

Western Small-footed Bat Conservation Management Plan



Alberta Species at Risk Conservation Management Plan No. 6

Western Small-footed Bat Conservation Management Plan

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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 into the first iteration of the plan (2012–2017), including: Dr. Cori Lausen (Birchdale Ecological), Kevin France (SRD, Lands Division) and Margo Pybus (SRD, Fish and Wildlife Division); Sue Cotterill (SRD, Fish and Wildlife Division) reviewed the draft; and Varina Crisfield helped with formatting and editing. For this new iteration of the plan, thanks to Sandi Robertson (AEP) for input and review, and formatting by Nyree Sharp.

Executive Summary

In Alberta, the western small-footed bat is restricted to the southeast where it lives in the badlands. It uses clay cutbanks along prairie rivers for roosting and hibernation sites, and forages around cottonwood trees. The western small-footed bat has been designated as a *Species of Special Concern* in Alberta because of these narrow habitat requirements.

The primary threats to this species are changes to habitat, in terms of large-scale changes to flood regimes that would eliminate roost sites, and alteration and/or removal of cottonwood galleries. This plan recommends ways to conserve western small-footed bat populations and habitat, including: monitoring populations, creating Best Management Practices (BMPs) regarding land use around cottonwoods, and providing education to landowners, public and land managers about the importance of this species' habitat needs.

Introduction

The western small-footed bat (*Myotis ciliolabrum*) is a *Species of Special Concern* in Alberta because it has a small range within the province, is found in a limited number of locations, and there is potential for its habitat to decline. The western small-footed bat is protected as a *Non-Game Animal* under the *Wildlife Act*.

The Endangered Species Conservation Committee's (ESCC) Initial Conservation Action Statement (2008) for the western small-footed bat indicates a need to:

1. Designate the western small-footed bat as a *Species of Special Concern*,
2. Develop and implement a conservation and management strategy, including monitoring (habitat associations and population size and distribution),
3. Actively conserve and manage important habitat (cottonwood trees), and
4. Secure funding and resources to support conservation actions.

Breeding Biology and Habitat Requirements

The western small-footed bat is strongly associated with arid and semi-arid areas, and in Alberta is restricted to the southeast where it uses the badlands and clay cutbanks along prairie rivers (Holloway and Barclay 2000). The highest concentrations of this species are along the Red Deer, South Saskatchewan and Milk rivers where suitable rocky roosting habitat is available (C. Lausen, unpubl. data). Specifically, this bat requires shallow crevices that are heated by the sun for maternity roosts, and deeper frost-free crevices for hibernation (Lausen and Barclay 2006). These specific habitat requirements limit its distribution. The western small-footed bat forages around cottonwood trees, and although this habitat association is not well understood, cottonwood stands appear to be an important habitat component (Holloway and Barclay 2000, ASRD&ACA 2008).

Distinct subpopulations of this species, with restricted gene flow, exist within and between river basins in Alberta, making subpopulations vulnerable to local extirpation. Moreover, bats are typically long-lived and have a low reproductive rate (usually only one offspring per year), making it difficult for populations to recover from declines (ASRD&ACA 2008).

Threats to Population

Habitat loss and alteration is the primary threat to western small-footed bat populations in Alberta. The most important habitat components are rock-roosting habitat and cottonwood galleries.

Habitat Loss and Alteration

Alteration and loss of rock-roosting habitat would have serious consequences for the survival of this species. However, the ways in which this habitat can be altered are limited, with dam construction and operation being the most likely. Dams have the potential to alter or destroy rock-roosting habitat through flooding and, additionally, flooding would isolate populations.

Upstream dam construction would also lead to fewer natural flooding events, which would reduce recruitment of cottonwood habitat, an important habitat component for the western small-footed bat. Conversion of flat areas of river valleys to irrigated cropland reduces or removes riparian woodlands and, to a lesser extent, overuse by cattle also alters these woodlands. Loss of cottonwood habitat appears to be the biggest and most likely threat to the western small-footed bat at this time (ASRD&ACA 2008).

Wind Energy Development

The development of windfarms in western small-footed bat range is a potential threat; it is well documented that bat fatalities occur at windfarms. It is unknown whether this species is likely to be killed by turbines, although some fatalities are expected.

Disease

White-nose syndrome, a fungal disease responsible for killing millions of bats in eastern North America, is spreading west. At this time, there has been one case of a western small-footed bat with the fungus in the USA. Given that the fungus is transferred by contact between bats in hibernacula, the western small-footed bat may be less vulnerable because it does not hibernate in large aggregations. However, bats may engage in swarming behaviour to mate, which would increase likelihood of infection. The potential catastrophic effects of the disease warrant increased monitoring of all bat species and protection of bat habitat.

Inventory and Monitoring

A number of bat surveys have been conducted in southeastern Alberta since 1987; a complete history can be found in ASRD&ACA (2008). Most surveys in which the western small-footed bat was the target species occurred between 2002 and 2006. The majority of bat records come from graduate students' research. Recently, acoustic bat detector surveys (being used as part of pre-development surveys, 2015-17) detected *M. ciliolabrum* in new areas in southern Alberta (Figure 1). However, these acoustic records will not be treated as confirmed records until substantiated by capture data.

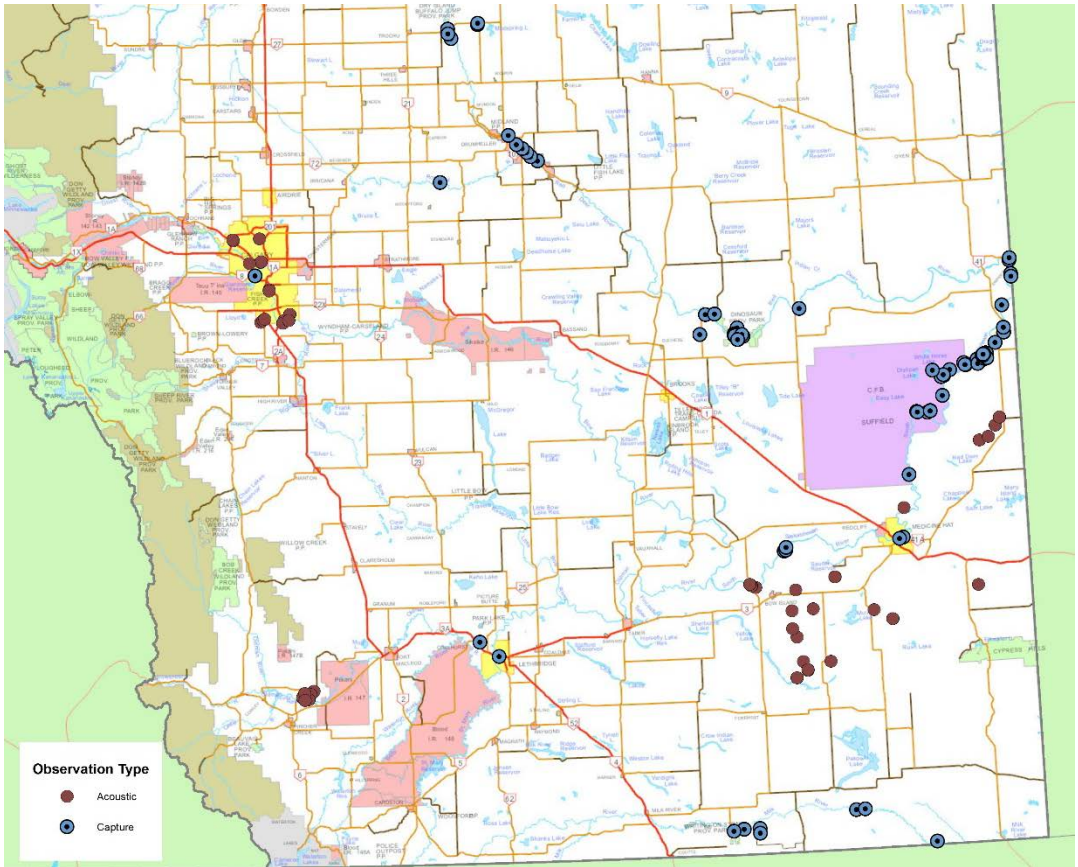


Figure 1. Distribution of western small-footed bats in Alberta.

Goal and Objectives

Goal

Maintain current distribution and breeding populations of western small-footed bat in Alberta.

Objectives

1. Inventory and monitoring: Use a combination of approaches to track population trends, conduct inventory in known and possible range, and monitor conditions of bats entering hibernacula.
2. Habitat management: Implement appropriate habitat protection measures for prairie riparian woodlands. Identify and track potential threats.
3. Education and communication: Improve education and communication about the importance of bats and their habitats with government, industry, public, and particularly landowners.
4. Research: Understand importance of riparian woodlands, and identify important foraging and roosting habitat to inform some kinds of development.

Management Actions

Inventory and Monitoring

Echolocation calls of *M. ciliolabrum* resemble other prairie *Myotis* (e.g., *M. lucifugus*, *M. volans*) and can be difficult to identify. New auto ID programs in conjunction with manual verification by an experienced biologist can detect *M. ciliolabrum* in some cases. Confidence in acoustic records will increase with improved reference calls and capture data. At this time, capture methods are recommended in conjunction with acoustic monitoring whenever possible. Reference recordings of *M. ciliolabrum* are required to improve acoustic analyses; representative (free-flying) recordings should be recorded during all mistnet inventories. (Refer to the *Handbook of Inventory Methods and Standard Protocols for Surveying Bats in Alberta*, ASRD 2006).

The following are recommended:

1. Population trends. A selection of sites should be monitored every five years to determine trends. Six monitoring sites are recommended: two on the Red Deer River, two on the South Saskatchewan River, and two on the Milk River. Monitoring can be conducted by AEP staff. Capture data should include all standard metrics, including tooth wear (ASRD 2006). If possible, sampling should be conducted twice during the summer season to coincide with late pregnancy / early lactation and fledging of young of year. The former period is the priority and is consistent with the North American Bat Monitoring protocol (Loeb et al. 2015).
2. Wintering areas. Also on a five-year basis, at least one known wintering area (such as Dinosaur Provincial Park) should be inventoried by capturing bats in the fall and spring to assess body condition. Additional metrics that should be collected in the fall include male:female ratios and stage of male reproduction (*i.e.*, pre- or post-mating). At this time it is not known whether *M. ciliolabrum* is susceptible to the fungus that causes white-nose syndrome; however, increased monitoring of this species, especially at wintering areas, is recommended when the syndrome is detected in Alberta.
3. Inventory. In addition to regular monitoring of selected sites, an inventory throughout the range (*i.e.*, all known subpopulations) is recommended every 10 years. The extent of habitat use should also be determined for each subpopulation. Surveys should also be conducted in suitable habitat where records are lacking, and could occur on an opportunistic basis, e.g., including acoustic monitoring with pre-development and other types of surveys.

All bat detection and capture data should be stored in FWMIS.

Habitat Management

Riparian Woodlands

Maintaining cottonwood habitat in riparian areas is essential. AEP, in consultation with a variety of organizations, such as Cows and Fish, should develop Beneficial Management Practices (BMPs) for prairie riparian woodlands, with consideration of other species that use cottonwood riparian habitat. BMPs will help to maintain habitat by defining appropriate use, including restrictions on conversion to cropland and recommending stocking rates and timing of cattle use. These BMPs should be incorporated into local landholders' farming and ranching operations and can be communicated through conservation organizations already operating in relevant areas (e.g., MULTISAR).

Some management practices are already in place to help to reduce human disturbance and habitat alteration, including a Protective Area Notation (PNT) for the Milk River Basin that prevents surface disturbance within a quarter section of the river, and upstream oil and gas activity within the river valley. Land use approval conditions should be developed along with accompanying spatial layers for the entire range of *M. ciliolabrum* to be included in the Landscape Analysis Tool (LAT) in order to identify and maintain riparian cottonwood stands

The risk of habitat loss due to changes in flood regimes could be addressed through a collaborative approach between all responsible governments and agencies (i.e., Government of Alberta, Government of Canada and relevant agencies in the US). This would involve education on the negative impacts of unnatural flooding events, such as loss of cottonwood forests, changes in species composition, and impacts on biodiversity. Policy to address or mitigate these impacts would be beneficial, but is beyond the scope of this plan.

Other Habitat Management

Recent pre-development surveys for wind energy facilities in southern Alberta acoustically detected *M. ciliolabrum*. Further monitoring in areas of high activity will help to identify possible foraging and/or travel corridors between roosts and foraging sites and inform turbine placement to avoid high use areas. Recommendations in section 3.1 will support these types of management decisions.

Education and Communication

There is considerable misunderstanding about bats, and it is essential to convey the important ecological role of bats to the public and landowners while dispelling myths that promote negative attitudes. This message needs to be part of all communication about the western small-footed

bat. The Alberta Community Bat Program (ACBP) has a comprehensive outreach program and can support messaging about this species. In addition, the importance of prairie riparian woodlands, especially cottonwood galleries, as key habitat for western small-footed bats (and other wildlife species) needs to be communicated to landowners and the public. As previously mentioned, working with existing programs that have developed working relationships with landowners will help to facilitate outreach.

Research

Research to investigate the foraging behaviour of western small-footed bats in riparian woodlands will help to inform habitat management. Continued research into roosting and hibernating habitat would also be valuable.

Summary

The western small-footed bat has a narrow range in Alberta with specific habitat requirements: cliffs for roosting and hibernation, and riparian woodlands for foraging. Maintaining these key habitat components is necessary for the bat's conservation. This plan will be reviewed and updated in five years.

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