



Conserving the Grasslands of Southern Alberta: Three Candidate Areas for Protection

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1.0 INTRODUCTION

1.1 CPAWS Southern Alberta Chapter

Historically, CPAWS Southern Alberta was known as the Calgary/Banff Chapter and focused primarily on conservation along the Eastern Slopes and montane regions of the province. In an effort to broaden the chapter's focus, the recently renamed, CPAWS Southern Alberta (CPAWS SAB) Chapter has expanded its work area to take a more holistic approach to conservation of the entire southern Alberta landscape. It is through this holistic, landscape scale lens that CPAWS SAB has been actively involved in the South Saskatchewan Regional Plan (SSRP) process advocating for the conservation and protection of Southern Alberta's ecologically significant areas and ecosystems. The *Planning Connections* report written by Sarah Elmeligi, Senior Conservation Planner, was CPAWS SAB's submission to the Regional Advisory Council for this land use planning process. The report discussed the importance of landscape scale conservation and made several planning recommendations to address the deficiencies within southern Alberta's current protected area network. The report was accompanied by an online interactive mapping tool that displayed environmentally significant areas (ESAs) within the SSRP and their characteristics (i.e., size, species composition, landownership). Grizzly bear and pronghorn movement data were included to illustrate the importance of connectivity across the landscape and highlight key areas for protection to maintain wildlife movement. In July 2010, a detailed assessment of current conservation tools and market based instruments (MBIs) was completed by Firyal Mohamed, a Conservation Analyst Intern hired from the University of Calgary. This assessment explored perceptions regarding the implementation of MBIs in Alberta and the potential role of environmental non-governmental organizations (ENGOS) in the emerging market based system.

Adding to this previous work, the purpose of this report is to contribute to CPAWS SAB's strategy to address conservation of the entire SSRP. This report specifically focuses on the currently underrepresented and often forgotten grassland natural region. ESAs within the grassland natural region of the SSRP were researched in detail and three large areas of concern were identified: Milk River-Sage Creek, South Saskatchewan Canyon-Chappice Lake, and Hays Reservoir-Bow River. This report provides details as to why these areas are significant, their current land use and management, level of protection, potential threats and recommended management options and opportunities for CPAWS SAB.

1.2 Alberta's Current Network of Protected Areas

The province of Alberta is well known for its beautiful network of parks and protected areas. Since the passing of the Provincial Parks and Protected Areas Act in 1930, a total of 12.5% of Alberta's land area is under some form of protection. However, 8.3% of this is within National Parks and only 4.2% is under the provincial parks system (CPAWS, 2007). Alberta is home to a diverse range of ecosystems spanning from the majestic Rocky Mountains in the west to the boreal forest in the north and the rugged badlands and native grasslands of the southeast. The government of Alberta uses six natural regions to describe the province's environmental diversity on a landscape scale. These regions are: the Rocky Mountains, Shield, Boreal Forest, Foothills, Grassland, and Parkland regions (Figure 1).

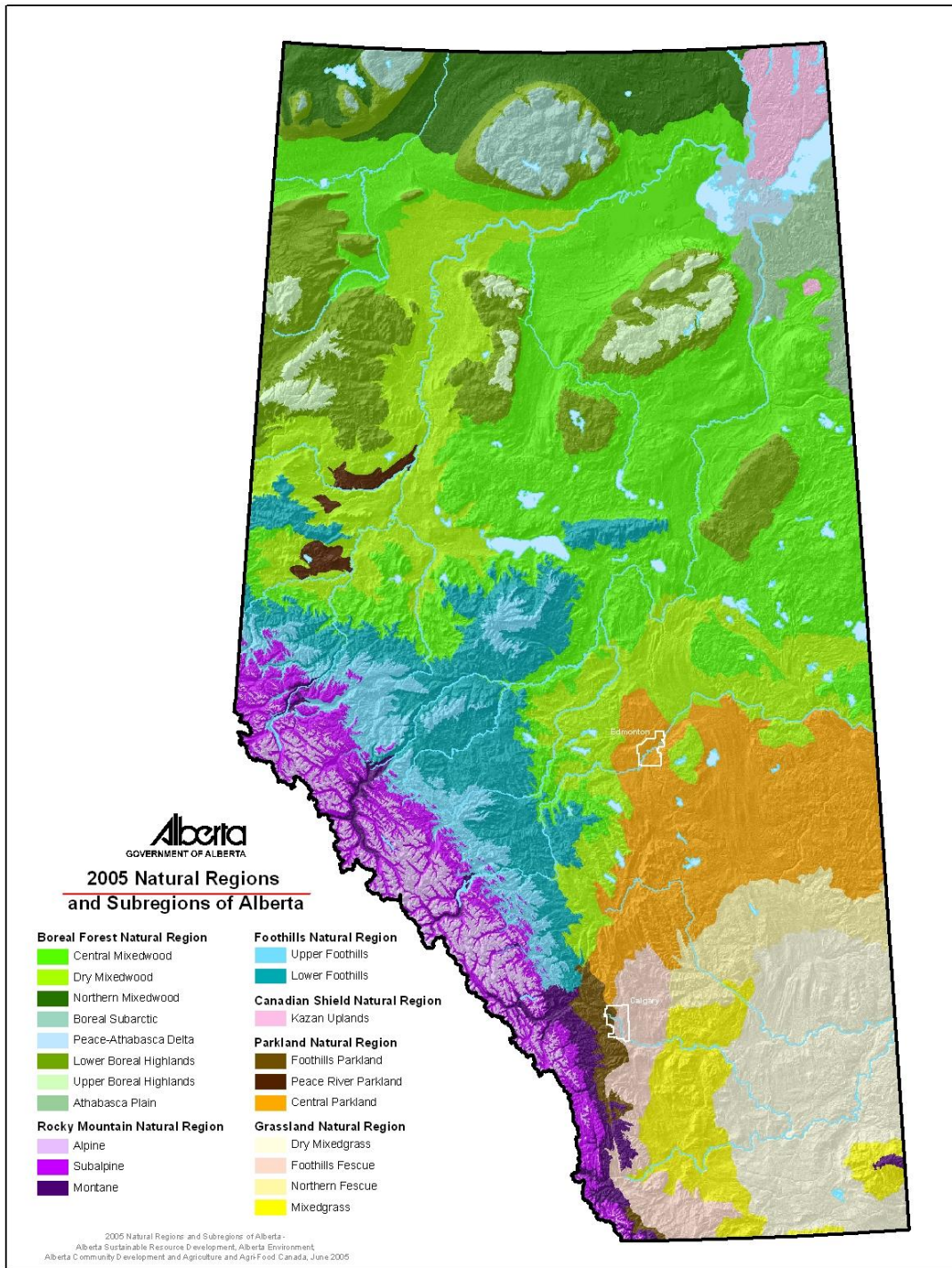


Figure 1: Map of Alberta's Natural Regions and Subregions (Government of Alberta, 2005)

These regions are broken down further into 21 sub-regions based on differences in geology, landforms, soil, hydrology, climate and dominant vegetation (Natural Regions Committee, 2006). To facilitate proper representation of each of the natural regions and subregions, Alberta Tourism, Parks and Recreation (ATPR) currently has a classification system of eight protected

areas that provide varying degrees of protection and a range of recreational opportunities (Table 1; ATPR, 2007).

Table 1: Summary of Alberta Protected Areas Classification (ATPR, 2007)

| Type of Protected Area | Intent and Permitted Use | Example |
|---------------------------|---|--------------------------------------|
| Ecological Reserves | Strict preservation of natural heritage in an undisturbed state for scientific research and education. Public access only by foot, low-impact activities such as wildlife viewing and photography permitted. | Kennedy Coulees Ecological Reserve |
| Wilderness Areas | Protection of natural heritage with opportunities for nature-based recreation such as backcountry hiking, wildlife viewing and mountain climbing. Access by foot only, no development of any kind permitted. | White Goat Wilderness Area |
| Wildland Provincial Parks | Preserve and protect natural heritage while providing opportunities for backcountry recreation. Minimize visitor impacts through trails and campsites, off-road vehicle riding and snowmobiling permitted in designated areas. | Marguerite River Wilderness Park |
| Willmore Wilderness Park | Established under its own specific legislation in 1959; similar to Wildland Provincial Parks | Willmore Wilderness Park |
| Provincial Parks | Preserve natural heritage while offering recreation, tourism activities in line with environmental protection. Offer a variety of recreation opportunities and facilities. | Dinosaur Provincial Park |
| Heritage Rangelands | Preserve and protect Alberta's grasslands using grazing to maintain ecological integrity. Carefully managed grazing with minimal recreation opportunities that are compatible with preservation of natural values is permitted. | Black Creek Heritage Rangeland |
| Natural Areas | Preserve natural heritage sites of local significance; allows low-impact recreation, typically quite small in land area. | Wagner Natural Area |
| Recreation Areas | Outdoor recreation and tourism is the primary objective, some areas are intensively developed while others are undisturbed. | Fish Lake Provincial Recreation Area |

The majority of Alberta's parks and protected areas are located within the iconic Rocky Mountain region, which provides ample opportunities for scenic adventures and recreation. Other areas such as the grassland natural region remain greatly underrepresented within Alberta's network of protected areas. The grassland natural region represents 14.4% (95,565 km²) of the province's land area (Natural Regions Committee, 2006). At present, however, only 1.29% of grassland ecosystems are protected under legislation (Government of Alberta, 2009). In 1991, the Canadian Environmental Advisory Council (CEAC) recommended that to effectively conserve biodiversity and wilderness, a protected area should be at least 4,000 km². The existing grassland protected areas fall well below this mark with the average size among the different types being 21.02 km² (2102.21 ha), or a mere 0.5% of the recommended size (ATPR, 2009).

Within the South Saskatchewan Region (SSR), grasslands represent 43% of the total land area (Government of Alberta, 2009) but comprise only 13.8% of protected areas of the region (with 85.6% being located in the Rocky Mountain Natural Region; CPAWS, 2009). Within this 13.8%,

there are seven natural areas, one ecological reserve, nine provincial parks and eleven provincial recreation areas (CPAWS, 2009). There are currently no heritage rangelands within the grassland natural region of the SSRP. This is somewhat unusual, as heritage rangelands prioritize grazing as an integral ecosystem process and ensure ongoing protection from development. Such a designation allows the traditional grazing approach that has preserved Alberta's grasslands over the years to continue (ATPR, 2010). There is an obvious need to increase grassland representation within Alberta's protected area network. CPAWS SAB understands that legislated protection under the Ministry of Parks, Recreation, and Tourism may not always be a viable option and that sometimes using other conservation tools (such as MBIs or grazing lease agreements) provide a more suitable approach to conservation.

MBIs, such as transfer of development credits, stewardship units, conservation easements, offsets and directives; use various policy tools to apply the economic principles of supply and demand to natural resource management (Designer Carrots, 2010). Conservation easements are a useful MBI for the grasslands, in which landowners obtain a voluntary legal agreement with qualified organizations to limit the type and level of development that can occur to preserve the ecological value of the land (Mohamed, 2010). However, there are currently several challenges facing the implementation of easements, such as valuation issues and uniformity among agreements, which may not always make them a suitable approach to conservation (Mohamed, 2010).

Grazing lease agreements are administered on public lands by Alberta Sustainable Resource Development (ASRD). They initially involve a rangeland health assessment that looks at the soil and vegetation characteristics of the land to be managed. Based on the results of the assessment, sustainable grazing practices such as maximum stocking rates for cattle are then specified for the land. If properly administered, grazing lease agreements can ensure that the grasslands are not overgrazed to allow for proper re-growth each year. They do not, however, provide protection from increasing development pressures such as road construction or oil and gas operations.

1.3 Importance of Protecting Alberta's Grasslands

Grasslands are one of the most endangered ecosystems of North America (Samson & Knopf, 1996). At one time, large expanses of diverse grasses, wildflowers and shrubs stretched across much of Canada. It is estimated that up to 75% of Canada's natural grasslands have already been lost due to development and conversion to agriculture (Ducks Unlimited Canada, 2006); in Alberta only 43% of native grasslands remain (Nernberg & Ingstrup, 2005). These grassland areas face multiple threats including urban expansion, oil and gas activity, road construction, agriculture and recreation to name just a few.

Although often overlooked, the native grasslands of southeastern Alberta provide many environmental, economic and social benefits to residents of the province. The grasslands of southern Alberta are essential for the maintenance of biodiversity and the protection of our air, soil and water resources. Approximately 80% of Alberta's species at risk are found within the SSR (Government of Alberta, 2009) with the majority of these species being located within the

grassland natural region. Many species, such as the ferruginous hawk (*Buteo regalis*) and swift fox (*Vulpes velox*), require large undisturbed areas of prairie that contain suitable habitat and food sources for them to survive.

Protecting the remaining large natural blocks of grassland will not only aid Alberta's species at risk, but will also help to preserve the natural ecological services this ecosystem provides. Native grasslands and pastures store carbon, thus playing an important role in climate regulation. The combined total of organic carbon stored in Alberta's native grasslands is approximately three times that of Canada's annual greenhouse gas emissions (Bremer, 2008). When native grasslands are converted for cropland production, much of this organic carbon is released into the atmosphere, increasing Canada's overall carbon emissions. Maintaining full vegetation cover also increases soil formation and reduces nutrient loss caused by erosion (Pleguezuelo & Zuazo, 2008). This helps preserve the fertility of the soil (Government of Alberta, 2009) while filtering sediment and pollutants from the water before they reach freshwater resources (Ducks Unlimited Canada, 2009). Native prairie cover provides important pollination services for nearby agriculture as it offers pollinator species a place to live.

Protecting the environmental benefits that grasslands provide translates into economic savings. If grasslands continue to be lost or degraded, the cost of replacing these services is transferred to society (Ducks Unlimited Canada, 2006). In Canada, prairie crop production profits decrease by \$6 million annually due to erosion (Agriculture and Agri-Foods Canada, 2003). Factoring in the cost of increased fertilizers to supplement this loss equates to a significant expenditure. Pollination services provided by animals living in the grasslands has an estimated global value of \$117 billion a year (Constanza et al, 1997); this illustrates the importance of grasslands conservation to agriculture. Waste treatment and water regulation ecosystem services provided by grasslands and rangelands are estimated to be \$87/ha and \$3/ha respectively (Constanza et al, 1997).



The grasslands ecosystem is also an essential part of Alberta culture and lifestyle. For decades, the prairies have provided local residents their livelihood while allowing them to enjoy nature through various recreation activities. (e.g., nature appreciation, hiking, and photography). The grasslands of the province contain aesthetic value and provide many tourism opportunities for visitors and residents, which benefits local communities. Grazing remains an important source of income for many Alberta residents, so implementing sustainable grazing practices is integral to maintaining their livelihood.

2.0 METHODS FOR SITE SELECTION

Research was undertaken for the SSRP (Figure 2) on a watershed basis beginning with the Milk River Watershed, followed by the South Saskatchewan River Watershed, and the the Red Deer and Bow River watersheds. For each watershed, a series of steps were taken to help CPAWS gain a holistic perspective on the grassland ecosystems within the SSRP. The overall project objective was to identify and investigate target areas for conservation and associated conservation initiatives.

Research began by reviewing the state of the watershed reports and water management plans to become familiar with each of the watershed's broader landscape. Then, all grassland ESAs within the selected watershed were identified and sorted based on land ownership and level of protection (Fiera Biological Consulting, 2009). For this project, interest was specifically focused on large, publicly owned areas of native grassland. These areas were identified based on the ESA report and then researched more

thoroughly (Fiera Biological Consulting, 2009; Sweetgrass Consultants, 1997). It should be noted that, different ESA selection criteria was used for each of the two ESA reports, resulting in differences in the detailed location and extent of the some of the ESAs. In most cases the criteria described by Sweetgrass Consultants overlapped with that by Fiera Biological Consulting and was used to supplement site descriptions. However, in some cases (as was the case for Hays Reservoir – Bow River Area) the information provided in both reports needed to be combined to gain a better overall understanding of the significance of the area.

Once ESAs that were potentially appropriate for provincially legislated protection were identified, adjacent ESAs that could possibly be connected to form a larger contiguous area were researched. The purpose of this part of the research was to incorporate connectivity into conservation recommendations. A variety of resources were used including the CPAWS online mapping tool, the ESA reports (Fiera Biological Consulting, 2009; Sweetgrass Consultants, 1997), township maps, and geographic information systems (GIS). The GIS portion of the research involved loading current land use layers and land ownership combined with ESA locations to delineate the approximate boundaries for each of the focus areas. A peer reviewed journal search was performed and any supplementary information found about the sites was included.

Following this, an investigation was undertaken to determine what, if any, conservation initiatives were taking place within these areas. Internet searches, phone interviews and e-mail were used to contact organizations involved in grasslands conservation. These organizations were then asked several questions to help CPAWS better understand the type of work each is involved in to identify potential areas for collaboration and to ensure little overlap amongst existing efforts.

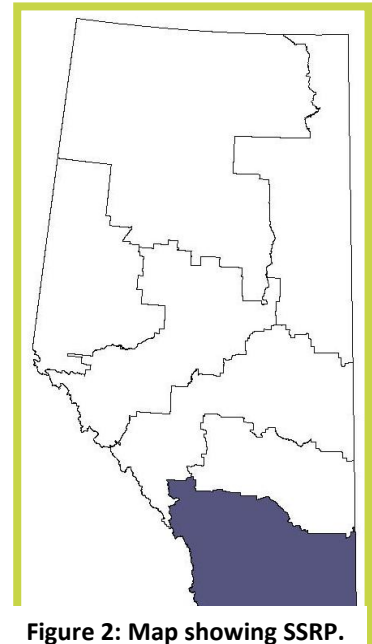


Figure 2: Map showing SSRP.

3.0 POTENTIAL CANDIDATE AREAS FOR LEGISLATED PROTECTION

In performing the above research methods, three grassland areas containing several ecologically important ESAs were identified and researched. The following sections provide a detailed review of each of the sites outlining their significance, features, current land management, level of protection and threats. Based on the resources available, some areas contain detailed information of the individual ESAs, while others contain a more general description of the area. The potential for legislated protection of each of the sites is still under investigation and CPAWS SAB will continue to actively seek feedback and collaboration with other partners. We understand that legislated protection is not always the best option, and other alternatives to conservation will be explored.

3.1 Milk River Sage Creek Area

SITE DESCRIPTION

The Milk River Sage Creek area is located in the southeastern corner of Alberta adjacent to the Saskatchewan and Montana borders, approximately 63 kilometers west of the Town of Milk River. The area is one of the least fragmented, geologically and biologically diverse grasslands of the Great Plains (AWA, 2010). The climate of this region is



semi-arid, receiving an average of 35.3cm of precipitation annually (Environment Canada, 1971-2000a). The area includes 26 ESAs that are all of national significance (Fiera Biological Consulting, 2009). Three of these ESAs make up the majority of the land area (Table 2), and combined represent a large block of dry mixedgrass prairie within the grassland natural region that contains significant landforms and habitat for a variety of species.

Table 2: ESAs within the Milk River Sage Creek Area

| ESA # | Name | Area (ha) | Significance Rating |
|-------|--|-----------|---------------------|
| 299 | Milk River Canyon etc. | 135,819.9 | National |
| 304 | Sage Creek, Manyberries Creek Badlands | 32,271.5 | National |
| 164 | Sage Creek | 34,491.8 | National |

ECOLOGICAL SIGNIFICANCE

The Milk River Watershed is provincially, nationally, and internationally significant for several reasons. Provincially, the area provides vital habitat for a large portion of Alberta's species at risk (e.g., ferruginous hawk, burrowing owl [*Athene cunicularia*] and northern leopard frog [*Rana pipiens*]) and key habitat for mule deer, pronghorn and elk populations. Nationally, the watershed provides important prairie habitat for several federally listed species at risk, such as the endangered sage grouse. Internationally, the watershed is a key part of the range of many migratory birds and is the source area for the recolonization of the swift fox in Alberta, Saskatchewan and Montana (Milk River Watershed Council [MRWC], 2010). The watershed contains an estimated 89.7km² of wetlands that help protect water quality in the region while providing important waterfowl habitat (MRWC, 2010). It is estimated that the watershed still has 81% of native prairie cover remaining and hosts an incredible diversity of plants species, with approximately 136 native species present in riparian areas (MRWC, 2010).

This area contains a number of ecologically significant features that justify the need for greater protection. The Milk River Canyon ESA (#299) is the largest of the ESAs found within this region and contains extensive badlands, sandstone outcrops, intriguing rock formations, diverse riparian woodlands, minor sand dunes and widespread lightly to ungrazed grasslands (Alberta Environmental Protection, 1997).



A total of 75 elements of conservation concern are found within this ESA. It contains thirteen rare or unique landforms and three sites of recognized significance: the Kennedy Coulee Ecological Reserve, the Milk River Natural Area and Writing-on-Stone Provincial Park (Fiera Biological Consulting, 2009). Intact riparian areas and large natural areas of this ESA provide important habitat for wildlife including focal species (a small group of species that are at risk, are well studied, and have resource requirements that encompass the needs of many other species) such as the burrowing owl and 11 other species at risk (Fiera Biological Consulting, 2009).

The Sage Creek and Manyberries Creek Badlands ESAs (#304 & 164 respectively) contain extensive dry mixed grasslands, saline wetlands, and the unique Manyberries Area Sandstone Dikes (Fiera Biological Consulting, 2009). The Onefour Heritage Rangeland Natural Area is located within ESA #304, and is an area which over time will likely be considered for designation as a heritage rangeland under the Wilderness Areas, Ecological Reserves, Natural Areas and Heritage Rangelands Act (ATPR, 2010). Both ESAs provide essential habitat for numerous species at risk (Table 3; Fiera Biological Consulting, 2009) and they support three rare

vegetation communities: creeping juniper/sun-loving sedge and yellow umbrella-plant, long-leaved sagewort and rabbitbrush, and western wheat grass and atriplex. In addition, 65 species of conservation concern live within these ESAs (Table 1 in Appendix). These are species which are not currently listed as at risk, but if current trends continue they will undoubtedly face troubles in the near future and as a result, warrant consideration in the land use planning process (Fiera Biological Consulting, 2009).

Table 3: Species at risk found within the Milk River Sage Creek Area ESAs (Fiera Biological Consulting, 2009)

| Common Name | Scientific Name | Alberta Wildlife Act Status | COSEWIC Status | ESA(s) found in |
|------------------------|----------------------------------|-----------------------------|-----------------|-----------------|
| <i>Amphibians</i> | | | | |
| Northern Leopard Frog | <i>Rana pipiens</i> | Threatened | Special Concern | 299, 304, 164 |
| Great Plains Toad | <i>Bufo Anaxyrus]cognatus</i> | Data Deficient | Special Concern | 299 |
| Short-horned lizard | <i>Phrynosoma hernandesi</i> | May be at risk | Special Concern | 299, 304 |
| <i>Birds</i> | | | | |
| Ferruginous Hawk | <i>Buteo regalis</i> | Threatened | Threatened | 299, 304, 164 |
| Greater Sage Grouse | <i>Centrocercus urophasianus</i> | May be at risk | Threatened | 299, 304, 164 |
| Western Burrowing Owl | <i>Athene cunicularia</i> | Threatened | Endangered | 299, 304, 164 |
| Mountain Plover | <i>Charadrius montanus</i> | Sensitive | Endangered | 299 |
| Loggerhead Shrike | <i>Lanius ludovicianus</i> | Special Concern | Threatened | 299 |
| <i>Fish</i> | | | | |
| Stonecat | <i>Noturus flavus</i> | Undetermined | ---- | 299 |
| Western Silvery Minnow | <i>Hybognathus argyritis</i> | May be at risk | Threatened | 299 |
| <i>Mammals</i> | | | | |
| Swift Fox | <i>Vulpes velox</i> | Endangered | Extirpated | 299, 304, 164 |
| <i>Insects</i> | | | | |
| Yucca Moth | <i>Tegeticula yuccasella</i> | | Endangered | 299 |
| <i>Vascular Plants</i> | | | | |
| Sand Verbena | <i>Tripterocalyx micranthus</i> | May be at Risk | Endangered | 299 |
| Soapweed | <i>Yucca glauca</i> | ---- | Vulnerable | 299 |

CURRENT LAND MANAGEMENT AND LEVEL OF PROTECTION

The land within the Milk River Sage Creek Area is predominantly publicly owned and leased for grazing purposes. A relatively small portion (30,913 ha) is currently managed as a Provincial Grazing Reserve (PGR) by ASRD in partnership with the Sage Creek Grazing Association (ASRD, 2008). PGRs specify a maximum stocking rate to allow for forage recovery from year to year. Although stocking rates, if sustainable, are a useful conservation tool, PGRs still permit a variety of recreational activities and industrial uses including sour gas developments, oil and gas wells, pipelines, and road construction (ASRD, 2008). This area already has an average of 0.65 well heads per square kilometre among the three ESAs studied (Fiera Biological Consulting, 2009).

The area contains several existing protected areas, including the Milk River Natural Area (53,440 ha), Kennedy Coulee Ecological Reserve (10,680 ha), and the Onefour Heritage Rangeland Natural Area (111,650 ha). Ecological reserves have the primary goal of ecological preservation and permit only low-impact recreation activities such as wildlife viewing and photography. In contrast, the two natural areas still allow for a greater variety of recreational activities such as hiking and camping that, over time can cause impacts to these ecosystems. Although there are some existing protected areas within the Milk River Sage Creek Area, the land area of the sites combined (1757.7km²) falls well below the recommended 4,000 km² that is recognized as necessary to provide effective biodiversity and wildlife protection (CEAC, 1992), illustrating the need for greater protection.

THREATS

Multiple threats could cause significant declines in the ecological integrity of the Milk River Sage Creek Area, both individually and cumulatively. As development increases, infrastructure upgrades will likely be required. There are plans for the realignment of Highway 41, which passes directly through the Milk River Sage Creek Area. Such an upgrade would increase the highway's traffic capacity to allow for a 24-hour north-south transportation corridor from the United States to Fort McMurray's oil sands (Hildebrand, 2008). The realignment of this highway could result in increased wildlife disturbance during construction as well as increased mortality caused by elevated traffic over its long term use.



Another threat facing the area is the transition from traditional grazing practices to cultivation. Many landowners within the region are turning to cultivation as a means of increasing profits during tough economic times. If this transition continues it will homogenize the landscape, undoubtedly having a substantial impact on the amount of native grassland areas remaining.



Increasing recreation and oil and gas development are other pressures facing this area. Recreational activities such as off-road vehicle use cause increased erosion and sedimentation of waterways. These vehicles can also destroy important burrows for animals such as the richardson's ground squirrel and burrowing owl. Hunting and fishing are currently permitted and place pressures on some species that are already in decline either by directly reducing their numbers, or limiting prey species that they depend on. Oil and gas

activities take up a relatively small land area, but lead to the construction of more roads and increase the possibility of soil contamination through oil leaks or spills.

OPPORTUNITIES

Maintaining the ecological integrity of the Milk River Sage Creek Area will help to ensure the livelihood of local residents while protecting Alberta's species at risk. The Alberta Wilderness Association (AWA) already has an existing campaign for the protection of the Milk River Sage Creek area of concern. This presents an opportunity for CPAWS SAB to collaborate with AWA in campaigning for the area's protection and help to leverage AWA's existing efforts. The MULTISAR program is a partnership between ASRD, Alberta Conservation Association, Prairie Conservation Forum (PCF), agricultural producers and others that work with local landowners to promote proper land management practices for the protection of multiple species at risk. This program takes a landscape scale approach to species at risk conservation and already has an established a working relationship with local landowners. Opportunities exist for CPAWS SAB to work collaboratively with these parties and support conservation of this area.

Dr. Cormack Gates at the University of Calgary is currently working on The Trilateral Northern Sagebrush Steppe Initiative, a transboundary collaboration between wildlife agencies in Montana, Alberta and Saskatchewan. The Initiative identifies sage grouse, pronghorn and mule deer as priority species that can serve as indicators of the overall health of the ecosystem. Research is currently underway studying the movement patterns of these animals to identify crucial habitat areas and corridors for protection and to help illustrate the importance of protecting such areas. CPAWS SAB could aid in this initiative by working to secure habitat protection for these species in the Milk River Sage Creek Area.

By combining current land use and ownership layers in a GIS, an area of concern boundary was determined. If the Milk River Sage Creek Area were to be designated as such, an estimated total of 343,264 ha of relatively natural grasslands could be protected under the Wilderness Areas, Ecological Reserves, Natural Areas and Heritage Rangelands Act (Figure 3). This would help to ensure the continued role of grazing in this ecosystem and the protection of species at risk and pronghorn habitat by limiting the type of development and recreation that can occur in the area.

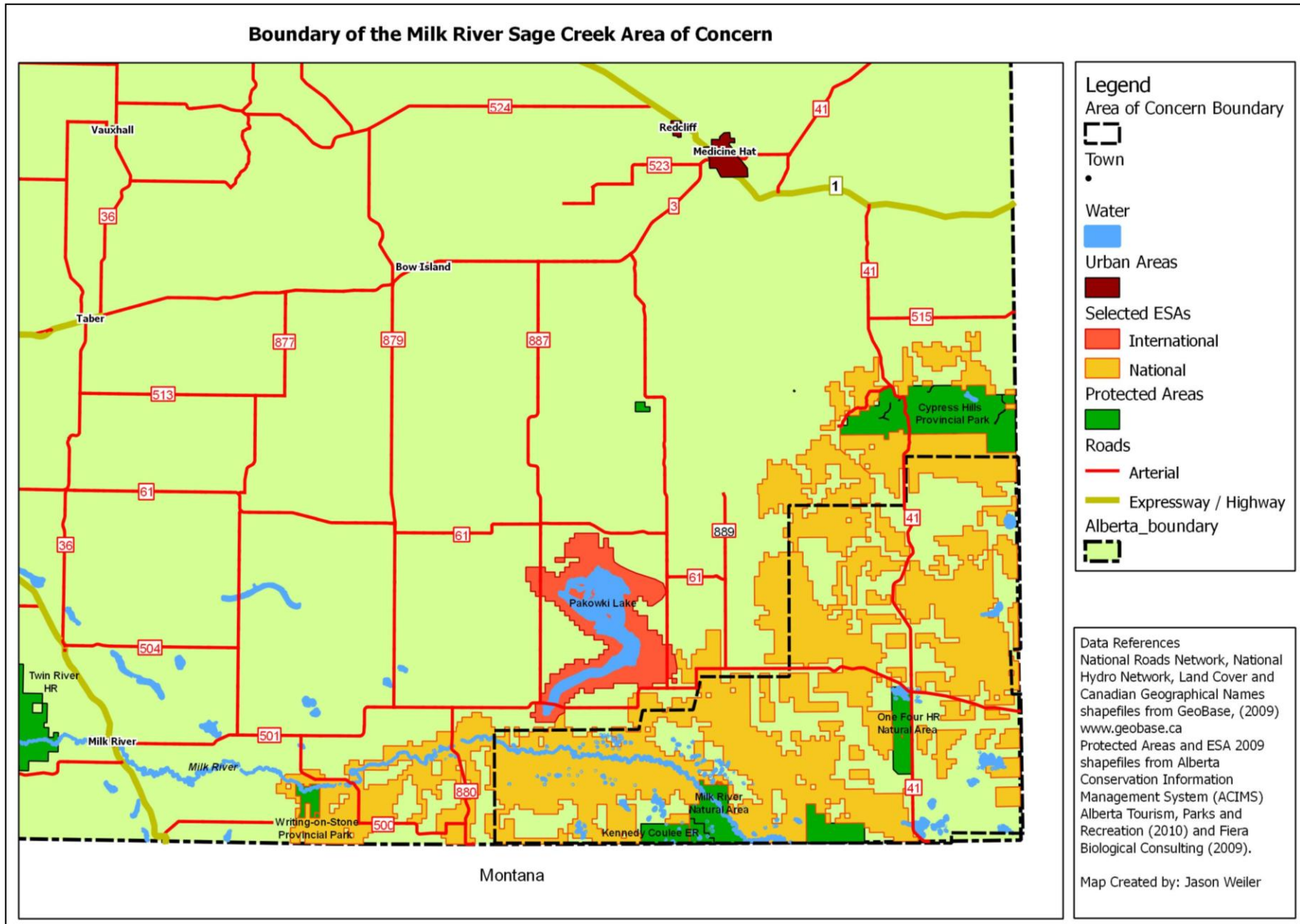


Figure 3: Map of the Milk River Sage Creek Area of Concern boundary.

3.2 South Saskatchewan Canyon – Chappice Lake Area



SITE DESCRIPTION

The South Saskatchewan Canyon – Chappice Lake Area is located approximately 20 kilometres northeast of the city of Medicine Hat beginning at Chappice Lake and extending north along the South Saskatchewan River. It includes the land that lies east of Canadian Forces Base Suffield National Wildlife Area (CFB) between the Alberta-Saskatchewan border. The area contains five ESAs characterized by a number of ecologically significant features. Combined, the ESAs

described below (Table 4) represent just over 50,000 ha of dry mixedgrass prairie within the grassland natural region; they contain significant landforms and habitat for a variety of species. The climate of this region is semi-arid with an average annual precipitation of 33cm (Environment Canada, 1971-2000). The majority of the land is publicly owned and privately leased from the ASRD for grazing purposes.

Table 4: ESAs within the South Saskatchewan Canyon – Chappice Lake Area

| ESA # | Name | Area (ha) | Significance Rating |
|-------|---|---------------------|---------------------|
| 211 | Chappice – Sam Lakes | 2,632.5 | International |
| 315 | South Saskatchewan Canyon | 1,798 | National |
| 286 | Chappice-Sam Lakes, South Saskatchewan River – Medicine Hat North | 25,354 | National |
| 292 | South Saskatchewan River – Medicine Hat North – South Saskatchewan Canyon | ~19,500 of 65,193.5 | National |
| 225 | N/A | 2,381.1 | National |

3.2.1 ESA #211: Chappice – Sam Lakes

DESCRIPTION

The Chappice – Sam Lakes ESA is located along Highway 41 in Cypress County approximately 20 km northeast of the city of Medicine Hat and 15 km southeast of the South Saskatchewan River. Chappice Lake is a 2.1 km² saline lake less than one metre deep throughout with approximately seven km of shoreline (Dickinson, 2009). Sam Lake is of similar size and type and is located approximately 5.5 km southeast of Chappice Lake. Both lakes rely on an extensive saline seepage zone to maintain water levels, which also sustains pockets of wet meadow vegetation in scattered areas around the lake’s edges (Sweetgrass Consultants, 1997).

The areas between and outward from the lakes are comprised of rare native dry mixedgrass prairie communities that provide habitat for a number of species, some of which are federally listed under the Species at Risk Act. The ESA contains large areas of contiguous crown land (>10km²) with most having 75% or more of native prairie species vegetation (Grassland Natural Region Report, 1997).

FEATURES & SIGNIFICANCE

The Chappice – Sam Lakes ESA has many features that make it a suitable candidate for increased legislated protection. Both lakes provide internationally significant critical habitat and staging areas for migrating shorebirds and waterfowl. Between 1987 and 2002, a total of twenty three species of shorebirds were recorded at Chappice Lake in the spring and fall months, including the nationally and provincially endangered piping plover (*Charadrius melodus*) (Dickinson, 2009). This area provides the only permanent mixedgrass nesting habitat in Alberta for this species (Sweetgrass Consultants, 1997).

Cottonwood trees on the north backshore of Chappice Lake provide nesting sites for the currently threatened ferruginous hawk. Upland areas of the ESA contain habitat for large populations of richardson ground squirrels (*Urocitellus richardsonii*), an indicator species and an important food source for many birds of prey and other ground-nesting grassland birds. Other bird species of concern observed in the area include: burrowing owl, sprague's pipit, and long-billed curlew (Dickinson, 2009).



Chappice Lake is considered to be of international importance because it is site where birds concentrate in significant numbers when breeding or during migration. The Lake supports 1% of the global or North American population of the Sanderling and Baird's sandpipers (IBA Canada, 2009). Due to these characteristics, in 1997 Chappice Lake was recognized as an Important Bird Area (IBA) by BirdLife International, the Canadian Nature Federation and Bird Studies Canada. IBA's are sites of recognized importance for the habitat they provide bird species (Dickinson, 2009). Unfortunately, such a designation does not provide any protection from further development and other possible threats.

In addition to the ESA's importance for birds, it also contains significant landforms that are unique to the southern Alberta landscape, such as the Chappice Lake drift basins and

saline/alkaline lakes (Fiera Biological Consulting, 2009). The slightly saline and sandy soils support provincially significant, rare vegetation communities of scratch grass, Nevada bulrush and salt grass (*Muhlenbergia asperifolia* - *Scirpus nevadensis* - *Distichlis stricta*.) The Alberta Natural Heritage Information Centre identifies these communities as having a sub-national conservation ranking of S1S2 (Allen, 2009), meaning that there are as few as five to twenty occurrences of this community or very few hectares remaining. The ESA also provides important habitat for mule deer (*Odocoileus hemionus*) (Sweetgrass Consultants, 1997).



CURRENT LAND MANAGEMENT AND LEVEL OF PROTECTION

The land surrounding Chappice Lake is currently partly owned and partly leased by Cavan Ranches for grazing (Dickinson, 2009). Over the years the Cavan family ranch has maintained the excellent condition of the native prairie vegetation surrounding Chappice Lake (Dickinson, 2009). This is in part because the salinity of the lake and its accompanying vegetation is not very attractive to grazing cattle, but also because of the land restrictions in place by the ranch. The Cavan Ranch places limits on the level and type of activities that are permitted, including limits on oil and gas operations and recreation. The land immediately surrounding Sam Lake has a grazing lease agreement with Randy Lehr, and is currently managed for grazing purposes, as is the land in between the two lakes.

The section of the ESA that comprises the IBA is considerably smaller than the whole ESA itself and does not include Sam Lake. The IBA is identified as being Chappice Lake itself, including a one kilometre buffer zone along the lake's edge (Dickinson, 2009). As mentioned above, the IBA designation at present does not provide any legal protection of the area, but it does help to raise awareness of its significance. IBA Canada recognizes this, and states that the conservation status of many unprotected IBA sites would greatly be improved if they were included in an expanded provincial protected areas network (Dickinson, 2009).

In addition to the IBA, there are currently two protective notations (PNT) on the land surrounding Chappice Lake; a flood hazard PNT (133.061 ha) and a rare and endangered species PNT (12.141 ha). PNTs manage land and water resources to achieve particular land use or conservation objectives. As the area has a history of periodic flooding, the flood hazard PNT was put in place at Chappice Lake in March of 1999 on crown lands. This PNT states that “no new above ground installations or land spraying [will be] permitted on sites below 725 metres in elevation” (Dickinson, 2009). Following this notation, in 2000 a rare and endangered species habitat protection area PNT was placed on approximately 30 acres of shoreline along Chappice Lake, which states that no new land dispositions will be permitted in the allotted area (Dickinson, 2009).

Several other potential designations for Chappice Lake have been attempted or are currently in progress. In 1996, Chappice Lake was nominated for Alberta Special Places program, a nomination which was supported by the Cavan Ranch, Public Lands and Grassland Naturalists. Unfortunately Chappice Lake did not meet the minimum land area requirement for such a designation. The IBA website recognizes that Chappice Lake could be a potential Western Hemisphere Shorebird Reserve Network site as well (IBA Canada, 2009).

3.2.2 ESA #315: South Saskatchewan Canyon

DESCRIPTION

The South Saskatchewan Canyon ESA is located along the southwestern border of the CFB Suffield approximately 42 kilometres northeast from the city of Medicine Hat. The area showcases a spectacular canyon along the South Saskatchewan River comprised of extensive coulees, eroding cutbanks, slump blocks and rugged badlands (Grassland Natural Region Report, 1997). The slopes and cliffs of the valley rise sharply from the river's edge, with many crevices that provide habitat for a number of species including bats (Holloway & Barclay, 2000).



This area is one of the premiere wild river sections in the grassland natural region. The climate is semi-arid; the area receives an average of 32cm of precipitation annually (Environment Canada, 1971-2000b). Vegetation along the canyon is sparse with some of the common species including juniper (*Juniperus spp.*), sage (*Artemisia spp.*), prickly pear cactus (*Opuntia polyacantha*), ball cactus (*Coryphantha vivipara*), wild rose (*Rosa spp.*), and a variety of grasses that are commonly associated with coulees such as spear grass (*Stipa comata*) and blue grama grass (*Bouteloua gracilis*). Scattered, small clusters of cottonwood trees (approximately 5-50 trees) (*Populus deltoids*) accompanied by undergrowth species of chokecherry (*Prunus virginiana*) and willow (*Salix spp.*) are also present along the river's edge (Holloway & Barclay, 2000).

FEATURES & SIGNIFICANCE

The South Saskatchewan Canyon ESA is valuable for a number of reasons that demonstrate the importance of protecting this unique landscape. The riparian areas throughout the canyon are intact and support diverse coulee vegetation (Grassland Natural Region Report, 1997), which provide habitat for focal species and protect the aquatic environment. This stretch of the river contains deep pools that offer critical habitat for fish such as the federally endangered lake sturgeon (Grassland Natural Region Report, 1997; ASRD, 2009a). The canyon also offers nesting areas for birds of prey such as the ferruginous hawk as well as provincially important staging



Photo: Calibas

areas for Canada Geese (Grasslands Natural Region Report, 1997). The Canyon is a vital overwintering area for large snakes and is home to Alberta's only lizard species, the short-horned lizard (*Phrynosoma hernandesi*), currently listed as *vulnerable* in Canada (ASRD, 2009a). Other species at risk that are found in this ESA include the northern leopard frog, western burrowing owl as well as several other fish and vascular plant species of recognized conservation concern (Table 2 in Appendix; Fiera Biological Consulting, 2009).

CURRENT LAND MANAGEMENT AND LEVEL OF PROTECTION

The South Saskatchewan Canyon ESA is adjacent to CFB Suffield National Wildlife Area which contains one of the largest remaining areas of native grassland in Canada (Sweetgrass Consultants, 1997). In addition to this, the Prairie Coulees Natural Area (44,170 ha) is located in the area; which contains several ravines and coulees adjoining the South Saskatchewan River. It also has a number of springs and associated plant communities that are currently under-represented in the parks and protected areas network (ATPR, 2009). The natural area established as part of the Alberta Special Places program (Alberta TRP 2009) in 1997 offers some protection from development, while facilitating recreational opportunities. Aside from this, land use within the ESA consists primarily of cattle ranching, with multiple active grazing lease agreements as well as some low-grade agricultural operations (Holloway & Barclay, 2000). Overall, there is little development along this stretch of the South Saskatchewan River and most

farms are located more than five kilometres from the river's edge (Holloway & Barclay, 2000). This ESA has some oil and gas development, with 1.22 well heads per square kilometre (Fiera Biological Consulting, 2009).

3.2.3 ESA # 286, 292 & 225

DESCRIPTION

Limited information was available for the other three ESAs located within the South Saskatchewan Canyon area (#286, 225 & 292). Only about 19,500 ha of ESA #292 falls within the potential boundary outlined in the map for this area. These ESAs are located northwest of Chappice Lake and are also adjacent to CFB Suffield. The combined information for the three ESAs is provided below. The majority of the land within these ESAs is publicly owned and leased for grazing purposes.

FEATURES & SIGNIFICANCE

Similar to ESA #315 (the South Saskatchewan Canyon), this area provides abundant nesting and staging areas for birds of prey and Canada Geese (Alberta Environmental Protection, 1997). It is a vital overwintering area for snakes and contains important habitat for short-horned lizards, mule deer and pronghorn (Sweetgrass Consultants, 1997).

ESA# 286 is the largest of the three, and has the highest number of elements of conservation concern (33). These include populations of a number of species at risk (great plains toad, northern leopard frog, ferruginous hawk, western burrowing owl, lake sturgeon, sand verbena and tiny cryptanthe), and over 25 other species of conservation concern (Fiera Biological Consulting, 2009). Rare vegetation communities of salt grass – western wheat grass (*Distichlis stricta - Pascopyrum smithii*) are located here, which have a sub-national conservation ranking of S2 by the Alberta Natural Heritage Information Centre (meaning that this community has as few as six to 20 occurrences [Allen, L., 2009]). The area has rare and unique landforms such as the Medicine Hat Area neck cutoffs (Fiera Biological Consulting, 2009), and one of the largest and highest density snake hibernaculas (overwintering areas) in Alberta, and possibly in Canada (Sweetgrass Consultants, 1997).

Combined, the three ESAs are substantially larger than the previous two and contain large natural areas that provide habitat for focal species such as the western burrowing owl and ferruginous hawks (Fiera Biological Consulting, 2009). In addition, the area is important for fossil Pleistocene vertebrates (Sweetgrass Consultants, 1997).

Each of the ESA's outlined above contain several species that are listed either provincially or federally, or both as species at risk (Table 5). Many of the species at risk within the individual ESAs are the same, and would thus all likely benefit from landscape scale conservation.

Table 5: Species at risk within the South Saskatchewan Canyon – Chappice Lake Area (Fiera Biological Consulting, 2009)

| Common Name | Scientific Name | Alberta Wildlife Act Status | COESWIC Status | ESA(s) # found in |
|------------------------|---------------------------------|-----------------------------|-----------------|--------------------|
| <i>Amphibians</i> | | | | |
| Northern Leopard Frog | <i>Rana pipiens</i> | Threatened | Special Concern | 315, 286, 292 |
| Great Plains Toad | <i>Bufo Anaxyrus]cognatus</i> | Data Deficient | Special Concern | 286, 292, 225 |
| Short-horned lizard | <i>Phrynosoma hernandesi</i> | May be at risk | Special Concern | 315 |
| <i>Birds</i> | | | | |
| Ferruginous Hawk | <i>Buteo regalis</i> | Threatened | Threatened | 315, 286, 292, 225 |
| Western Burrowing Owl | <i>Athene cunicularia</i> | Threatened | Endangered | 315, 286, 292, 225 |
| Piping Plover | <i>Charadrius melodus</i> | Endangered | Endangered | 211 |
| Long-billed Curlew | <i>Numenius americanus</i> | Special Concern | Special Concern | 211 |
| Prairie Falcon | <i>Falco Mexicanus</i> | Sensitive | Not at Risk | 315, 286 |
| Sprague’s Pipit | <i>Anthus spragueii</i> | Special Concern | Threatened | 211 |
| <i>Fish</i> | | | | |
| Lake Sturgeon | <i>Acipenser fulvescens</i> | Undetermined | Endangered | 315, 286, 292 |
| <i>Mammals</i> | | | | |
| Ord’s Kangaroo Rat | <i>Dipodomys ordii</i> | Endangered | Special Concern | 292 |
| <i>Vascular Plants</i> | | | | |
| Sand Verbena | <i>Tripterocalyx micranthus</i> | May be at Risk | Endangered | 286, 292 |
| Tiny Cryptanthe | <i>Crypantha minima</i> | May be at Risk | Endangered | 286, 292 |

THREATS

Likely one of the greatest threat facing all three of these ESAs is oil and gas development, which is relatively higher here than in other locations within the grassland natural region. For example, the Chappice – Sam Lakes ESA has a high well density of 4.14 oil heads/km² (Fiera Biological Consulting, 2009). Numerous wells produce sweet gas, with energy leases held by Enco Plus, Direct Energy, Search Energy, and Nexen Drilling (Dickinson, 2009). The water table lies very close to the ground surface surrounding the lakes, making this area more susceptible to groundwater depletion or contamination caused by industrial activities. Activities that

deplete the groundwater resources will exacerbate extended periods of drought causing changes to species composition (Dickinson, 2009).

The Keystone Pipeline project proposed by TransCanada Keystone Pipeline GP Ltd. poses a significant threat to this site. The proposed pipeline has several routing options but each would pass through 1.8 kilometres of the South Saskatchewan Canyon (National Energy Board, 2006). The Canadian portion of the project is scheduled to begin in 2013 and will involve the construction of 526 kilometres of pipeline with accompanying facilities. Construction and operation of the pipeline could cause many adverse environmental effects, as outlined in the environmental screening report by TransCanada and summarized below:

- Disturbance of grasses, forbs, shrubs and trees as well as native range, rare ecological communities and rare plants;
- Reduced groundwater flow leading to increased saturation and salinization;
- Introduction of sediments and contaminants to terrestrial and aquatic ecosystems;
- Loss of fish habitat, including blockage of fish passage during migration periods (lake sturgeon);
- Loss of wetland function, terrestrial and aquatic habitat in wetlands; and
- Disturbance of wildlife, including SARA listed species (northern leopard frog, great plains toad, burrowing owl, piping plover, ferruginous hawk, long-billed curlew) as well as other species of special status (Keystone Pipeline Draft Environmental Screening Report, National Energy Board, 2006).

Another major threat facing this area is the proposed construction of the East Palliser Transmission Project by Altalink. If constructed, the proposed route would intersect the land area between Chappice and Sam Lake, isolating this ESA from the other ESAs north of this area (Altalink, 2010). Wildlife disturbance would occur during the construction phase of the project, and movement patterns of many species including migratory birds and pronghorn may be affected by the transmission lines.

The realignment of the existing Highway 41 discussed in the Milk River section, would also likely create the same threats of wildlife mortality and result in the possible disturbance of important bird staging and/or nesting areas caused by construction and subsequent increased road traffic (Dickinson, 2009). The increasing number of bird watchers around Chappice – Sam Lake may also disturb piping plover and other birds during critical periods of their nesting cycle (Dickinson, 2009). Dredging/canalization, and sand and gravel extraction are other potential threats, although these activities may not occur directly within the ESA (IBA Canada, 2009).

OPPORTUNITIES

Although some current protective measures are in place within the South Saskatchewan Canyon – Chappice Lake area, they are likely inadequate to properly conserve the ecological integrity of this native prairie ecosystem. The fact that the Chappice – Sam Lake ESA already has several measures in place, such as the IBA designation and two protective notations, helps to support the need for more meaningful conservation by illustrating the ecological significance of this ESA. Being adjacent to CFB Suffield, one of the last largest remaining protected blocks of

native prairie in Alberta, all of the ESAs within this area present an opportunity to substantially increase the available core habitat for many species at risk. The lower portion of this area along the South Saskatchewan River, if protected, would maintain a vital movement corridor, linking the Suffield pronghorn population to southern portions of the species' range.

Based on the preliminary ecological research completed, two potential legal designations that may be suitable to better conserve this ecologically important area are described below. These designations are merely options, which CPAWS SAB will be discussing with local landowners and affected stakeholders.

Heritage Rangeland Designation

Under the Wilderness Areas, Ecological Reserves, Natural Areas and Heritage Rangelands Act, the ESAs within the South Saskatchewan Canyon – Chappice Lake Area and surrounding undeveloped land represents approximately 122,314 ha of native grassland possibly suitable for protection as a heritage rangeland (Figure 4). Such a designation would ensure the continued role of grazing in this ecosystem and the protection of an Important Bird Area, species at risk and pronghorn habitat by limiting the amount and type of development and recreation. This would also help to preserve the cultural connection that local residents have with the land by allowing low-impact recreation and the continual benefits of sustainable grazing operations.

Migratory Bird Sanctuary

Based on the criteria for establishing Migratory Bird Sanctuaries (MBS), the Chappice – Sam Lakes ESA is also likely a suitable candidate for such a designation. In order to be eligible for MBS designation a site must meet one of the four criteria as specified by Environment Canada; one of the criteria being: "It regularly supports at least 1% of a population of one species or subspecies" (Environment Canada, 2010). Chappice Lake supports a great diversity of waterfowl species, including the endangered piping plover. "In the spring of 1988, 4,500 sanderling and 3,000 Baird's sandpiper were observed (Wershler, 1990), comprising respectively 2% of N. American population (sanderling) and 1–2% of global population (Baird's sandpiper)" (Dickinson, 2009). A MBS is potentially a suitable alternative to a heritage rangeland. Under the Migratory Birds Convention Act, this designation would prohibit any activities that would disturb, injure, destroy or remove migratory birds, their nests, or eggs, as well as prohibiting any hunting of listed species (Environment Canada, 2010).

In addition to these options, CPAWS SAB will be working with local landowners to explore other conservation options that will help maintain the important ecological attributes, habitat, and social values and livelihood of this region.

Boundary of the South Saskatchewan Canyon - Chappice Lake Area of Concern

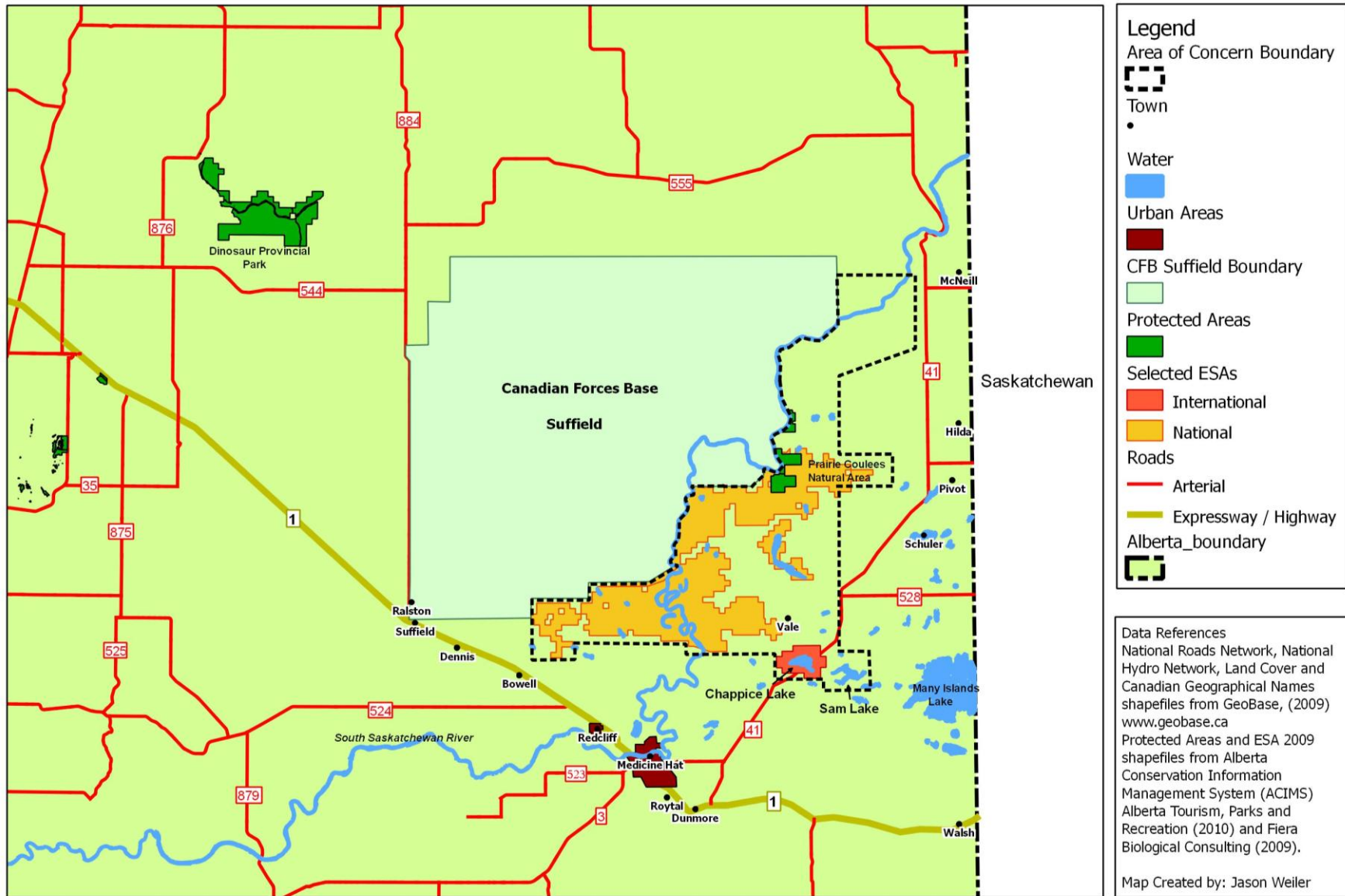


Figure 4: Map of the South Saskatchewan Canyon –Chappice Lake Area of Concern boundary.

3.3 Hays Reservoir-Bow River Area

SITE DESCRIPTION

The Hays Reservoir-Bow River Area ESAs are located in the Municipal District of Taber, approximately 82 kilometres northeast of the City of Lethbridge (Table 6). The Hays Reservoir is about 4 kilometres south of the town of Hays along highway 875. The climate of the region is semi-arid with an average precipitation of 36.8cm falling annually (Environment Canada, 1971-2000c). The land cover within these ESAs consists of native, dry, mixed grassland vegetation and sand dunes that provide important habitat for migrating shorebirds and several species at risk. The area contains a mixture of privately owned croplands, publicly owned lands leased for grazing purposes and undeveloped grassland areas (Fiera Biological Consulting, 2009).

Table 6: ESAs found within the Hays Reservoir – Bow River Area (Fiera Biological Consulting, 2009)

| ESA ID | Name | Area (ha) | Significance Rating |
|--------|---------------------------------|----------------------|---------------------|
| 201 | Hays Reservoir | 1,981.7 | International |
| 117 | N/A | ~7,432 of 374,350.1 | National |
| 289 | Bow River, Lower bow Dunes etc. | ~17,769 of 166,212.7 | National |
| WID | Wolf Island Dunes | 1,686 | Provincial |

ECOLOGICAL SIGNIFICANCE

The four ESAs combined with the surrounding undeveloped, publicly owned and privately owned land constitute approximately 84,012 ha. The Hays Reservoir ESA, located in the western portion of this area, contains five islands, has minor marsh development and is surrounded by large tracts of native mixed grassland (Sweetgrass Consultants, 1997; Fiera Biological Consulting, 2009). Birdlife International, the Canadian Nature Federation and Bird Studies Canada recognize the Hays Reservoir as a globally significant IBA for congregatory species (IBA Canada, 2009). The Reservoir provides important staging and production areas for waterfowl, including puddle ducks, diving ducks and Canada Geese. It also contains habitat for one of the largest colonies of double-crested cormorant in Alberta and is one of few major feeding areas for American white pelicans in Alberta (Sweetgrass Consultants, 1997). The freshwaters of the Hays Reservoir remain relatively clear, with shallow areas providing exceptional breeding habitat for the great plains toad, a federally listed species of special concern (ASRD, 2009a; Sweetgrass Consultants, 1997). This ESA also provides important habitat for focal species such as the ferruginous hawk and burrowing owl, both which are listed as threatened in Alberta (Fiera Biological Consulting, 2009).

The Wolf Island Dunes ESA was not included in the 2009 ESA report, but was originally listed as an area of provincial significance in 1997 by Sweetgrass Consultants. Due to the noteworthy features this ESA contains and to the fact that the area is still relatively undeveloped, it is included in this description of the Area of Concern. The Wolf Island Dunes are located immediately south of Highway 875 and contain native mixed grassland vegetation on sand dune terrain (Sweetgrass consultants, 1997). Active sand blowouts occur in this ESA but are rare throughout the grassland natural subregion. These blowouts sustain conditions that are

essential to the long-term survival of several rare plant species (Sweetgrass Consultants, 1997), including low alpine lupin (*Lupinus pusillus*), sand verbena (*Abronia micrantha*) and bur-sage (*Franseria acanthicarpa*). This area also provides suitable habitat for burrowing owls, and breeding habitat for two bird species uncommon to the region, the grasshopper sparrow and brewer's sparrow (Sweetgrass Consultants, 1997).



ESA # 117 is a large area that spans multiple locations throughout different natural regions of the province. Within the defined Area of Concern there are several small blocks of this ESA totalling approximately 7,432 ha of grassland. As the information outlined in the 2009 ESA report is for the entire ESA, it is difficult to determine which criteria would be found within the portions of this area. However, based on GIS land cover analysis and the surrounding ESA characteristics, it is likely that these areas are comprised

of dry mixed grassland that contains habitat for threatened focal species such as the ferruginous hawks and burrowing owls.

The same situation exists for the Bow River, Lower Bow Dunes ESA (#289) as it spans the entire length of the Bow River, crossing the grassland, parkland and rocky mountain natural regions of the province. The approximate 17,769 ha of this ESA that fall within the Area of Concern boundary includes important wildlife habitat for the same focal species mentioned above. The stretch of the Bow River which passes through this part of the ESA provides important habitat for the federally endangered lake sturgeon, and the river shiner and silver redhorse (two species of conservation concern; Fiera Biological Consulting, 2009).

Using the descriptions of the 1997 ESAs that fall within the 2009 location of this ESA (Lower Bow Dunes and Purple Springs Dunes), the following ecologically significant features have also been identified. This area contains native mixedgrass prairie species and sagebrush on active sand dune terrain with some minor sand blow-outs. The small wetlands present are important breeding areas for the great plains toad as well as waterfowl production and staging areas (Sweetgrass Consultants, 1997). The area is home to several rare plants including sand verbena (*Abronia micrantha*), low milk vetch (*Astragalus lotiflorus*), prickly milk vetch (*Astragalus kentrophyta*), low annual lupine (*Lupinus pusillus*) bur-sage (*Franseria acanthicarpa*), and smooth goosefoot (*Chenopodium subglabrum*; Table 3 in Appendix). It also contains several sharp-tailed grouse dancing grounds (Sweetgrass Consultants, 1997). The potential boundary includes the confluence of the Oldman, Bow, and South Saskatchewan Rivers, which further supports the case for effective conservation of this site.

In addition to the ecologically significant features described above, all of the ESAs are situated within known pronghorn migratory routes and provide important habitat for mule deer and white-tailed deer. With proper protection, this area may help to provide more suitable habitats with low fragmentation and native prairie landscapes for pronghorn movements as well as many species at risk in Southern Alberta. Table 7 provides a summary of the all of the species at risks that are found within this area.

Table 7: Species at risk found within the Hays Reservoir-Bow River Area (Fiera Biological Consulting, 2009)

| Common Name | Scientific Name | Alberta Wildlife Act Status | COESWIC Status | ESA(s) # found in |
|------------------------|-------------------------------|-----------------------------|-----------------|--------------------|
| <i>Amphibians</i> | | | | |
| Great Plains Toad | <i>Bufo Anaxyrus]cognatus</i> | Data Deficient | Special Concern | 201, 289 |
| Northern Leopard Frog | <i>Rana pipiens</i> | Threatened | Special Concern | 289 |
| Short-horned lizard | <i>Phrynosoma hernandesi</i> | May be at risk | Special Concern | 289 |
| <i>Birds</i> | | | | |
| Ferruginous Hawk | <i>Buteo regalis</i> | Threatened | Threatened | 201, 117, 289 |
| Western Burrowing Owl | <i>Athene cunicularia</i> | Threatened | Endangered | 201, 117, 289, WID |
| Sprague’s Pipit | <i>Anthus spragueii</i> | Special Concern | Threatened | 289 |
| <i>Fish</i> | | | | |
| Lake Sturgeon | <i>Acipenser fulvescens</i> | Undetermined | Endangered | 289 |
| <i>Vascular Plants</i> | | | | |
| Sand Verbana | <i>Abronia latifolia</i> | May be at Risk | Endangered | 289, WID |

CURRENT LAND MANAGEMENT AND LEVEL OF PROTECTION

The majority of the land including and surrounding the ESAs is publicly owned and privately leased from the ASRD for grazing purposes, with a small 2,413.1 ha portion being designated as a Provincial Grazing Reserve (ASRD, 2009b). The PGR was established in 1979 and as of April 1997 has been managed in partnership by the Badland Hills Cattle Grazing Association (ASRD, 2009b). Approximately 876.1 ha of this PGR has been developed for mechanical irrigation. The PGR currently permits hunting in the fall as well as oil and natural gas production (ASRD, 2009b). Other areas in and surrounding the boundary are heavily cultivated with annual croplands. The site is within the Bow River Irrigation District.

This area also contains a site of recognized significance; the Hays Reservoir IBA as designated by the BirdLife International, the Canadian Nature Federation and Bird Studies Canada. The Hays

Reservoir ESA (201) has a considerable amount of oil and gas development, with approximately 3.43 well heads/km² and pipeline density of 0.66 km/km² (Fiera Biological Consulting, 2009). Aside from these developments, the majority of the land area remains unprotected and undeveloped.

THREATS

The Hays Reservoir – Bow River Area is in a relatively rural part of the province, but between 2001 and 2006 it experienced a population growth of 4.5% (Statistics Canada, 2006). As communities within the Municipal District of Taber continue to grow, this will likely cause increasing pressure from development on the ESAs within this area. Increasing oil and gas production is one of the major threats facing the ESAs within the Hays Reservoir – Bow River Area. Such development further fragments the landscape and increases the chances of accidental site contamination. Given that the reservoir is already designated as an IBA, and that this area is in close proximity to the Bow River, oil and gas operations increase the chances of water contamination which would affect local residents and wildlife.



Accompanying the population growth experienced in Taber and the oil and gas development is an increase in road density. Road construction may disturb nesting shorebirds at the IBA site, and subsequently lead to increased wildlife mortality from vehicular collisions. The PGR located at this site presently does not include a large proportion of the grassland area within this region, and still allows recreation and development to occur. As is the case with the previous two sites, the increasing trend of transitioning from grazing to cultivation also poses a threat to this region.

OPPORTUNITIES

Maintaining the ecological integrity of the Hays Reservoir-Bow River Area and adjacent grassland habitats is important because this area provides vital habitats for a number of species, many of which are at risk. Aside from the IBA designation, there does not appear to be any active conservation initiatives within this area. The combination of public and privately owned land use presents a unique opportunity for CPAWS SAB to engage local landowners and stakeholders. An investigation should take place to determine the feasibility of increasing conservation of this area, possibly as a heritage rangeland, along with the implementation of MBIs on the privately owned land.

By connecting the ESAs and the adjacent undeveloped grassland areas in between, a total approximate area of 84,012 ha of heritage rangeland could be created under the Wilderness

Areas, Ecological Reserves, Natural Areas and Heritage Rangelands Act (Figure 5). Such a designation would ensure the continued role of grazing in this ecosystem and help to protect and maintain water quality within the Hays Reservoir and Bow River. This would also ensure the protection of the IBA, species at risk and pronghorn habitat by limiting the amount and type of development and recreation that can occur in the area.

The Bow River Basin Council (BRBC) currently offers funding for projects that seek to improve the ecological, cultural or recreational integrity of the Bow River. As a portion of the Bow River flows directly through this area, this provides CPAWS SAB with an opportunity to secure funding from the BRBC to further investigate the potential of protecting this significant area.



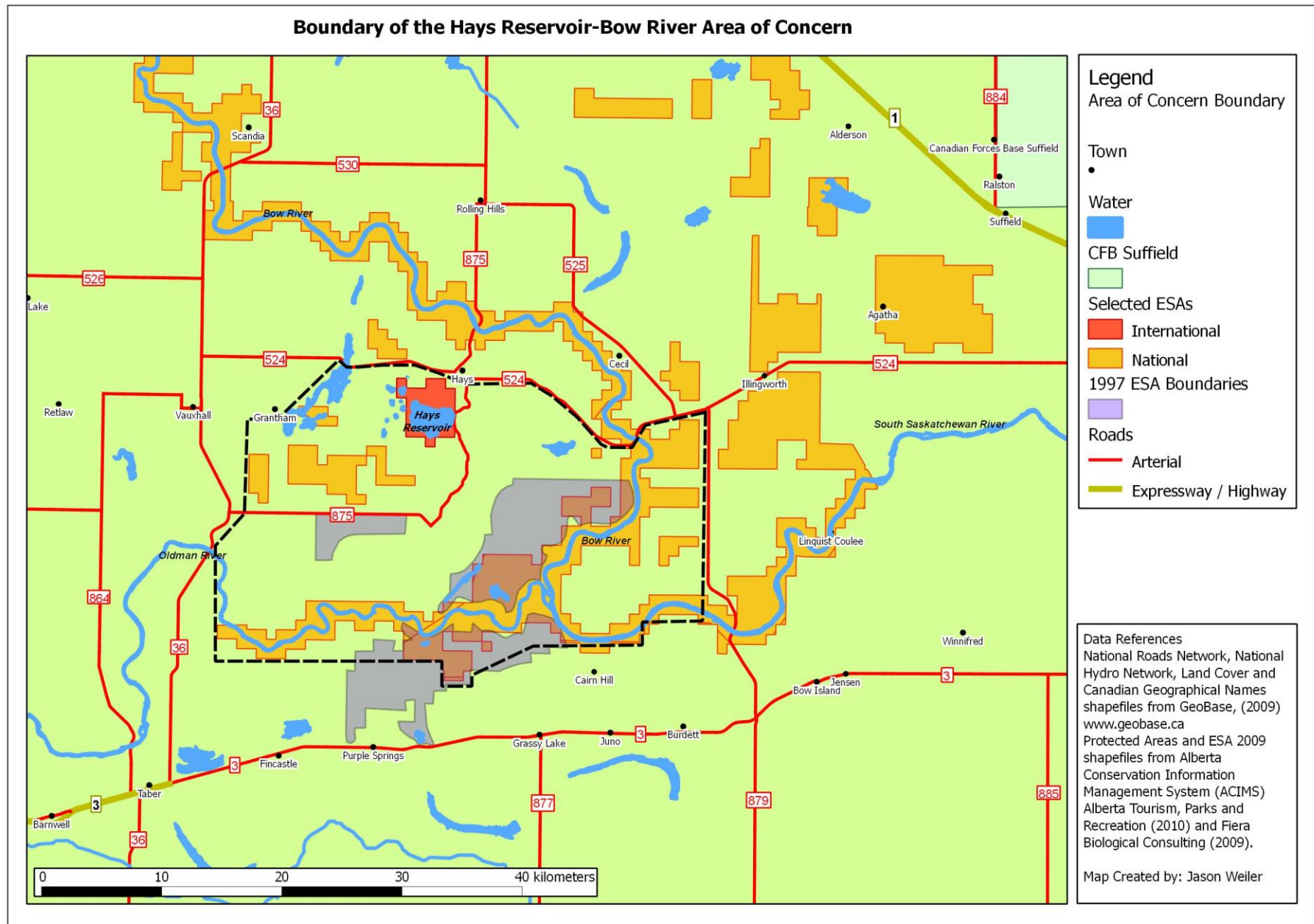


Figure 5: Map of the Hays Reservoir- Bow River Area of Concern boundary.

4.0 OVERALL RECOMMENDATIONS

The above sections have outlined three potential candidate areas suitable for increased legislated conservation efforts in whole or in part. In each case, the landscape surrounding the sites was evaluated to assess its ecological integrity, land use, and current management to better understand their overall significance and to define concrete rationale for protection.

With the majority of the province's species at risk being located in the South Saskatchewan Region, it is no longer acceptable to continue development without first properly taking into account how it will affect the viability of these species. To adequately address the current gap in Alberta's network of protected sites, the upcoming South Saskatchewan Regional Plan needs to increase the extent of protected areas in the region and include land use objectives that accomplish landscape connectivity. Legal restrictions should be put in place that will significantly reduce the impact of development in ESAs of national and international significance. Most species require larger core habitats that are connected to other core areas across the landscape. Protecting core habitats and ensuring they are effectively connected will contribute greatly to the recovery of many species at risk throughout the region. Several undeveloped landscapes already contain natural barriers to species movement, such as topography and waterways. Land use planning should use current wildlife biology research and account for these existing barriers to ensure that planned wildlife movement corridors are used effectively by the focal species.

All three candidate areas currently have active grazing leases managed by ASRD. Stocking rates for these areas are based on results of rangeland health assessments; these only take into consideration the soil and vegetation characteristics, and do not account for the full extent of ecosystem function. Perhaps areas currently under a grazing lease would benefit from a new rangeland assessment protocol that includes biodiversity and the ecosystem services that grasslands provide. Such an assessment would more accurately depict the role of grazing in the health of the ecosystem, by not simply considering the capacity of the land to be used for grazing. A revised protocol that includes such components would help to guide better sustainable rangeland management.

Collaboration amongst ENGOs, landowners, stakeholders, and the Alberta Government is required to move grassland conservation in southern Alberta forward. Through the research and consultation completed with this project, several organizations such as Alberta Wilderness Association and the Prairie Conservation Forum have already been contacted. CPAWS SAB will continue to engage these organizations while identifying other potential partnerships. Since two of the three areas contain IBAs, perhaps contacting Important Bird Areas Canada or their contributing members would be beneficial to the conservation of these areas as this organization is already familiar with the sites. To continue with this research, CPAWS SAB will begin an investigation of the social and political feasibility of legislated protection as well as alternative methods of conservation for these sites.

5.0 CONCLUSION

Alberta's current network of parks and protected areas does not adequately represent, or protect the full extent of the province's natural heritage. The grassland natural region of Alberta still remains greatly underrepresented within the province's protected area network. The grassland ecosystems of Alberta provide many environmental, economic and social benefits to Albertans. They are also important for preserving Canada's biodiversity as a large proportion of Alberta's species at risk live there. Increasing the number of grassland protected areas within Alberta's current network of protected sites will help to ensure the vast environmental diversity of the province is properly represented and that this fragile ecosystem is preserved. By increasing conservation efforts in the three Areas of Concern would help protect a total of 549,590 ha of dry mixed grasslands. This would be a modest but essential first step in increasing the level of protection for this important ecosystem.

CPAWS SAB takes a landscape scale approach to conservation. It is through this approach that ecologically significant areas across Alberta can be identified, protected, and connected to allow the province's wildlife and ecological processes to thrive in the face of climate change and other pressures. The information contained in this report clearly illustrates the ecological as well as some of the social significance of the three candidate sites for protection. It serves as a basis to continue investigation the feasibility of legislated protection, alongside other conservation tools for these areas. CPAWS SAB will continue to seek for partners for collaboration or input regarding these areas, in order to ensure that these beautiful grassland ecosystems remain intact.

6.0 REFERENCES

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APPENDIX : Species of Conservation Concern at Each of the Sites

Table 1: Species of Conservation Concern within the Milk River – Sage Creek Area

| Common Name | <i>Scientific Name</i> |
|-----------------------------|----------------------------------|
| Acadian Hairstreak | <i>Satyrium acadicum</i> |
| Acastus Checkerspot | <i>Chlosyne acastus robusta</i> |
| American Pellitory | <i>Xanthoxylum Fraxineum</i> |
| Annual Skeletonweed | <i>Shinnersoseris rostrata</i> |
| Brassy Minnow | <i>Hyboagnathus hankinsoni</i> |
| Bur Ragweed | <i>Ambrosia deltoidea</i> |
| Bushy Cinquefoil | <i>Potentilla paradoxa</i> |
| Cerastium brachypodium | <i>Cerastium brachypodium</i> |
| Chaffweed | <i>Anagallis minima</i> |
| Chenopodium desiccatum | <i>Chenopodium desiccatum</i> |
| Chenopodium incanum | <i>Chenopodium incanum</i> |
| Common tickseed | <i>Coreopsis leavenworthii</i> |
| Downy paintbrush | <i>Castilleja purpurea</i> |
| Dwarf fleabane | <i>Conyza ramosissima</i> |
| Dwarf woollyheads | <i>Psilocarphus brevissimus</i> |
| Early buttercup | <i>Ranunculus fascicularis</i> |
| Fallacious Screw Moss | <i>Tortula fallax</i> |
| Flowering-quillwort | <i>Lilaea scilloides</i> |
| Geyer's onion | <i>Allium geyeri</i> |
| Hairy pepperwort | <i>Marsilea vestita</i> |
| Hawk's-beard | <i>Crepis Virens</i> |
| Jaffueliobryum wrightii | <i>Jaffueliobryum wrightii</i> |
| Kelsey's cat's eye | <i>Cryptantha kelseyana</i> |
| Linanthus | <i>Linanthus septentrionalis</i> |
| Linear-leaved scorpionweed | <i>Phacelia linearis</i> |
| Little-seed rice grass | <i>Oryzopsis micrantha</i> |
| Low cinquefoil | <i>Potentilla plattensis</i> |
| Low townsendia | <i>Townsendia exscapa</i> |
| Low yellow evening-primrose | <i>Oenothera flava</i> |
| Moquin's sea-blite | <i>Suaeda moquinii</i> |
| Nebraska sedge | <i>Carex nebrascensis</i> |
| Nodding umbrella-plant | <i>Eriogonum cernuum</i> |
| Non-pollinating Yucca Mouth | <i>Tegeticula corruptrix</i> |
| Olive-backed pocket mouse | <i>Peroagnathus fasciatus</i> |
| Olsar's Roadside-skipper | <i>Amblyscirtes vialis</i> |

| | |
|--------------------------------|---|
| Painted Turtle | <u><i>Chrysemys picta</i></u> |
| Pale blue-eyed grass | <u><i>Sisyrinchium septentrionale</i></u> |
| Pasture sedge | <u><i>Carex petasata</i></u> |
| Picradeniopsis | <u><i>Picradeniopsis oppositifolia</i></u> |
| Poison suckleya | <u><i>Suckleya suckleyana</i></u> |
| Prairie false dandelion | <u><i>Nothocalais cuspidata</i></u> |
| Prairie wedge grass | <u><i>Sphenopholis obtusata</i></u> |
| Pursh's milk vetch | <u><i>Astragalus purshii</i></u> |
| Red three-awn | <u><i>Aristida purpurea var longiseta</i></u> |
| Rocky Mountain Dotted Blue | <u><i>Euphilotes ancilla</i></u> |
| Ruddy Copper | <u><i>Lycaena rubidus</i></u> |
| Salt-marsh sand spurry | <u><i>Spergularia salina</i></u> |
| Sand nut-grass | <u><i>Cyperus schweinitzii</i></u> |
| Shrubby evening-primrose | <u><i>Calylophus serrulatus</i></u> |
| Slender cress | <u><i>Rorippa tenerrima</i></u> |
| Small-flowered hawk's-beard | <u><i>Crepis occidentalis</i></u> |
| Smooth boisduvalia | <u><i>Boisduvalia glabella</i></u> |
| Smooth narrow-leaved goosefoot | <u><i>Chenopodium subglabrum</i></u> |
| Spatulate-leaved heliotrope | <u><i>Heliotropium curassavicum</i></u> |
| Tortula caninervis | <u><i>Tortula caninervis</i></u> |
| Tufted hymenopappus | <u><i>Hymenopappus filifolius</i></u> |
| Two-tailed Swallowtail | <u><i>Papilio multicaudata</i></u> |
| Upland evening-primrose | <u><i>Camissonia andina</i></u> |
| Variiegated Meadowhawk | <u><i>Sympetrum corruptum</i></u> |
| Waterpod | <u><i>Ellisia nyctelea</i></u> |
| Waterwort | <u><i>Elatine triandra</i></u> |
| Watson's knotweed | <u><i>Polygonum polygaloides ssp confertiflorum</i></u> |
| Weidemeyer's admiral | <u><i>Limenitis weidemeyerii</i></u> |
| Woodland skipper | <u><i>Ochlodes sylvanoides sylvanoides</i></u> |
| Yellow-bellied Marmot | <u><i>Marmota flaviventris</i></u> |

Table 2: Species of Conservation Concern within the South Saskatchewan Canyon – Chappice Lake Area

| Common Name | Scientific Name |
|------------------------------|--|
| American Pellitory | <i>Xanthoxylum Fraxineum</i> |
| Annual Skeletonweed | <i>Shinnersoseris rostrata</i> |
| Bur Ragweed | <i>Ambrosia deltoidea</i> |
| Bushy Cinquefoil | <i>Potentilla paradoxa</i> |
| Chaffweed | <i>Anagallis minima</i> |
| Clammyweed | <i>Polanisia trachysperma</i> |
| Common Beggarticks | <i>Bidens frondosa</i> |
| Common Dodder | <i>Cuscuta gronovii</i> |
| Common Tickseed | <i>Coreopsis leavenworthii</i> |
| Draba Reptans | <i>Carolina draba</i> |
| False Buffalo Grass | <i>Monroa squarrosa</i> |
| Few-flowered Aster | <i>Aster pauciflorus</i> |
| Field Grape Fern | <i>Botrychium simplex</i> |
| Flowering-quilwort | <i>Lilaea scilloides</i> |
| Green Ash | <i>Fraxinus pennsylvanica</i> |
| Hairy Pepperwort | <i>Marsilea vestita</i> |
| Kelsey's Cat's Eye | <i>Cryptantha kelseyana</i> |
| Large Canada St. John's-wort | <i>Hypericum perforatum</i> |
| Lianthus | <i>Linanthus septentrionalis</i> |
| Little-Seed Rice Grass | <i>Oryzopsis micrantha</i> |
| Low Yellow Evening Primrose | <i>Oenothera flava</i> |
| Nodding Umbrella Plant | <i>Eriogonum cernuum</i> |
| Olive-backed Pocket Mouse | <i>Perognathus fasciatus</i> |
| Pale Blue-eyed Grass | <i>Sisyrinchium septentrionale</i> |
| Poison Suckleya | <i>Suckleya suckleyana</i> |
| Prairie Cord Grass | <i>Spartina pectinata</i> |
| Prairie Wedge Grass | <i>Sphenopholis obtusata</i> |
| Prickly Milk Vetch | <i>Oxytropis acanthacea</i> |
| Pursh's Milk Vetch | <i>Astragalus purshii</i> |
| Red Three-Awn | <i>Aristida purpurea var longiseta</i> |
| River Shiner | <i>Notropis girardi</i> |
| Sand nut-grass | <i>Cyperus schweinitzii</i> |
| Sandhills Cinquefoil | <i>Potentilla finitima</i> |
| Shrubby Evening-Primrose | <i>Calylophus serrulatus</i> |
| Silver Redhorse | <i>Moxostoma anisurum</i> |
| Smooth Boisduvalia | <i>Boisduvalia glabella</i> |
| Smooth Sweet Cicely | <i>Osmorhiza claytonii</i> |

| | |
|----------------------------|--|
| Spatulate-leaved Helitrope | <i>Heliotropium curassavicum</i> |
| Waterwort | <i>Elatine triandra</i> |
| Watson's goosefoot | <i>Chenopodium Watsonii</i> |
| Watson's Knotweed | <i>Polygonum polygaloides ssp confertiflorum</i> |

Table 3: Species of Conservation Concern within the Hays Reservoir – Bow River Area

| Common Name | Scientific Name |
|------------------------|--|
| American white pelican | <i>Pelecanus erythrorhynchos</i> |
| Bur-sage | <i>Ambrosia spp.</i> |
| Caspian tern | <i>Hydroprogne caspia</i> |
| Low annual lupine | <i>Lupinus Pusillus</i> |
| Low milk vetch | <i>Astragalus lotiflorus</i> |
| Prickly milk vetch | <i>Oxytropis acanthacea</i> |
| Salt marsh sand spurry | <i>Spergularia salina</i> |
| Smooth goosefoot | <i>Chenopodium subglabrum</i> |
| Watson’s knotweed | <i>Polygonum polygaloides ssp confertiflorum</i> |