

A Case for Protecting Native Grasslands

Prepared by the Society of Grasslands Naturalists March 2020.

Introduction

The purpose of this document is to provide information to support the protection of native grasslands, which are also referred to as rangelands, prairie wool, and unbroken prairie. It is the hope that future generations can continue to reap the harvests of good planning, wise investment, and stewardship

This document has been prepared by request after informal discussion with planning officials at the public presentation about the Brier Run development. However, the information gathered is generally applicable also to other patches of native grasslands in Medicine Hat and Area.

The following relevant observations have been gathered from publications by, and conversations with the Society of Grasslands Naturalists, SEAWA, “Cows & Fish”, and instructors in environmental awareness and education in the field of ecology.

Some people wonder about the importance of protecting native grasslands and riparian areas in city and suggest that conservation efforts are better applied to the vast landscapes of natural prairie that exist in the Crown and private ranchlands in Southern Alberta. Grassland Naturalists believes that everyone in all jurisdictions needs to contribute to the protection and conservation of native grasslands and riparian areas. In doing so, the City can obtain return on their investment from ever increasing valuation of the natural capital. We have a few remaining large patches of intact native grasslands and several smaller patches of native grasslands. Some of the areas within these native grassland types may be disturbed (modified).

A traditional financial business case for conserving natural areas is difficult to create for specific instances of unbroken prairie. Instead general estimates of the monetary value ecological services of grasslands are listed. However, planning decisions on specific spaces must also be guided by qualitative considerations important to humans, as well as long-term health of communities of all species that rely on natural spaces.

Historically, the comprehensive Medicine Hat River Valley Study (1977) made important recommendations for the City of Medicine Hat to create a backbone of protected natural spaces from which appropriate development could radiate. The study recommends that: “All replotting reviews and special studies should include thorough consideration of the recommendations in this report and should be structured to complement and implement them.” (pp. 167). Recommendations in the River Valley Study and those in this document are in harmony, though the latter covers a larger scope.

Within the City of Medicine Hat, and the tri-municipal area, native grasslands are found in both small and large patches in Ranchlands, Police Point Park, Burnside, Echo Dale, Brier Run, Ross

Creek, Hillsides, and West of the City including the Echo Dale Regional Park. The City's Parks and Recreation has in place a number of stewardship strategies and actions that support the protection of native grasslands in specific parks, namely, Police Point Park, Echo Dale Park, and Ranchlands Environmental Reserve. Native grasslands also grow near creeks and rivers such as Seven Persons and the South Saskatchewan River. The plant communities vary, depending on whether they are on upland sandy soils, on sunny or shady sides of coulees, or near water.

However, today these and other native grasslands are at a higher risk to being disturbed. Development within, or close to these grasslands and seeding of non-native species that are aggressive and invasive, such as crested wheatgrass, Kentucky bluegrass, and Cicer milk-vetch. Some of seed may be unintentionally introduced by the purchase of environmentally friendly seed that has not been screened through a certificate of analysis (e.g. weeds and noxious grasses such as downy brome). All acres of native grasslands in southern Alberta, including Medicine Hat are important to invest in and will benefit the city and its taxpayers for present and future generations

Three important phenomena form the basis for the need to launch strategies immediately to protect grasslands.

- A. Ecological Services. Native grasslands including riparian area are an important source of Natural Capital and provide many Ecological Services.
- B. Risk. Native grasslands in SE Alberta, and indeed throughout the world, are at risk. Grasslands are the most rapidly disappearing ecosystem. Conservation areas need to be in place before development plans can responsibly proceed. The City of Medicine Hat has the present opportunity to identify and put in place strategies and actions that will help protect native grasslands, including riparian areas, that will form a backbone around which future urban development can expand, for the mutual benefit of present and future generations of people and other species.
- C. Urgency. Many development plans as well as the MDP and IDP are in process without prior commitments to conserve natural space. Both the climate and biodiversity emergencies are products of cumulative effects of local actions everywhere. We all at every level, from household to municipality to nation, need to do our part to learn, plan and act responsibly. Attention to every bit of unbroken prairie will prevent further unexpected loss of our natural heritage. All acres of native grasslands in southern Alberta, including Medicine Hat are important to invest in and will benefit the city and its taxpayers for present and future generations

The following pages expand on the above three phenomena.

A. ECOLOGICAL SERVICES and NATURAL CAPITAL

The protection of the native grasslands can return significant economic, environmental and social benefits.

Native grasslands provide many ecological goods and services such as pollination, carbon storage, clean air and water supply, climate regulation, erosion control, nutrient cycling, waste treatment, gas regulation, disturbance prevention, medicinal resources and biodiversity. Furthermore, the topography and geology of Medicine Hat area present unique vistas, along with opportunities for nature study, academic research, and activities that promote health, wellness and enjoyment, including activities that augment education, culture and spirituality, and recreational activities such as walking and biking on trails, wildlife and scenic art and photography.

Researches have estimated monetary values for the ecological services performed by native grasslands. Two examples follow.

Sarah J. Wilson, 2009 estimates the value of British Columbia native grassland's carbon storage to be \$21 million per year or about \$28.38/ha (Sarah J. Wilson, 2009). In addition, Wilson estimates native grassland pollination at \$1,109/ha/yr based on 0.74 million hectares. In Alberta, it is estimated that native grasslands store from 50 to 200 tons per ha in the soil. Total organic carbon in the 7 million hectares of native grasslands in Alberta is equivalent to about three times the current annual emissions of all greenhouse gases in Canada (E. Bremer, 2008).

The University of Manitoba valued their grasslands at \$411.6 Million/year based on 2.4 million hectares. Ecosystem goods and services valuation included: carbon storage, nutrient cycling, water regulation, soil erosion control, soil formation, waste treatment, recreation and aesthetics (\$40.7 Million/year), and refugium function. Note: university also added an additional \$524.6 Million per year for forage production.

The Natural Capital Coalition defines natural capital as “the stock of renewable and non-renewable resources (e.g. plants, animals, air water, soils, minerals) that combine to yield a flow of benefits to people. Natural capital is a stock, and from it flows ecosystem services or benefits. These services (where service is defined as a system supplying a public need) can provide economic, social, environmental, cultural, spiritual and (happiness) benefits. The value of these benefits can be understood in qualitative or quantitative (including economic) terms, depending on context. Biodiversity is an essential component of natural capital stocks and an indicator of their condition and resilience. Biodiversity itself benefits directly to people.”

Protecting and restoring native grasslands in our city is an investment that will have long-term benefits and will only increase in value with time. Similarly, the tri-municipal agreement for areas surrounding Medicine Hat should also name the unbroken grassland areas as highly valuable in the natural state and

worthy of protection from disturbance. To do this collaboration, partnerships, and funding will need to be explored together with Medicine Hat College, Grasslands Naturalists, and SEAWA as well as local businesses and governments at all levels to address and reduce the negative impacts and cumulative effects on native grasslands.

Ranchlands Environmental Reserve 2 F & G



Burnside 2020



B. NATIVE GRASSLANDS ARE AT RISK

1. **Native grasslands** and riparian areas are at risk in all of southern Alberta. Of the estimated original 4.78 million ha in the Dry Mixedgrass Natural Subregion (dominant native grassland east of Lethbridge/Bassano and south of Hanna/Oyen all the way to the U.S. border) today about 2 million ha or 43% of these native grasslands remain (B. Adams 2013). These natural landscapes are further at risk today from human caused disturbances including: invasive and noxious species, development, and inadequate stewardship and protection safeguards.
2. Native grasslands in the City of Medicine Hat are also at risk to disturbance, development and the invasion of weedy and agronomic species such as baby's breath, crested wheatgrass, turf grasses, downy brome, and leafy spurge. Furthermore, riparian areas in the city are affected by the aggressive advancement of the invasive Russian olive tree. Much of the natural vegetation in Medicine Hat and area has already been lost to invasive species, lack of care, encroachment, agriculture, and developments on or near natural areas.
3. Cultivated grasslands such as tame pastures and turf grasses, and modified native grasslands² do not perform ecological goods and services as well as native grasslands. For example, the amount of carbon storage is less in cultivated/disturbed grasslands because of soil exposure, cultivation, and shallower root systems.
4. **Disturbance and invasives.** Native grasslands in the City are at risk to disturbance, development and the invasion of weedy and agronomic species such as baby's breath, crested wheatgrass, turf grasses, downy brome, and leafy spurge. Furthermore, riparian areas in the city are affected by the aggressive advancement of the invasive Russian olive tree.

5. On their weekly walks, members of the Society of Grasslands Naturalists have observed that many of the City's native grasslands are at risk due to disturbance and resulting modification. The end result of such a process are unhealthy native grasslands².
6. **Loss of ecological services.** Disturbed (modified) native grasslands (those with a high % of non-native plants) and human developed grasslands such as turf grasses and crested wheatgrass hillsides do not provide the values, uses, and benefits of the complex plant community that exist in native grasslands. They have reduced biodiversity, more susceptible to wind and water erosion, less carbon storage (root systems are shallower), and thus result in lower return on natural capital investment.
7. Disturbed and turf grasslands are more costly to maintain, requiring regular mowing, watering, fertilizer and weed control.
8. Native grasslands are adapted to the natural environment and climate. They do benefit from periodic "grazing", however, not to the extent that turf grasses require. Healthy, native grasslands are less susceptible to the invasion of noxious and weedy species.
9. Modified native grasslands³ have lost a good percentage of their biodiversity, structure and ecological services. Therefore they are at risk to reduced watershed performance, increased costs related to wind and water erosion, less carbon storage and increased greenhouse gas emissions, reduced pollination, and a decline in habitat quality and populations of many species that are already threatened in the grasslands areas. In addition, a loss in native grasslands translates into a loss of genetic and landscape biodiversity.
10. Such environmental reserves support and allow for compatible passive recreation and learning opportunities such as walking/biking, wildlife watching, and courses.

² Unhealthy native grasslands are those lands with an ecological health score of < 50%, which is a significant loss of biodiversity and ecosystem function (B. Adams 2016)

³ Modified native grasslands are native grasslands with > 70% non-native species and invasive and noxious weed species may be present, as well as human-caused bare soil (B. Adams, 2016).



Example of Hillside native grassland and riparian area along South Saskatchewan River near Echo Dale Regional Park. Photo courtesy of Ian Wallis, 2018.

C. URGENCY

Climate change and reduction in biodiversity are experienced globally, regionally and personally. While individual actions seem miniscule in the big picture of global trends, it is by the actions of every individual and municipality that a healthier environment for people and other species can be experienced.

The City's Parks and Recreation has in place a number of stewardship strategies and actions that support the protection of native grasslands in specific parks, namely, Police Point Park, Echo Dale Park, and Ranchlands Environmental Reserve. However, today these and other native grasslands are at a higher risk to being disturbed. For example development within these grasslands, development close to these grasslands, and seeding of non-native species that are aggressive and invasive, such as crested wheatgrass, Kentucky bluegrass, and Cicer milk-vetch. Some of seed, (e.g. weeds and noxious grasses such as downy brome) may be introduced by the purchase of environmentally friendly seed that is not screened through a certificate of analysis. In partnership with organizations and homeowners, we need to collaborate on many fronts to address and reduce the negative impacts and cumulative effects on native grasslands



Invasive Species. On left is Yellowhead (*Inula helenium*) and Eurasian buckthorn on right. Russian Olive is located in the background in both pictures. Photos courtesy of John Slater, 2019.

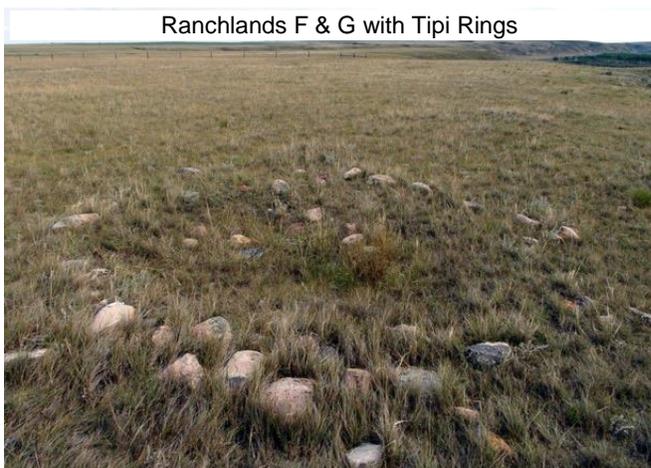
STRATEGIES, ACTIONS and RECOMMENDATIONS

We believe that municipalities have a responsibility to exercise good stewardship of natural spaces, whether they be riparian areas near water, coulees, or areas of amazing complex communities of native plants on flat land in the upper regions. Leading by example is the best way to encourage citizens likewise to be good stewards of land and the species that dwell there.

The 1976 River Valley Study commissioned by the city of Medicine Hat provides abundant information and recommendations for designating areas where diligent conservation and restoration efforts are made to provide a “backbone” of natural spaces in advance of development plans so that development does not (unintentionally) interrupt and destroy the natural treasure that we enjoy today and wish to preserve for future generations.

■ Recommendations for Specific Areas and Issues

1. General requirements to identify, protect and conserve native grasslands must be integrated into present municipal plans, strategies and action plans. For example, a section about the unbroken native prairie and requirements to identify and protect native grasslands should be included in the new Municipal Development Plan, the Tri-Municipal Development Plan, the Integrated Pest Management Plan, and the Echo Dale Regional Park Renewal Plan.



2. **Burnside:** Protect the hillside native grasslands and maintain at least 100 meter (reference 12) Associates set back from the coulee edge to prevent soil erosion and related human-caused disturbances. Plan single loaded scenic drives to maintain public access to the scenery and paths (an example is McCutcheon Drive in NW and Taylor Drive in the south). Provide a buffer between the housing developments and native grasslands in the Burnside Area Structure Plan, so that disturbance and invasion of noxious plants are minimized.
2. **Echo Dale Regional Park Plan:** Protect and restore the native grassland hills and area located south of the crested wheatgrass flats. And protect and restore riparian areas along the South Saskatchewan River and associated coulee draws.
3. **Environmental Education and Monitoring in the Environmental Reserve at Ranchlands 2 F & G:** Permit environmental education activities by schools, Medicine Hat College, and the MH Interpretive Program (Proponents to submit an application and plan to be approved by the City). Environmental measurements and sampling may be taken over several years for such metrics as biomass production, species presence and cover, monitoring of invasive species,

pollinators and wildflowers, and, in general, the many ecological services provided. This will also require support from Canada Environment and other mentors and granting agencies.

4. **Environmental awareness and education** in other areas such as Kin Coulee Park, Police Point Park, Brier Run, and Ross Creek should be encouraged. Support community programs that increase appreciation, health and commitment to care. Examples might be a program to adopt a park, or organize neighborhood path & park learning activities such as wildflower and butterfly walks, and participate in neighborhood clean-ups and weed pulls.
5. **Weed Bylaw and Integrated Pest Management Plan:** Upgrade the bylaw and develop plans to prevent the establishment and spread of noxious and invasive species in the tri-municipal area. A fully funded and effective bylaw for weed control enforcement can help further protect native grasslands and reduce weed control costs by the City and property owners. It will be wise to begin with protection, and education programs that advise citizens of a more alert response, by citizens and bylaw officers alike, to the presence of weeds. Implementation and compliance can be enhanced through partnerships with other organizations. All municipal departments, schools, homeowners, businesses, and industry have a need to become skilled at identification, prevention and control of invasive species. In some cases, this may require solutions “made in Medicine Hat”. For example, the issue of non-regulated and invasive species Russian olive trees dominating the ravines/coulees, riparian areas, and also starting to establish in open grassland (not good for SAR species requiring an open prairie). How do we make an amendment in the City’s weed bylaw to not protect this tree, and how do we include this invasive tree in the integrated pest management plan?
6. An **Ecosystem Goods and Services Study** the Tri-Municipal Area should be developed in partnership with Grasslands Naturalists, SEAWA and other organizations with an interest in environmental sustainability to give a more complete economic view of the value of green spaces relative to their costs to protect, conserve, and steward. This study could inform the decisions for the Municipal, Integrated Pest Management, and EDRP Plans and related bylaws.
7. **Collaboration and Benefits.** Positive cumulative effects for many economic, environmental and social values and uses can result from collaboration and partnership of governments at the federal, provincial, and local scales. All acres of native grasslands in southern Alberta, including Medicine Hat are important to invest in and will benefit the city and its tax payers for present and future generations.

General Recommendations for Grasslands Protection in Tri-Municipal area.

1. **Develop and implement** a stewardship maintenance plan in order to maintain the ecological function of these grasslands so that the ecological goods and service continue to flow and provide the wide array of values, uses and benefits to the community.

2. **Identify and Protect** the larger patches of native grasslands from human-caused disturbance and development. Areas proposed for designated protection include native grasslands found in the Burnside and Brier Run Area Structure Plans, Ross Creek hillsides, Ranchlands, Police Point Park, and Echo Dale Regional Park. These protection areas also include associated riparian areas. Identify and protect our native grasslands NOW for the well-being of present and future generations of citizens at home, at work and at play. Protecting the larger patches of native grasslands from further disturbance and development and the implementation of a stewardship maintenance plan can help to maintain the ecological function of these grasslands and provide the wide array of values, uses and benefits.

Protection means not allowing any further human-caused development or disturbance in native grasslands, and controlling spread of invasive species. The management and control of invasive and noxious species to increase the health, biodiversity, and ecological services of problematic and modified native grasslands.

3. Build a **GPS native grassland inventory** and classification map for the Tri-Municipal development area. This data and map will help governance and decision making regarding the protection of native grasslands in Medicine Hat.

4. Identify by GPS the boundaries of environmentally friendly activities such as walking/biking, wildlife watching and specific areas that are rich in educational value. People in the Society of Grasslands Naturalists can be good partners for that task. Strategically placed durable signage can provide a means to educate the public.

5. Integrate into specific municipal plans, strategies and action plans the general requirements to **identify, protect and conserve native grasslands**. For example, requirements to identify and protect native grasslands should be included in the new Municipal Development Plan, the Tri-Municipal Development Plan, the Integrated Pest Management Plan, and the Echo Dale Regional Park Renewal Plan.

6. Collaboration and partnering with government at the federal, provincial, and local scales and with NGOs in the community can produce a positive cumulative effect with regard to the protection, restoration, and educational opportunities.

7. Support and approve environmental awareness and education programs for High Schools, Medicine Hat College, and MH Interpretive Program in the Ranchlands Environmental Reserve 2 F & G. This approval would also include the associated riparian area found below this ER.

8. Establish partnerships to monitor the ecology of native grasslands so they can continue to function in a healthy state. Possible partner organizations might include Grasslands Naturalists, SEAWA, Prairie Conservation Forum, and municipal departments and boards such as Investment Medicine Hat, Parks and Recreation Department, and UERAB.

9. Facilitate a stewardship culture of low-impact recreation activities on existing paths, such as walking, hiking, bird watching, bicycling, and photography. Such activities would increase awareness of the beauty and function of native prairie grasslands, especially if appropriate signage were strategically placed. Also, where development occurs use Low Impact Development standards as guided by Alberta Low Impact Development Partnership.

10. **Funding.** Limited budget and poor support for possible increasing of taxes to cover any costs related to implementing the stated recommendations is a challenge. However, it can be accomplished by the development of a course/fine filter approach to the stewardship of native grasslands. Protection of these native grasslands is of highest priority. This will require effort and partnership with organizations such as SEAWA and the Grassland Naturalists. City property owners will require increased awareness and education and becoming partners in making wise choices to gardening, i.e. not purchasing invasive species, controlling any present invasive species, and reporting any noxious/invasive species. The recent goat project to help control leafy spurge is a good example of thinking outside of the box to address invasive species and their spread into native grasslands and riparian areas. Grants and other funding mechanisms need to be explored to help addressing the protection and healthy ecological functioning of native grasslands. Funding can be obtained through partnership funding applications with businesses such as Methanex, Co-Op and Toronto Dominion.

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