canadian population was around 50 pairs, until key habitat became unsuitable through lack of appropriate management (Knapton 1987). The establishment of large areas of grassland in Illinois has recently resulted in a 10-fold increase in Henslow's Sparrows numbers (Herkert 2005).

Establishment of a large patch of habitat in at least one location in Ontario within five years will improve the likelihood that suitable habitat will be found by immigrating Henslow's Sparrows. Isolated habitat patches should be greater than 50 ha in size. Several small habitat patches (minimum 30 ha) separated by less than 2 km may function together as a single large habitat patch and will be given preference over small isolated patches during recovery implementation. Over the longer term, establishing additional geographically distinct patches of suitable habitat will likely be an objective to mitigate for possible catastrophic disturbance at a single large patch.

2.3 Approaches Recommended to Meet the Objectives

2.3.1 Recovery Planning

Table 2 outlines a broad strategy to address threats, with reference to the pertinent objective.

Table 2. Strategies for Recovery

Priority	Threats addressed	Broad strategy to address threats	Recommended approaches to meet the objectives	Outcomes or deliverables
High	Habitat loss Catastrophic disturbance	Habitat protection	<ul style="list-style-type: none"> Develop a method to identify candidate habitat areas. Secure habitat; restore or manage as below. 	<ul style="list-style-type: none"> At least one large patch (> 50 ha) of suitable habitat established and secured.
High	Habitat loss and degradation	Habitat protection	<ul style="list-style-type: none"> Identify and protect critical habitat. 	<ul style="list-style-type: none"> Candidate sites for protection identified. Protection strategies identified.
High	Habitat loss and degradation Catastrophic disturbance	Habitat restoration or management	<ul style="list-style-type: none"> Develop criteria for the prioritization of sites that would most clearly benefit from strategic restoration activities. Develop appropriate restoration and management tools to restore breeding habitat at each site as needed. Actively manage habitat to maintain habitat supply. 	<ul style="list-style-type: none"> Suitable habitat is restored where cost-effective and appropriate, with a priority on projects most likely to be successful. Suitable habitat is maintained.
High	Habitat loss and degradation	Public outreach	<ul style="list-style-type: none"> Identify relevant landowners and land managers for candidate habitat, and support appropriate land management. 	<ul style="list-style-type: none"> Appropriate management agreements obtained.
Medium	Habitat loss and degradation	Public outreach	<ul style="list-style-type: none"> Identify neighbouring landowners, land managers, and other target audiences, and support the development of appropriate outreach materials. Provide guidance to interested neighbouring landowners on agricultural 	<ul style="list-style-type: none"> Additional target audiences identified. Information materials provided to landowners and land managers.

Priority	Threats addressed	Broad strategy to address threats	Recommended approaches to meet the objectives	Outcomes or deliverables
			practices compatible with Henslow's Sparrow (such as later-season hay harvest).	
High	N/A	Inventory and monitoring	<ul style="list-style-type: none"> Develop and implement protocol to monitor habitat conditions in priority and/or occupied sites. 	<ul style="list-style-type: none"> Database maintained; results reported; strategies for addressing negative changes developed and implemented.
High	N/A	Inventory and monitoring	<ul style="list-style-type: none"> Conduct annual surveys at priority locations to monitor annual population trend, productivity, and survivorship in Canada in relation to habitat characteristics. 	<ul style="list-style-type: none"> Determine population status and distribution Maintain a georeferenced database of survey results.
Medium	Loss of Breeding & Wintering Habitat Outside Canada	Collaborate with international partners	<ul style="list-style-type: none"> Collaborate with United States to understand threats outside of Canada. Share information with United States to better understand information gaps. Assess the need to work outside of Canada to assist with the recovery. 	<ul style="list-style-type: none"> Species requirements and information gaps better understood. Determine need to work outside Canada.

2.3.2 Narrative to Support Recovery Planning Table

Lack of suitable, secure breeding habitat is thought to be the primary reason that Henslow's Sparrow has declined in Canada. Where apparently suitable habitat is available, it is often too small to support Henslow's Sparrow or lacks important vegetation structural components. Cooperative and voluntary measures will be the primary means used to secure habitat areas. This strategy recommends that large patches of habitat be located and secured and/or habitat restoration, rehabilitation, and enhancement be implemented immediately as the primary tool by which Henslow's Sparrow will be recovered in Ontario. The success of recovery efforts in Ontario will depend on sufficient source populations being available in the United States and large patches of habitat being available in Ontario.

2.4 Critical Habitat

2.4.1 Identification of the Species' Critical Habitat

Identifying and protecting critical habitat and monitoring its condition are recovery priorities. However, critical habitat can not be identified at this time. Possible and probable breeding evidence was documented in only nine locations in the 2001–2005 Ontario Breeding Bird Atlas, and there were no confirmed breeding records. Individual reports since 2005 and surveys in 2007 and 2008 have also not resulted in any confirmed breeding records. Henslow's Sparrows tend to exhibit ephemeral site occupancy and given Ontario's low population numbers, there are no known locations where regular sightings of this species occur. In addition, much of the formerly occupied habitat is now believed to be unsuitable because of development, conversion to shrubland, or earlier harvesting of hayfields. Consequently, insufficient information is currently available to identify critical habitat.

Although the literature provides information on the general type of habitat that the species uses, the extent of potential and actual habitat within Ontario is not known. Surveys in 2002 catalogued historical record locations and examined a portion of these sites for Henslow's Sparrows (Wiercinski 2002). Additional sighting locations since 2002, held by the Natural Heritage Information Centre and identified during Ontario Breeding Bird Atlas surveys, should be added to this list, searched for breeding Henslow's Sparrows, and their current status as suitable habitat described. Habitat assessments of breeding and sighting locations (1980-2005) were initiated in 2007 and 2008; however, some additional work is required. Much of this habitat now appears to be unsuitable for Henslow's Sparrow.

Critical habitat identification will require an assessment of habitat condition and confirmed presence at historical breeding locations and locations at which singing males have been detected since 1980. Priority should be given to the most recent records. However, as much of this habitat is expected to now be unsuitable for Henslow's Sparrow, this activity should be undertaken concurrently with the identification of large areas of secure grassland that may be candidate areas for habitat enhancement or restoration. Preferably, these areas of potential habitat will be located on public land or in areas already identified as critical habitat for other species with similar habitat needs to ensure that a stable supply of grassland habitat is available. These areas will also need to be located in an "open" landscape where there are relatively few forest patches or physical structures such as buildings. The South Cayuga Fields area considered by Enright (1995) should be reassessed as potential recovery habitat. Historical breeding locations and candidate habitat areas should be surveyed for breeding Henslow's Sparrow to confirm the breeding status of this species in Ontario and to provide a baseline for subsequent population monitoring and help in the identification of critical habitat for Henslow's Sparrow. The identification of critical habitat, depending on whether Henslow's Sparrow is regularly occurring and/or breeding on Walpole Island First Nation, will be considered in consultation with the Walpole Island First Nation, and may be described within a multi-species action plan developed with Walpole Island First Nation.

2.4.2 Schedule of Studies to Identify Critical Habitat

The activities listed in Table 3 are necessary to identify critical habitat for the Henslow's Sparrow and will be incorporated into an action plan for this species.

Table 3. Schedule of Studies: Recommended activities for the identification of critical habitat for Henslow's Sparrow

Description of activity	Outcome/rationale	Completion date
1. Assess habitat condition at historical breeding locations and current sighting locations (defined as habitat occupied from 1980 to 2010).	a. Location of all historically occupied habitat collated. b. Current area of suitable habitat at historically documented sites confirmed.	2011
2. Confirm breeding status at locations identified in Activity 1 where suitable habitat currently exists.	a. Breeding status in Ontario confirmed. b. Partial critical habitat identification completed.	2013

2.5 Performance Measures

The recovery strategy must follow the adaptive management approach, whereby new information feeds back into the plan on a regular basis in order to take advantage of new tools, knowledge, challenges, and opportunities. A five-year evaluation of the recovery strategy will be based upon the performance measures listed below.

Table 4. Recovery Performance Measures

Population and distribution objective	Performance measure(s)	Broad strategy
1. Establish and secure at least one large patch (greater than 50 ha) of suitable grassland habitat.	At least one patch of suitable habitat is secured.	Habitat protection
2. Establish at least one stable breeding population.	Increased number of breeding pairs.	Habitat protection

2.6 Effects on Other Species

Recovery efforts that are focused on Henslow's Sparrows — especially efforts that are designed to protect, restore, rehabilitate, or enhance grassland habitats — will benefit a variety of other at-risk grassland species. Grassland habitat restoration adjacent to wetlands, tallgrass prairie, or existing protected areas will be especially beneficial. Species at risk listed in Table 5 utilize grassland, prairie or wetland habitats and would benefit from the restoration of Henslow's Sparrow habitat.

Appropriate management of adjacent agricultural areas (such as later-season hay harvesting) would increase the size of habitat area available to Henslow's Sparrow, and other grassland species at-risk or undergoing range-wide declines (e.g., Grasshopper Sparrow and Savannah Sparrow). No species of conservation concern are expected to be detrimentally affected.

Table 5. List of species at risk that are expected to benefit from recovery activities directed at Henslow's Sparrow

Common name	Latin name	COSEWIC status
American Badger	<i>Taxidea taxus</i>	Endangered
Bird's Foot Violet	<i>Viola pedata</i>	Endangered
Butler's Garter Snake	<i>Thamnophis butleri</i>	Threatened
Climbing Prairie Rose	<i>Rosa setigera</i>	Special concern
Dense Blazing Star	<i>Liatris spicata</i>	Threatened
Eastern Foxsnake	<i>Elaphe vulpina gloydi</i>	Threatened
Eastern Prairie Fringed-orchid	<i>Platanthera leucophaea</i>	Endangered
Gattinger's Agalinis	<i>Agalinis gattingeri</i>	Endangered
Loggerhead Shrike <i>migrans</i> subspecies	<i>Lanius ludovicianus migrans</i>	Endangered
Milksnake	<i>Lampropeltis triangulum</i>	Special concern
Monarch Butterfly	<i>Danaus plexippus</i>	Special concern
Northern Bobwhite	<i>Colinus virginianus</i>	Endangered
Pink Milkwort	<i>Polygala incarnata</i>	Endangered
Purple Twayblade	<i>Liparis liliifolia</i>	Endangered
Riddell's Goldenrod	<i>Solidago riddellii</i>	Special concern
Short-eared Owl	<i>Asio flammeus</i>	Special concern
Showy Goldenrod	<i>Solidago speciosa</i> var. <i>rigidiuscula</i>	Endangered
Skinner's Agalinis	<i>Agalinis skinneriana</i>	Endangered
Slender Bush-clover	<i>Lespedeza virginica</i>	Endangered
Small White Lady's-slipper	<i>Cypripedium candidum</i>	Endangered
Tuberous Indian Plantain	<i>Arnoglossum plantagineum</i>	Special concern
White Prairie Gentian	<i>Gentiana alba</i>	Endangered
Willowleaf Aster	<i>Symphyotrichum praealtum</i>	Threatened

2.7 Statement When One or More Action Plans Will be Completed

Henslow's Sparrow will be included in a multi-species action plan for priority grassland birds in Ontario. This action plan, which may also include species such as Short-eared Owl, Loggerhead Shrike, *migrans* subspecies, and Northern Bobwhite, will be completed by 2013. Depending on whether Henslow's Sparrow is regularly occurring and/or breeding on Walpole Island First Nation, Henslow's Sparrow may be described within a multi-species action plan developed in consultation with Walpole Island First Nation.

3. REFERENCES

- Austen, M. 1994. Henslow's Sparrow: an update. *Ontario Birds* 12(2): 59–66.
- Austen, M., R. Pratt, M. Cadman, D. Cuddy, and R. Knapton. 1997. National recovery plan for Henslow's Sparrow. Report No. 17. Recovery of Nationally Endangered Wildlife (RENEW) Committee, Ottawa, Ontario.
- Burger, L.D., L.W. Burger, and J. Faaborg. 1994. Effects of prairie fragmentation on predation on artificial nests. *Journal of Wildlife Management* 30: 57–64.
- Cadman, M.D., P.F.J. Eagles, and F.M. Helleiner (eds.). 1987. Atlas of the breeding birds of Ontario. Federation of Ontario Naturalists and Long Point Bird Observatory. Available at: <http://www.birdsontario.org/atlas/atlasbook.jsp>.
- Chandler, C.R. and M.S. Woodrey. 1995. Status of Henslow's Sparrow during winter in coastal Mississippi. *Mississippi Kite* 25: 2–24.
- Cuddy, D. 1984. Henslow's Sparrow: guidelines for population monitoring and habitat management in Ontario. Report prepared for the Wildlife Branch, Ontario Ministry of Natural Resources, Toronto, Ontario [cited in Austen *et al.* 1997].
- Cully, J.F., Jr. and H.L. Michaels. 2000. Henslow's Sparrow habitat associations on Kansas tallgrass prairie. *Wilson Bulletin* 112: 115–123.
- Enright, L. 1995. Draft habitat management plan for Henslow's Sparrow (*Ammodramus henslowii*) in Ontario. Long Point Bird Observatory, Long Point, Ontario.
- Environment Canada. 2006. Species at risk: Henslow's Sparrow. Environment Canada. Available at: http://www.speciesatrisk.gc.ca/search/speciesDetails_e.cfm?SpeciesID=23#initiative.
- Fuller, G.T., S.R. Chandler, and M.S. Woodrey. 2005. Diet of Henslow's Sparrow wintering in pine savannas in coastal Mississippi. P. 113 *in* Proceedings of the 2005 American Ornithologists' Union Conference, Santa Barbara, California. American Ornithologists' Union, McLean, Virginia.
- Gauthier, J. and Y. Aubry (eds.). 1996. The breeding birds of Québec: atlas of the breeding birds of Québec. Association québécoise des groupes d'ornithologues, Province of Quebec Society for the Protection of Birds, Canadian Wildlife Service, Environment Canada, Quebec Region, Montreal, Québec.
- Godfrey, W.E. 1972. Encyclopédie des oiseaux du Québec. Les Éditions de l'homme, Montreal, Québec.

- Hands, H.M., R.D. Drobney, and M.R. Ryan. 1989. Status of Henslow's Sparrow in the north central United States. Report prepared for the U.S. Fish and Wildlife Service, Twin Cities, Minnesota.
- Herkert, J.R. 1994a. Status and habitat selection of the Henslow's Sparrow in Illinois. *Wilson Bulletin* 106: 35–45.
- Herkert, J.R. 1994b. The effects of habitat fragmentation on midwestern grassland bird communities. *Ecological Applications* 4(3): 461–471.
- Herkert, J.R. 1997. Population trends of the Henslow's Sparrow in relation to the Conservation Reserve Program in Illinois, 1975–1995. *Journal of Field Ornithology* 68: 235–244.
- Herkert, J.R. 1998. (Revised 2003). Effects of management practices on grassland birds: Henslow's Sparrow. Northern Prairie Wildlife Research Center, Jamestown, North Dakota. Available at: <http://www.npwrc.usgs.gov/resource/literatr/grasbird/hesp/hesp.htm>.
- Herkert, J.R. 2005. Density dependent habitat selection by Henslow's Sparrow. P. 114 *in* Proceedings of the 2005 American Ornithologists' Union Conference, Santa Barbara, California. American Ornithologists' Union, McLean, Virginia.
- Herkert, J.R., P.D. Vickery, and D.E. Kroodsma. 2002. Henslow's Sparrow (*Ammodramus henslowii*). *In* A. Poole and F. Gill (eds.), *The birds of North America*, No. 672. The Birds of North America, Inc., Philadelphia, Pennsylvania.
- Hyde 1939. The life history of Henslow's Sparrow. *Passerherbulus henslowii* (Audubon). University of Michigan Misc. Publ., Ann Arbor.
- Johnson, E.I., J.K. DiMiceli, and P.C. Stouffer. 2005. Effects of fire on movements, body condition, and abundance of wintering Henslow's Sparrows in southeastern Louisiana. P. 106 *in* Proceedings of the 2005 American Ornithologists' Union Conference, Santa Barbara, California. American Ornithologists' Union, McLean, Virginia.
- Kahl, R.B., T.S. Baskett, J.A. Ellis, and J.N. Burroughs. 1985. Characteristics of summer habitats of selected nongame birds in Missouri. *Agricultural Experiment Station Research Bulletin* 1056. College of Agriculture, University of Missouri, Columbia, Missouri.
- Knapton, R.W. 1982. The Henslow's Sparrow (*Ammodramus henslowii*) in Canada: a status report. Report prepared for the Wildlife Branch, Ontario Ministry of Natural Resources, Toronto, Ontario. 78 pp. [cited in Austen *et al.* 1997].
- Knapton, R.W. 1986. A search for Henslow's Sparrows during the 1986 nesting season in the eastern, central and southwestern regions of Ontario. Report prepared for the Wildlife Branch, Ontario Ministry of Natural Resources, Toronto, Ontario [cited in Austen *et al.* 1997].

Knapton, R.W. 1987. Henslow's Sparrow. Pp. 452–453 *in* M.D. Cadman, P.F.J. Eagles, and F.M. Helleiner (eds.), Atlas of the breeding birds of Ontario. Federation of Ontario Naturalists and Long Point Bird Observatory. Available at: <http://www.birdsontario.org/atlas/atlasbook.jsp>.

Krebs, R. 2002. The breeding ecology of, and effects of military activity on, the Henslow's Sparrow at Fort Drum, New York. MSc thesis, State University of New York, Brockport, New York.

Mattice, J.A., D.W. Brauning, and D.R. Diefenbach. 2005. Abundance of Grassland Sparrows on reclaimed surface mines in western Pennsylvania. General Technical Report PSW-GTR-191. U.S. Department of Agriculture Forest Service. Available at: http://www.fs.fed.us/psw/publications/documents/psw_gtr191/Asilomar/pdfs/504-510.pdf (accessed 2006).

McNair, D.B. 1998. Henslow's Sparrow and Sedge Wren response to a dormant-season prescribed burn in a pine savanna. *Florida Field-Naturalist* 26(2): 46–47.

McPeck, G. 1991. Henslow's Sparrow. Pp. 478–479 *in* R. Brew, G.A. McPeck, and R.J. Adams, Jr. (eds.), The atlas of breeding birds of Michigan. Michigan State University Press, East Lansing, Michigan.

Morgan, J.P., D.R. Collicut, and J.D. Thompson. 1995. Restoring Canada's native prairies, a practical manual. *Prairie Habitats*, Argyle, Manitoba.

NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 4.7. NatureServe, Arlington, Virginia. Available at: <http://www.natureserve.org/explorer> (accessed March 1, 2006).

New York State Department of Environment and Conservation. 2005. New York State breeding bird atlas 2000–2005. Available at: <http://www.dec.state.ny.us/website/dfwmr/wildlife/bba/>.

Peck, G.K. and R.D. James. 1987. Breeding birds of Ontario: nidiology and distribution. Vol. 2. Passerines. Life Science Miscellaneous Publications. Royal Ontario Museum, Toronto, Ontario.

Pennsylvania Breeding Bird Atlas. 2006. Second Pennsylvania breeding bird atlas 2004–2008. Available at: <http://www.carnegiemnh.org/atlas/home.htm>.

Peterjohn, B.G. and D.L. Rice. 1991. The Ohio breeding bird atlas. Ohio Department of Natural Resources, Columbus, Ohio.

Peterson, A. 1983. Observations on habitat selection by Henslow's Sparrow in Broome County, New York. *Kingbird* 33: 155–164.

Piehler, K.G. 1987. Habitat relationships of three grassland sparrow species on reclaimed surface mines in Pennsylvania. M.S. thesis, West Virginia University, Morgantown.

- Plentovich, S.M., N.R. Holler, and G.E. Hill. 1999. Habitat requirements of Henslow's Sparrows wintering in silvicultural lands of the Gulf coast plain. *Auk* 116: 109–115.
- Reid, W. 1992. Henslow's Sparrow. Pp. 386–387 in D.W. Brauning (ed.), *Atlas of breeding birds in Pennsylvania*. University of Pittsburgh Press, Pittsburgh, Pennsylvania.
- Reinking, D.A., D.A. Wiedenfield, D.H. Wolfe, and R.W. Roerbaugh, Jr. 2000. Distribution, habitat use, and nesting success of Henslow's Sparrow in Oklahoma. *Prairie Naturalist* 32(4): 219–232.
- Robins, J.D. 1967. Ecology of Henslow's Sparrow. M.S. thesis, Western Michigan University, Kalamazoo [cited in Skipper 1998].
- Robins, J.D. 1971. A study of Henslow's Sparrow in Michigan. *Wilson Bulletin* 83(1): 39–48.
- Skinner, R.M., T.S. Baskett, and M.D. Blenden. 1984. Bird habitat on Missouri prairies. Terrestrial Series No. 14. Missouri Department of Conservation, Jefferson City, Missouri.
- Skipper, C.S. 1998. Henslow's Sparrows return to previous nest site in western Maryland. *North American Bird Bander* 23: 36–41.
- Smith, C.R. 1992. Henslow's Sparrow (*Ammodramus henslowii*). Pp. 315–330 in K.J. Schneider and D.M. Pence (eds.), *Migratory nongame birds of management concern in the northeast*. U.S. Fish and Wildlife Service, Region 5, Department of the Interior, Newton Corner, Massachusetts.
- Smith, D.J. and C.R. Smith. 1992. Henslow's Sparrow and Grasshopper Sparrow: a comparison of habitat use in Finger Lake National Forest, New York. *Bird Observer* 20(4): 187–194.
- Thatcher, B.S., D.G. Krementz, and M.S. Woodrey. 2005. Henslow's Sparrow winter survival estimates and response to prescribed burning. P. 87 in *Proceedings of the 2005 American Ornithologists' Union Conference*, Santa Barbara, California. American Ornithologists' Union, McLean, Virginia.
- Wiens, J.A. 1969. An approach to the study of ecological relationships among grassland birds. *Ornithological Monographs* No. 8. American Ornithologists' Union, McLean, Virginia. 93 pp.
- Wiercinski, M. 2002. Henslow's Sparrow status report. Unpublished report to the Henslow's Sparrow Recovery Team. Consulting Biologist
- Winter, M. 1999. Nesting biology of Dickcissels and Henslow's Sparrows in southwestern Missouri prairie fragments. *Wilson Bulletin* 111: 515–526.
- Winter, M. and J. Faaborg. 1999. Patterns of area sensitivity in grassland-nesting birds. *Conservation Biology* 13: 1424–1436.

Winter, M., D.H. Johnson, and J. Faaborg. 2000. Evidence of edge effects on multiple levels in tallgrass prairie. *Condor* 102: 256–266.

Zimmerman, J.L. 1988. Breeding season habitat selection by the Henslow's Sparrow (*Ammodramus henslowii*) in Kansas. *Wilson Bulletin* 100(1): 17–24.

4. CONTACTS

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