Weidemeyer's admiral conservation management plan

Alberta species at risk conservation management plan No.5

Alberta

Weidemeyer's Admiral Conservation Management Plan

Published by Alberta Environment and Parks

Revised version of Weidemeyer's Admiral Conservation Management Plan 2012–2017

Cover photo: Norbert Kondla (Weidmeyer's admiral)

Date of publication February 2021

ISBN 978-1-4601-4881-5

ISSN 1922-9984

This publication is available online at https://open.alberta.ca/publications/9781460148815

An HTML version of this publication is also available online at https://www.alberta.ca/species-at-risk-resources.aspx

This publication may be cited as:

Alberta Environment and Parks. 2021. Weidemeyer's Admiral Conservation Management Plan. Alberta Species at Risk Conservation Management Plan No. 5. Edmonton, AB. 19 pp.

Table of Contents

List of Figures

Preface

Conservation management plans are developed for *Species of Special Concern* to provide guidance for land and resource management decisions that affect the species and their habitat. These plans are intended to be a resource tool for Alberta Environment and Parks—Resource Stewardship Division (AEP—RSD) and for provincial and regional land and resource management staff.

Conservation management plans provide background information including species biology, threats to species and habitat, and inventory/monitoring history. Plans also provide a goal, objectives and actions (management recommendations). Management recommendations are typically categorized into inventory and monitoring needs; habitat management and conservation; education and communication; and additional management considerations as required.

Conservation management plans are generally prepared by an Environment and Parks fish and wildlife biologist who has been designated as the provincial species lead. Writers from outside AEP—RSD are occasionally sought to prepare plans for species for which there is little in-house expertise. In order to ensure accuracy and utility, each plan is reviewed by a species expert and a designated provincial representative from forestry and/or lands programs. In some cases there may be additional reviewers from staff, industry, and other agencies.

Conservation management plans are internal guidance documents. They are implemented under the guidance of the species lead and are "living" documents that can be revised at any time as required. Conservation management plans are more succinct than the recovery plans that are prepared for *Endangered* and *Threatened* species and do not involve participation of a multi-stakeholder team.

Conservation management plans are approved by the Director of Species at Risk and Stewardship, Fish and Wildlife Stewardship. Plans will be reviewed annually by the species lead and updated if necessary, and a more in-depth review will occur five years after a plan's approval.

Acknowledgements

Several people provided input and/or review comments throughout various stages of development of the original plan (2012–2017, including: Robert F. Foster (Northern Bioscience), Greg Pohl (Northern Forestry Centre), Dr. James Calpas (Alberta Agriculture and Rural Development) and Norine Ambrose (Cows and Fish). In addition, the following people reviewed the draft plan: Sue Cotterill, Brandy Downey, Richard Quinlan, Lisa Wilkinson (Alberta Sustainable Resource Development—Fish and Wildlife Division) and Jennifer Richman (Alberta Sustainable Resource Development—Lands Division). The revised plan was reviewed by Medea Curteanu (Environment and Climate Change Canada) and edited by Nyree Sharp (AEP).

Executive Summary

Weidemeyer's admiral (*Limenitis weidemeyerii oberfoelli*) is designated as *Special Concern* provincially and federally because of its limited breeding range in the Milk River basin of southern Alberta. Its range is restricted by the extent and connectivity of the shrubby riparian habitat it requires, and it is relatively uncommon even in suitable habitat. Weidemeyer's admirals spend their lives feeding, courting and breeding in this habitat. Current status of populations is unknown and little is known about trends in population.

Recommendations in this plan include: monitor known populations for trends, conduct surveys to identify distribution, confirm host plants, quantify potential threats, extend habitat protection to all populations, and conduct research to determine hybridization with the white admiral (*Limenitis arthemis*). These actions need to be supported by outreach, particularly regarding the risks of fire and the habitat requirements of this species.

1.0 Introduction

Weidemeyer's admiral (*Limenitis weidemeyerii oberfoelli*) is designated as *Special Concern* and ranked as Critically Imperilled (S1) in Alberta because of its limited breeding range (Alberta Endangered Species Conservation Committee [ESCC] 2006; Pohl *et al.* 2010; COSEWIC 2012; Environment and Climate Change Canada [ECCC] 2019). It is found in low numbers in suitable shrubby riparian habitat (Figure 1) and is at risk if this habitat is lost or degraded. The current status of populations is unknown and little is known about population trends. This species is also listed as *Special Concern* under the federal *Species at Risk Act* (SARA).

Figure 1. Typical shrubby riparian habitat along the Milk River in Writing-on-Stone Provincial Park (photo by author).

Since the release of the initial provincial conservation management plan for this species, the following documents have been created: updated federal status report (COSEWIC 2012) and federal conservation management plan (ECCC 2019). The federal conservation management plan contains comprehensive habitat descriptions, life history and population inventory data based on recent monitoring efforts, and should be referenced for details. Broad management strategies in the federal and provincial plans are aligned, with additional specific actions in this provincial plan.

1.1 Breeding Biology, Distribution and Habitat Requirements

Weidemeyer's admiral resides in riparian areas throughout the Great Plains and desert regions of the United States and Mexico, and in the extreme southern prairies of Alberta, where it is at the northern periphery of its range (COSEWIC 2012). In Alberta, its range is restricted to riparian and mid-elevation shrublands in the Grassland Natural Region along an 80-km corridor of the Milk River, its tributaries, and the lower region of the Lost River (Smith and Bird 1977; Austin and Murphy 1987; COSEWIC 2000; COSEWIC 2012). The Canadian range (Figure 2) is within the Dry Mixedgrass and Mixedgrass natural subregions of Alberta. Recent survey work found new occurrences (Snable and Burns 2015; Alberta Conservation Information Management System [ACIMS] 2016; Curteanu and Burns unpubl. data) and confirmed that the populations at the east and west ends of the range are connected (ECCC 2019).

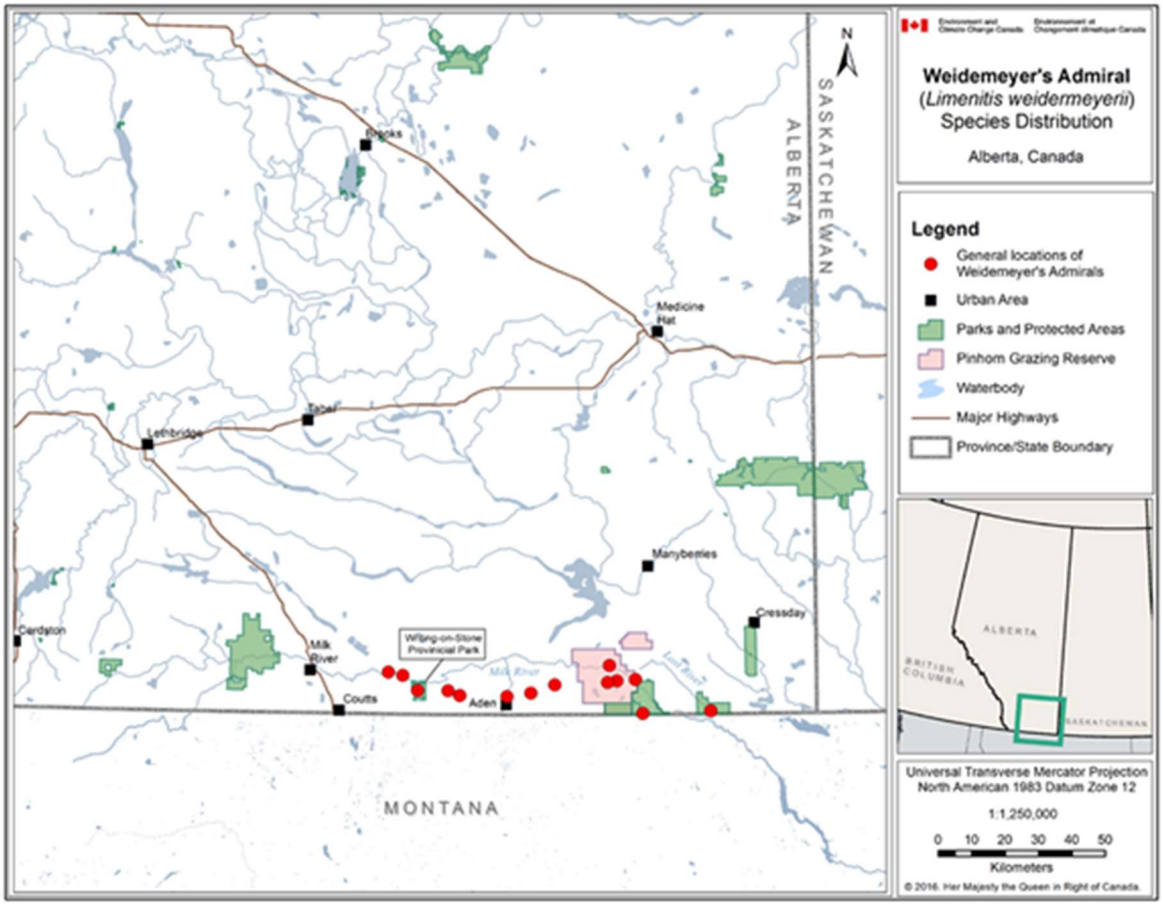

Figure 2. The Canadian distribution of Weidemeyer's admiral (ECCC 2019).

Weidemeyer's admiral spends most of its life as a caterpillar on a host plant. In the United States, it has been reported on trembling aspen (*Populus tremuloides*), chokecherry (*Prunus virginiana*), Drummond's willow (*Salix drummondiana subcoerulea*) (Scott 1986) and other species of willow (*Salix* spp.) (Bird *et al.* 1995). These tree and shrub species are present in the riparian regions of the Milk River basin, but caterpillars have only been observed on saskatoon (*Amelanchier alnifolia*) (Pike 1987; Bird *et al.* 1995). Late instar larvae overwinter in a hibernaculum, with adults emerging the following spring in June. Weidemeyer's admiral is univoltine (a species limited to one brood of offspring per year) in Alberta, where there is a short growing season, although two flight periods (i.e., two broods) have been recorded in the US (Scott 1986).

Starting in early June and extending into late July, adults breed in shrubby riparian habitats along the Milk River (Bird *et al.* 1995). Adult male Weidemeyer's admirals have often been observed in "patrolling" behaviour (i.e., searching for females; Pike 1987; M. Curteanu, pers. comm.), while females tend to spend their time perched in shrubs or patrolling host plants as they search for oviposition sites (Pike 1987; Porter 1989; Alberta Sustainable Resource Development and Alberta Conservation Association [ASRD and ACA] 2005). Males patrol early in the day and perch later in the day (Porter 1989).

Studies suggest that adult male Weidemeyer's admirals require territories that contain both adequate food resources and perches (Rosenberg 1984, 1989). Tall plants have vantage points from which males can defend territories and detect and attract females. Male territories are usually along trails or corridors where females travel in search of oviposition sites. High-quality food sources include sap from willows (created by sapsuckers [*Sphyrapicus* spp.]) and aphid-rich (Family Aphididae) sites with suitable amounts of honeydew (Rosenberg 1984, 1989). Western snowberry (*Symphoricarpos occidentalis*) and western white clematis (*Clematis ligusticifolia*) are important indicator shrub species and nectaring plants (Pike 1987; COSEWIC 2012; ECCC 2019).

Food availability, suitable breeding habitats, and microclimatic requirements are likely the reasons this species is restricted to the small areas of available habitat in the Milk River basin.

1.2 Threats to Populations

The primary factor limiting the distribution of Weidemeyer's admiral in Alberta is the natural availability and connectivity of suitable habitat. There are several threats to these butterfly populations.

1.2.1 Fire

Fires are a risk to the stability of existing populations (ECCC 2019). It is expected that the severity and frequency of fire in the prairies will increase as a result of climate change (Sauchyn and Kulshreshtha 2008).

1.2.2 Human-related Disturbance

Habitat can be degraded by livestock through excessive browsing and grazing in riparian woodlands, trampling and disturbance of host shrubs (i.e., dislodging pupae and larvae), and soil compaction (ASRD and ACA 2005). Soil compaction (from livestock spending long periods of time in these areas during the growing season) and excessive activity may also reduce the vigour of host and nectar-producing plants.

1.2.3 Hydrology

Changes to hydrological flow could affect floodplain habitat. In particular, the riparian areas where this species lives will be under threat over the next century if flood regimes are not naturalized (Bradley and Smith 1986). Naturalized refers to a system where flood regimes follow natural seasonal events rather than those flood events imposed by anthropogenic activities such as dams. Overstorey tree species, such as plains cottonwood (*Populus deltoids*), rely on natural flood patterns for reproduction and growth, and provide shade for the understorey shrubs used by Weidemeyer's admiral.

In addition, there are two large siphons from St. Mary's River into the Milk River which increase natural flows during the irrigation season (Milk River Watershed Council Canada 2013). Both siphons, now over 100 years old, are located in Montana. The loss of these siphons, resulting in loss of river flow during the summer months, could result in a lower water table that would reduce the vigour of the shrubby riparian zone habitat on which Weidemeyer's admiral relies.

1.2.4 Invasive Species

Two non-native, invasive plants from Montana have been identified as potential threats (COSEWIC 2012), and one— Russian olive (*Elaeagnus angustifolia*)—has spread into Alberta. Russian olive can outcompete species such as plains cottonwood (Pearce and Smith 2001). However, the current locations and small area of occurrence of Russian olive is not expected to affect Weidemeyer's admiral habitat within the next ten years (COSEWIC 2012).

1.2.5 Hybridization

Hybridization can have large impacts on rare species (Allendorf *et al.* 2001). Hybrids of Weidemeyer's admiral and white admiral have been identified in Alberta (Pinel and Kondla 1985; Curteanu and Burns unpubl. data). The extent of hybridization and potential effects on Weidemeyer's admiral are unknown (ECCC 2019).

1.3 Provincial Monitoring History

No regular provincial monitoring occurs for this species. Records continue to be limited to a few locations within an 80-km long region that includes the Milk River and its tributaries. There is one historical occurrence from the lower region of the Lost River, which has not been validated.

Surveys conducted in 2015 and 2016 found Weidemeyer's admiral in four new locations: Deer Creek, Bear Creek, Phillips Coulee and Breed Creek (ECCC 2019). These new data suggest that the distribution of this species is continuous rather than composed of two metapopulations.

2.0 Goal and Objectives

2.1 Goal

Maintain distribution and breeding populations of Weidemeyer's admiral in Alberta (including populations that are discovered in the future).

2.2 Objectives

1. Inventory and monitoring: Monitor priority areas where Weidemeyer's admiral populations are known to exist, and where prime habitat occurs along the Milk River valley and tributaries, to track population trends, conduct surveys to identify the species' distribution, confirm host plants (a priority), assess habitat health and quantify potential threats.

2. Habitat management: Implement appropriate protection and management for Weidemeyer's admiral habitat while improving our understanding of habitat requirements. Work with relevant agencies.

3. Research and management: Investigate ways to control harmful invasive pests such as Russian olive. Investigate hybridization with the white admiral: how much is occurring and whether offspring are reproductively viable.

4. Education and communication: Improve education and communication with government, industry, public and landowners about the risks of fire and about the habitat requirements of Weidemeyer's admiral and other at-risk species.

3.0 Management Actions

3.1 Inventory and Monitoring

Inventory and monitoring is essential to determine species distribution, population estimates and population trends within Alberta. Inventories should be conducted at historical sites (refer to ECCC 2019 for sites), and when possible, along the Milk River and its tributaries, Lost River and other suitable locations where this species likely resides (including both public and private lands). Presence/absence surveys, using catch and release methods, should be conducted multiple times at each location during the flight period. New habitat information can be used to update the Weidemeyer's admiral habitat model and identify new areas to survey.

Determining larval host plants is a priority, and can be achieved by observing females ovipositioning or by searching for larvae. Identifying larval host plants will assist in the protection and conservation of habitat for Weidemeyer's admiral. These surveys should be limited to areas with known populations of Weidemeyer's admiral.

Photos should be taken to verify species observations.

3.2 Habitat Management

Weidemeyer's admirals are found in river basins within provincial parks, crown land and private land. Habitat management should focus on the following: high-quality habitat, potential habitat connections between known populations, and areas identified as requiring habitat improvement.

Riparian health assessments should be used to evaluate the overall health of known and suitable habitat, and to understand the impacts of potential threats such as invasive species and livestock. On site visits and/or aerial videography could be used to assess habitat quality.

Land use and grazing beneficial management practices (BMPs) for the Weidemeyer's admiral have been developed (Rangeland Conservation Service Ltd. 2016). Information on appropriate BMPs should be communicated through municipalities and conservation organizations already operating in the Milk River basin (e.g., MULTISAR) and ranchers should be encouraged to adopt BMPs.

Some management practices are already being used to reduce human disturbance and habitat alteration, including a PNT for the Milk River basin that prevents surface disturbance within a quarter section of the river and any upstream oil and gas activity within the river valley. However, not all Weidemeyer's admiral occurrences are within the PNT. It is important to review existing

habitat protection where Weidemeyer's admiral occurs and update using protective notations (PNTs), Alberta's landscape analysis tool (LAT) or other applicable tools.

Both the province and the federal government have agreed upon the implementation of the Pan-Canadian Approach to Transforming Species at Risk Conservation in Canada, which focuses on multiple species and ecosystem approaches for species at risk conservation. Similarly, the Canada Nature Fund for Aquatic Species at Risk, led by Fisheries and Oceans Canada, supports actions taken to address priority threats and contribution to conservation of aquatic species at risk. The Milk River in southern Alberta is part of the priority places and areas identified under both initiatives (terrestrial species – Summit to Sage Priority Place; aquatic species - Southern Prairies Priority Area). Implementation of these initiatives will likely have positive benefits for Weidemeyer's admiral populations and their habitats.

The risk of habitat loss due to changes in flood regimes needs to be addressed using a collaborative approach between all responsible governments and agencies (i.e., Government of Alberta, Government of Canada and relevant agencies in the US). Education on the negative effects of unnatural flooding events such as the loss of cottonwood forests, changes in species composition, and impacts on biodiversity, is required to inform management decisions. Policy to address or mitigate these impacts is also required. The federal government provides regulatory protection for aquatic critical habitat under the *Species at Risk Act*. Critical habitat orders for the Rocky Mountain Sculpin and Western Silvery Minnow have been issued for portions of the Milk River. These critical habitat orders prevent destruction or degradation of in-stream critical habitats, including maintaining necessary flows while ensuring modifications are permitted under *SARA* as appropriate.

3.3 Research and Management

Genetic research is needed to first understand how much hybridization is occurring, and secondarily to determine whether genetic material is being exchanged between neighbouring populations, both within Alberta and between Alberta and the US. Non-lethal sampling (i.e., wing clips) should be collected for genetic research.

3.4 Education and Communication

Education should emphasize habitat conservation, and could include school talks, interpretative talks at provincial parks, and displays at park and community events.

It is important to maintain communication with landowners, industry, government and the public to raise awareness about Weidemeyer's admiral and its habitat needs. Organizations that could be involved with communication include: AEP, Alberta Agriculture and Forestry, Agriculture and

Rural Development Network, MULTISAR, municipal agriculture departments and other relevant agencies.

4.0 Summary

Weidemeyer's admiral in Alberta is limited to riparian areas within the Milk River basin and is vulnerable to certain types of habitat alteration and disturbance. Targeted inventories and monitoring are required. Further information about the species' habitat requirements, including determination of host plants, is necessary to identify habitat requirements. The small and restricted range of this species necessitates habitat management and protection. Education should accompany management actions, and these should be supported by long-term monitoring.

This management plan will be reviewed in five years, and may be updated prior to that time if new relevant information becomes available. The review will be led by AEP, in consultation with entomology researchers.

5.0 Literature Cited

Alberta Conservation Information Management System. 2016. Parks Ecology Program, Alberta Tourism Parks and Recreation, Edmonton, Alberta.

Alberta Endangered Species Conservation Committee. 2006..Weidermeyer's Admiral Initial Conservation Action Statement. Recommended to the Minister of Sustainable Resource Development. Edmonton, AB. 2 pp.

Alberta Sustainable Resource Development and Alberta Conservation Association. 2005. Status of Weidemeyer's admiral (*Limenitis weidemeyerii*) in Alberta. Alberta Sustainable Resource Development, Wildlife Status Report No. 58. Edmonton, AB. 13 pp.

Allendorf, F.A., R.F. Leary, P. Spruell and J.K. Wenburg. 2001. The problems with hybrids; setting conservation guidelines. Trends in Ecology and Evolution 16: 613-622.

Austin, G.T., and D.D. Murphy. 1987. Zoogeography of Great Basin butterflies: patterns of distribution and differentiation. Great Basin Naturalist 47:186–201.

Bird, C.D., G.J. Hilchie, N.G. Kondla, E.M. Pike and F.A.H. Sperling. 1995. Alberta butterflies. The Provincial Museum of Alberta. Edmonton, AB. 349 pp.

Bradley, C., and G. Smith. 1986. Plains cottonwood recruitment and survival on a prairie meandering river floodplain, Milk River, southern Alberta and northern Montana. Canadian Journal of Botany 64: 1433–1442.

COSEWIC. 2000. Status Report on the Weidemeyer's Admiral (*Limenitis weidemeyerii*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa.15 pp.

COSEWIC. 2012. COSEWIC assessment and status report on the Weidemeyer's admiral *Limenitis weidemeyerii* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa, ON. ix + 37 pp. URL: http://publications.gc.ca/collections/collection_2010/ec/CW70-9-2009-eng.pdf.

Environment and Climate Change Canada. 2019. Management plan for the Weidemeyer's admiral (*Limenitis weidemeyerii*) in Canada. *Species at Risk Act* Management Plan Series. Environment and Climate Change Canada. Ottawa, ON. iii + 35 pp.

Milk River Watershed Council Canada. 2013. Milk River transboundary state of the watershed report, 2nd edition. Compiled by Palliser Environmental Services Ltd. and prepared for Milk River Watershed Council Canada (Alberta) in collaboration with the Milk River Watershed Alliance (Montana). Milk River, Alberta. 238 pp.

Pearce, C.M., and D.G. Smith. 2001. Plains cottonwood's last stand: can it survive invasion of Russian olive onto the Milk River, Montana floodplain? Environmental Management 28:623–637.

Pike, E.M. 1987. *Limenitis weidemeyerii* or Weidemeyer's admiral in Canada. Unpublished report for World Wildlife Fund of Canada. 10 pp.

Pinel, H.W. and N.G. Kondla. 1985. Skippers and butterflies of the Police Coulee area, Alberta. Blue Jay 43: 213-223.

Pohl, G., G. Anweiler, C. Schmidt and N. Kondla. 2010. An annotated list of the Lepidoptera of Alberta, Canada. ZooKeys 38:1–549.

Porter, A.H. 1989. Genetic evidence for reproductive isolation between hybridizing *Limenitis* butterflies in southwestern New Mexico. American Midland Naturalist 122:275–280.

Rangeland Conservation Service Ltd. 2016. Beneficial Management Practices for the Milk River and South Saskatchewan River Watersheds, Alberta (2016 Update): A Component of the Multie Species at Risk (MULTISAR) Conservation Strategy. Unpublished report prepared for MULTISAR. Airdrie, Alberta. 526 pp.

Rosenberg, R.H. 1984. The effect of the landscape on the population structure of the admiral butterfly, *Limenitis weidemeyerii*. Pp. 143–144 in Brandt, J., and Agger, P. (eds.). Methodology in landscape ecological research and planning: proceedings, 1st seminar, International Association of Landscape Ecology, Oct 15–19, 1984, Roskilde, Denmark. Roskilde University Centre, Denmark.

Rosenberg, R.H. 1989. Behavior of the territorial species *Limenitis weidemeyerii* (Nymphalidae) within temporary feeding areas. Journal of the Lepidopterist Society 43:102–107.

Sauchyn, D., and S. Kulshreshtha. 2008. Prairies. Pp. 275–328 in Lemmen, D.S., F.J. Warren, J. Lacroix and E. Bush (eds.). From impacts to adaptation: Canada in a changing climate 2007. Government of Canada. Ottawa, ON. 448 pp.

Scott, J.A. 1986. The butterflies of North America. Stanford University Press. Stanford, CA. 583 pp.

Smith, W.W. and C.D. Bird. 1977. Some butterflies and skippers from the Milk River-Lost River area of southeastern Alberta. Blue Jay 35(1): 15-18.

Snable, V. and L. Burns. 2015. Weidemeyer's Admiral (*Limenitis weidemeyerii oberfoelli*) distribution surveys in the Milk River Basin, Alberta 2015. Edmonton, Alberta. 37 pp.

List of Titles in the Alberta Species at Risk Conservation Management Plan Series

(as of February 2021)

No. 1 Long-toed Salamander Conservation Management Plan.

No. 2 Sprague's Pipit Conservation Management Plan.

No. 3 Long-billed Curlew Conservation Management Plan.

No. 4 Harlequin Duck Conservation Management Plan, 2010–2015.

No. 5 Weidemeyer's Admiral Conservation Management Plan.

No. 6 Western Small-footed Bat Conservation Management Plan.

No. 7 White-winged Scoter Conservation Management Plan.

No. 8 Bull Trout Conservation Management Plan, 2012–2017.

No. 9 Prairie Falcon Conservation Management Plan, 2012–2017.

No. 10 Black-throated Green Warbler, Bay-breasted and Cape May Warbler Conservation Management Plan, 2014–2019.

No. 11 Great Plains Toad Conservation Management Plan, 2015–2020.

No. 12 Prairie Rattlesnake Conservation Management Plan, 2015–2020.

No. 13 Hare-footed Locoweed Conservation Management Plan, 2016–2021.

No. 14 Barred Owl Conservation Management Plan, 2016–2021.