

ADAPTIVE MANAGEMENT PLAN

2015 to 2040

ANN & SANDY
CROSS



CONSERVATION AREA



THANK YOU



Ann and Sandy Cross

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generous support from:



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**Ann & Sandy Cross Conservation Area
Adaptive Management Plan 2014 to 2040**

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ANN & SANDY CROSS CONSERVATION AREA

The Ann & Sandy Cross Conservation Area (ASCCA) comprises 4,800 acres of rolling foothills land donated by the late Ann and Sandy Cross.

In addition to its mandate of protecting natural habitat for wildlife, the ASCCA offers conservation education programs that foster awareness, appreciation and action.

Mission Statement

- Protect habitat and provide space for native species of wildlife; and
- Promote and support conservation by engaging in conservation related activities.

Our Vision

The ASCCA aspires to a day when it is recognized from the local to the international levels as a model of sustainability, and a leader in landscape-level approaches to the management of protected areas.

Guiding Principles

The ASCCA will:

- be a good steward of the lands within the Cross Conservation Area;
- develop and operate conservation education programs;
- work with and build strong relationships with its neighbours;
- collaborate with other conservation oriented organizations; and
- conduct or facilitate research that is consistent with our Mission Statement.

Scope and Purpose of the Management Plan

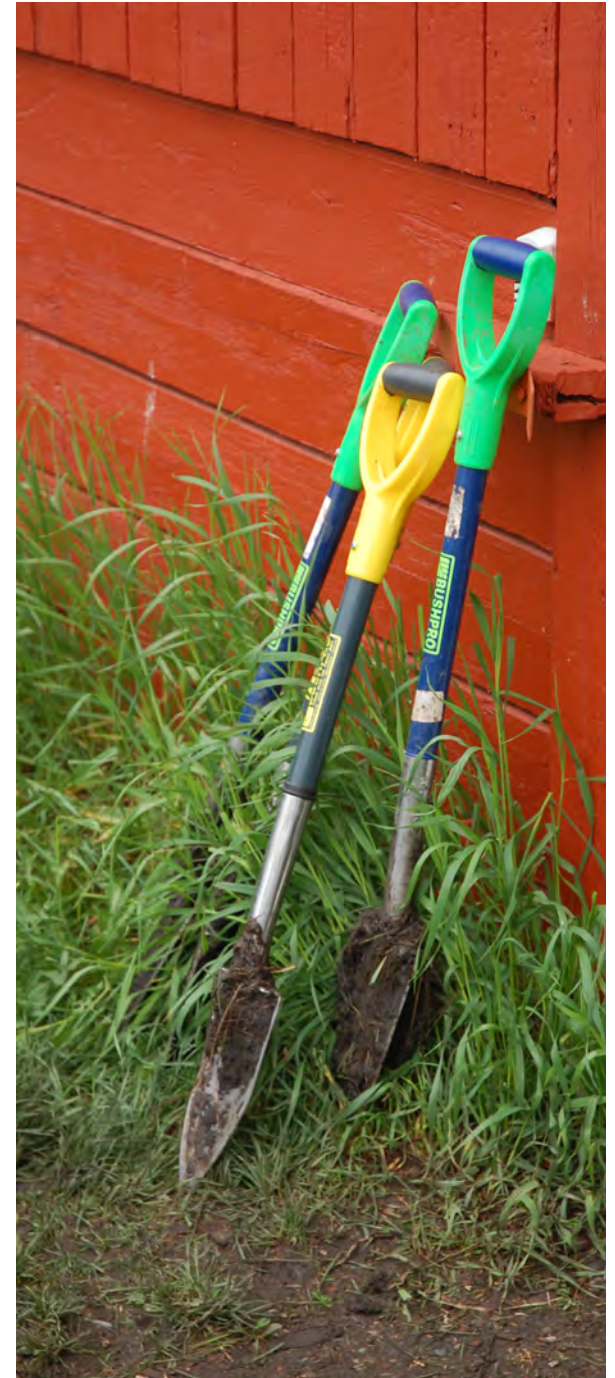
This plan is an evolution of the policies and directions set down by the original donors, Ann and Sandy Cross. It reflects the benefit of hindsight and incorporates more recent understandings relative to population growth and the environment as they apply to the ASCCA. Although the original plan was developed over 25 years ago, it has provided a sound base for decision making to the present. Many of the issues and concerns it discussed have come to be and remain relevant today. This plan looks 25 years forward and should be reviewed every five years to ensure it remains relevant and responds to the issues which will undoubtedly arise over time.

Throughout this plan, the land will be specifically referred to as the “Cross Conservation Area” and the operations as the “ASCCA”.

This plan will:

- perpetuate a dynamic organization and is intentionally drafted with an appropriate level of flexibility so that the management and board of the ASCCA are able to deal with the unexpected and adapt to ever changing external factors;
- address the unique natural features of the land;
- reflect the specific challenges presented from being proximate to Calgary’s rapidly urbanizing landscape;
- identify and establish clear objectives and goals;
- continue to recognize the importance of making the Cross Conservation Area available to scientists and researchers for programs and conservation research, including research that addresses regional land-use change and ecological integrity as well as the impact of climate change and other human influences on the landscape;
- consider ways of addressing problems that could compromise habitat conservation, e.g., development pressures, climate change, invasive species management, the shifting fescue-aspen mosaic and encroachment;
- outline an action plan; and
- create a financial plan for its implementation.

The maintenance and restoration of the Cross Conservation Area’s ecological integrity underlies all facets of this plan, primarily for the benefit of native wildlife and secondarily, for the benefit, education and enjoyment of present and future users.



Historical Background and Legal Framework

The late Sandy Cross, the son of A.E. Cross (one of the Calgary Stampede’s “Big Four”), and Helen Rothney Macleod (the daughter of Colonel James Macleod), began purchasing land south of Calgary in 1945 for what would become Rothney Farm and ultimately the Ann & Sandy Cross Conservation Area. At that time the land was comprised of a number of homesteads and much of it was under cultivation. Prior to the arrival of settlers, the land was the territory of the Blackfoot nation and was teeming with wildlife including bison. (For current species lists, see Appendix A.)

Ann and Sandy Cross donated a total of 4,800 acres to the Province of Alberta in two tranches—the last being 2,800 acres in 1996. At the time, it was the largest private land donation in Canadian history. The land was leased back to the ASCCA for a term of 99 years. The land may only be used for conservation, conservation education, nature interpretation and habitat retention and enhancement.

In 1991 funds were raised to build the education centre, Belvedere House, the present venue for education programs and the current location of the administrative office.

The ASCCA is independently operated and managed as a private Alberta corporation and is a federally registered charity.

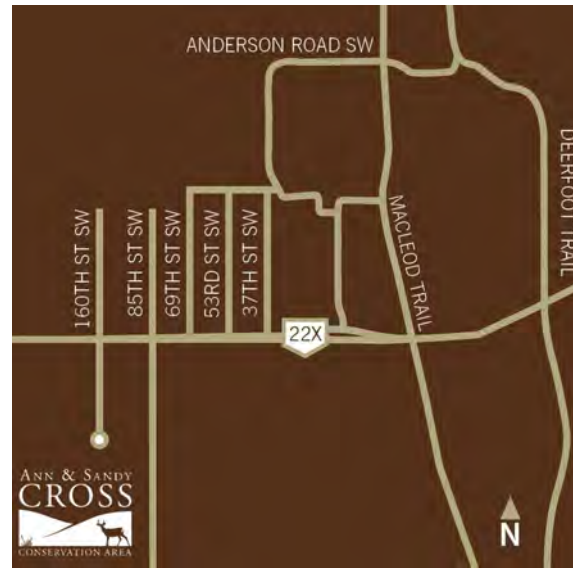
The 99 year lease with the Province of Alberta is managed by the Ministry of Environment and Sustainable Resource Development (ESRD).

Legislation and Regulations affecting the management and operation of the ASCCA include:

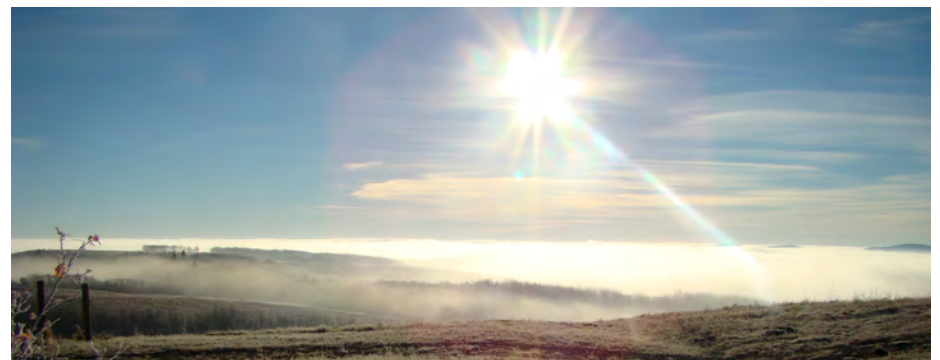
- *Wildlife Act* (Alberta)
- *Municipal Government Act* (Alberta)
- *Public Lands Act* (Alberta)
- *Income Tax Act* (Federal - as it pertains to registered Charities)
- *Fisheries Act* (Federal)

Location

The Ann & Sandy Cross Conservation Area is 1.5 km west of the Calgary city limits off Highway 22X (follow the links for directions).



<http://www.crossconservation.org/about/contact-and-directions>



Legal Description and Zoning

The 4800 acres of the ASCCA are leased from the Crown. The lease is for the surface only. Mines and minerals below the ASCCA are owned by a number of parties including the Crown, corporations and private individuals. The owners of mines and minerals need special permission from the Crown before they would be permitted surface access to extract mines and minerals because this is a conservation area.

The Cross Conservation Area is located in the Municipal District of Foothills No. 31. Specifically, the Cross Conservation Area is designated as an Environmental Protection district. The ASCCA includes the following:

- Sections 4 and 5-22-2 W5M;
- East half of Section 6-22-2 W5M;
- East half of Section 7-22-2 W5M;
- Sections 8 and 9-22-2 W5M;
- Sections 16 and 17-22-2 W5M; and
- East half of Section 18-22-2 W5M.

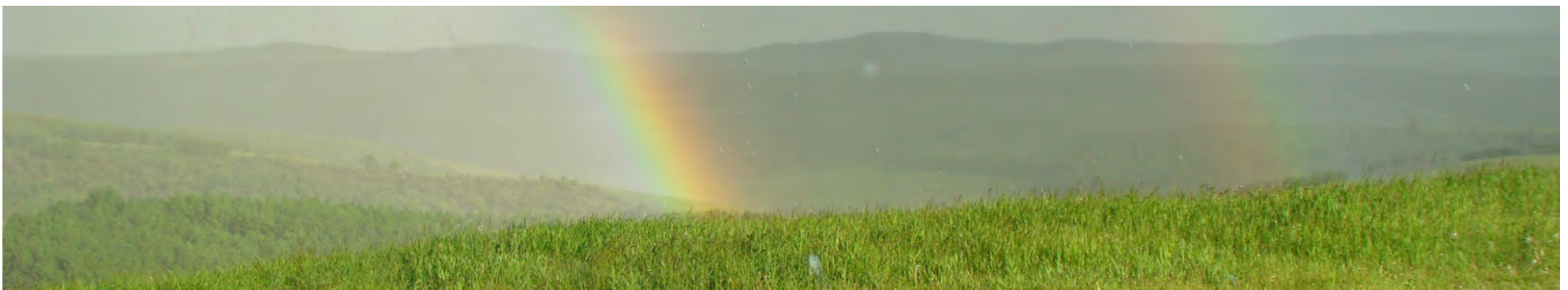
Walking trails are open to public access. A trail map is provided on the ASCCA website:

<http://www.crossconservation.org/node/21>

Physiography and Hydrology

The varied topography of the Cross Conservation Area is a result of upheaval caused by the Rocky Mountain uplift (see Appendix B). The Cross Conservation Area has significant elevation variations common to the eastern slopes of the Rocky Mountains and is often referred to as the Alberta Foothills. The highest ridge is 1340 m (4390 feet) and the lowest point is 1125 m (3685 feet). Bedrock outcroppings can be seen along Pine Creek. The surface area features sandstone rock outcrops typical of the Paskapoo Formation and are of the tertiary geologic age and reflects the effects of glaciation 10,000 years ago. Much of the area is covered with a deposit of pebble and loam till and, although the soil is well suited for agriculture, the topography is not. The soils are prone to erosion in many places.

Most of the Cross Conservation Area drains eastward on Pine Creek with one spring flowing north toward Fish Creek. There are more than 19 springs on the Cross Conservation Area, most of which flow year-round. All water flowing from the Cross Conservation Area ultimately discharges into the Bow River. Pine Creek was at one time the home of numerous beaver lodges and dams. There are also four man-made reservoirs on the Cross Conservation Area. They were built to ensure a year-round supply of water for ranching operations. One reservoir, on the southern arm of Pine Creek, was once a trout farm. The reservoirs are teeming with aquatic life.

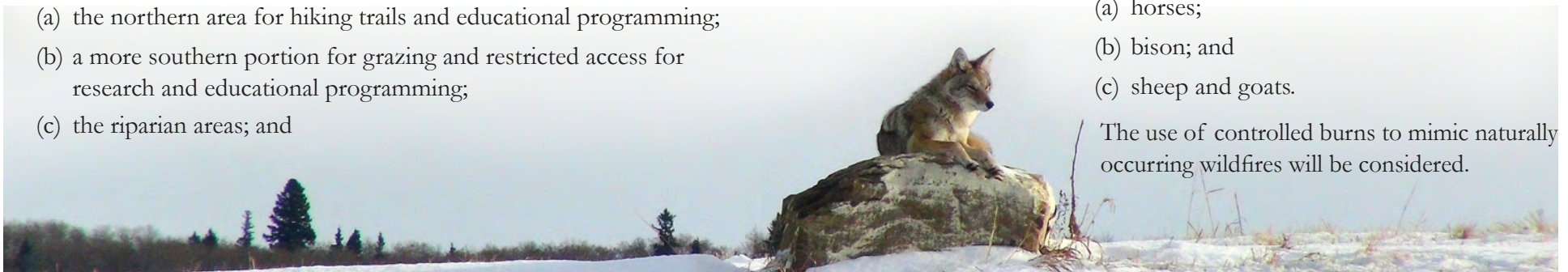


Recommendations and Actions



Habitat Management

1. The ASCCA's natural landscape and ecology will be preserved, restored and enhanced.
2. Land uses and activities are managed to ensure healthy aquatic and terrestrial ecosystems including, maintaining and improving ecological connectivity in and surrounding the Cross Conservation Area.
3. Our conservation education programming will be further integrated into our habitat management plans through citizen science projects tied to the Alberta school curriculum and through projects developed through the academic community.
4. Use of the land by the ASCCA and others is coordinated with efforts to incorporate environmental protection and ecological restoration of the Cross Conservation Area.
5. The ASCCA uses the following "Land Management Zones":
 - (a) the northern area for hiking trails and educational programming;
 - (b) a more southern portion for grazing and restricted access for research and educational programming;
 - (c) the riparian areas; and
 - (d) specific use areas: Belvedere House, Rothney Farm, residences and related out buildings of the "Tynan" property (east boundary, Section 9), and residence near Belvedere House (north boundary, Section 17).
6. Natural grazing by resident and transient elk herds is supplemented by strategic rotational cattle grazing for vegetation management, avoiding riparian areas. Salts and minerals will be used to manage grazing pursuant to an annual grazing management plan and will not be used in sensitive areas such as drainages and riparian areas. Under the existing grazing contract, the contractor may not use motorized vehicles to manage the herd and cannot use outside feed. Grazing will be distributed throughout the ASCCA and concentrated grazing will be initiated where and when required, protecting native grasses and the land from erosion. Use of external forage will not be permitted. Other species considered, from time to time, for grazing might include:
 - (a) horses;
 - (b) bison; and
 - (c) sheep and goats.



The use of controlled burns to mimic naturally occurring wildfires will be considered.

- Recommendations and Actions continued -

7. The Cross Conservation Area's cultural and natural heritage (First Nations, homesteading and agricultural) will continue to be honoured and managed with protection of the natural environment as a priority:
 - (a) Cultural history will continue to be incorporated into educational programming, and will be included in new educational facilities. For example, a tipi will be set-up and it will include programming to respect and honour the Cross Conservation Area's First Nations heritage. The tipi will also provide four-season shelter and a venue for educational programs.
 - (b) The facilities at the Rothney Farm will continue to be improved to preserve, enhance and expand the property and its use as a maintenance facility, working ranch and educational site.
 - (c) Sites of early homesteading and occupation will continue to undergo improvement, preservation and enhancement. Sites include the Stuart Barn area, the Cross log cabin, the former trout ponds (Goodwin Reservoir), the sawmill site and the reforestation of logged-out areas.
 - (d) Steps will be taken with the Municipal District of Foothills 31 and the Government of Alberta to close remaining open road allowances to limit unauthorized access.
 - (e) Water sources will be maintained, preserved, enhanced and restored. Sources include naturally occurring springs, drilled water wells, creeks and ponds. These features will be integrated with agricultural, recreational and educational uses.
8. The threat of wild fires will be minimized by:
 - (a) enforcing the no smoking policy;
 - (b) limiting the use of motor vehicles. The ASCCA will designate one or more dedicated internal corridors for motorized vehicles for use by staff and volunteers, and for use by first responders for health emergencies and fires;
 - (c) mowing as a means for fire and weed control and to provide easier and safer trail access;
 - (d) continuing the grazing program, which is currently managed by a third party; and
 - (e) being prepared in the event of fire. Protocol includes:
 - (i) identifying high concern areas;
 - (ii) instructing staff and volunteers in effective firefighting methods;
 - (iii) obtaining and maintaining appropriate fire-fighting equipment on site; and
 - (iv) maintaining an ongoing liaison with local fire departments.
9. Noxious weeds will be managed by:
 - (a) mowing, controlled burns, use of herbicides (primarily applied by hand to specific plants);
 - (b) removing weeds manually; and
 - (c) grazing cattle or other domestic herbivores (such as sheep and goats).



10. The ASCCA will take a leadership role by using existing and restored wetlands to store water, control downstream flooding and regulate the summer flow by:
 - (a) determining, through the advice of professionals, the present state of the watersheds and establishing and executing a watershed restoration plan;
 - (b) using the engineering of beavers and other natural processes;
 - (c) gaining an improved understanding of our water balance through continued research and real time monitoring; and
 - (d) educating other people about watershed management best practices.
11. The ASCCA will use the residences located onsite in a manner consistent with the Mission Statement and Guiding Principles, which include their use:
 - (a) as staff housing;
 - (b) by approved tenants (which results in improved security);
 - (c) as facilities for strategic partners with goals and values consistent with those of the ASCCA (including wildlife conservation, rescue and rehabilitation, endangered species conservation); and
 - (d) as a source of revenue to create enhanced sustainability of the ASCCA.



12. Recreational uses will not be permitted unless under the direct control of the ASCCA. New uses and activities on the ASCCA may include overnight stays at Stuart Barn and organized trail rides.
13. Recreational and educational uses, trails, site access and parking will be designed and situated to complement and safeguard natural and cultural heritage resources.
14. Motorized vehicles are not permitted in natural areas except for specific management purposes.
 - (a) Persons visiting the lands and arriving by motor vehicle will park in designated parking areas.
 - (b) Designated parking areas may be paved, gravel or grass and are to be located at locations on or near the perimeter of the lands or on or near the Rothney Farm.
15. Land uses other than those permitted under the Crown Lease must be approved by ESRD and must be compatible with the Mission Statement, Vision and Guiding Principles for the ASCCA. New activities or practices that would negatively affect the landscape or that could result in ecological damage require board approval.
16. The ASCCA will assist the representatives of the Alberta Crown responsible for elk management by providing facilities (including the existing live elk trap located near the Goodwin Reservoir) for the purpose of live trapping and relocating elk as part of the Alberta Crown elk management program. Trapping of other species, including beavers, is permitted with the authorization of the Board. Hunting may be authorized in cases where:
 - (a) a non-native animal is discovered on the ASCCA; or
 - (b) the Board, after consultation with the representatives of the Alberta Crown responsible for elk management, determines that culling is in the best long-term interests of the elk population.

Conservation and Education

1. The goal of ASCCA's conservation education programs is to build capacity for stewardship by connecting education participants with nature and inspiring conservation practices.
2. Conservation education programs shall be developed and reviewed annually in conjunction with the ASCCA's overall budgeting process, and will continue to reflect the Mission Statement and Guiding Principles of the ASCCA and will foster awareness, appreciation and action.
3. Onsite experiential conservation education programs will be continued and improved, and outreach programs will be expanded through:
 - (a) curriculum-based programs; and
 - (b) conservation community learning opportunities including day camps.
4. Strive for opportunities for conservation education programs with students from high needs areas:
 - (a) Seek funding from third parties to cover costs.
 - (b) Provide subsidies to schools when required to enable travel or registration costs.
5. Success of the education programs will be measured through feedback from participants (e.g., surveys), with periodic third party review.
6. Relationships will be developed with schools of all academic levels to incorporate multi-day programming at the Cross Conservation Area and through outreach, e.g., scientific data gathering relevant to ASCCA and education participants.
7. Continue development and use of education volunteers for program delivery and enhancement.
8. Establish and deliver professional development opportunities for teachers.
9. Enrich visitor learning through:
 - (a) development and placement of educational interpretive signage; and
 - (b) development and distribution of educational interpretive materials.
10. Incorporate technology where appropriate to reach visitors and bring the ASCCA to others via the Internet, e.g., attract virtual visitors using wildlife cameras and webcams.
11. Package our programs for use in other natural areas on a fee for service basis.



Public Activities and Access

1. Protection of the natural areas is a primary consideration. Activities may be temporarily restricted or prohibited to protect habitat and wildlife and reduce fire risk.
2. Hikers will be advised of ground rules, such as: hike only on the trails, remove all litter, no smoking and no pets on the property.
3. Maintain and manage existing public uses such as hiking trails to meet increasing demands. This will include the enforcement of a single point of entry to the Cross Conservation Area along with increased accessibility for persons with disabilities.
4. Parking facilities will be provided where appropriate, subject to the need and available funding.
5. Limits will be set when necessary to control the number and frequency of visitors to the Cross Conservation Area. Hiker fees may be imposed to reduce the number of hikers.
6. The area steward program will continue to play an important role as observers of hiker activity and its impact on the land. Staff resources will be dedicated to the recruitment of stewards and maintenance of the program as required from hiking pressures or observed ecological degradation.
7. Equestrian patrols will be utilized along the perimeter and on select routes within the Cross Conservation Area.
8. Programs will be advanced to engage neighbouring property owners in protecting the Cross Conservation Area as “area stewards.” Relationships with neighbours will be developed to enhance the ecological function and performance of the ASCCA in a regional context through the expansion of greenspace and ecological corridors.
9. New recreation uses will incorporate place-based experiential conservation education.



Strategic Partners and Other Collaborative Efforts

The ASCCA will continue to make use of the expertise, experience and resources of conservation organizations, educational institutions, specialized researchers, government agencies, private industry and others to fulfill the ASCCA's Mission Statement and to achieve our Vision while adhering to our Guiding Principles. The ASCCA may make land available by sub-lease, license or temporary occupation to others when the Board determines it would be in the best interests of the Cross Conservation Area to do so. Some examples of third parties who are currently strategic partners, collaborators or otherwise able to assist the ASCCA in fulfilling its mandate, include:

- The Calgary Foundation
- Mount Royal University
- The City of Calgary
- Government of Alberta
- Miistakis Institute
- Cows and Fish
- University of Calgary
- University of Lethbridge
- Calgary Zoological Society
- Nature Conservancy of Canada
- Ducks Unlimited Canada
- Trout Unlimited Canada
- Municipal District Foothills No. 31
- Alberta Junior Forest Warden Association
- Canadian Wildlife Federation
- Scouts Canada
- Girl Guides of Canada
- Duke of Edinburgh Awards
- Carbon Farmers
- White Moose Ranch Ltd.
- Alberta Institute for Wildlife Conservation



Over the years we have collaborated with our partners to conduct and publish wildlife population, habitat and conservation studies, including those pictured above.



Implementation Plan

Short Term

Habitat Management

- (a) Continue these steps to reduce the risk of fire including:
 - (i) managing the use of cattle grazing to decrease buildup of fuel;
 - (ii) increasing staff training;
 - (iii) frequent mowing of high risk areas;
 - (iv) liaising regularly with local fire departments;
 - (v) identifying and documenting high risk areas;
 - (vi) increasing signage prohibiting smoking;
 - (vii) continuing and increasing vigilance;
 - (viii) prohibiting the use of motor vehicles except for official use.
- (b) Increase oversight by implementing the provision of more security through the use of equestrian patrols and area stewards;
- (c) Take further steps to reduce the spread of noxious weeds through the use of hand pulling, mowing and the spot use of herbicides when required;

- (d) Continue to protect and restore watersheds and wetlands by:
 - (i) further reducing the impact of cattle grazing;
 - (ii) expanding the use of beaver reintroduction as a technique
- (e) Increase monitoring of visitor activities to reduce impact on habitat.

Throughout the implementation of the Adaptive Management Plan there shall be continuous evaluation of its overall effect as part of management's regular report to the ASCCA's board of directors.

Conservation Education

- (a) Continue to seek adequate funding;
- (b) Increase the ratio of visits by children from high needs schools;
- (c) Incorporate technology to further deliver offsite programming;
- (d) Collaborate with similar education focused organizations to exchange ideas for improved programming;
- (e) Improve visitor experience; and
- (f) Monitor visitor education participant opinions via surveys and third party evaluations.

- Implementation Plan continued -

Public Activities and Access

- (a) Maintain a single point of entry for hikers on the ASCCA. Ensure hikers stay on designated trails and remove nothing from the land except their own garbage;
- (b) Research and place clear way-finding and interpretive signage for visitors;
- (c) Increase signage on the property;
- (d) Continue to monitor existing trail system and to close trails to hikers or construct new trails as is considered necessary by management;
- (e) Increase monitoring of visitor satisfaction and impact on the ASCCA through observation and the use of surveys;
- (f) Initiate a new guided hiking program;
- (g) Consider providing winter access to designated cross country ski trails if research shows that the potential impact on the land and animals is not significant; and
- (h) Conduct visitor exit and other surveys.

Long Term

Habitat Management

- (a) Annually establish, with outside professional advice when required, key ecological indicators by which changes to the baseline inventory can be monitored, including:
 - (i) using historical and aerial photographs to help make assessments;
 - (ii) watching for variations from long-term data collections;

- (b) Continue land reclamation by:
 - (i) completing the fencing of riparian areas;
 - (ii) reforesting riparian areas;
 - (iii) providing specific habitat and opportunities for repopulation of native species, including:
 - continuing to work with ESRD to manage the elk population;
 - continuing to relocate beaver to the Cross Conservation Area;
 - supporting the relocation programs of other agencies for native species;
- (c) Develop a long-term strategy using outside resources to respond to climate change;
- (d) Increase the protection of wildlife corridors and ecological connectivity through education and awareness as well as through the influence over development proposals;
- (e) Maintain long term strategy to restore native fescue grasses;
- (f) Continue reforestation of logged-out areas;
- (g) Monitor the interface between humans and wildlife on the ASCCA and surrounding areas to mitigate conflict;
- (h) Continue protecting, restoring and enhancing riparian areas;
- (i) Further develop working relationships with other private and public conservation areas locally, nationally and internationally;
- (j) Research ways to mitigate the ecological impact of increased urbanization in and around the Cross Conservation Area; and
- (k) Develop contingency plans to respond to overwhelming development around the Cross Conservation Area.

- Implementation Plan continued -

Conservation Education

- (a) Continue and expand youth focused conservation education programs;
- (b) Increase programming to include week-long programs with overnight stays;
- (c) Initiate a docent program to train volunteers and students to educate visitors to the Cross Conservation Area – especially during high hiker traffic periods;
- (d) Construct additional teaching facilities to house present and future educational programs;
- (e) Initiate research into the delivery of conservation education programs in other settings or for other organizations with similar curricula with the assistance of academia and other experts—in particular, Mount Royal University, the Calgary Zoological Society and the Alberta Institute for Wildlife Conservation; and
- (f) Measure the effectiveness of the ASCCA's conservation curricula.

Public Activities and Access

Increase or develop:

- (a) a number of guided hikes at the Cross Conservation Area;
- (b) an overnight hiking program for Scouts, Guides and similar organizations using the Stuart Barn as a resource;
- (c) an Outdoor Education School for week-long experiential place-based programs;
- (d) an expanded docent program;
- (e) horse based patrols;
- (f) research opportunities;
- (g) volunteer stewardship activities; and
- (h) strategic partnerships with other like-minded organizations with a purpose of restoring habitat and providing conservation education programs.



Financial and Administrative Plan

Continue to build a solid financial foundation to assure the ASCCA's sustainability by:

1. maintaining the “donor centric” mindset from which the board, staff, and volunteers cultivate relationships essential for developing focussed achievable outcomes;
2. reviewing our by-laws and revising them to strengthen governance and fund development capabilities;
3. establishing the “Friends of the ASCCA” patrons group to help diversify the volunteer base and assist in fund development;
4. effectively engaging the board and staff in fundraising activities;
5. monitoring and intervening (subject to board approval) in serious cases where future land use proposals and development activities could adversely impact the ecological health and diversity of the Cross Conservation Area;
6. meeting increasing visitor demand due to population growth, but also from the desire of more visitors to become familiar with the outdoors, which inspires them to become involved in the ASCCA;
7. increasing the number of annual fund donors;
8. maintaining adequate insurance coverage—including coverage for Directors and Officers;
9. implementing innovative/entrepreneurial business ventures and revenue centers that are consistent with the ASCCA's mission to generate revenue while supporting our ecosystem goals;
10. expanding our donor base to reflect changing demographics in our community;
11. formalizing a planned giving program;
12. ensuring the ASCCA's key volunteers have an opportunity to participate in planning and stewardship decision making;
13. regularly conducting visitor satisfaction surveys; and
14. securing trained and dedicated staff to support the plan.

Our objective is to ensure that the ASCCA is financially sustainable.



Opportunity Evaluation Criteria

Vision and Profile

- Does it align with the ASCCA's vision, mission and values?
- Is there opportunity to advance the ASCCA's reputation and brand?
- Is it relevant to Albertans?
- Is it associated with respected partners?
- Is there the ability to partner or play a key role with government and scientific communities?

Conservation

- Does it advance conservation initiatives within and beyond the Cross Conservation Area?
- Can this new partner become a key contributor to collaborative conservation initiatives?
- What is its overall impact on lands and wildlife – i.e., the total environmental footprint?

Education

- Does it develop direct and indirect education opportunities?
- Will the partner organize shared programming?
- Can broader community education be initiated?
- Does it provide knowledge and awareness to stakeholders and visitors?

Financial

- Does it appeal to past and potential donors?
- Does it meet the financial demand for capital commitment and operating expenses?
- Are there opportunities for ASCCA to increase the prospective donor base?
- Can ASCCA maintain organizational impact and the oversight of projects, contracts and relationship management?

The ASCCA has adopted these "Opportunity Evaluation Criteria" for the board and management to use when determining whether an opportunity should be considered.

Risks

- Could the ASCCA's reputation be affected?
 - Might there be public resistance to the outcome?
 - Could there be uncertainty about returning the land back to its natural state?
 - Could environmental harm occur?
-
- Is there a risk of releasing unwanted or diseased animals?
 - Are there financial concerns related to resolving potential issues?
 - Are there community concerns, such as increased traffic and noise?



APPENDIX A Species Observed in the Ann & Sandy Cross Conservation Area

The Ann & Sandy Cross Conservation Area will be forever indebted to the foresight and dedication of the late Olga Droppo for collecting and compiling the initial database.

MAMMALS

Small

13-lined ground squirrel / *Spermophilus tridecemlineatus*
Deer mouse / *Peromyscus maniculatus*
Least chipmunk / *Tamias minimus*
Least weasel / *Mustela erminea*
Long-tail weasel / *Mustela frenata*
Masked shrew / *Sorex cinereus*
Meadow vole / *Microtus pennsylvanicus*
Pocket gopher / *Thomomys sp.*
Pygmy shrew / *Sorex hoyi*
Red least chipmunk squirrel / *Tamiasciurus hudsonicus*
Red-backed vole / *Clethrionomys gapperi*
Richard ground squirrel / *Spermophilus richardsoni*
Short-tailed weasel (ermine) / *Mustela erminea*

Medium

Badger / *Taxidea taxus*
Porcupine / *Erethizon dorsatum*
Red fox / *Vulpes vulpes*
Snowshoe hare / *Lepus americanus*
Striped skunk / *Mephitis mephitis*

Large

Black bear / *Ursus americanus*
Cougar / *Puma concolor*
Coyote / *Canis latrans*
Lynx / *Lynx canadensis*

Ungulates

Buffalo (bison) / *Bison bison**
Moose / *Alces alces*
Mule deer / *Odocoileus hemionus*
Rocky mountain elk (wapiti) / *Cervus elaphus*
White-tail deer / *Odocoileus virginianus*

* present historically

Flying

Little brown bat / *Myotis lucifugus*

Aquatic

Beaver / *Castor canadensis*
Muskrat / *Ondatra zibethicus*

Transient

Eastern grey squirrel / *Sciurus carolinensis*
Wolf / *Canis lupus*

Domestic

Cat / *Felis catus*
Cattle / *Bos taurus*
Dog / *Canis familiaris*
Horse / *Equus caballus*
Sheep / *Ovis aries*

AMPHIBIANS

Frogs

Boreal chorus frog / *Pseudacris maculata*
Wood frog / *Rana sylvatica*

Salamanders

Tiger salamander / *Ambystoma tigrinum*

BIRDS

Resident Birds

Barred owl / *Strix varia*
Black-billed magpie / *Pica hudsonia*
Black-capped chickadee / *Parus atricapillus*
Blue jay / *Cyanocitta cristata*



Photo: Kim Payne

Photo: Dick Choy

Common raven / *Corvus corax*
Downy woodpecker / *Picoides pubescens*
Gray partridge / *Perdix perdix*
Great gray owl / *Strix nebulosa*
Great horned owl / *Bubo virginianus*
House sparrow / *Passer domesticus*
Pileated woodpecker / *Dryocopus pileatus*
Ring-necked pheasant / *Phasianus colchicus*
Rock pigeon (dove) / *Columba livia*
Ruffed grouse / *Bonasa umbellus*
Saw-whet owl / *Aegolius accadicus*
Sharp-tail grouse / *Tympanuchus phasianellus*
Short-eared owl / *Asio flammeus*

Wetland Birds

Belted kingfisher / *Megaceryle alcyon*
Double-crested cormorant / *Phalacrocorax auritus*
Great blue heron / *Ardea herodias*
Pelican / *Pelecanus erythrorhynchos*
Red-winged blackbird / *Agelaius phoeniceus*
Waterfowl / Anatidae
Canada geese / *Branta canadensis*
Snow geese / *Chen caerulescens*
Trumpeter swan / *Cygnus buccinator*
Tundra swan / *Cygnus columbianus*

Marsh (Dabbling) Ducks / Anatinae

American wigeon / *Anas americana*
Blue winged teal / *Anas discors*
Gadwall / *Anas strepera*
Green winged teal / *Anas crecca*
Mallard / *Anas platyrhynchos*
Northern shoveler / *Anas clypeata*
Wood duck / *Aix sponsa*
Diving Duck / Aythyinae
Barrow's goldeneye / *Bucephala islandica*
Bufflehead / *Bucephala albeola*
Canvasback / *Aythya valisineria*
Common goldeneye / *Bucephala clangula*
Common merganser / *Mergus merganser*
Hooded merganser / *Lophodytes cucullatus*
Lesser scaup / Aythyinae
Ring-necked duck / *Aythya collaris*

Shore Birds

Black tern / *Chlidonias niger*
Coot / *Fulica americana*
Franklin's gull / *Larus pipixcan*
Greater yellowlegs / *Tringa melanoleuca*
Killdeer / *Charadrius vociferus*
Lesser yellowlegs / *Tringa flavipes*
Sandhill crane / *Grus canadensis*
Solitary sandpiper / *Tringa solitaria*
Sora / *Porzana carolina*
Spotted sandpiper / *Actitis macularia*
Wilson's snipe / *Gallinago gallinago*

Birds of Prey

American kestrel / *Falco sparverius*
Bald eagle / *Haliaeetus leucocephalus*
Broad-winged hawk / *Buteo platypterus*
Cooper's hawk / *Accipiter cooperii*
Ferruginous hawk / *Buteo regalis*
Golden eagle / *Aquila chrysa*
Merlin / *Falco columbarius*
Northern goshawk / *Accipiter gentilis*
Northern harrier / *Circus cyaneus*
Peregrine falcon / *Falco peregrinus*
Prairie falcon / *Falco mexicanus*
Red-tailed hawk / *Buteo jamaicensis*
Sharp-shinned hawk / *Accipiter striatus*
Swainson's hawk / *Buteo swainsonii*

Summer Visitors

Alder flycatcher / *Empidonax alnorum*
American crow / *Corvus brachyrhynchos*
American goldfinch / *Carduelis tristis*
American pipit / *Anthus rubescens*
American redstart / *Setophaga ruticilla*
American robin / *Turdus migratorius*
Baltimore oriole / *Icterus galbula*
Bank swallow / *Riparia riparia*
Barn swallow / *Hirundo rustica*
Blue-headed vireo / *Vireo solitarius*
Brewer's blackbird / *Euphagus cyanocephalus*
Brown-headed cowbird / *Molothus ater*
Cedar waxwing / *Bombycilla cedrorum*

Chipping sparrow / *Spizella passerina*
Clay-colored sparrow / *Spizella pallida*
Cliff swallow / *Petrochelidon pyrrhonota*
Common yellowthroat / *Geothlypis trichas*
Eastern kingbird / *Tyrannus tyrannus*
Eastern phoebe / *Sayornis phoebe*
European starling / *Stumus vulgaris*
Golden-crowned kinglet / *Regulus satrapa*
Gray catbird / *Dumetella carolinensis*
Gray jay / *Perisoreus canadensis*
Hairy woodpecker / *Picoides villosus*
Hermit thrush / *Catharus guttatus*
Horned lark / *Eremophila alpestris*
House wren / *Troglodytes aedon*
Hummingbird / *Selasphorus sp.*
Lazuli bunting / *Passerina amoena*
Le Conte's sparrow / *Ammodramus leconteii*
Least flycatcher / *Empidonax minimus*
Lincoln's sparrow / *Melospiza lincolni*
Mountain bluebird / *Sialia currucoides*
Mourning dove / *Zenaidura macroura*
Northern flicker / *Colaptes auratus*
Northern rough-winged / *Stelgidopteryx erripennis*
Northern waterthrush / *Selurus noveboracensis*
Olive-sided flycatcher / *Contopus cooperi*
Orange crowned warbler / *Vermivora celata*
Ovenbird / *Seiurus aurocapillus*
Pine siskin / *Carduelis pinus*
Purple martin / *Progne subis*
Red breasted nuthatch / *Sitta canadensis*
Red-eyed vireo / *Vireo olivaceus*
Rose-breasted grosbeak / *Phencticus ludovicianus*
Ruby-crowned kinglet / *Regulus calendula*
Sapsucker- yellow bellied / *Sphyrapicus varius*
Sapsucker-red naped / *Sphyrapicus nuchalis*
Savannah sparrow / *Passerculus sandwichensis*
Say's phoebe / *Sayornis saya*
Song sparrow / *Melospiza melodia*
Sprague's pipit / *Anthus spragueii*
Swainson's thrush / *Catharus ustulatus*
Tennessee warbler / *Vermivora peregrina*
Townsend's solitaire / *Myadestes townsend*
Tree swallow / *Tachycineta bicolor*



Veery / *Catharus fuscescens*
Vesper sparrow / *Pooecetes gramineus*
Warbling vireo / *Vireo gilvus*
Western meadowlark / *Stumella neglecta*
Western tanager / *Piranga ludoviciana*
Western wood-pewee / *Contopus sordidulus*
White breasted nuthatch / *Sitta carolinensis*
White-crowned sparrow / *Zonotrichia leucophrys*
White-throated sparrow / *Zonotrichia albicollis*
Willow flycatcher / *Empidonax traillii*
Yellow warbler / *Dendroica petechia*
Yellow-rumped warbler / *Dendroica coronata*

Winter Visitors

Am. Tree sparrow ./ *Spizella arborea*
Bohemian waxwing / *Bombycilla garrulus*
Common redpoll / *Carduelis flammea*
Dark-eyed junco / *Junco hyemalis*
Evening grosbeak / *Coccothraustes vespertinus*
Gray-crowned rosy finch / *Leucosticte tephrocotis*
Gyr Falcon / *Falco rusticolus* (white morph)
Northern shrike / *Lanius excubitor*
Pine grosbeak / *Pinicola enucleator*
Red crossbill / *Loxia leucoptera*
Rough-legged hawk / *Buteo lagopus*
Snow bunting / *Plectrophenax nivalis*
Snowy owl / *Nyctea scandiaca*
White-winged crossbill / *Loxia leucoptera*

BUTTERFLIES

Skippers, Family Hesperidae

Arctic skipper / *Carterocephalus palaemon*
Dreamy dusky wing (spread-wing) / *Erynnis icelus*
European skipper / *Thymelicus lineola*
Garita skipper (folded-wing) / *Oarisma garita*
Long dash skipper (folded-wing) / *Polites mystic*

Swallowtails, Family Papilionidae

Anise swallowtail / *Papilio zelicaon* (nitra)
Pale swallowtail / *Papilio eurymedon*
Tiger swallowtail / *Papilio canadensis*

White and Sulphurs, Family Pieridae

Alfalfa sulphurs / *Colias eurytheme*
Cabbage white / *Pieris rapae*
Checkered white / *Pieris protodice*
Large marble / *Euchloe ausonides*
Western white / *Ponita occidentalis*

Gossamer-winged, Family Lycaenidae

Acmon blue / *Plebejus acmon*
Arctic blue / *Agriades franklinii*
Melissa blue / *Lycaeides melissa*
Silvery blue / *Glaucopsyche hydamus*
Western tailed blue / *Everes amyntula*

Brushfoots, Family Nymphalidae

Aphrodite fritillary / *Speyeria aphrodite*
Common alpine / *Erebia epipsodea*
Common wood nymph / *Ceryonis pegala*
Great spangled fritillary / *Speyeria cybele*
Green comma / *Polygonia faunus*
Milbert's tortoise shell / *Aglais milberti*
Mormon fritillary / *Speyeria mormonia*
Mourning cloak / *Nymphalis antiopa*
Painted lady / *Vanessa cardui*
Pearl crescent / *Phyciodes cocyta*
Red admiral / *Vanessa atalanta rubria*
Red disked alpine / *Erebia discoidalis*
Ringlet / *Coenonympha inornata*
Satyr anglewing / *Polygonia satyrus*
Small wood nymph / *Ceryonis oetus*
Silvery blue / *Glaucopsyche hydamus*

White admiral / *Limenitis arthemis*
Zephyr anglewing / *Polygonia zephyrus*
Western tailed blue / *Everes amyntula*

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White admiral / *Limenitis arthemis*
Zephyr anglewing / *Polygonia zephyrus*

FUNGI

Gilled Fungi

Blackfooted pax / *Paxillus atrotomentosus*
Common paxillus / *Paxillus involutus*
Destructive pholeota / *Pboleota destruens*
Dung mushroom / *Psilocybe merdaria*
Early morel / *Verpa bohemica*
Fairy ring / *Marasmius oreades*
Flat-top agarics / *Agaricus meleagris*
Fly agaric / *Amanita muscaria*
Honey mushroom / *Armillaria mellea*
Horse mushroom / *Agaricus arvensis*
Inky cap / *Coprinus atramentarius*
Japanese parasol / *Coprinus plicatilis*
Meadow mushroom / *Agaricus campestris*
Mica (inky) cap / *Coprinus micaceus*
Morel / *Morchella esculenta*
Oyster mushroom / *Pleurotus ostreatus*
Poison pie / *Hebeloma crustuliniforme*
Red-gilled cortinarius / *Cortinarius semisanguineus*
Round dung mushroom / *Psilocybe coprophila*
Shaggy mane / *Coprinus comatus*
Short-stemmed russula / *Russula brevipes*
Velvet foot / *Flammulina velutipes*
Western chevalier / *Tricholoma leucophyllum*
Woodland mushroom / *Agaricus silvicola*

Puffballs and Earthstars, Gasteromycetes

Beaked earth star / *Geastrum pectinatum*
Gem-studded puffball / *Lycoperdon perlatum*

Giant puffball / *Calvatia gigantea*
Golden puffball / *Bovista colorata*
Hygroscopic earth star / *Geastrum recolligens*
Lead-coloured puffball / *Bovista plumbea*
Pear-shaped puffball / *Lycoperdon pyriforme*
Small tumbling puffball / *Bovista pusilla*
Western giant puffball / *Calvatia booniana*



Coral Fungi

Comb tooth hericium / *Hericium ramosum*
Crown coral fungi / *Clavicornia pyxidata*

Sac Fungi, Ascomycetes

Brown -cup fungi / *Peziza repanda*
Red eyelash cup / *Scutellinia scutellata*

Slime Mold Fungi, Myxomycetes

Pink bead slime mold fungi / *Lycogala epidendron*
Slime mold / *Fuligo septica*

Sponge Mushroom, Boletes

Aspen bolete / *Leccinum insigne*
Black-leg / *Polyporus badius*
Bracket fungi / *Polyporus velpinus*
Giant mtn. polypore / *Bondarzewia montana*
Rusty gilled polypore / *Gloeophyllum saepiarium*
Smoky polypore / *Bjerkandera adusta*
Spring polypore / *Polyporus mori*

Bracket Fungi, Hymenomycetes

Artist's conk / *Ganoderma appplanatum*
False tinder conk / *Phellinus tremulae*
Hairy turkey tail / *Trametes hirsuta*
Hairy white shelf fungi / *Trametes pubescens*
Poplar polypore / *Trichoptum subchartaceum*
Red belt conk / *Fomitopsis pinicola*
Red wort fungi / *Peniophora rufa*
Silver leaf (purple) / *Stereum purpureum*
Splitgill / *Schizophyllum commune*
Tinder conk or horse hoof / *Fomes fomentarius*
Violet-pored bracket fungi / *Hirschioporus pargamenus*

LICHENS

Crust Lichen, Crustose

Common aspen lichen / *Arthonia patellulata*
Crusted orange lichen / *Caloplaca cerina*
Greyish green lichen / *Mycoblastus sanguinarius*
Orange rim lichen / *Caloplaca halocarpa*

Leaf Lichen, Foliose

Apple pelt lichen / *Peltigera malacea*
Brown lichen / *Parmelia albertana*
Brown wort lichen / *Melanelia subaurifera*
Candleflame lichen / *Candelaria concolor*
Culed snow lichen / *Flavocertraria cucullata*
Dog pelt lichen / *Peltigera canina*
Floury starburst lichen / *Parmeliopsis aleurites*
Frog pelt lichen / *Peltigera neoploydactyla*
Green speckleback lichen / *Parmelia flaventior*
Green starburst lichen / *Parmeliopsis ambigum*
Grey starburst lichen / *Parmeliopsis hyperopta*
Grey-eyed rosette lichen / *Physcia aipolia*
Hooded rosette lichen / *Physcia adscendens*
Lustrous brown lichen / *Parmelia exasperatula*
Monk's hood lichen / *Hypogymnia physodes*
No-hoods rosette lichen / *Physcia tenella*
Pelt lichen / *Peltigera elizabethae*
Pincushion orange lichen / *Xanthonia polycarpa*
Powder orange lichen / *Xanthonia fallax*
Powder sunshine lichen / *Cetraria pinastri*
Star rosette lichen / *Physcia stellaris*

Studded leather lichen / *Peltigera aptosa*
Temporary pelt lichen / *Peltigera didactyla*
Toad pelt lichen / *Peltigera scabrosa*
Waxpaper lichen / *Parmelia sulcata*

Club Lichen, Fruticose

Black foot lichen / *Cladonia phyllophora*
Mealy-pixie cup lichen / *Chlorophaea*
Pixie cup lichen / *Cladonia fimbriata*
Scarlet toothpick lichen / *Cladonia bacillaris*
Shrub funnel lichen / *Cladonia crispata*
Sieve cup lichen / *Cladonia multififormis*
Slender cup lichen / *Cladonia gracilis*
Stump cladonia / *Cladonia botrytes*
Tall toothpick lichen / *Cladonia subulata*
Tiny toothpick lichen / *Cladonia coniocraea*
Torneclug lichen / *Cladonia cariosa*

Shrub Lichen

Punctured gristle lichen / *ramalina dilacerata*
Reindeer lichen / *Cladina rangiferina*
Wolf lichen / *Letharia vulpina*

Hair Lichen

Black bear lichen / *Alectoria glabra*
Old man's beard lichen / *Usnea subfloridana*
Powdery old man's beard / *Usnea lapponica*
Scutfy beard lichen / *Usnea scabrata*
Simple horsehair lichen / *Bryoria simplicior*

PLANTS

Trees

Balsam poplar / *Populus balsamifera*
Blue spruce / *Picea pungens*
Flowering almond / *Prunus triloba*
Lodgepole pine / *Pinus contorta*
Mugo pine / *Pinus mugo*
Paper birch / *Betula papyrifera*
Siberian crabapple / *Malus baccata*
Trembling aspen / *Populus tremuloides*
Water birch / *Betula occidentalis*
White spruce / *Picea glauca*

Shrubs

Bearberry / *Arctostaphylos uva-ursi*
Bebb's willow / *Salix bebbiana*

Buckbrush / *Symphoricarpos occidentalis*
Canada buffaloberry / *Shepherdia canadensis*
Caragana / *Caragana arborescens*
Chokecherry / *Prunus virginiana*
Common juniper / *Juniperus communis*
Common lilac / *Syringa vulgaris*
Common wild rose / *Rosa woodsii*
Cotoneaster / *Cotoneaster acutifolia*
Creeping juniper / *Juniperus horizontalis*
European mountain ash / *Sorbus aucuparia*
Golden current / *Ribes aureum*
Low-bush cranberry / *Viburnum edule*
Mock orange / *Philadelphus sp.*
Northern black current / *Ribes hudsonianum*
Northern gooseberry / *Ribes oxycanthoides*
Prairie rose / *Rosa arkansana*
Prickly rose / *Rosa acicularis*
Pussy willow / *Salix discolor*
Red-osier dogwood / *Cornus stolonifera*
Round-leaved hawthorn / *Crataegus rotundifolia*
Saskatoonberry / *Amelanchier alnifolia*
Shining willow / *Salix lucida*
Shrubby cinquefoil / *Potentilla fruticosa*
Smooth willow / *Salix glauca*
Snowberry / *Symphoricarpos albus*
Spiraea / *Spiraea betulifolia*
Spreading dogbane / *apocynum androsaemifolium*
Tartarian honeysuckle / *Lonicera tartarica*
Wild black current / *Ribes americanum*
Wild red current / *Ribes triste*
Wolf willow / *Elaeagnus commutata*
Yellow willow / *Salix lutea*
Hooker's cinquefoil / *Potentilla hookeriana*

Woody Vines

Purple clematis / *Clematis occidentalis*
Twining honeysuckle / *Lonicera dioica*

Flowering Plants (Herbs)

Lily, Liliaceae

Death camas / *Zigadenus venenosus*
Fairybells / *Disporum trachycarpum*
False solomon's-seal / *Smilacina racemosa*
Nodding onion / *Allium cernuum*
Prairie onion / *Allium textile*
Star-flowered solomon's-seal / *Smilacina stellata*

Twisted-stalk / *Streptopus amplexifolius*
Western wood lily / *Lilium philadelphicum*
White camas / *Zigadenus elegans*

Iris, Iridaceae

Blue-eyed grass / *Sisyrinchium montanum*

Orchid / Orchidaceae

Blunt-leaved bog orchid / *Habenaria obtusata*
Bracted bog orchid / *Habenaria viridis*
Green bog orchid / *Habenaria hyperborea*
Northern twayblade / *Listera borealis*
Pale coralroot / *Corallorhiza trifida*
Round-leaved orchid / *Orchis rotundifolia*
Spotted coralroot / *Corallorhiza maculata*
Striped coralroot / *Corallorhiza striata*
Yellow lady's-slipper / *Cypripedium calceolus*

Nettle, Urticaceae

Common nettle / *Urtica dioica*

Sandalwood / Santalaceae

Pale comandra / *Comandra umbellata*

Buckwheat / Polygonaceae

Alpine bistort / *Polygonum viviparum*
Bind weed / *Polygonum convolvulus*
Common knotweed / *Polygonum arenastrum*
Curly dock / *Rumex crispus*
Garden rhubarb / *Rheum rhabotanicum*
Golden dock / *Rumex maritimus*

Goosefoot / Chenopodiaceae

Green sorrel / *Rumex acetosa*
Lamb's quarters / *Chenopodium album*
Maple-leaved goosefoot / *Chenopodium gigantospermum*
Narrow-leaved dock / *Rumex tangulivalis*
Oak-leaved goosefoot / *Chenopodium salinum*
Rabbit-foot knotweed / *Polygonum monspeliense*
Russian pigweed / *Axyris amarantoides*
Russian thistle / *Salsola kali*
Spear-leaved goosefoot / *Monolepis nuttalliana*
Striate knotweed / *Polygonum erectum*
Western dock / *Rumex occidentalis*
Yellow umbrella plant / *Eriogonum flavum*

Amaranth / Amaranthaceae

Red-root pigweed / *Amaranthus retroflexus*

Pink / Caryophyllaceae

Bladder campion / *Silene cucubalis*
Blunt-leaved sandwort / *Moehringia lateriflora*
Common trailing chickweed / *Stellaria media*
Fleshy chickweed / *Stellaria crassifolia*
Glandular m-e chickweed / *Cerastium vulgatum*
Long-leaved chickweed / *Stellaria longifolia*
Long-stalked chickweed / *Stellaria longipes*
Mouse-eared chickweed / *Cerastium arvense*
Night-flowering catchfly / *Silene noctiflora*
Parry's catchfly / *Silene parryi*

Buttercup / Ranunculaceae

Baneberry / *Actaea rubra*
Canada anemone / *Anemone canadensis*
Cut-leaved anemone / *Anemone multifida*
Early buttercup / *Ranunculus glaberrimus*
Graceful buttercup / *Ranunculus inamoenus*
Heart-leaved buttercup / *Ranunculus cardiophyllus*
Long-fruited anemone / *Anemone cylindrica*
Low larkspur / *Delphinium bicolor*
Macoun's buttercup / *Ranunculus macounii*
Northern buttercup / *Ranunculus pedatifidus*
Prairie buttercup / *Ranunculus rhomboides*
Prairie crocus / *Anemone patens*
Seaside buttercup / *Ranunculus cymbalaria*
Small-flowered buttercup / *Ranunculus abortivus*
Tall buttercup / *Ranunculus acris*
Tall larkspur / *Delphinium glaucum*
Veiny meadow rue / *Thalictrum venulosum*

Poppy / Papaveraceae

Iceland poppy / *Papaver nudicaule*

Fumitory / Fumariaceae

Golden corydalis / *Corydalis aurea*

Mustard / Brassicaceae

Annual draba / *Draba nemorosa*
Ball mustard / *Neslia paniculata*
Bird-rape / *Brassica campestris*
Bitter cress / *Cardamine pensylvanica*
Common peppergrass / *Lepidium densiflorum*
Dog mustard / *Erucastrum gallicum*
Drummond's rockcress / *Arabis drummondii*
Flixweed / *Descurainia sophia*
Gray tansy mustard / *Descurainia richardsonii*

Green tansy mustard / *Descurainia pinnata*
Hairy rockcress / *Arabis hirsuta*
Marsh yellow cress / *Korippa palustris*
Reflexed rockcress / *Arabis bolboellii*
Sand rocket / *Diploaxis muralis*
Shepherd's-purse / *Capsella bursa-pastoris*
Small-flowered prairie rocket / *Erysimum inconspicuum*
Stinkweed / *Thlaspi arvense*
Tall hedge mustard / *Sisymbrium loeselii*
Tower mustard / *Arabis glabra*
Tumbling mustard / *Sisymbrium altissimum*
Wild radish / *Raphanus raphanistrum*
Wormseed mustard / *Erysimum cheiranthoides*

Saxifrage / Saxifragaceae

Bishop's cap / *Mitella nuda*
Richardson's alumroot / *Heuchera richardsonii*

Grass of parnassus / Parnassiaceae

Grass-of-parnassia / *Parnassia palustris*

Rose / Rosaceae

Agrimonia / *Agrimonia striata*
Brook cinquefoil / *Potentilla rivalis*
Early cinquefoil / *Potentilla concinna*
Graceful cinquefoil / *Potentilla gracilis*
Hooker's cinquefoil / *Potentilla bookeriana*
Large-leaved yellow avens / *Geum macrophyllum*
Plains cinquefoil / *Potentilla bipinnatifida*
Prairie cinquefoil / *Potentilla pensylvanica*
Purple avens / *Geum rivale*
Rough cinquefoil / *Potentilla norvegica*
Running raspberry / *Rubus pubescens*
Silverweed / *Potentilla anserina*
Three-flowered avens / *Geum triflorum*
White cinquefoil / *Potentilla arguta*
Wild raspberry / *Rubus idaeus*
Wild strawberry / *Fragaria virginiana*
Wooly cinquefoil / *Potentilla hippiana*
Yellow avens / *Geum aleppicum*

Pea / Fabaceae

Alfalfa / *Medicago sativa*
Alpine hedysarum / *Hedysarum alpinum*
Alsike clover / *Trifolium hybridum*
American milk-vetch / *Astragalus americanus*
Ascending milk-vetch / *Astragalus striatus*
Bird's-foot trefoil / *Lotus corniculatus*





Black medick / *Medicago lupulina*
Cicer milk-vetch / *Astragalus cicer*
Cream-colored peavine / *Lathyrus ochroleucus*
Drummond's milk-vetch / *Astragalus drummondii*
Early yellow locoweed / *Oxytropis sericea*
Elegant milk-vetch / *Astragalus encosmus*
Golden bean / *Thermopsis rhombifolia*
Ground plum / *Astragalus crassicaarpus*
Indian breadroot / *Psoralea esculenta*
Indian milk-vetch / *Astragalus aboriginum*
Late yellow locoweed / *Oxytropis monticola*
Loose-flowered milk -vetch / *Astragalus tenellus*
Northern hedysarum / *Hedysarum boreale*
Onobrychis / *Onobrychis vicifolia*
Purple milk-vetch / *Astragalus dasyglottis*
Purple prairie clover / *Petalostemon purpureum*
Red clover / *Trifolium pratense*
Reflexed locoweed / *Oxytropis deflexa*
Showy locoweed / *Oxytropis splendens*
Silky lupine / *Lupinus sericeus*
Tufted vetch / *Vicia cracca*
White clover / *Trifolium repens*
White sweet clover / *Melilotus alba*
Wild licorice / *Glycyrrhiza lepidota*
Wild vetch / *Vicia americana*
Yellow hedysarum / *Hedysarum sulphurescens*
Yellow sweet clover / *Melilotus officinalis*

Geranium / Geraniaceae

Sticky purple geranium / *Geranium viscosissimum*
White geranium / *Geranium richardsonii*

Flax / Linaceae

Wild blue flax / *Linum lewisii*

Milkwort / Polygalaceae

Seneca-root / *Polygala senega*

Spurge / Euphorbiaceae

Leafy spurge / *Euphorbia esula*

Violet / Violaceae

Bog violet / *Viola nephrophylla*
Early blue violet / *Viola adunca*
Wood violet / *Viola canadensis*
Yellow prairie violet / *Viola nuttallii*

Evening Primrose / Onagraceae

Common fireweed / *Epilobium angustifolium*
Enchanter's nightshade / *Circaea alpina*
Glandular willowherb / *Epilobium glandulosum*
Marsh willowherb / *Epilobium palustre*
Northern willowherb / *Epilobium ciliatum*
Scarlet butterfly-weed / *Gaura coccinea*
Yellow evening primrose / *Oenothera biennis*

Carrot / Apiaceae

Caraway / *Carum carvi*
Cow parsnip / *Heracleum lanatum*
Heart-leaved alexanders / *Zizia aptera*
Snake-root / *Sanicula marilandica*
Squawroot / *Perideridia gairdneri*
Sweet cicely / *Ozymorhiza depauperata*
Water hemlock / *Cicuta maculata*
Water parsnip / *Sium suave*

Dogwood / Cornaceae

Bunchberry / *Cornus canadensis*

Wintergreen / Pyrolaceae

Common pink wintergreen / *Pyrola asarifolia*
Greenish-flowered wintergreen / *Pyrola chlorantha*
One-flowered wintergreen / *Moneses uniflora*
One-sided wintergreen / *Orthilia secunda*

Heath / Ericaceae

Bearberry / *Arctostaphylos uva-ursi*

Primrose / Primulaceae

Fairy candelabra / *Androsace septentrionalis*
Shooting star / *Dodecatheon conjugens*
Saline shooting star / *Dodecatheon pulchellum*
Fringed loosestrife / *Lysimachia ciliata*

Gentian / Gentianaceae

Marsh gentian / *Lomatogonium rotatum*
Northern gentian / *Gentianella amarella*
Prairie gentian / *Gentiana affinis*

Phlox / Polemoniaceae

Moss phlox / *Phlox hoodii*
Narrow-leaved collomia / *Collomia linearis*

Borage / Boraginaceae

Blue-bur / *Lappula squarrosa*
Comfrey / *Symphytum officinale*
Fringed puccoon / *Lithospermum incisum*
Hound's-tongue / *Cynoglossum officinale*
Large-flowered stickseed / *Hackelia floribunda*
Stickseed / *Hackelia americana*
Tall lungwort / *Mertensia paniculata*
Yellow puccoon / *Lithospermum ruderale*

Vervain / Verbenaceae

Carpet vervain / *Verbena bracteata*

Mint / Lamiaceae

American hedge-hyssop / *Gratiola neglecta*
Bergamot / *Monarda fistulosa*
Hemp nettle / *Galeopsis tetrahit*
Marsh hedge-nettle / *Stachy palustris*
Marsh scullcap / *Scutellaria galericulata*
Wild mint / *Mentha arvensis*

Nightshade / Solanaceae

Black henbane
Wild tomato / *Solanum triflorum*

Figwort / Scrophulariaceae

American brooklime / *Veronica americana*
Bracted lousewort / *Pedicularis bracteosa*
Butter and eggs (toad-flax) / *Linaia vulgaris*
Common red paintbrush / *Castilleja miniata*
Elephant-head / *Pedicularis groenlandica*
Lilac-flowered beardtongue / *Penstemon gracilis*
Owl's-clover / *Orthocarpus luteus*
Smooth blue beardtongue / *Penstemon nitidus*
Wandering veronica / *Veronica peregrina*
Yellow paintbrush / *Castilleja lutescens*
Yellow rattle / *Rhinanthus minor*

Broom-rape / Orobanchaceae

Clusterd broom-rape / *Orobanche fasciculata*

Plantain / Plantaginaceae

Common plantain / *Plantago major*

Madder / Rubiaceae

Northern bedstraw / *Galium boreale*
Small bedstraw / *Galium trifidum*

Sweet-scented bedstraw / *Galium trilorum*

Honeysuckle / Caprifoliaceae

Twin-flower / *Linnæa borealis*

Bluebell / Campanulaceae

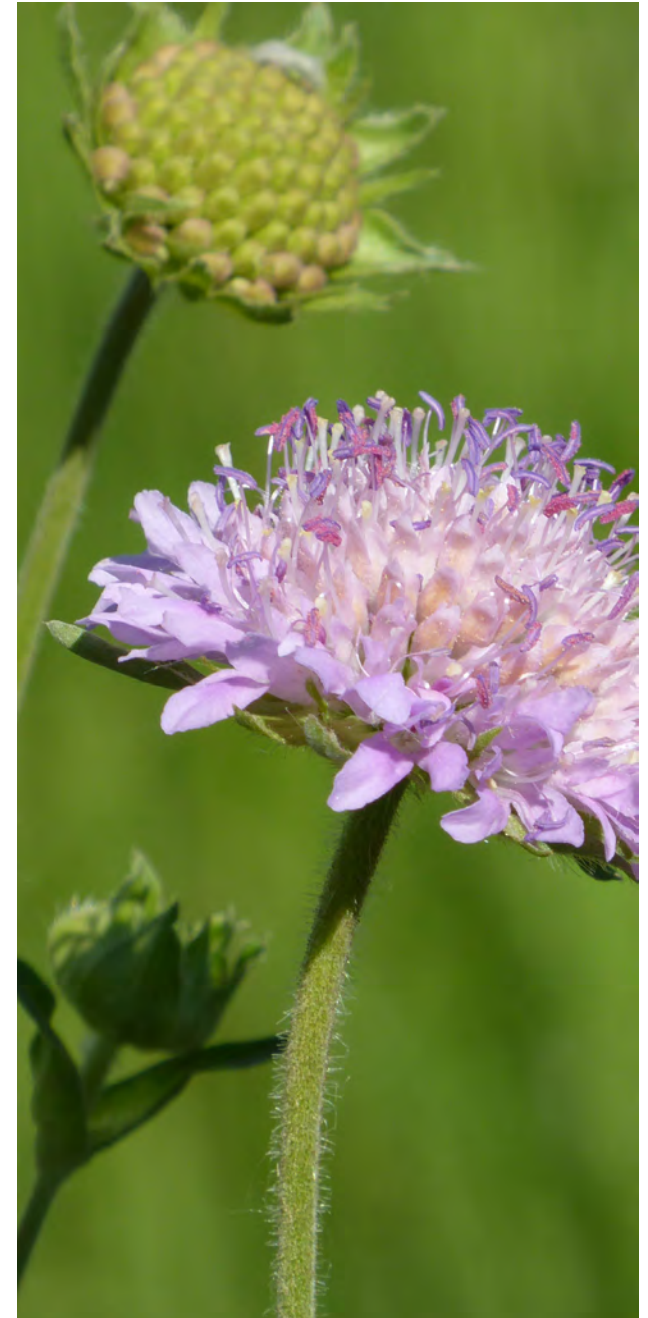
Harebell / *Campanula rotundifolia*

Teasel / Dipsacaceae

Field scabious / *Knautia arvensis*

Composite / Asteraceae

Absinthe wormwood / *Artemisia absinthium*
Annual hawk's-beard / *Crepis tectorum*
Arrow-leaved coltsfoot / *Petasites sagittatus*
Balsam groundsel / *Senecio pauperculus*
Biennial sage / *Artemisia biennis*
Blazing star / *Liatris punctata*
Bull thistle / *Cirsium vulgare*
Canada thistle / *Cirsium arvense*
Common blue lettuce / *Lactuca pulchella*
Common burdock / *Arctium minus*
Common dandelion / *Taraxacum officinale*
Common Goat's-beard / *Tragopogon dubius*
Common groundsel / *Senecio vulgaris*
Common tall sunflower / *Helianthus nuttallii*
Common yarrow / *Achillea millefolium*
Creeping white prairie aster / *Aster falcatus*
Dragonwort / *Artemisia dracunculus*
Entire-leaved groundsel / *Senecio integerrimus*
Flodman's thistle / *Cirsium flodmanii*
Gaillardia / *Gaillardia aristata*
Giant goldenrod / *Solidago gigantea*
Green-leaved pussytoes / *Antennaria neglecta*
Hairy golden aster / *Heterotheca villosa*
Heart-leaved arnica / *Arnica cordifolia*
Leafy arnica / *Arnica chamissonis*
Leafy-bracted aster / *Aster subspicatus*
Lindley's aster / *Aster ciliolatus*
Low goldenrod / *Solidago missouriensis*
Low pussytoes / *Antennaria aprica*
Marsh aster / *Aster borealis*
Marsh ragwort / *Senecio congestus*
Meadow aster / *Aster campestris*
Meadow goat's-beard / *Tragopogon pratensis*





Narrow-leaved hawkweed / *Hieracium umbellatum*
Narrow-leaved sunflower / *Helianthus maximiliani*
Nodding beggarticks / *Bidens cernua*
Palmate-leaved coltsfoot / *Petasites palmatus*
Pasture sage / *Artemisia frigida*
Perennial smooth sow thistle / *Sonchus uliginosus*
Perennial sow thistle / *Sonchus arvensis*
Pineappleweed / *Matricaria matricaroides*
Pink pussytoes / *Antennaria rosea*
Plains sage / *Artemisia campestris*
Prairie sage / *Artemisia ludoviciana*
Rhombic-leaved sunflower / *Helianthus subrbomboideus*
Showy aster / *Aster conspicuus*
Showy fleabane / *Erigeron speciosus*
Showy goldenrod / *Solidago nemoralis*
Silvery groundsel / *Senecio canus*
Small-leaved pussy / *Antennaria parvifolia*
Smooth aster / *Aster laevis*
Smooth fleabane / *Erigeron glabellus*
Spiny sow thistle / *Sonchus asper*
Stiff goldenrod / *Solidago rigida*
Tall pussytoes / *Antennaria anaphaloides*
Tufted fleabane / *Erigeron caespitosus*
Tufted white prairie aster / *Aster ericoides*
Vine-leaved coltsfoot / *Petasites vitifolius*
Wandering fleabane / *Erigeron peregrinus*
Wavy-leaved thistle / *Cirsium undulatum*
Western aster / *Aster ascendens*
Western willow aster / *Aster hesperius*
Yellow false dandelion / *Agoseris glauca*

AQUATIC PLANTS

Free Floating

Duckweed / Lemnaceae
Common duckweed / *Lemna minor*
Star duckweed / *Lemna trisulca*

Submergent Plants

Pondweed / Potamogetonaceae
Linear-leaved pondweed / *Potamogeton strictifolius*
Small-leaved pondweed / *Potamogeton pusillus*
Thread-leaved pondweed / *Potamogeton filiformis*
Hornwort / Ceratophyllaceae
Coontail hornwort / *Ceratophyllum demersum*
Buttercup / Ranunculaceae
White water buttercup / *Ranunculus circinatus*
Yellow water buttercup / *Ranunculus gmelinii*

Water-starwort / Callitrichaceae
Vernal / water-starwort / *Callitriche verna*

Watermilfoil, Halogagaceae

Spiked water milfoil / *Myriophyllum exalbescens*
Water milfoil / *Myriophyllum verticillatum*

Buckwheat, Polygonaceae

Water smartweed / *Polygonum amphibium*

Emergent Plants

Cattail, Typhaceae

Common cattail / *Typha latifolia*

Buttercup, Ranunculaceae

Celery-leaved buttercup / *Ranunculus sceleratus*

Mare's-tail, Hippuridaceae

Common mare's-tail / *Hippuris vulgaris*

Bur-reed, Sparganiaceae

Narrow-leaved bur-reed / *Sparganium angustifolium*

Arrowgrass, Juncaginaceae

Seaside arrowgrass / *Triglochin maritima*
Slender arrowgrass / *Triglochin palustris*

Rush, Juncaceae

Knotted rush / *Juncus nodosus*
Slender rush / *Juncus tenuis*
Toad rush / *Juncus bufonius*
Wire or Baltic rush / *Juncus balticus*

Grass, Poaceae

Awnead wheatgrass / *Agropyron trachycaulum*
Barnyard grass / *Echinochloa crusgalli*
Blue grama grass / *Bouteloua gracilis*
California oat grass / *Danthonia californica*
Columbia needle grass / *Stipa columbiana*
Crested wheatgrass / *Agropyron pectiniforme*
Early blue grass / *Poa cusickii*
Fowl blue grass / *Poa palustris*
Fowl manna grass / *Glyceria striata*
Foxtail barley / *Hordeum jubatum*
Fringed brome grass / *Bromus ciliatus*
Green needle grass / *Atipa viridula*
Hairy wild rye / *Elymus innovatus*
Hooker's oat grass / *Helictotrichon hookeri*
June grass / *Koeleria macrantha*

Kentucky bluegrass / *Poa pratensis*
Little bluestem grass / *Schizachyrium scoparium*
Marsh reed grass / *Calamagrostis canadensis*
Meadow foxtail / *Alopecurus pratensis*
Needle and thread grass / *Stipa comata*
Nodding brome grass / *Bromus anomolus*
Northern brome / *Bromus inermis ssp. Pumpellianis*
Northern reed grass / *Calamagrostis inexpansa*
Northern wheatgrass / *Agropyron dasystachyum*
Parry oat grass / *Danthonia parryi*
Plains reed grass / *Calamagrostis montanensis*
Prairie muhly / *Muhlenbergia cuspidata*
Quack grass / *Agropyron repens*
Reed canary grass / *Phalaris arundinacea*
Rough fescue / *Festuca scabrella*
Sand reed grass / *Calamovilfa longifolia*
Sheep fescue / *Festuca ovina*
Slough grass / *Beckmannia syzigachne*
Smooth brome grass / *Bromus inermis*
Sweet grass / *Hierochloa odorata*
Tall manna grass / *Glyceria grandis*
Timothy grass / *Phleum pratense*
Water foxtail / *Alopecurus aequalis*
Western porcupine grass / *Stipa curtiseta*
Western wheatgrass / *Agropyron smithii*
Wild oat / *Avena fatua*
Witch grass / *Panicum capillare*

Sedge, Cyperaceae

Awned sedge / *Carex atherodes*
Beaked sedge / *Carex rostrata*
Beautiful sedge / *Carex coccinea*
Bebb's sedge / *Carex bebbii*
Blunt sedge / *Carex obtusata*
Capitate sedge / *Carex capitata*
Common bulrush / *Scirpus validus*
Creeping spike rush / *Eleocharis palustris*
Douglas sedge / *Carex douglasii*
Golden sedge / *Carex aurea*
Graceful sedge / *Carex praegracilis*
Great bulrush / *Scirpus acutus*
Hairy-fruited sedge / *Carex lasiocarpa*
Lens-fruited sedge / *Carex lenticularis*
Low sedge / *Carex stenophylla*
Needle spike rush / *Eleocharis acicularis*
Northern bog sedge / *Carex gynocrates*
Richardson's sedge / *Carex richardsonii*
Sartwell's sedge / *Carex sartwellii*

Short sedge / *Carex canescens*
Small-flowered bulrush / *Scirpus microcarpu*
Sprengel's sedge / *Carex sprengelii*
Sun-loving sedge / *Carex pennsylvanica*
Thick-spike sedge / *Carex microptera*
Thread-leaved sedge / *Carex filifolia*
Water sedge / *Carex aquitilis*
Woolly sedge / *Carex lanuginosa*

SPORE PRODUCING PLANTS

Spikemoss, Selaginellaceae

Little spikemoss / *Selaginella densa*
Horsetail / Equisetaceae
Common horsetail / *Equisetum arvense*
Smooth horsetail / *Equisetum laevigatum*
Variegated horsetail / *Equisetum variegatum*

Fern / Polypodiaceae

Fragile fern / *Cystopteris fragilis*
Smooth cliff break fern / *Pellaea glabella*

MOSES AND LIVERWORTS, BRYOPHYTES

Feather Moss, Pleurocarpous Moss

Beautiful beak moss / *Eurhynchium pulchellum*
Delicate willow moss / *Amblystegium serpens*
Forest grass moss / *Brachythecium salebrosum*
Hill grass moss / *Brachythecium campestre*
Red-stem moss / *Pleurozium schreberi*
River tufa moss / *Cratoneuron filicinum*
Sickle moss / *Saniona uncinata*
Stair-step moss / *Hylacomium splendens*
Stocking moss / *Pylaisiella polyantha*
Wiry fern moss / *Abietinella abietina*

Acrocarpous Moss

Bristle (blunt-leaved) moss / *Orthotrichum obtusifolium*
Bristle (sharp-leaved) moss / *O. speciosum*
Fire (purple horn-toothed) moss / *Ceratodon purpureus*
Hairy screw moss / *Tortula ruralis*
Pale-leaved thread moss / *Pohlia wahlenbergii*
Paper lantern moss / *Plagiommium speciosum*
Red foot moss / *Bryoerythrophyllum recurvirostre*
Screw (twisted) moss / *Tortula mucronifolia*

Liverworts, Hepatics

Cedar-shake liverwort / *Plagiochila asplenoides*
Green-tongue liverwort / *Marchantia polymorpha*



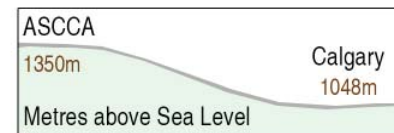
APPENDIX B Maps of the Ann & Sandy Cross Conservation Area

VEGETATION



Distance from ASCCA to Calgary south boundary: 1.6 km
 Distance from ASCCA to Calgary city centre: 30 km

TOPOGRAPHY



- ▭ Manmade Reservoirs
- Buildings
- Springs
- ▭ Water

SUPPORT



Financial and in-kind support is essential to our success.

If you are interested in partnership opportunities, please contact:

Greg Shyba, CEO
Ann & Sandy Cross Conservation Area
403-931-4070

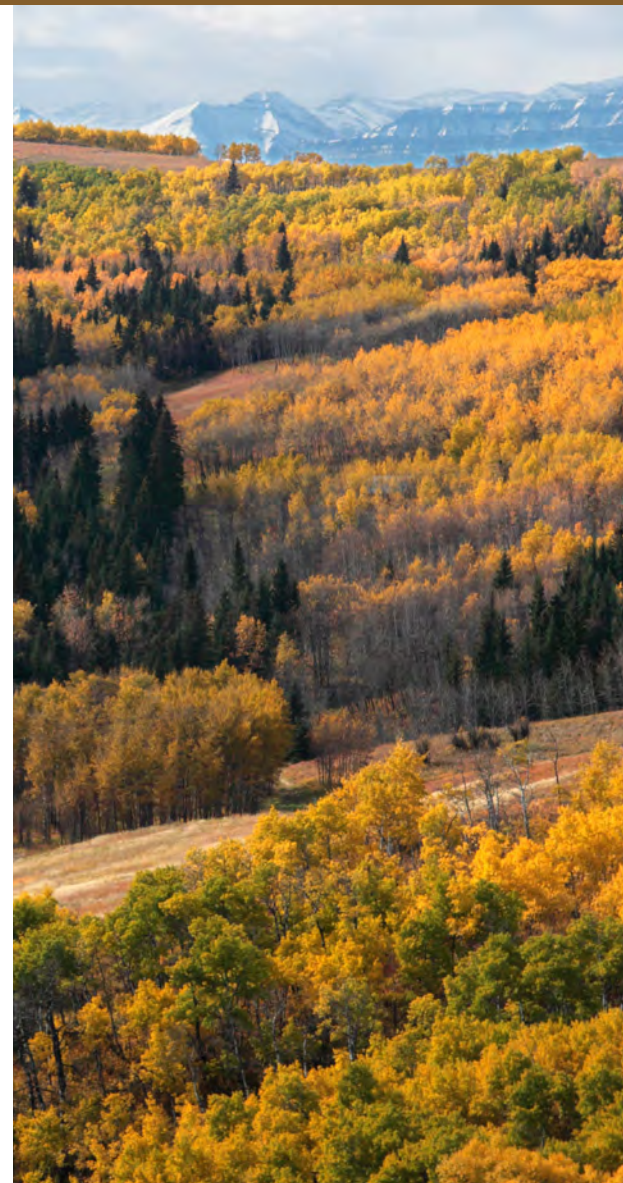
gshyba@crossconservation.org

To make a donation, please visit our donation page.



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