



**COMMUNITY CONSERVATION PLAN**  
for the  
**Colgate Prairie Important Bird Area**

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## Executive Summary

This Community Conservation Plan for the Colgate Prairie was prepared as part of Saskatchewan's Important Bird Areas (IBA) Program. In this program, special areas are awarded an Important Bird Area designation for conservation purposes if the areas are used by large concentrations of birds, if birds present are at risk, or if the sites represent intact biomes and their natural bird inhabitants have restricted ranges.

Colgate Prairie is a 75 km<sup>2</sup> area on the Trossachs Plain in the moist mixed grasslands ecoregion of southeastern Saskatchewan. Most of the land (Lomond #3 pasture, 88%) is Crown owned and administered by the Prairie Farm Rehabilitation Administration (PFRA), 9% is privately owned and 3% is provincial Crown land. Dominant soils are loamy brown Chernozems with "severe limitations" for agriculture and best suited for grazing or perennial forage crops.

Colgate Prairie is of primary importance to Burrowing Owls, Ferruginous Hawks and grassland shorebirds and songbirds. Burrowing Owls are endangered in Canada and Ferruginous Hawks are considered vulnerable. In the IBA ranking, this site is of national importance.

The objectives of this plan are to draw attention to the importance of Colgate Prairie and to encourage continued sustainable grazing for the benefit of birds and farmer pasture-patrons. This plan should also bring stakeholders together to

chart a future course to achieve these goals. Specific recommendations include:

- Maintain native grasslands and nearby permanent cover;
- Monitor range condition to be able to adapt to potential changes in vegetation especially in view of potential climate change;
- Assist schools and other local organizations to explain the value of the pasture;
- Continue or increase monitoring of bird numbers and reproduction, and related ecosystem parameters; and
- Encourage research in those specific areas that satisfy information needs or relate to future management and potential threats.

The IBA Program was launched initially by BirdLife International in the U.K. Today there are BirdLife Partners in over 100 countries. In Canada the national partners are the Canadian Nature Federation and Bird Studies Canada. In Saskatchewan, the conservation component of this program is being delivered by Nature Saskatchewan. Funding partners of this Community Conservation Plan include the Canadian Millennium Partnership Program, Canadian Adaptation and Rural Development Saskatchewan (CARDS), the University of Saskatchewan, Saskatchewan Environment and Resource Management (SERM), the U. S. National Fish and Wildlife Foundation and Ducks Unlimited Canada.

## 1. Introduction

Bird conservation is not 'just for the birds.' In a widely acknowledged and visionary treatment of the causes, human uses and the state of decline of diverse life forms on Earth, E.O. Wilson (1992) suggests that certain species will and should receive special attention. Wilson points out that individual species, which may be large and colourful or otherwise charismatic, often are conservation favorites even though they represent a small fraction of living things. Such species, Wilson claims, can motivate conservation at many levels, from individual to government. Since no species exists in isolation from other species or its environment, such conservation efforts already in the first instance serve to protect elements of a functioning life support system. If human economic, cultural and social values are adopted in addition to species and ecosystems concerns, the conservation efforts will come 'full circle' and have gone well beyond the birds.

It is hoped that this report may provide a significant impetus for further conservation by

- i) explaining why Colgate Prairie is 'important,'



- ii) describing the local grassland ecosystems of which the birds are a part;
- iii) reviewing appropriate literature, considering what is known but also speculating as to the potential impact of what is not known;
- iv) anticipating opportunities and concerns across as many elements of the natural system as possible; and
- v) outlining opportunities and challenges for conservation and listing stakeholders and contact people (Appendix 1).

## 1.1 Why protect birds?

Surveys of human values and economic impacts have shown that birds have attracted the attention of many people in Saskatchewan and around the World. In a 1991 survey, 83.3% of Canadians reported that "maintaining abundant wildlife is very or fairly important" (Filion et al. 1993). Globally, 62% of people surveyed in 1990 in 42 countries reported "strong approval" for the ecology movement (Nevitte 1996). These human values are more than wishful thinking to many people. A survey in Saskatchewan in 1996 showed that 74% of the population was involved in indirect nature-related activities (through media, visiting zoos, purchasing art and the like), and 15% of the population participated in trips specifically to view wildlife ([www.ec.gc.ca/nature](http://www.ec.gc.ca/nature)). These data signal a change in values by which we rank the worth of humans and wildlife, an expansion of the 'human-

animal boundary' (Cartmill 1993). These changing world views represent both a responsibility and an opportunity. It will be the conservation planner's role to help formulate a scenario in which these new opportunities are realized.

This community conservation plan focuses on the Colgate Prairie (Fig. 1), on the Trossachs Plain of the moist mixed-grass ecoregion of south-central Saskatchewan. The area is considered important because it holds relatively high densities of Burrowing Owls (*Speotyto<sup>1</sup> cunicularia*) and Ferruginous Hawks (*Buteo regalis*) which are considered endangered and vulnerable, respectively, in Canada.

## 1.2 Possible approaches to bird protection

The Colgate Prairie deserves special consideration because of the comparatively high densities of threatened birds, the area's use by many grassland songbirds, and the rarity of continuous blocks of grasslands particularly in the moist mixed grass ecoregion.

The grassland's existence is not an accident. It is an outcome of Canada's prairie settlement pattern at a time when our nation attempted to come to grips with the limits of

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<sup>1</sup> The name of this owl's genus has been changed repeatedly by ornithologists. Judging by the shape and number of chromosomes, the Burrowing Owl is unique and given its own genus *Speotyto*. Considering the species appearance and ecology, it is similar to other small owls of the genus *Athene*.

European- style agriculture in a water-starved land (Sect. 5.2). By protecting the grassland's ability to remain productive and function naturally, we are conserving birds, an ecosystem and grassland ecovars<sup>2</sup> which are valuable in their own right. We are also supporting low-input and efficient beef production.

Biodiversity conservation is often perceived in the short-term as a drain on an industry, and usually wrongly so.<sup>3</sup> The current agricultural crisis is severe and not due to bird protection initiatives. On the contrary, birds are indicators of environmental sustainability and ecosystem health. The approach taken here is that there are many genuine and long-term solutions that are good for both birds and farmers. An ecosystem healthy enough for birds is also of

benefit more broadly to Saskatchewan's outdoor oriented people (Sect. 1.1).

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<sup>2</sup> plant varieties that are uniquely adapted to the local ecological conditions.

<sup>3</sup> According to statistics, farmers in the Redberry Lake IBA (Appendix 3) spend less on insect pest control than farmers in adjacent R.M.s. Although this question has not been critically examined, both farmers and biologists accept that this may be due to the thousands of gulls that nest on islands in Redberry Lake and fly out to feed in the surrounding fields.

An example of how landscape conservation can save municipal costs was provided by Salzman (1998) who writes: "Perhaps surprisingly, at the moment ecosystem services are rarely included in agency cost-benefit analyses or policy debates. We explicitly value and place dollar figures on 'ecosystem goods' such as timber and fish. Yet the services underpinning these goods have no value - not because they are worthless but rather there is no market to capture and express their monetary value directly.

Replacement costs offer the clearest method to provide dollar values for ecosystem services. Thus, when New York City was faced with drinking water that failed Environmental Protection Agency standards, it chose to invest \$ 1-1.5 billion in the natural restoration of the Catskills Mountains watershed rather than construction of a \$ 6-8 billion water treatment plant."

Fig. 1

At the Colgate Prairie Important Bird Area (IBA), at the foot of the Missouri Coteau,<sup>4</sup> agriculture is the dominant landscape modifier. Bird conservation is intricately tied to developments in agriculture. Agricultural land uses have a tradition of change in prairie Canada (Sect. 5.2) and will continue to evolve. The people of the of Trossachs Plain exhibit a pattern of lifestyle and land use that is an outcome of complex forces. Such forces do change over time and people respond with their personal choices according to social and economic necessities, and regulations and incentives. The IBA planning process should examine such barriers and rewards and attempt to shape these where possible for win-win solutions.

Effective conservation should include all elements of the natural system, and also the human elements. A participatory, community-based research and management system might be adopted. Kramer's (1986) model of community-based research and action outlines several stages that cannot be skipped: need -> interest -> involvement -> ownership -> commitment -> collaboration. An important characteristic in this process is the sharing of power. Weeks and Packard (1997) have illustrated how several barriers arising from a top-down management style have hampered conservation success.

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<sup>4</sup> Going westward, the Missouri Coteau is an abrupt step-like rise onto the second prairie plain (steppe) with a total of two plains rising from the Manitoba lowlands toward the Rocky Mountains. This Coteau's band of hill-and-dale landscape extends northwesterly across southern Saskatchewan. The first prairie step or escarpment lies near the eastern edge of southern Saskatchewan.



## 2 IBA Site Information

Colgate Prairie IBA (#SK013; Latitude 49° 24' N, Longitude 103° 52' W, 608 m above sea level) lies southeast of the town of Colgate, and about 25 km south of the city of Weyburn, Saskatchewan. Glacial ice margins covered the area 16,000 years ago, leaving behind a plain with a mix of boulders, gravel, sand, silt and clay.

In eco-geographic terms, Colgate Prairie lies in the prairie ecozone of Saskatchewan (241,030 km<sup>2</sup>), within the moist mixed grass prairie ecoregion (67,890 km<sup>2</sup>, 11% of Saskatchewan lands), approximately 50 km southeasterly of the higher elevation aspen parkland ecoregion (81,570 km<sup>2</sup>). Within mixed prairie, Colgate Prairie lies in the Trossachs plain ecodistrict (3,000 km<sup>2</sup>). A mere 5 km southwest, the Trossachs and adjacent plains give way to the hill-and-dale landscape of the Missouri Coteau.

Virtually the entire Trossachs Plain is level except for the shallow valleys of Jewel and Roughbark Creeks. These creeks flow easterly into the Souris River. Long Creek approximates the western boundary of Trossachs plain and eventually also joins the Souris River. Ultimately, the waters of the Souris River drain into Hudson Bay. It is one of the southernmost rivers that is part of the Arctic Ocean's watershed.

Dominant soils are loamy brown Chernozems,<sup>5</sup> with little or no slope. This plain merges with the clayey Regina Plain to the north. The rating of soil capability for agriculture is Class 4 which includes "soils with severe limitations which are best suited to the production of perennial forage crops; improvement practices are feasible" (Fung et al. 1999:218). The limitation is mainly due to poor soil structure and/or permeability. Water erosion risk is low and wind erosion risk moderate (Fung et al. 1999).

The IBA is called Colgate Prairie to include both Lomond #3 pasture and the small areas of native vegetation (12%) outside of the pasture boundaries (Fig.2). The village of Colgate<sup>6</sup> is located 3 km NE of Lomond #3 pasture. Lomond #3 is locally known as the Maxim pasture, because its headquarters are located adjacent to the ghost town of Maxim,

<sup>5</sup> Chernozem is a Russian word for the dark-coloured soil of grasslands.

<sup>6</sup> According to Barry (1998) "Village (PO 1910-) south of Weyburn on #35.

The residents of the district asked the Canadian Northern Railway for Bellville or Bell City, after the local school district (Bell No. 1629). Whether these were rejected by the post office or the railway is unknown. The railway's planned siding name had been INGLEFORD (Lori Ingell farmed at 12-6-15-W2 where there was a ford over the Roughbark Creek, hence Ingell's Ford, after a nearby rural post office (1908-26). What prompted the change to Colgate is unknown. It is possible the railway chose to honour William Colgate (1783-1857), the American industrialist and philanthropist whose name lives on on toothpaste shelves around the World. There is also a village called Colgate near Crawley, West Sussex, England. Soon after it opened, Colgate absorbed Stinson (6-5-14-W2), 1910-12), which was named for George H. Stinson, its only postmaster."

where the north and south pasture blocks join  
(Fig. 2).

Fig 2

The birds on the Colgate Prairie no doubt mix with those on nearby pastures. The entire complex of grassland 'islands' (Fig. 2) is important, as are small patches of native habitat throughout Trossachs Plain, although to a lesser extent. Nearby community pastures are 32 km<sup>2</sup> (Brokenshell #2), 151 km<sup>2</sup> (Laurier) and 91 km<sup>2</sup> (Lomond #1).

Monthly mean temperatures are 19° C in July and -14° C in January. Mean annual precipitation is 35-40 cm, with most occurring in June and July (Fung et al. 1999).

## 2.1 Mixed prairie.

Thorpe (in Fung et al. 1999:136-137)

writes: "The boundary between Aspen Parkland and Mixed Prairie represents a transition in which tree cover becomes insignificant within areas of natural vegetation. Occasional aspen groves south of this line tend to be tiny rings around water bodies, making up much less than one percent of the land area. Also associated with this transition is the decline of fescue prairie as a major community type, leaving mixed prairie as the dominant type. Mixed prairie covers the drier part of the dark brown soil zone as well as the brown soil zone.

'Mixed prairie' is so called because it is a mixture of midgrasses and shortgrasses. The leaves of midgrasses reach heights of 20 to 30 cm. The most important species are Western Porcupine Grass, Needle-and-Thread<sup>7</sup>, Green

Needle Grass, Northern Wheat Grass, and Western Wheat Grass. June Grass and Plains Reed Grass are intermediate in size between midgrasses and shortgrasses. Most of the foliage of shortgrasses is below a height of 10 cm. The most common grass is Blue Grama, while there are a variety of short, grass-like sedges: Low Sedge, Sun-loving Sedge and Threadleaved Sedge. Of a large number of associated broad-leaved species, the most abundant are Pasture Sage, Moss Phlox, Scarlet Mallow, Small-leaved Everlasting, and Prairie Crocus. Broad-leaved herbs make up a small proportion of the biomass of mixed prairie as long as it is not overgrazed, although brightly coloured flowering herbs such as Golden-bean and milkvetches (*Astragalus* spp.) appear conspicuous in spring. Beneath the grasses and forbs there is usually a mat-like ground cover of low clubmoss.

Fire was probably a frequent agent of disturbance in the natural mixed prairie. Burns still occur occasionally, but the recovery of grasses by sprouting from buds at or below the ground surface is fairly rapid. An external force which continues to control the prairie is variation in weather. Droughts are more frequent and more severe in the grassland than in the forest. Research has shown shifts in the proportions of moisture-demanding species (e.g. Western Porcupine Grass, Northern Wheat Grass) and drought-tolerant species (e.g. Needle-and-Thread, Blue Grama) in response to weather cycles. Long-term monitoring of research areas has shown ten-fold variation in annual grass production depending on precipitation.

Another great source of variation in mixed prairie is the degree of impact by livestock grazing. Heavy cattle grazing discriminates against the midgrasses, the foliage of which is tall and easily accessible. Decreases in the proportion of midgrasses allow increases of the shorter species, including Blue Grama, June Grass, and sedges. However, the midgrass Needle-and-Thread also increases relative to the somewhat larger Western Porcupine Grass. Most of the broadleaf species such as Pasture

<sup>7</sup> On 4 April 2001, Minister Pat Laurier introduced legislation to amend the Saskatchewan Honours and Emblems Act to recognize Needle-and-Thread as Saskatchewan's official grass species. This action was spearheaded by the Saskatchewan's Prairie Conservation Action Plan (Sect. 2.2.6). The White-tailed Deer became the provincial animal and curling Saskatchewan's official sport.

Sage are unpalatable to cattle and so are more conspicuous in heavily grazed prairie. However, there are a few broad-leaved species such as Winterfat that are palatable and act as deersers."

## 2.2 Existing conservation measures

The ecosystem and the grassland birds of the Colgate Prairie owe their persistence in large measure to their own ingenuity, but also to conservation values among people, and to legal protection. The legal statutes and policies outlined below have been complemented by specific conservation initiatives outlined in Section 5.4. Agricultural adaptation and changing policies are described in Section 5.2).

**2.2.1 Federal and provincial acts.** In the late 1800s and early 1900s it became increasingly clear that migratory waterfowl were on the decline. Market hunting was quickly identified as a cause, but the other major cause, habitat loss, was not well recognized. Legislated migratory bird protection passed the United States Senate in 1913. In 1916, Canada and the United States signed the Migratory Birds Treaty. The *Migratory Birds Convention Act* passed

Parliament in 1917. Mexico signed the Migratory Birds Treaty in 1936 (Foster 1978).

The *Migratory Birds Convention Act* and its regulations give Environment Canada the authority to protect migratory birds, and control seasons and bag limits for hunted species. Soon after the Act passed Parliament, the first Dominion ornithologist was hired. Bird management was under the Parks Branch until the section of the branch administering the Act became the Canadian Wildlife Service in 1947.

The province of Saskatchewan brought its legislation quickly into line with the *Saskatchewan Wildlife Act*, as did most of the other provinces. The *Canada Wildlife Act* of 1973 further cemented a partnership in conservation between the federal government, and the provinces and territories.

In addition to its traditional responsibilities in the area of fish, wildlife and parks management, the Government of Saskatchewan has recently passed the *Wildlife Act 1997* (replacing the *Wildlife Act*) to include Species at Risk. The province has also created *The Conservation Easements Act 1997* (Section 5.4.3) and introduced the Representative Areas Network (Section 2.4.1).

**2.2.2 The proposed Species-at-Risk Act.** Environment Canada Minister David Anderson introduced the newest version of the act, Bill-C5, in January 2001, replacing Bill-C33. Previous

versions of this act expired when elections had been called. The new act prevents the direct killing of endangered species anywhere in Canada, and offers protection for the species and its 'home' on federal land. On lands of other jurisdictions, protection is a matter of negotiation. Provinces were encouraged to implement their own act. Saskatchewan has done so in 1997 (Sect 2.2.1).

The main objective of this proposed legislation, according to Minister Anderson, is to help prevent wildlife in Canada from becoming extinct and to provide for the recovery of species now at risk. However, the proponents of stronger legislation point out there are a series of political loopholes that reduce the effectiveness of the proposed Act.

The Act recognizes the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as the body to provide a public record of species recommended for listing. However, the final say as to which of the species will actually receive protection rests with the Environment Minister and Cabinet, not biologists. When the listing of a species is approved by Cabinet, species recovery plans will be prepared, but the implementation of such plans is again at the discretion of the government. Therefore, the preservation of habitat which is usually identified in recovery plans and an integral part of any meaningful action, is not mandatory, but subject to a political decision. The Minister recognized these shortcomings but felt that it was important

to make some concessions to obtain greater buy-in by stakeholders.

Minister Anderson has accepted a proposed mechanism of compensation for landowners in the event that species protection comes into unequivocal conflict with resource use. The Government's 2000 budget contained a commitment of \$90 million over three years, and stabilized funding of \$45 million in subsequent years for the protection of species at risk. Also, a new habitat stewardship program, has already started to contribute approximately \$5 million to over 60 partnership projects.<sup>8</sup> Provisions will also make it easier for Canadians to donate ecologically sensitive lands and easements by reducing the capital gains arising from such donations through the EcoGifts Program.

A recent survey by Pollara indicates that many Canadians are willing to restrict mining and logging activities, leave lands undeveloped, and even accept fewer tax cuts to protect wildlife; 45% stating that "...tax cuts are nice, but legislation to protect wildlife is more important." Of those surveyed, 66% said they "strongly supported" a law to protect endangered species, while another 28% said they "somewhat supported" such a law -- for a total support of 94%.

**2.2.3 Canadian Biodiversity Strategy.** The authors of the Canadian Biodiversity Strategy

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<sup>8</sup> One of these projects is carried out on the Sandoff Lake, and Chaplin-Old Wives lakes IBA (Appendix 3).

defined "biodiversity" as "the variety of species and ecosystems on Earth and the ecological processes of which they are part" (Anonymous 1995). Diversity is broadly defined including genetic and species diversity, diversity in ecological function (e.g. ground water recharge, plant production, soil building) and diversity among ecosystems (e.g. land-based, water-based).

The goals of the Canadian Biodiversity Strategy are to:

- conserve biodiversity and use biological resources in a sustainable manner;
- improve our understanding of ecosystems and increase our resource management capability;
- promote an understanding of the need to conserve biodiversity and use of biological resources in a sustainable manner;
- maintain or develop incentives and legislation that support the conservation of biodiversity and the sustainable use of biological resources; and
- work with other countries to conserve biodiversity, use biological resources in a sustainable manner and share equitably the benefits that arise from the utilization of genetic resources (Anonymous 1995).

A Saskatchewan Biodiversity Action Plan is being drafted. This plan places biodiversity conservation goals in a provincial context.

**2.2.4 Saskatchewan's Representative Areas Network.** Text in this section was provided by Nancy Cherney, Fish and Wildlife Branch,

Saskatchewan Environment and Resource Management .

Saskatchewan has established a network of ecologically important land and water areas across the province, through a system called the Representative Areas Network (RAN). This system started with a base of sites totaling nearly 3 million hectares (7.4 million acres) including national and provincial parks, wildlife refuges, and ecological and other reserves in the province. Working from this solid foundation, Saskatchewan's Representative Areas Network expanded by about 50 per cent in less than three years!

One of the primary goals of the RAN program is to protect biodiversity - the richness and variety of life - by selecting and designating areas representative of Saskatchewan's natural ecological diversity. An objective and consistent method for assessing this diversity was developed to guide representative area identification. Notably, an enduring features approach to define the range of diversity in Saskatchewan was selected. Enduring features, such as specific rock, soil and land form patterns, are considered to be very stable over long periods of time and are likely to contain characteristic plant and animal communities. Classifying the province into different enduring feature groupings and measuring the level of protection already afforded to specific landscape types (and associated plant and animal communities) highlighted deficiencies in terms of protection. Landscape types with little or no protection were rated a high priority for action in the RAN.

This scientific approach for selecting representative areas was blended with the wealth of local knowledge gathered through land use planning and other community-based consultation processes. Suggestions and needs identified through these processes also help determine the kinds and levels of activity that may occur within designated sites. Regulations developed as a result govern activities in each site and are intended to reflect the diversity of goals and values that are meant to be protected.

Representative area designation is flexible, supporting many resource pursuits such as trapping, hunting, and fishing. However, site management seeks to curb activities like commercial logging, road construction and mining or petroleum exploration and development, particularly within Crown land sites. The intention is to ensure long-term resource protection within representative areas by minimizing disturbance and degradation.

Crown lands administered by Saskatchewan Environment and Resource Management may be designated according to any one of a number of legislative options. Depending on features/values to be protected and the level of use to be continued within a site, choices include Ecological Reserves, Provincial Parks (several categories), Protected Areas or Wildlife Refuges. From August, 1997 to March 31, 2000, about 500,000 hectares of Crown land were formally designated and added to the Network - 4 ecological reserves, several parkland reserves, 1 protected area, and 1 wildlife refuge.

Private lands and lands not under Environment and Resource Management's administration are also important within the network and can be managed or guided through the use of partnership agreements, memoranda of understanding or conservation easements. These types of arrangements enable the department to work closely with partners and private landowners to ensure maintenance of the long-term health of the soil, water, plants, animals, and other parts of the ecosystem. From August, 1997 to March 31, 2000, some 1.2 million hectares of private land and lands not administered by SERM were included in the Network through voluntary partnerships.

Government commitment to live up to the challenge of establishing a Representative Areas Network for the people of Saskatchewan remains strong. Public discussions for proposed representative areas are proceeding in order to bring together a mix of perspectives on the particular lands and to identify the full range of values that may need long-term protection. As these discussions conclude and site boundaries are finalized, the Network will continue to grow and offer opportunities for education, research and the enjoyment of Saskatchewan residents, today and for generations to come.

**2.2.5 North American Bird Conservation Initiative.** Conservation plans, including the present one, are wish lists - but not without important functions. They can coordinate the will

and strategies between different people/programs. The North American Bird Conservation Initiative is a 'super strategy' that attempts to unify various bird conservation initiatives and create national and international partnerships (Fig 3). It is the role of IBA and others to foster complementary local partnerships.

Different conservation plans focus on different levels (national vs. provincial, birds vs. biodiversity, disturbed areas vs. ecosystems). When combined with local context and stakeholder

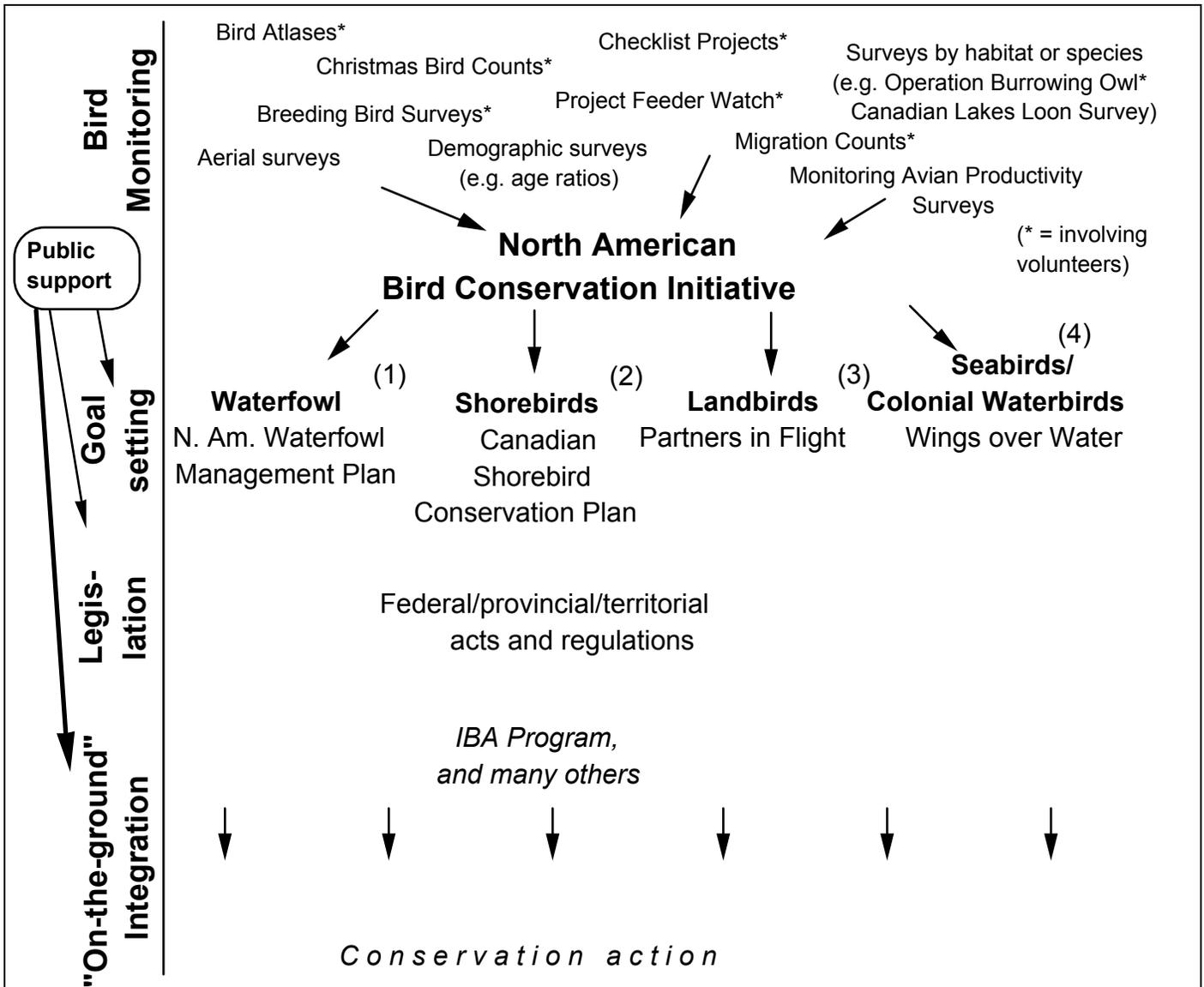


Fig. 2. A schematic diagram to show how different bird-monitoring approaches might combine with public support and regulatory instruments to form a basis for conservation action. References: (1) North American Waterfowl Management Plan Committee 1998, (2) Environment Canada 1999, (3) Canadian Landbird Conservation Working Group 1996, (4) in preparation.

participation, these plans can lead to meaningful action. This North American Bird Conservation Initiative hopes to provide serious impetus for cooperative solutions, and joint action taken in Canada, the United States and Mexico. This continental initiative is supported in principle by the Commission on Environmental Cooperation, which was established as a companion to the North American Free Trade agreement.

In regard to cooperation in conservation, Figure 3 also shows that birds have experienced a long tradition of care by many people. It is noteworthy that, in addition to bird monitoring projects by professional biologists, an enormous amount of data is gathered by thousands of bird watchers each year (e.g. bird feeder watches, and other bird counts; Fig. 3). This is tangible evidence of a widespread personal will to conserve this charismatic component of nature (e.g. Sect 1). This public will and public power has been harnessed effectively for data gathering, it is starting to be harnessed in a tourism-economic sense, but many opportunities may have been ignored thus far. How could this power be harnessed for instance by farmers in IBAs (Sect. 6.4)?

**2.2.6 Prairie Conservation Action Plan.** The Prairie Conservation Action Plan was an initiative spearheaded by World Wildlife Fund Canada. The plan was released in 1987, Canada's Wildlife Centennial year commemorating the 100th anniversary of North America's first wildlife

sanctuary, the Last Mountain Lake National Wildlife Area. The plan's main focus, delivered under "Let's leave some wild in the West," was identifying critical habitat and threats to it, preparing status reports for species at risk of extinction, and executing conservation action for these species.

Since the formulation of the Prairie Conservation Action Plan, many named or unnamed and large or small initiatives led to prairie conservation. Most important was an increasing awareness of the values of native prairie and awareness of its imminent threats. It was during this time, for instance, that the government-subsidized re-grassing programs using introduced varieties were phased out. New extension programs were created or existing programs brought into line with the increasingly mature perceptions of native prairie and its role in a ranching economy and in the biosphere.

In the late 1990s, the Prairie Conservation Action Plan was re-invigorated through collaborative partnerships in each of the prairie provinces with some cross-coordination. In Saskatchewan, leadership was undertaken by the Saskatchewan Stock Growers Association and Saskatchewan Environment and Resource Management, with headquarters for the plan housed in the offices of the Saskatchewan Stock Growers Association in Regina ([www.pcap-sk.org](http://www.pcap-sk.org)). A coordinating committee included approximately 20 agencies. Funding partners of the program are: Canadian Adaptation and Rural Development Saskatchewan, Canadian Wildlife

Service, Ducks Unlimited Canada, Prairie Farm Rehabilitation Administration, Saskatchewan Agriculture and Food, Saskatchewan Environment and Resource Management, and the Saskatchewan Wetland Conservation Corporation. Goals are to sustain a healthy native grassland grazing resource, to maintain biological diversity, to promote a sustainable use of the resource and a quality of life for people, and to disseminate quality information.

The change in this scenario from a non-government/government conservationist's initiative to one co-driven by a production sector is a welcome sign of our time. The challenge will be to move from a narrow focus on individual components of the native ecosystem (e.g. rare plants) to incorporate conservation values systematically in the full food production and consumption chain.

**2.2.7 PFRA Community Pastures.** The Prairie Farm Rehabilitation Administration (PFRA, Sect. 6.1, 7.1) operates 87 community pastures covering 9,150 km<sup>2</sup>, of which 62 are in Saskatchewan. For a fee, close to 4,000 farmers graze over 214,000 head of cattle. Most of the pastures were developed in the late 1930s and early 1940s on cultivated marginal land severely eroded by wind, or on rangeland heavily overgrazed by cattle.

The pasture program's objectives are to protect marginal soils from erosion by maintaining permanent cover on these lands, to help producers with small farms strengthen their

operations by allowing them to use these pastures for summer grazing of cattle, to encourage high quality, long-term cattle production by providing a breeding service using over 3,000 good quality bulls, and to manage the rangeland resource to ensure a healthy relationship between soils, plants and animals (PFRA pamphlet entitled Community pastures).

**2.2.8 Crown-owned pasture lands.** Five pasture-wetland quarter sections and seven cultivated quarters lie immediately adjacent to Lomond pasture. Many more such quarters are located along the Missouri Coteau and the Souris River valley (Fig. 2).

Saskatchewan Agriculture and Food ([www.agr.gov.sk.ca/Crown\\_Lands\\_Pastures/](http://www.agr.gov.sk.ca/Crown_Lands_Pastures/)) also manages a pasture program. The purpose of the pasture lease program is to provide a means to manage agricultural Crown land in a sustainable fashion and to preserve it for future generations. This is accomplished by: i) selecting lessees for advertised Crown land in a consistent and objective manner; ii) establishing requirements for renewing agricultural leases; and iii) facilitating the transfer of leases between generations, co-lessees, or buyers and sellers.



### 3 The IBA Program

The IBA program is an international initiative coordinated by BirdLife International<sup>9</sup> (Appendix 2), a partnership of over 100 countries seeking to identify and conserve sites important to all bird species worldwide. Through the protection of birds and habitats, it also promotes the conservation of the world's biodiversity.

<sup>9</sup> In 2000, BirdLife International was active in over 100 countries with a network of 95 national NGOs with over 2.5 million members worldwide. Globally the budget for conservation was over 269 million US\$ with a staff of 4,161 people. BirdLife partners owned or managed 1,131,916 ha of natural habitat. Over 2 million children involved were involved in "Building a better future."

BirdLife International's Director of Network and Programs, Marco Lambertini, concludes "... we are indeed an impressive network. But there is something else beyond the figures, the budgets and the programs that makes BirdLife even more effective for conservation; it's the competence and the passion for what we do and believe in.

There are currently IBA programs in Europe, Africa, the Middle East, Asia, and the Americas. The Canadian IBA program is part of the Americas IBA program that includes the United States, Mexico, and 17 countries in Central and South America.

The Canadian BirdLife co-partners are the Canadian Nature Federation and Bird Studies Canada (Appendix 2). Bird Studies Canada is primarily responsible for site identification and designation. The Canadian Nature Federation facilitates conservation planning and implementation, working with its provincial partners.

The goals of Canada's IBA program are to:

- identify a network of sites that conserve the natural diversity of Canadian bird species and are critical to the long-term viability of naturally occurring bird populations;
- determine the type of protection or stewardship required for each site, and ensure the conservation of sites through partnerships of local stakeholders who participate in development and implementation of appropriate on-the-ground conservation plans; and
- establish ongoing local involvement in site protection and monitoring.

IBAs are identified by the presence of birds falling under one or more of the following internationally agreed-upon categories:

- Sites regularly holding significant numbers of an endangered, threatened, or vulnerable species;
- Sites regularly holding an endemic species, or species with restricted ranges;

- Sites regularly holding an assemblage of species largely restricted to a biome; and
- Sites where birds concentrate in significant numbers when breeding, in winter, or during migration.

provides education and develops policy options so as to enhance prairie and other agroecosystems.

### 3.1 IBA Saskatchewan

Nature Saskatchewan is working with the Canadian Nature Federation and Bird Studies Canada (Appendix 2) to deliver the conservation planning component of this program in Saskatchewan. IBA Saskatchewan was launched on 1 February 1999. Conservation plans for 13 (Appendix 3) of the 53 Saskatchewan sites are now completed.<sup>10</sup>

IBA Saskatchewan has two homes, one in Nature Saskatchewan's office in Regina (Appendix 2) and one at the Centre for Studies in Agriculture, Law and the Environment (CSALE, [www.ag.usask.ca/centres/csale](http://www.ag.usask.ca/centres/csale)), at the University of Saskatchewan in Saskatoon. CSALE is a newly formed strategic partnership integrating the disciplines of science, law and economics to conduct research into environmental issues related to agriculture. CSALE undertakes studies,



Alan R. Smith

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<sup>10</sup> The author, Joe Schmutz is internationally known for his research and conservation of prairie birds of prey, and has participated in a nationally sponsored interdisciplinary ecosystem and community-based research program. Joe was contracted by Nature Saskatchewan as IBA Community Conservation Planner. Joe has been appointed as a Research Fellow and taken up residence in the Centre for Studies in Agriculture, Law and the Environment (CSALE), College of Agriculture, University of Saskatchewan.

## 4 IBA species information

Colgate Prairie is of primary importance to Burrowing Owls, Ferruginous Hawks, and grassland shorebirds and songbirds. Burrowing Owls are endangered in Canada and Ferruginous Hawks are considered vulnerable.<sup>11</sup> In the IBA criteria, the Colgate Prairie IBA ranks nationally in importance.

### 4.1 Local bird diversity.

Carol Bjorklund has kindly provided her extensive bird records.<sup>12</sup> Carol is a naturalist who now lives in Weyburn. She was raised south of Goodwater and farmed with her husband near Bromhead (Fig. 2). Her comments about herself as a budding naturalist and her observations tell an interesting local story.

<sup>11</sup> Risk categories are:

Extinct

Extirpated - gone from a region

Endangered - facing extinction

Threatened - likely to become endangered

Vulnerable or of Special Concern - sensitive to human activities or natural events. Species in this category are not legally considered "at-risk."

<sup>12</sup> This labour-of-love accounts for many hours afield and great care taken, another example of the exemplary effort by many people devoted to birds in their natural environment (Sects. 1.1, 2.2.3).

Carol's bird observations go back 35 years, and at the beginning they were sketchy because she was still learning to recognize birds. Her birding actually started much earlier. She recalls being a girl barefoot in her grandmother's farmyard north of Tribune, when a red bird with black wings flashed by her. This sighting of a Scarlet Tanager is still etched in her memory. She also recalls the delicate "coo-hoo" of Burrowing Owls, "wafting on the evening breeze during the summers of her childhood." Later, Burrowing Owls lived in the pasture on her farm. This particular pasture is now gone, as are many others. However, Carol added, there are also pastures where Burrowing Owls used to nest, and the pastures are still there but the owls are not.

The birds Carol saw or heard over time are reported in Table 1. Carol also added notes about specific species in the area.

"Long-billed Curlews were last seen in her pasture at Bromhead in the late 1960s. A pair lived there in 1964 when Carol and her husband first moved in. She walked by the curlews and the godwits, learning to distinguish them - they rarely flew away. She had no binoculars at the time and had to get close to the birds. After 1970, when Carol drove a school bus, she watched curlews and noted their disappearance from a pasture in the Missouri Coteau."

Golden Eagles breed somewhere south of Bromhead. They are resident on the Trossachs Plain winter and summer. A pair with young can be seen often in fall but the nest was not found.

The eagles can be seen on the PFRA pastures year-round, and the range rider reported nests in use there.

Prairie Falcons nest somewhere north of Radville. Virtually every time Carol visited her bird route near the Brokenshell (#2) pasture, a Prairie Falcon would soar, silently overhead.

Burrowing Owls nested in scattered pastures through this area in the past. Now they are still found on the PFRA pastures. These pastures, according to Carol, are essential to the survival of most, if not all, local birds.

Christmas Bird Counts (Table 2) collected over 15 years illustrates that a number of bird species are winter regulars. The area is particularly important for Horned Lark, Lapland Longspur and Snow Bunting.

Table 1. List of bird species recorded by Carol Bjorklund. The "regional list" is for the Bromhead area of southeastern Saskatchewan compiled from 1964 to 1999. Sightings throughout the year were recorded for a total of 215 species. The lists for the specific community pastures were compiled in summer 2001, and includes some species not on the regional list. Lomond #3 was visited many times in 2001, species for other pastures must be considered a minimum.

Regional list	Additional Sightings	Lomond #1	Lomond #3 (IBA)	Laurier	Brokenshell #1	Brokenshell #2
Pied-billed Grebe		X	X			
Horned Grebe		X				
Red-necked Grebe						
Eared Grebe		X	X	X		
Western Grebe		X				
	Clark's Grebe	X				
American White Pelican		X	X	X	X	
Double-crested Cormorant			X			
American Bittern			X			
Great Blue Heron		X	X	X		
Black Crowned Night Heron			X			
Turkey Vulture						
Greater White-fronted Goose						
Snow Goose						
Canada Goose			X	X	X	
Brant Goose						
Tundra Swan						
Wood Duck						
Gadwall		X	X	X		X
American Widgeon			X	X		
Mallard		X	X	X		
Blue-winged Teal		X	X	X		
Cinnamon Teal						
Northern Shoveler			X			
Northern Pintail		X	X	X		
Green-winged Teal						
Canvasback		X	X			
Redhead		X	X			
Lesser Scaup		X				
Bufflehead						
Common Goldeneye						
Ruddy Duck		X	X			
Bald Eagle						
Northern Harrier		X	X	X	X	X
Sharp-shinned Hawk						
Cooper's Hawk						
Northern Goshawk						
Swainson's Hawk		X	X	X	X	X
Red-tailed Hawk		X	X		X	
Ferruginous Hawk			X	X	X	
Rough-legged Hawk						
Golden Eagle					X	
American Kestrel						
Merlin			X	X		
Gyr Falcon						
Peregrine Falcon						
Prairie Falcon			X	X	X	
Gray Partridge						
Ring-necked Pheasant						
Sharp-tailed Grouse						
Yellow Rail						
Sora						

<i>(Table 1 Contd.)</i> Regional list	Additional Sightings	Lomond #1	Lomond #3 (IBA)	Laurier	Brokenshell #1	Brokenshell #2
American Coot			X			
Sandhill Crane			X			
Whooping Crane						
American Golden Plover			X			
Lesser Golden Plover						
Black-bellied Plover						
Semipalmated Plover			X			
Killdeer		X	X	X	X	
American Avocet			X	X		
Greater Yellowlegs			X			
Lesser Yellowlegs			X			
Willet			X	X	X	
Spotted Sandpiper			X			
Upland Sandpiper		X	X	X	X	X
Long-billed Curlew						
Marbled Godwit			X	X	X	X
	Sanderling		X			
	Semipalm. Sandpiper		X			
	Least Sandpiper		X			
	White-rumped Sandpiper		X			
	Baird's Sandpiper		X			
	Pectoral Sandpiper		X			
	Sharp-tailed Sandpiper		X			
	Stilt Sandpiper		X			
	Buff-breasted Sandpiper		X			
	Short-billed Dowitcher		X	X		
Long-billed Dowitcher			X	X		
Common Snipe			X			
Wilson's Phalarope			X		X	X
Franklin's Gull			X	X	X	
Ring-billed Gull		X	X		X	
California Gull						
Herring Gull						
Common Tern						
	Forster's Tern			X		
Black Tern			X		X	
Rock Dove						
Mourning Dove			X			
Black-billed Cuckoo						
Yellow-billed Cuckoo						
Great Horned Owl						
Snowy Owl						
Burrowing Owl				X	X	
Long-eared Owl						
Short-eared Owl						
Northern Saw-whet Owl						
Common Nighthawk		X			X	
Ruby-throated Hummingbird						
Belted Kingfisher						
Red-headed Woodpecker						
Yellow-bellied Sapsucker						
Downy Woodpecker						
Hairy Woodpecker						
Northern Flicker						
Western Wood-Pewee						
Eastern Wood-pewee						
Alder Flycatcher						
Willow Flycatcher					X	
Least Flycatcher					X	
Eastern Phoebe						

Say's Phoebe				
Great-crested Flycatcher				
Western Kingbird	X	X	X	

<i>(Table 1 Contd.)</i>	Additional					
Regional list	Sightings	Lomond #1	Lomond #3 (IBA)	Laurier	Brokenshell #1	Brokenshell #2
Eastern Kingbird		X	X	X	X	
Loggerhead Shrike						
Northern Shrike						
Solitary Vireo						
Warbling Vireo						
Red-eyed Vireo						
Blue Jay						
Black-billed Magpie						
Common Crow		X				
Horned Lark		X	X	X	X	X
Purple Martin						
N. Rough-winged Swallow		X		X		
Tree Swallow				X	X	
Bank Swallow						
Cliff Swallow		X	X	X		
Barn Swallow		X	X	X	X	X
American Crow		X	X	X		
Black-capped Chickadee						
Red-breasted Nuthatch						
White-breasted Nuthatch						
Brown Creeper						
Rock Wren		X				
House Wren					X	
Sedge Wren			X			
Marsh Wren			X			
Golden-crowned Kinglet						
Ruby-crowned Kinglet						
Eastern Bluebird						
Mountain Bluebird						
Townsend's Solitaire						
Veery						
Gray-cheeked Thrush						
Swainson's Thrush						
Hermit Thrush						
American Robin			X			
Gray Catbird					X	
Northern Mockingbird						
Sage Thrasher						
Brown Thrasher			X		X	
European Starling						
American Pipit						
Sprague's Pipit		X	X	X	X	X
Bohemian Waxwing						
Cedar Waxwing						
Tennessee Warbler						
Orange-crowned Warbler						
Nashville Warbler						
Yellow Warbler		X	X		X	
Chestnut-sided Warbler						
Magnolia Warbler						
Yellow-rumped Warbler						
Black-throated Green Warbler						
Blackburnian Warbler						
Palm Warbler						
Bay-breasted Warbler						
Blackpoll Warbler						

Black-and-white Warbler  
 American Redstart  
 Ovenbird  
 Northern Waterthrush  
 Connecticut Warbler  
 Mourning Warbler

<i>(Table 1 Contd.)</i> Regional list	Additional Sightings	Lomond #1	Lomond #3 (IBA)	Laurier	Brokenshell #1	Brokenshell #2
Common Yellowthroat			X			
Wilson's Warbler						
Canada Warbler						
Yellow-breasted Chat						
Summer Tanager						
Rose-breasted Grosbeak						
Black-headed Grosbeak						
Scarlet Tanager						
Spotted Towhee						
American Tree Sparrow						
Chipping Sparrow						
Clay-colored Sparrow		X	X	X	X	X
Field Sparrow						
Vesper Sparrow		X	X		X	
Lark Sparrow						
Lark Bunting				X	X	X
Savannah Sparrow		X	X	X	X	X
Grasshopper Sparrow		X	X	X	X	X
Baird's Sparrow		X	X	X	X	X
Le Conte's Sparrow			X			
Sharp-tailed Sparrow			X			
Fox Sparrow						
Song Sparrow		X	X			
Lincoln's Sparrow						
Swamp Sparrow						
White-throated Sparrow						
Harris' Sparrow						
White-crowned Sparrow						
Dark-eyed Junco						
McCown's Longspur						
Lapland Longspur						
Smith's Longspur				X		
Chestnut-collared Longspur		X	X	X	X	X
Snow Bunting						
Great-tailed Grackle						
Bobolink		X	X	X	X	X
Red-winged Blackbird		X	X	X		
Western Meadowlark		X	X	X	X	X
Yellow-headed Blackbird			X			
Rusty Blackbird			X			
Brewer's Blackbird		X	X	X		X
Common Grackle			X			
Brown-headed Cowbird		X	X	X		X
Orchard Oriole			X			
(Northern) Oriole						
Baltimore Oriole			X			
Rosy Finch						
Pine Grosbeak						
Purple Finch						
Common Redpoll						
Hoary Redpoll						
Pine Siskin						
American Goldfinch		X	X	X	X	



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Evening Grosbeak

House Sparrow

Total : 215

45

X  
86

46

39

19

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Table 2. Christmas bird count data provided by Carol Bjorklund for the Bromhead area of SE Saskatchewan. A total of 36,705 birds were counted singly or in flocks of estimated size, comprising 6-15 species.

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1996	1997	1998	1999	2000
Rough-legged Hawk			2												
Golden Eagle				1	2	2	2	1	1		1		1	1	
Prairie Falcon	1						1							2	1
Gray Partridge	18	25	53	205	19	13		T <sup>a</sup>	35		94				53
Ring-necked Pheasant	1		3	7	2	6	3	13	22		95	1	42	12	22
Sharp-tailed Grouse	12	2			9	12	42	16	15		39	37	2	6	
Rock Dove		10	3			2		5	10	8			16	2	18
Great Horned Owl	1	7	5	6	5	4	4	4	3	3	2	2	1	4	1
Snowy Owl	2		4	7		8	1		2	1	9		2	1	
Short-eared Owl	1	()				1							1		
Downy Woodpecker			1	2											
Horned Lark	380	7	96	870	183	164	34	1962	3299	1	14	2	805	82	2
Black-billed Magpie	7	3	11	2	4	4	4	5	3	5	6	2	5	4	22
Black-capped Chickadee				4											
Bohemian Waxwing			10												
European Starling			1				17		7	20	3			4	4
Lapland Longspur					1005	5445	33	263	164	35			1298	915	3
Snow Bunting	714	1	2	575	2123	2476	294	335	5601	262			3112	773	75
Common Redpoll	25	23			17		326		13					41	
Hoary Redpoll	3				4		3							5	
House Sparrow	31	310	159	37	13	18	140	14	71	175	194	99	28	90	136
Unidentified Redpoll		4	2		4				6					8	
Total birds	1196	392	352	1716	3390	8155	904	2618	9252	510	457	143	5313	1950	357
Total bird species	13	10	13	11	12	13	14	11	14	9	10	6	12	15	11

<sup>a</sup> Tracks seen

## 4.2 Ferruginous Hawk.

Ferruginous Hawks are one of three 'soaring hawks' that breed in prairie Canada. They occur only on the Great Plains and intermountain valleys of North America. In Saskatchewan their habitat includes mixed-grass, fescue and aspen parkland ecoregions.

Ferruginous Hawks are frequently referred to as 'open country' raptors. They select this habitat for breeding, on migration and in winter. Ferruginous Hawks may coexist with Red-tailed and Swainson's Hawks, but each of the three species also has a sufficient ecological uniqueness to be able to occupy some habitats which the others avoid (i. e. incomplete niche overlap).

Ferruginous Hawks nest where grazing is the dominant land use or where the open landscape is otherwise unaltered. Interestingly, Ferruginous Hawk density actually increased with small amounts of cultivation, but declined when >50% of the land was cultivated (Fig. 4; Schmutz 1984). This initial increase could reflect that the hawks benefit indirectly from the agricultural inputs that elevate plant productivity and thereby prey.

Aspects of the natural history of Ferruginous Hawks were summarized by Bechard and Schmutz (1995). Ferruginous Hawks usually have only one mate for one to several breeding

seasons. A dark form occurs about 10% of the time and from a distance appears black on belly, back and wings. This contrasts with the light form, whose feathers on back, legs and wings are a mix of rusty 'ferruginous' brown, gray and white. Both forms have a grayish tail.

Male Ferruginous Hawks range in weight from 977-1347 g, and females from 1501-2074 g. They arrive in Canada in late March from their wintering grounds in the southwestern United States or northern Mexico. They arrive already paired or pair in March-April soon after their arrival. Ferruginous Hawks are most vulnerable to disturbance at the nest-building to hatching stage (White and Thurow 1985), but some pairs seem to adjust readily to human activity near their nests.

Ferruginous Hawks prefer to nest in trees or on other elevated structures (boulders, sheds), but will nest on eroded banks or cliffs and even relatively level ground when no other nest sites are available. Nest building starts in April and the hawks lay one to five (mean 3.6) eggs, brown-spotted on white, in April or early May. Between 1975-77, the first young in a total of 70 nests near Hanna, Alberta hatched over a 15-day period, with mean dates 26 and 27 May and 4 June, respectively. Hatching success after 32 days of incubation is generally high, and an average of 2.1 young per occupied nest survive to fledging at 5-6 weeks of age. Mortality during the first year is high (estimated at 65%), but much lower among adults (estimated at 25%). Fledglings and adults generally remain near their nests for one month,

or they may move a short distance to favorite young hunting areas within the territory. In August, the

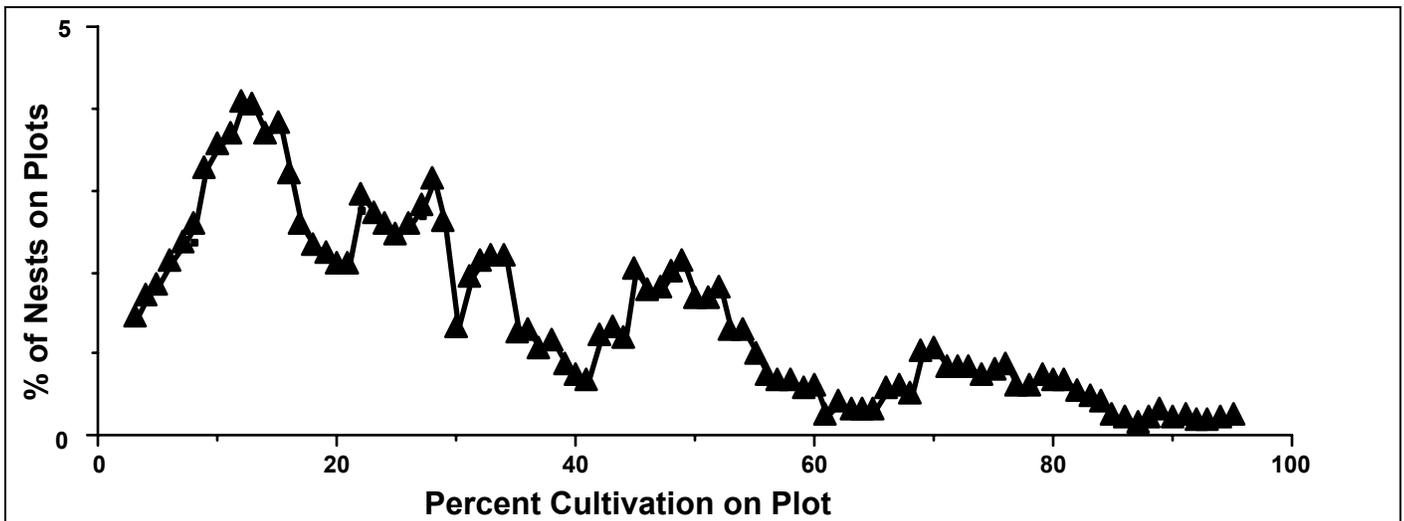


Figure 4. Proportion of nesting Ferruginous Hawks in relation to cultivation, averaged over three years in an 11-year period 1978-83. Nests were located on randomly selected 41-km<sup>2</sup> study plots per year in southeastern Alberta. The connected triangles represent a moving average for an 8% cultivation span.

drift away, beginning their migration. Adults follow later, remaining on the nesting areas as late as mid-October (Bechard and Schmutz 1995).<sup>13</sup>

Only female Ferruginous Hawks have a brood patch for incubation, although males may shelter warm eggs briefly. The male is the main provider of food especially until the fledging of young. The youngest breeders recorded were 2 years old (i.e. hatched 2 seasons before).

Ferruginous Hawks are unusual in their reliance on only two major groups of mammals

for the majority of their food: rabbits and hares, and ground squirrels and prairie dogs. Collating results from 20 diet studies in the United States and Canada, Olendorff (1993) recorded that rabbits and hares comprised 67% of the Ferruginous Hawk's diet by biomass (20% by items), and ground squirrels and prairie dogs 25% by biomass (44% by items).

Historic records of egg collectors and naturalist explorers of the prairies affirm at least a 40% reduction in the Ferruginous Hawk's breeding distribution in Canada. *En route* from Yorkton, Saskatchewan, to Edmonton, Macoun and Macoun (1909) noted Ferruginous Hawks "regularly and commonly." Today, Ferruginous Hawks have retreated to the south and west of Saskatchewan where ranching on native range predominates (Houston and Bechard 1984). They still exist on isolated community pastures in

<sup>13</sup> Jim Watson and co-workers at the Washington State Department of Fish and Wildlife noted some unusual travels by Ferruginous Hawks in 1999. Two of ten hawks equipped with satellite-monitored radios left their breeding area in southeast Washington, drifted across the Rockies and spent late summer and fall in prairie Canada. One of these, a male, stayed well into October in the Cypress Hills area of Saskatchewan, presumably attracted by the Richardson's ground squirrels that delayed hibernation in the mild fall weather.

otherwise extensive crop production areas (Banasch et al. 1994).

After a period of absence, a small population of Ferruginous Hawks now exists in extreme southwestern Manitoba.

In the United States, Ferruginous Hawks have reportedly declined in comparison to their distribution several decades ago. During the last decade, numbers of hawks have increased in two states, remained unchanged in ten and declined in two (Bechard and Schmutz 1995).

Schmutz (1994a) estimated the Ferruginous Hawk population to be 1,000-1,500 pairs in Saskatchewan, 1,800 pairs in Alberta and approximately 50 pairs in Manitoba. At most, a handful of individuals can be seen in the interior of British Columbia. Schmutz (1987) also estimated the size of the entire grassland population (east of the Rocky Mountains) of Ferruginous Hawks to be 14,000 individuals or 7,000 pairs.

Using data from Breeding Bird Surveys for Canada, and Christmas Bird Counts and hawk watching stations in the United States, Kirk and Hyslop (1998) examined trends for Canadian raptors including Ferruginous Hawks. Data for Ferruginous Hawks from the Breeding Bird Surveys showed a statistically significant 6% mean annual increase over the long term (1966-94), and a non-significant 8% increase over a recent shorter term (1985-98). Christmas Bird Counts on the wintering grounds also yielded a significant 4% average increase per year. Finally,

records from mountain lookouts in Utah, Nevada and New Mexico (1983-91) yielded non-significant 2% increase. Overall, Ferruginous Hawk populations may be considered stable and the prognosis for their currently available grassland habitat may be positive also.

COSEWIC (Sect. 2.2.2) listed the Ferruginous Hawk as threatened in 1980 in Canada. The Ferruginous Hawk was down-listed to "vulnerable" in 1995. In Saskatchewan, this species is currently considered for listing. The Ferruginous Hawk is not listed by the U.S. Fish and Wildlife Service as an endangered species.

Unlike some other endemic species of the Great Plains, Ferruginous Hawks have persisted in prairie Canada despite some large scale ecosystem changes. This suggests that the Ferruginous Hawk is fairly resilient, despite its dependence on native grasslands and ground squirrels. There can be little doubt that the key to conservation of Ferruginous Hawks lies in the protection of rangeland and the prairie wildlife community within it.

### 4.3 Burrowing Owl.

The Burrowing Owl is unusual among owls in the way it combines diurnal and nocturnal activity, nests in burrows below ground and inhabits treeless plains. Its somewhat comical appearance attracts the attention of people. The natural history of the Burrowing Owl was reviewed by Haug et al. (1993).

The Burrowing Owl is a brown and buffy-white owl, weighing approximately 150 g and standing stilt-like on sparsely feathered lower legs. Burrowing Owls occur only in the Americas. In North America, the northernmost populations are migratory, mid-continent populations exhibit shorter distance movements, and in the southwestern United States, Florida and northern Mexico the owls are non-migratory.

Burrowing Owls frequent dry, grassy and treeless plains where they are almost invariably associated with burrows, mainly of badgers, prairie dogs or ground squirrels. The owls can grow tolerant of human activity and often nest near farms or on vacant ground in cities or towns. Burrowing Owls are monogamous and both participate in the rearing of up to 12 young.

Burrowing Owls are opportunistic feeders, but their main prey includes insects, small mammals and birds. In prairie Canada, small mammals may be an important food source immediately upon arrival in April and through egg laying, at a time when insects are sparse and

often inactive. In this way, the availability of mammal prey can influence the number of eggs laid and owlets fledged. Owl families remain together near their home burrow until late August when males tend to move short distances to alternate feeding/roosting areas, followed by females and then by juveniles.

Prairie Burrowing Owls depart in early October, apparently migrating at night during favorable weather. They may stop for one to several days, before they migrate on, eventually reaching their wintering grounds in Texas and adjacent areas in the United States and Mexico.

Once common on the Canadian prairies and in parts of the southern interior of British Columbia, the owls have gradually declined throughout the second half of this century. The major factors that have been implicated in this decline, in part by contributing to an inadequate food supply and reduced reproduction in recent years, include habitat loss and change, insecticides, road kills and predation. This owl was listed nationally as threatened in 1978 and endangered in 1995.

In a study of owl survival using radio-telemetry (Clayton and Schmutz 1999), owl mortality was 45% among adults and 55% among juveniles in the 5-month study period alone. Mortality rates were nearly the same in two study areas in Alberta and Saskatchewan. In the Alberta area, where a variety of grasslands existed in a ranching area with only 20% cultivation, deaths were largely due to mammalian and avian predators; in Saskatchewan, where grasslands

existed in small patches and 90% of the land was cultivated, a similar mortality rate was due to collision with vehicles, predators and presumed starvation.

In addition to habitat loss, two major habitat changes have apparently exerted a negative influence on Burrowing Owls. The owls rely on burrows in sparse vegetation for escape habitat. Burrowing mammals, notably prairie dogs, have been eliminated from large tracts of the Great Plains to the owls' detriment. Also, a reduction in prairie fires and fenced areas protecting trees from grazing has allowed trees to expand into what was formerly treeless plain. This has benefited avian predators that nest in trees and mammalian predators that use trees for concealment. A synthesis suggests that these kinds of changes are widespread throughout the Great Plains ecosystem and impact the owls year-round. These changes may be largely irreversible.

Efforts to recover the owls have included supplementing food and building 'predator-proof' nests with demonstrable but modest success on the Regina Plains. Remaining efforts are to protect habitat used by Burrowing Owls. Operation Burrowing Owl (Hjertaas 1997) invites landowners to set aside land containing burrows and adjacent land that may contain food for the owls. In 1997, 488 OBO landowner members in Saskatchewan reported 88 pairs. This is considerably lower than the 721 pairs of owls reported by 232 members in 1988 (<http://www.nature.sask.com/obo>).

#### 4.4 Grassland birds<sup>14</sup>

Grassland birds in prairie Canada as a group appear to be declining faster than any other group (Downes et al. 2000). According to Gayton (in Houston and Schmutz 1999), "Between plowing and overgrazing, [the Canadian prairies are] perhaps the most extensively altered Biome on the planet."

Historically, bird populations on the Canadian portion of the Great Plains were reasonably well documented in comparison to the United States. In Canada, there was tradition of having naturalists participate in expeditions to describe and collect species for museum collections (Houston and Schmutz 1999).

During Prairie settlement, some birds declined and became extinct. Other species disappeared - perhaps due to widespread poisoning campaigns for wolves and rodents - only to return later, such as magpies and now ravens appear to do (Gainer and Schmutz 1997).

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<sup>14</sup> Nearly all Canadian prairie songbirds migrate and are thus shared with the United States and Mexico. Grassland songbirds are also a conservation concern in the United States, and the participation of the National Fish and Wildlife Foundation in conservation planning on grassland IBAs are proof of that commitment.

According to its web site ([www.nfwf.org](http://www.nfwf.org)), "the National Fish and Wildlife Foundation conserves healthy populations of fish, wildlife and plants, on land and in the sea, through creative and respectful partnerships, sustainable solutions, and better education. The Foundation meets these goals by awarding challenge grants to projects benefiting conservation education, habitat protection and restoration, and natural resource management."

Some species, notably geese, exhibited dramatic increases. Geese derive nutrients more easily now from waste grain on migration and in winter. However, the grassland specialists apparently continue to decline (Houston and Schmutz 1999).

Davis et al. (1999) have examined grassland songbird abundance by habitat type throughout the prairie and parkland edge regions in Saskatchewan. Several of their 1,675 point counts were located on the Lomond and other pastures on Trossachs Plain. Data indicated that "...Sprague's Pipits and Chestnut-collared Longspurs occurred more frequently in native and seeded pastures than in hayland or croplands, whereas Baird's Sparrows occurred as frequently in hayland as in native and seeded pastures. The occurrence of Baird's Sparrows did not differ significantly between lightly, moderately and heavily grazed pastures. Sprague's Pipits and Chestnut-collared Longspurs occurred more often in the drier prairies of the southern portion of the province."

Dunn et al. (1999) have compiled data on Canadian birds, including grasslands song birds, taking into account which jurisdiction has primary responsibility, or most of the species range (Table 3). This compilation also considers how vulnerable the birds are in their particular environment.

Documented or expected reasons for the declines vary and include habitat loss (e.g. cultivation), and habitat change (e.g. from native to tame grasses or grassland to parkland/

shrubland<sup>15</sup>), plant-animal community change (e.g. brome grass invasion, tree-nesting predators) and direct impacts (e.g. roadkills, insecticides).

Table 3. Grassland songbirds that are of conservation concern (Vulnerability) and are prominent on the Canadian portion of the Great Plains. Ranks are low = 1 and high = 5.

Species	Vulnerability	Portion of range in Canada
Sprague's Pipit <sup>1</sup>	5	4
Clay-coloured Sparrow	4	5
Savannah Sparrow	3	4
Baird's Sparrow	4	3
Le Conte's Sparrow	3	5
McCown's Longspur	4	3
Chestnut-collared Longspur	4	2

<sup>1</sup> also considered threatened by COSEWIC

<sup>15</sup> This subtle yet important factor is not always fully appreciated. Nature has shaped a species for a specific way of life which it cannot alter, even over a 100 year settlement period. In a farming context it may be akin to crops grown. Many non-farmers wonder why farmers do not diversify as quickly as markets dictate; forgetting that a crop grown is influenced by soil type, machinery on farm, know-how, tradition, sequence of crop rotations and so on.

encouraged through a series of acts and policies repeatedly modified while an emerging nation tried to come to grips with territorial claims and the limited capacity of the land.

## 5 Human Context

It is unlikely that birds can be protected in isolation from human practices and values. The section below is intended to provide a review of historical underpinning including approaches currently employed in agriculture.

### 5.1 Land ownership

The community pastures are owned and administered by the Crown. Virtually all of the adjacent lands in Trossachs plain are privately owned (Fig. 2) and used for cereal or pulse crop production.

### 5.2 Historical land use.

Colgate Prairie and Trossachs Plain are part of a large block of land claimed under Treaty No. 4 which was signed in 1874. The grasslands lie close to the eastern edge of Palliser's Triangle, an arid region of southern Saskatchewan and Alberta which Palliser correctly declared as marginally if at all suitable to European-style agriculture. Despite this limitation, over time much of the land came to be cultivated,

Potyondi (1995) provides a detailed settlement history for southwestern Saskatchewan. This review applies here also, and is pertinent because it gives insight into how it was that agriculture in western Canada was and still is considerably removed from ecological and economic sustainability (e.g. Anderson et al. 1991).<sup>16</sup>

When John Palliser traversed the Moose Jaw Creek area in 1858, NW of Colgate Prairie, Palliser recorded in his notebook that the "...whole region as far as the eye could reach was covered by buffalo, in bands varying from hundreds to thousands" at an estimated density of 3-4 individuals per km<sup>2</sup>.

At such high densities, bison rapidly denuded the grasslands over which they passed. Some range ecologists speculate that the remaining grasslands in prairie Canada today may be in better condition on average than grasslands at the time of the bison. Palliser likened their denuding impact to locusts and recorded in his notes his concern for food for the horses after a herd had passed through an area (Potyondi 1995).

The Saskatchewan portion of the Palliser Triangle was occupied by the allied Indian

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<sup>16</sup> Winston Churchill is quoted for saying "The farther you look back, the farther you can plan into the future."

Nations of Assiniboine, Saulteaux and Plains Cree. Potyondi (1995:19) writes:

"Isaac Cowie, a young apprentice clerk with the Hudson's Bay company, records the historical richness of the local game and fur resources. In 1868, he traded at his Wood Mountain post for '485 prime buffalo robes, 22 buffalo bosses, 79 buffalo tongues, 21 prime badgers, 1 grizzly bear, 21 red foxes, 132 kitt [swift] foxes, 16 hares (jackrabbits), 3 skunks, 1 wolverine [and] 59 wolves."

Once live bison became scarce, their scattered and bleached bones were profitably sent to the 'American' mid-west for their phosphate, required as fertilizer and in sugar refineries. This 'bony endeavor' became especially lucrative after the Canadian Pacific Railway reached the region in 1881.

Determined to find another economic activity for Palliser's Triangle after the loss of the 'keystone' bison, the Canadian Government introduced a liberal and attractive grazing lease policy in 1881. The markets had and continued to have dramatic impacts on this frontier economy. For instance, an outbreak of anthrax in Britain led to the import of North American beef. Canadian beef became even more desirable after the British learned of an outbreak of pleuropneumonia in the 'American' herds.

As is often the case in public administration, the design of new initiatives is strongly influenced by prevailing approaches and customs of the time. So it was for prairie settlement. In Sir Wilfrid Laurier's second term

in office, in the rush to unify Canada right across to the West Coast, he spared no cost to settle the prairies and to achieve an economic integration to solidify Canada's stronghold on the region. In this haste, there was little regard for environmental or sustainability concerns, even if these had been recognized at the time (Potyondi 1995).

The extensive land use and sparse occupation of the grasslands under a ranching economy seemed not to satisfy the eastern Canadian urge to settle and claim once and for all Canada's West.<sup>17</sup> In 1886, a druggist-entomologist-fruit breeder was retained by the Canadian Government to make recommendations on how to best prosper from prairie agriculture. A series of agriculture stations was conceived, and the first, Indian Head near Regina, was established in 1890. The Saskatchewan Department of Agriculture was formed in 1905 and data were gathered. Mixed farming was hailed as the path to success. Settlement and essentially free land was aggressively promoted, such that by 1916 the human population in southwest Saskatchewan had nearly quadrupled in 10 years.

If competition from American ranchers who blatantly ignored Canadian range laws, and a decimating winter of 1906-07 was not enough, the ranching economy of the Palliser Triangle was dealt a final blow with the introduction of the Dominion Lands Act in 1908. This act encouraged farming by allocating extra land,

<sup>17</sup> If history repeats itself, what is today's equivalent to the prairie-settlement-panacea 100 years ago? Is it globalization?

beyond the 160 acres per farmstead as was customary, outside of the arid Palliser Triangle.

It soon became apparent that Palliser's doubts about the suitability of the plains to European-style farming were warranted. Severe water limitation was soon recognized and 'summer fallowing' was hailed as the technique of choice, growing crops only twice in three, or once in two years. This practice conserved moisture but predisposed the soil to erosion by wind and water. The moisture holding capacity of the soil was further weakened by loss of organic matter that had been accumulated over 10,000 years and halved in 50 years.

The drought of 1918-22 was to be expected at some time as we now know (e.g. Nemanishen 1998), but it was different in that it lasted longer. By 1919, southwestern farmers were farming dust. The economic devastation and the personal pain to many families was enormous. While farmers paid limited attention to the advice by agricultural specialists during the exuberant settlement years, the hardship made them receptive to scientific knowledge. A 'Better Farming Conference' in Swift Current in 1920 led to many extension activities, including a 'better farming train' which stopped frequently across the country for experts to deliver advice and answer questions. The Prairie Farm Rehabilitation Administration was conceived at this time and officially created in 1935.

In many ways, settlement of the prairies is not completed, but it continues in different forms (e.g. from family farms to investor-owned

intensive livestock operations). When a new (economic) force came to bear, or when sustainability challenges had to be faced, practices were merely amended in reaction to what was in existence. Agricultural research and extension played an important role, as it does today. In the 1920s, summer fallowing was advocated by experts who reached local farmers via the 'better farming train.' Today, the mode of communication is pamphlets, television and the internet.

In Potyondi's Chapter entitled "Lessons taught in vain," he concludes that "The more things change... The more they stay the same." One element of 'same' relevant to the birds of Colgate Prairie may be the difficulty in accounting for broad (eco)system-based limitations and the forging of solutions that consider many system elements broadly and holistically. The 'creative tension' between the two strategies of adapting what works on the one hand, and starting fundamentally new, might be more often critically examined.<sup>18</sup>

### **5.3 Current land use.**

Lands of the Colgate area and surrounding region were settled around 1911.

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<sup>18</sup> Einstein is quoted as saying "One should not use the same kind of thinking that lead one into trouble, to try and get oneself out."

**5.3.1 Farming.** Currently, approximately 50-65% of Trossachs Plain is in crops, and another 15-25% is summerfallow, and the rest is grazing land (Fig. 2). Wheat is the primary crop grown ( $\geq 50\%$ ), with oats, flaxseed and mustard secondary. Wheat yields are among the lowest in the province. Some form of soil conservation tillage is practiced on 65% or more farms and at least 25% practice zero tillage (Fung et al. 1999:226-229).

**5.3.2 Ranching/Cattle on farms.** There are apparently no large ranches where the majority of a landowner's livelihood comes from range cattle. The Trossachs Plain was not part of the ranching industry that was active farther west from the 1880s to 1920s (Sect. 5.2). Cattle are raised on 16-21% of farms (Fung et al. 1999:233), and these are likely to be shipped to the community pastures for summer grazing.

Cattle held on farms may graze small parcels of land too steep to cultivate, spend their summers on range in community pastures, range over stubble fields after harvest picking up waste grain, or are 'finished' in feedlots prior to 'shipping.' Gayton (1991) estimated from 1986 statistics that less than 25% of cattle owners in Saskatchewan derived their primary income from cattle.

In general, and there are clearly exceptions, the contribution to biodiversity of native grasslands on farms is limited because the

sites are highly fragmented. Also, when a family's main income is derived from grain production, attention is often diverted from the careful range management needed to sustain both the ranch and grassland life. For instance, fall and winter range 'rested' during the summer growing season provides cover for breeding birds requiring mid-high grass cover. Despite the limited biodiversity benefit, these strips and patches of grasslands between fields are important to reduce erosion by water and wind, and this should be encouraged.<sup>19</sup>

Gayton (1991) broadly analyzed range condition in Saskatchewan from a variety of agricultural statistics. This indirect approach was apparently necessary because the data recorded even for public lands are insufficient to properly analyze land use, grazing and range vegetation trends. According to this analysis, declining cattle and improved grain prices were linked to a "massive conversion of native rangeland into annual cropland" in the late 1970s and early 1980s (Gayton 1991:107). When grain prices declined again in the late 1980s, more and larger-bodied breeds of cattle exerted increasing pressure on the remaining native and seeded grasslands. Given that native grasslands require an estimated 55 years to return to their original condition, some lands were re-seeded with tame grasses to satisfy some of the increased demand

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<sup>19</sup> On 22 March 2001, Saskatchewan Agriculture and Food has announced funding for a \$26-million perennial cover program, which, according to Minister Serby is to "...promote good land stewardship and help address issues related to soil conservation, protecting water resources, reducing greenhouse gas emissions and conserving Saskatchewan's biodiversity."

for grazing more quickly. Still, Gayton concluded that Saskatchewan rangelands were in a deteriorating condition at the time.

Currently, there is no single Public Lands policy for Saskatchewan. However, there are diverse attempts, especially in grasslands, to improve range condition on all public lands. The impetus comes from the recognition that range in good to excellent condition serves as 'drought proofing' for the periodic dry years that are an inevitable part of the ecosystem. Once destroyed, range takes decades to recover.

In a nearly 100-year-old tradition of agricultural extension in Saskatchewan, the Grazing and Pasture Technology Program is a joint government and industry funded program. Interestingly, this program has neither stick nor carrot to affect grazing strategies. According to Zoheir Abouguendia (pers. comm.), the most effective way to raise a producer's awareness is to have one producer talk to another producer, not 'expert' to producer. This strategy may be fruitfully employed in 'community conservation' planning for IBA.<sup>20</sup>

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<sup>20</sup> In some sense, this may be happening in the Chaplin and Reed lakes IBAs (Appendix 3). Observing the involvement of the people of Chaplin and the surrounding community during a "Shorebird ecology and conservation workshop," it was evident that the people had 'bought into' the value of the birds. The enormous bird concentrations there and the international connections which the birds provided had clearly been noticed. This interest was bolstered by a vision to capitalize on the tourism potential which the birds help provide. If this ecological, social and economic tie can come to fruition, this will be noticed by other communities and will no doubt be a bonus for other community conservation efforts.

**5.3.3 Oil and gas extraction.** According to Fung et al. (1999:180), there are no oil reserves under Colgate Prairie. However, a major oil field is located south of Weyburn, and scattered minor oil fields surround the pastures. All pastures (Fig. 2) are underlain with a broad band of potash and salt extending across southern Saskatchewan.

## **5.4 Conservation management achieved at the site.**

This section highlights activities by some organizations that are active and visible in the area. This list does not give due credit to the day-to-day choices people make in their own lives that advance - or discourage - conservation one step at a time. One is reminded by the sage advice of unknown origin '...to heed only the important things in life, but to know that all things important are small.'

**5.4.1 PFRA's range management.** Since its establishment in the 1930s, the Lomond #3 community pasture, has been managed by the Prairie Farm Rehabilitation Administration of Agriculture and Agri-Food Canada through its Community Pasture Program, Range Management Section. The pattern of cattle grazing across and within all fields in this pasture is managed by using fencing, controlling access to stockwater, and through strategic placement of salt licks and rubbing posts. Seasonal stocking rate at each

field, measured in animal-unit-month, are adjusted every year according to annual growing condition and range condition assessed periodically.

Range condition (Sect. 6.2) compares the existing plant community on the pasture to the potential or sub-climax plant community. The potential community is usually determined by examining similar range site benchmark nearby which are part of a functional grassland ecosystem but have not received any grazing or other vegetation use. These tend to be patches 'fenced out' along a pasture's edge or cut off by roads. Alternatively, permanently fenced benchmarks can be created for future comparisons. Range condition is an ecological plant community parameter and not a measure of productivity.

Another important range management consideration is the area ratio of seeded pastures in relation to the total native pastures. Fields re-seeded with Eurasian or early season North American grasses are important for early spring green-up and grazing; early spring grazing can be harmful to native range. In late summer and fall/winter, native range has the advantage by providing palatability and nutritious forage for summer and fall grazing when early season grasses are less palatable. Thus, a pasture program must include an appropriate mix of early and late season grazing capacity for proper range management.

Range condition on the Colgate Prairie IBA was last assessed in 1983 by George Chu

(personal communication) and for the nearby Laurier pasture (Fig. 2) by Bill Houston in 1993 (Houston 1993). At Laurier, range condition was assessed on 25 transects and varied from the upper range of "fair" through "good" to the lower range of "excellent." There was no poor rating. The report made several recommendation, including strategic cross-fencing, cattle attractants (e.g. salt licks, drinking water) to achieve more even grazing pressure and reducing stocking rate from 12,042 animal-unit-months to 11,120 AUM.

Based on a smaller number of transects, seven so-called "fields" of the Lomond #3 community pasture were assessed by George Chu. Condition varied from the high range of fair to low range of good. Plant species recorded in both surveys are presented in Table 4. The differences in species diversity between the two pastures are likely due to range site differences in transects used. For both pastures, the species recorded is a minimum.

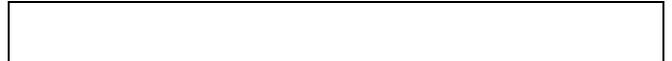


Table 4. Plant species recorded as part of range condition assessment at Laurier (Houston 1993) and Lomond #3 (1983; George Chu, Pers. communication) community pastures.

	Laurier	Lomond
<u>Grasses</u>		
Bearded or awned wheatgrass	X	X
Blue grama	X	X
Blue-eyed grass	X	
Bluegrass	X	X
Canada bluegrass	X	
Green needle grass	X	X
Hooker's oat grass	X	
Indian rice grass	X	
June grass	X	X
Needle and thread grass	X	X
Northern wheatgrass	X	X
Pepper grass	X	
Porcupine grass		X
Prairie muhly	X	
Sandberg's bluegrass	X	
Tufted hair grass	X	
Western porcupine grass	X	
Western wheatgrass	X	X
Wild barley		X
<u>Sedges</u>		
Sedge species	X	X
<u>Cactus</u>		
Prickly pear cactus	X	X
<u>Forbs</u>		
Aster species	X	
Broomweed	X	
Cinquefoil	X	
Crocus	X	
Dandelion	X	
Field chickweed	X	
Goat's beard	X	
Goldenbean	X	
Goldenrod	X	
Gumweed	X	
Hairy golden aster	X	
Lance-leaved Psoralea	X	
Narrow-leaved Milkvetch	X	
Northern bedstraw	X	
Owl's clover	X	
Pasture sage	X	X

Prairie coneflower	X	
Scarlet globe mallow	X	
Silverweed	X	
Smooth blue beardtongue	X	
Sow thistle	X	
Three-flowered avens	X	
Wild blue flax	X	
Yarrow	X	
<u>Woody shrubs</u>		
Hoary sagebrush	X	
Prairie sage	X	
Rosebush	X	
Western snowberry	X	X
No. of transects	25	11

Min. No. of species 47 14

**5.4.2 Saskatchewan Wetland Conservation Corporation** (SWCC) is cooperating with towns, RMs and private landowners to promote the conservation of native prairie. SWCC also has riparian habitat restoration and demonstration projects in the wider region around Colgate Prairie (e.g. Huel 1998). SWCC's mission is "To lead and coordinate the province's wetland conservation initiatives to ensure the sustainability and biodiversity of the prairie environment for people and wildlife."

SWCC is delivering a program called "Linking communities, wetlands and migratory birds" in partnership with Wetlands International-The Americas. Two workshops have been held with many delegates representing different sites (Demoskoff 1999). SWCC also established a TransAmerica Migratory Bird Fund to facilitate research, land management and education (Demoskoff 1999).

**5.4.2.1 Strategic grazing** to maintain range and riparian habitat, and reduce weed invasion. The following text was provided by Tom Harrisson of SWCC. "The potential for enhancement of a site along Long Creek in Lomond #3 (Colgate) pasture was evaluated by individuals from PFRA, SWCC and Pheasants Forever in mid-September of 1997. Two segments along Long Creek on the Lomond PFRA pasture were identified as potential sites for riparian enhancement projects.

The first is approximately a 50 acre parcel of land along Long Creek in the southwest corner of the pasture. The plan is "to idle" these 50 acres and allow woody vegetation to become dominant and vigorous. The acceptance of this

plan from PFRA depended on the development of an access point for cattle to the water and the continued attempt at controlling leafy spurge. The fence constructed around this 50 acres was built with page wire. This allowed the use of sheep or goats for leafy spurge control. The site went ungrazed in 1998 and 50 sheep were introduced to this area in 1999. They soon became adapted to eating the spurge and within weeks all the flowers had been consumed. Monitoring in the form of stem density, vegetative cover and biomass was initiated in 1999 by SWCC and PFRA. Grazing with sheep continued in 2000 and 2001 as did monitoring. Almost all spurge growth is consumed during the growing season and the condition of the riparian zone has improved with substantial decreases in the amount of bare soil and increases in vegetative cover.

The second segment was a 2.5 km stretch of Long Creek in a large 2100-acre field. The field was split in half with all of the creek and riparian areas being located in one of the new fields. Grazing in the new riparian field was deferred and was managed to prevent the cattle from camping out in the riparian zones. This allows vegetation a rest period to recover. Cattle could be moved out of that field before too much damage to the riparian areas occurs. Approximately one 1.5 km of fence was built to separate the fields, and two watering sites for the other field were constructed. Solar energy was employed to pump water to a series of troughs at these watering sites. In the fall of 1997, a backhoe was brought in to excavate a well along the creek which would act as a water source for the livestock watering system. A solar pumping system was purchased and installed at the well. Water is pumped via an underground pipeline to a trough system located approximately a half mile

southeast of the well. A similar watering system was installed adjacent to the 50 acre enclosure site in 1999. These water systems provide water for approximately 325 cow-calf pairs as they move through the rotation. Fence construction began in both locations in the fall of 1997 and was completed in 1998. This has been managed as such by the PFRA through to 2001.

**5.4.3 Ducks Unlimited Canada** has a long and active presence in the Missouri Coteau region, including the Trossachs Plain. In this part of the moist-mixed grasslands, Ducks Unlimited's activity is limited to some permanent cover projects and older wetland developments including Tatagwa, Neptune, Goodwater and Tribune marshes.

From the 1950s until the mid 1980s, Ducks Unlimited Canada's activities were based on securing and enhancing permanent wetland habitat for breeding, moulting and staging waterfowl. From the mid 1980s to the present, strategies focused on encouraging land use practices which benefit waterfowl and other wildlife by improving habitat through the provision of upland nesting cover, securement of small wetlands, and by encouraging sustainable land use practices that provide soil and water conservation benefits.

Extension program options include winter cereals promotion and development, forage production and management, grazing management, and the provision of 'flushing bars' to protect nesting birds from injury during hay cutting. Modified agriculture options include the conversion of cropland to forages and managed grazing. Intensive programs are implemented in areas with the highest capabilities for waterfowl production and include purchase and lease of existing native habitat, hay land, tame pasture, and cultivated land, which is then converted to nesting cover. Conservation easements (Sect. 6.6)

and the restoration, enhancement and creation of wetlands are other options included as intensive programs. Policy initiatives that promote sustainable land use and provide wildlife benefits are also being pursued by Ducks Unlimited Canada.

#### **5.4.4 Saskatchewan Wildlife Federation.**

According to its website ([www.swf.sk.ca/](http://www.swf.sk.ca/)), "The Saskatchewan Wildlife Federation is a nonprofit, non-government, charitable organization of over 25,000 members representing every walk of life. Per capita we are the largest organization of sportsmen and conservationists in the world. 130 local branches are affiliated with the provincial body, who in turn is affiliated with the Canadian Wildlife Federation in Ottawa, our national parent body.

As a provincial organization, we are committed to the wise use and management of all our natural resources. Every resource use decision must be made with the most up-to-date information available and with long term planning being a part of that decision. The preservation of habitat for all species of fish and wildlife has become the single most important task for both governments and private conservation groups. The Saskatchewan Wildlife Federation is an acknowledged leader in this field through its many programs.

The Saskatchewan Wildlife Federation strongly supports the principle that hunting, trapping, and fishing contribute to the management and therefore the sustainability of our wildlife resources. Rights of the hunters, trappers, and fishermen should not be infringed upon and legislation to protect them from harassment while participating in these activities should be enacted. Hunting, fishing and trapping, conducted in a responsible manner in accordance with regulations, are wise uses of our renewable natural resources consistent with the conservation ethic.

The use and enjoyment of wildlife must always be subject to, and limited by, laws aimed at securing the conservation and maintenance of wildlife resources. The conservation and protection of Saskatchewan wildlife requires responsible behavior from all people. The sportsman's dollars are hard at work conserving and managing Saskatchewan's resources, with 30% of all hunting, trapping, and fishing license going into the provincial government's Fish & Wildlife Development Fund to purchase and enhance wildlife lands and fisheries management."

**5.4.4.1 Wildlife lands.** To stem the loss of native habitat in Saskatchewan, the Saskatchewan Wildlife Federation passed a resolution in 1969 to channel 30% from hunting, fishing and trapping license fees into a Fish and Wildlife Development Fund created for this purpose. Through this fund, 175,000 acres of wildlife habitat have been purchased (see atlas, Saskatchewan Wildlife Federation 1995). In addition the federation owns 50,000 of wildlife habitat and has secured another 400,000 through stewardship efforts. Finally, an additional 9,000 acres have been purchased through cost sharing with Saskatchewan Environment and Resource Management. These land purchases are ongoing with additional funds from a habitat Trust Fund administered by the Saskatchewan Wildlife Federation. This Fund receives moneys from various programs including a hide collection program, raffles, and other fundraising and donations.

#### **5.4.5 Saskatchewan Pheasants Forever.**

Pheasants and peasant hunting are reasonably common in extreme southern, especially

southeastern Saskatchewan. There is at least one landowner adjacent to the Lomond Pasture who participates in Pheasants Forever's habitat management program. A Saskatchewan Pheasants Forever chapter is based in Regina. Llewellyn Matthews is the habitat committee chair (Appendix 1).

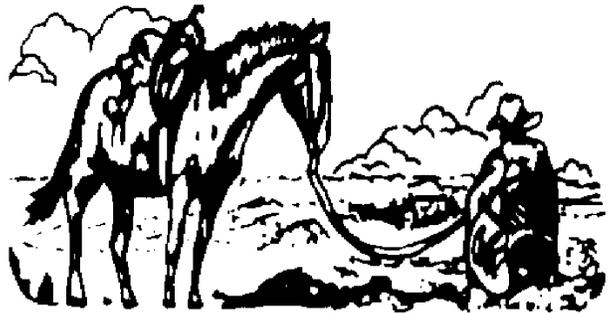
Pheasants Forever Canada has headquarters in Calgary with a web site under construction. According to the U.S. website "Pheasants Forever is a non-profit conservation organization founded in 1982. Pheasants Forever is dedicated to the protection and enhancement of pheasant and other upland wildlife populations through habitat improvement that benefits farmers and wildlife alike.

Pheasants Forever is fortified by a unique system of county chapters that provide incentive for sportsmen and women to raise money: 100% of the funds raised by chapters, exclusive of membership fee, remain at the chapters level for local habitat projects. Each Pheasants Forever chapter maintains local control of its habitat funds. Chapter leaders, with help from resource professionals, establish habitat restoration programs, customized to meet the needs of upland wildlife in their area. This enables people who belong to and support Pheasants Forever to see the direct results of their contributions."

A provincial program to rear pheasants in captivity and bolster wild populations of this Eurasian game bird through maintain themselves and are especially vulnerable to severe winter weather.

## 6 Opportunities

Since the birds in the IBA do not exist in isolation of the people or the ecosystem, the aim of this conservation plan will be well served by pointing out those circumstances which can help the combined cause of conservation and quality of human life.



### 6.1 PFRA administration.

By virtue of PFRA ownership and administration, the grasslands of Lomond No. 3 community pasture receive professional care and will apparently remain so with state-of-the-art range management and multi-use, including biodiversity considerations (Sect. 6.2). Barring any fundamental legislative change by the Government of Canada, this scenario should

remain a win-win situation for patrons and biodiversity conservation alike. This in itself is an enormous conservation opportunity realized.

The PFRA pastures play an important role in the local farming economy. Cattle usually do not go to pastures until after seeding - being able to send cattle to pasture allows farmers to devote their attention to managing and harvesting crops. Without this opportunity, many farmers would likely not have cattle and this would undermine the grazing fee (economic) justification for leaving the land in grassland. Extensive grazing is also a low input and time and energy efficient means of food production.

In addition to economic opportunities for the farming sector, grasslands conserve biodiversity and provide ecological services (Sect. 1.2 footnote 2) such as preventing water and wind erosion, reducing atmospheric CO<sub>2</sub> and enhancing water quality.

## 6.2 Range Management.

Prairie conservationists are increasingly coming to accept that prairie ecosystem conservation and ranching have much in common (Schmutz 1994, Page 1997, van Tighem 2000). The kinds of benefits realized depend on the grazing management strategies employed and the degree to which landscapes are intact.

In the smaller patches of grassland interspersed in cropland, or the community pasture's edge, weed control can be a particular challenge because of the proximity of weed seed on the borders of cultivated lands (Sect. 7.2). Especially if pastures are 'improved' through re-seeding with Eurasian grass varieties, they support fewer species of birds (Wilson and Belcher 1989) and need periodic re-grassing to sustain cattle. In recent years, seeding of Eurasian grasses has declined in favor of maintaining native range or using North American varieties in re-seeding practices. Locally adapted native grass varieties have some distinct advantages in the long term (Christian and Wilson 1999)

Examining the relationship between cattle grazing and biodiversity, Groskorth (1998) has shown that plant biodiversity in the mixed grasslands of Saskatchewan peaked in the 'fair' to 'good' range categories (Fig. 5). This conclusion was corroborated by Bai et al. (1998) who examined sites in the mixed, moist mixed and aspen parkland ecoregions.

Grassland ecosystems have evolved under the influence of grazers, from the large and once numerous bison to mice (voles) and grasshoppers. For this reason the link between grazing, biodiversity and ecosystem stability is not surprising. While the goals of range management are to maintain good-excellent range condition - to the right of the biodiversity peak - in practice, most pastures and range include nearly the full spectrum of conditions. Despite attempts to achieve even grazing pressure, cattle will overuse some areas (near water, salt blocks or gates) and under-use others. This within-pasture-diversity in range condition is also fortuitous, because some species prefer slightly overgrazed sites (Horned Larks, Richardson's ground squirrels,

grasshoppers), and others underutilized sites (mice and voles, Baird's Sparrow). The result is a complex and interdependent prairie ecosystem where human use is an integral part.

The criticisms that have been raised by some against beef 'producers' have been directed mostly at the feedlot segment of the long production chain from cow-calf operator to consumer. Feeding grain to cattle is highly inefficient and costly from an environmental point of view. The feedlot 'finishing' process could be much shorter than in prevailing practice.

The grassland conservation opportunity arising from a well-managed traditional ranch is potentially enormous.

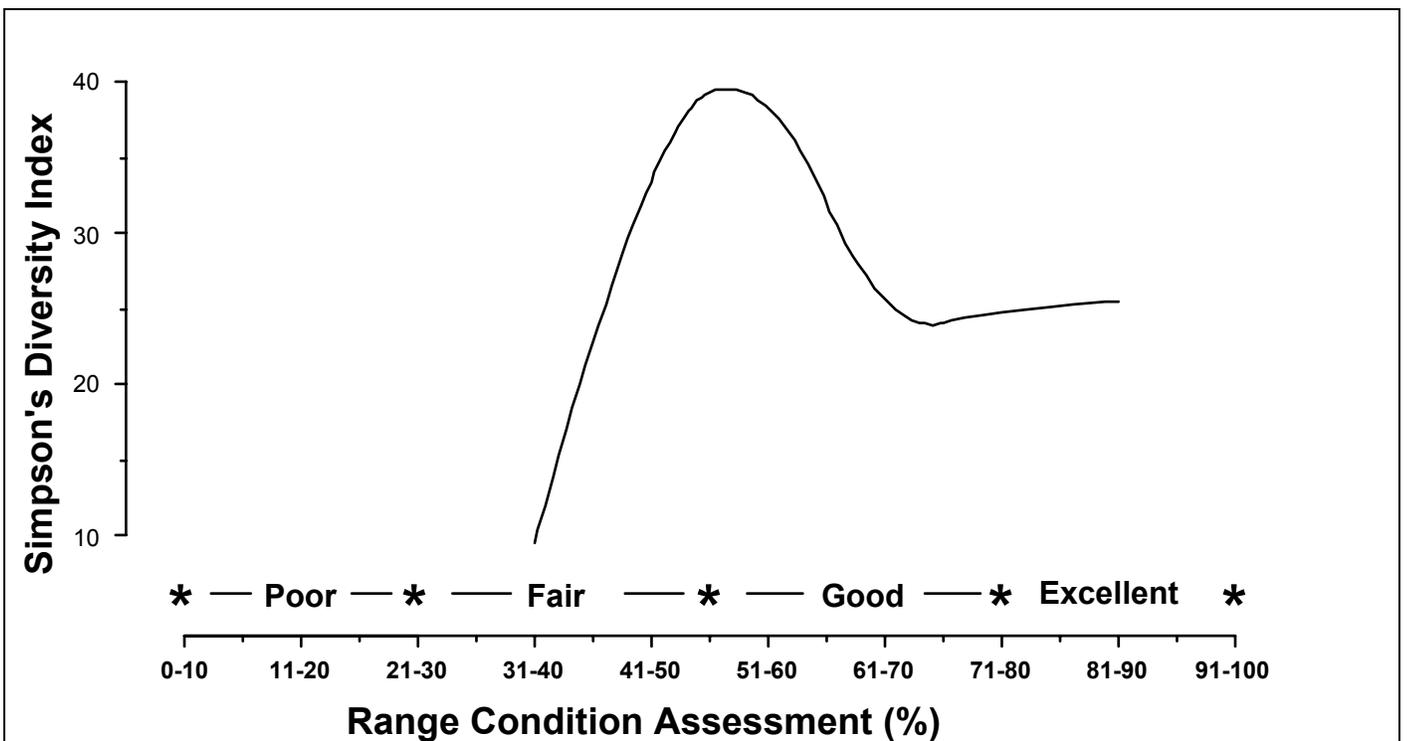


Figure 5. Species diversity estimates from study plots in the Saskatchewan mixed grass ecoregion are compared with a standard method in which range condition is assessed (Groskorth 1998). Although the two

methods measure communities differently, the data show a generally accepted trend of peak diversity under fair to good range condition.

### 6.3 Crown lands.

The juxtaposition of native cover on public vs. private land (Fig. 2) shows at a glance the importance of public land in grassland conservation. The conservation of Crown grasslands is critical given how much has been lost. These grasslands represent a conservation opportunity in perpetuity. Here, land uses should be buffered from short-term market signals that could undermine grassland conservation. Crown-owned lands also represent an opportunity for incorporating societal benefits, such as biodiversity conservation, recreation, and land and water quality.

According to Gayton (1991), the exact area that remains of each of tall-, mixed-, and fescue grasslands and aspen parkland with fescue is unknown. Using Canadian Wheat Board statistics and adding acreage for provincial and PFRA community pastures, he estimated that approximately 11.3 million acres of native rangeland remain in Saskatchewan. This represents only 17% of the provinces original area of grassland.

Because most of Saskatchewan's extensive grasslands are Crown-owned, public land policy is highly relevant to grassland conservation. According to Thornton et al. (1995), "the Saskatchewan government, through Saskatchewan Rural Development [now Saskatchewan

Agriculture and Food], owns and administers over 9 million acres (36,423 km<sup>2</sup>) of Crown land designated as 'agricultural.' Included in those 9 million acres are over 7 million acres of grazing land. Saskatchewan Rural Development estimates that more than 95% of their grazing land are native range. The Prairie Farm Rehabilitation Administration holds title to over 1.3 million acres of Saskatchewan grazing land. They estimate that 80% of their titled acres remain as native rangeland." Together, they administer 68% of Saskatchewan's native grasslands. Saskatchewan's Wildlife Habitat Protection Act is one tool for protecting key public grasslands .

Various policies threaten the conservation-minded administration of Crown lands. Lands that are not Wildlife Habitat Land or otherwise restricted are for sale with the purpose to "improve the equity base for farm operation and agriculture in Saskatchewan" (Thornton et al. 1995). Range improvement assistance may, according to Thornton et al. (1995), reward mismanagement by encouraging overgrazing through the subsequently reduced lease rates. Another threat is the conversion of native range to tame pasture. Finally, when the government moved from a land tax based on the land's production capacity to one based on the land's market value, taxes on marginal lands increased out of proportion to other lands. This placed pressure on extensive ranchers to recover this extra cost somehow (Panel, Fifth Prairie

Conservation and Endangered Species Conference, Saskatoon, 22 Feb. 1998).

accomplishments and make recommendations.

Thornton et al. (1995) challenge that the "policy governing the management of federal and provincial grazing lands should be rewritten to reflect the wider public rather than solely agricultural interests." The Saskatchewan Round Table on the Environment and Economy (1991:23) suggested that "Governments and agricultural producers must develop programs and policies to ensure the sustainable use of grazing resources" to:

- "1. Develop management plans for all grazing lands to ensure sustainable use of grazing resources and to achieve multiple land use objectives;
2. Manage all remaining native rangelands to maintain Saskatchewan's biological diversity. Restore damaged areas to productive rangelands; and
3. Retain grazing policies and programs that support retention of native prairie ecosystems."

Saskatchewan Agriculture and Food has created a Crown Land Stakeholder's Forum with the mandate "To provide advice to the Department on agricultural Crown land policy development that helps promote the sustainable and integrated use of Crown land while providing opportunities for diversification and economic growth." This forum is to help draft a new policy to replace land lease legislation coined in the 1960s. The inaugural meeting was held on 9-10 February 2000, followed by a meeting on 12-13 April. The committee overseeing the forum is given a two-year period within which to review

## 6.4 Strategic cooperatives.

Bird watchers and the conservation-minded public are growing in numbers (Sect. 1.1) and an opportunity may exist to enlist their help specifically for strategic conservation initiatives. Volunteer bird watchers already perform an important role in bird monitoring (Sect. 2.2.5).

Agricultural cooperatives exist in many forms, from machinery cooperatives to marketing cooperatives and to vertically integrated organizations. Recently, legislation facilitates the establishment of new generation cooperatives in Saskatchewan (Sask. Economic and Co-op. Development. 1999).

Recent conservation literature (e.g. Roberts et al. 1999) describes the notion of 'intentional communities,' where strategic linkages among individuals and organizations go beyond the normal hierarchical structure and combine goals (e.g. fresh food and local community development). One future option may be the formation of cooperatives uniting consumers and producers strategically around a product (food) that also has specific meaning (bird conservation in an IBA). Such cooperatives may be local in scope at first, but there is little reason to think they cannot unite people over considerable distances (e.g. suburban Vancouver or Montreal. A focus on food is appropriate, because agriculture is the dominant landscape modifier in Saskatchewan's IBAs. A focus on food is furthermore important because the recent trends to

ever larger industrial farms threatens landscape diversity and thus birds.

## 6.5 Tourism.<sup>21</sup>

There are apparently no tourist attractions, campgrounds or parks near Colgate pasture. The region is visited by Saskatchewan hunters each year because Long Creek and its tributaries support some of the highest pheasant densities in Saskatchewan. Some outfitters are active in the region and attract out-of-province hunters primarily for waterfowl hunting.

## 6.6 Conservation Easements Act.

This Act could aid in the protection of native habitat on privately held land on Trossachs Plain. The Saskatchewan Environment and Resource Management web site states: "A conservation easement is a voluntary legal agreement between a landowner and a qualified conservation agency. Under this agreement, the landowner continues to own and manage the land with benefits to both the landowner and the environment. As a landowner, you can take steps to preserve your property's conservation values, retain use of the land, and at the same time receive income tax benefits.

A conservation agency of your choice can assist you in preparing an agreement. A

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<sup>21</sup>"Tourism in Saskatchewan generates \$1.14 billion annually for the provincial economy, employs 42,000 Saskatchewan people, and is the province's fourth largest economic sector. By 2010, it is expected to employ 65,000 workers and to generate revenues of \$2 billion annually. " (Saskatoon Sun, 4 June 2000, p. 17).

conservation easement can be granted for a specified time, or in perpetuity.

Granting a conservation easement means you are preserving the environment value of your land for the future. If the easement is granted in perpetuity, the natural values of the property will be protected indefinitely, no matter who owns the land in the future. The donation of a conservation easement is viewed by Revenue Canada as a charitable gift. The value of the gift is the difference between the land's value with the conservation easement and the best land-use value without the easement. This taxable benefit may be observed at the time of donation or extended over five years.

If the land is sold, the conservation easement will be transferred with the property, and terms of the easement will remain. These arrangements may also ease the financial burden of intergenerational land transfer. In some instances, conservation agencies may be willing to purchase an easement on privately-owned lands."

## **7 Threats**

### **7.1 Legislative or policy changes.**

PFRA's pastures program is hailed by PFRA and others as a sustainable agriculture program where renewable resources are used for economic growth while maintaining their health and quality for future generations (PFRA pamphlet). In the event of any currently unforeseen change in policy, PFRA administrators, pasture patrons and naturalists should join forces and carefully scrutinize and if necessary resist any change that may adversely affect one or more of the interests.

As a federal department, the Canadian public would expect that PFRA has an obligation to manage PFRA land congruent with other federal acts and conventions, including the biodiversity convention. This obligation is acknowledged by PFRA through its multiple land use philosophy.

### **7.2 Exotic species.**

With the advent of increased transportation of products around the globe, and intended and unintended imports of species - the 'homogenization' of the World's species - brings

both benefit and harm.<sup>22</sup> This challenge, with examples of serious damage in some cases, is living proof of the validity of community ecology, or of the contention that species rarely exist or function in isolation of other species in the community to which they belong. Species can play an integral part in one community and be a serious pest in another.

Leafy Spurge is one invasive exotic species that threatens range resources in the IBA.<sup>23</sup> Leafy spurge has invaded the Colgate Prairie and efforts are currently underway to eliminate this highly invasive and competitive foreigner to North American rangelands (Sect. 5.4.2.1).

In a study in Manitoba, Belcher and Wilson (1989) found Leafy Spurge to be one of three Eurasian invaders,<sup>24</sup> along with Kentucky Blue Grass and Smooth Brome Grass. They

<sup>22</sup> In a section entitled "The dilemma of free trade," Driesche and Driesche (2001:15) state: "Laws prohibiting the entry of a given type of product on grounds of prevention of pest invasions have at times been attacked as protectionist measures in disguise. Under current world treaties on trade, such practices are subject to challenge by the country whose products are excluded..."

"Efforts to limit trade to prevent pest invasion and protect local biodiversity will increasingly have to be defended in World Trade Organization dispute panels against opposing interests whose economic concerns would be hurt by such restrictions. How will the still-uncertain ecological and economic costs of potential invasions be judged against the easily quantifiable economic costs if permission to import a specific good is denied? What is missing is a broad body of knowledge of the social and economic consequences of nonnative species invasions."

<sup>23</sup> A handbook for ranking exotics and for determining management priorities is provided at <http://www.nature.nps.gov/pubs/ranking/ranking.htm>

<sup>24</sup> Saskatchewan Agriculture and Food lists 41 species as noxious weeds.

quoted an experimental study that showed that disturbance by humans promotes the establishment of Leafy Spurge; 45 times more seeds established themselves on bare soil compared to undisturbed vegetation. Where any of the three alien species occurred in their study, coverage of native species was decreased, such that leafy spurge is considered "...a considerable threat not only to the economic use of prairie rangelands but also to its conservation as native vegetation." In Belcher and Wilson's study area, of 83 leafy spurge infested sites, 49 were centered on trails, fireguards and roads, and 30 on disturbances caused by track vehicles; only 4 sites were not associated with a visible soil disturbance.

David Pimentel and others have summarized the dilemma of alien species, as described in the following report (full report available at [http://www.news.cornell.edu/releases/Jan99/species\\_costs.html](http://www.news.cornell.edu/releases/Jan99/species_costs.html)).

"A few bad actors among the more than 30,000 non-indigenous species in the United States cost \$123 billion a year in economic losses, Cornell University ecologists estimate.

It doesn't take many trouble-makers to cause tremendous damage," Cornell University ecologist David Pimentel says of a list that runs from alien weeds (cost: \$35.5 billion) and introduced insects (\$20 billion) to human disease-causing organisms (\$6.5 billion) and even the mongoose (\$50 million ). (See accompanying list, "25 Unwelcome Visitors.") Aside from the economic costs, he adds, more than 40 percent of species on the U.S. Department of the Interior's endangered or threatened species lists are at risk primarily because of non-indigenous species.

Pimentel, who presented his findings today (Jan. 24, 1999) at the annual meeting of

the American Association for the Advancement of Science (AAAS) in Anaheim, Calif., noted, however, that "most introduced species of plants, animals and microorganisms have become widely accepted and even beneficial participants in our lives."

The researchers also acknowledged that 98 percent of the U.S. food supply comes from such introduced species as wheat, rice, domestic cattle and poultry with a value of more than \$500 billion a year.

### **7.3 Trampling by cattle.**

Cattle inadvertently crush bird nests on the ground. When cattle range over large areas, the chance of a nest being stepped on is lessened. Also, the common practice of rotating cattle through different pastures will insure that some parts of the grassland will have no impact during the roughly 4-6 week nesting period.

### **7.4 Accidents.**

Given the oil and gas industry's activities in the region, there is some potential for accidents. There are no major roads or rail transportation routes that may lead to accidental chemical spills or the like. However, road mortality can be serious for Burrowing Owls even on secondary roads (Houston and Schmutz 1997).

Fires could alter habitat temporarily and destroy nests, but this would most likely be beneficial for the range in the long term. Although fire is a valued range management tool (Barsh 1997), - after all, the range evolved under the disturbance of irregular fires (Archibold and Wilson 1980) - it is useful only when properly controlled. Control happens in at least two ways. A boundary and mechanism is in place to stop a fire where intended. A fire is set at an appropriate time -- hot fires can do more damage than good and alter the plant community more than is intended. Fires during the breeding season would be a considerable threat to wildlife.

### **7.5 Disturbance.**

Human and other disturbances can reduce an animal's occupancy of cover to escape from predators or the elements, an animal's feeding time, and it can prevent an animal from breeding. These impacts are often very difficult to detect and thus to avoid. This is unlikely to be a recurrent problem in this IBA.

### **7.6 Roads and pipelines.**

Roads, pipelines and similar disturbances seem benign on the surface, but can have considerable impact. Roads and pipelines have an

impact well beyond their narrow breadth. Currently there are few roads or trails on the pastures, and pasture managers and range rider travel on prairie trails and on horseback. Roads and pipelines are added by the oil and gas industry, and this is a considerable concern.

The international journal *Conservation Biology* devoted eight articles to the ecological impacts of roads on terrestrial and aquatic ecosystems, including 1) increased mortality from road construction, 2) increased mortality from collision with vehicles, 3) modification of animal behaviour, 4) alteration of the physical environment, 5) alteration of the chemical environment, 6) spread of exotic species and 7) increased alteration and use of habitat by humans (2000, Vol. 14, pages 16-94).

## **7.7 Plant community and climate change.**

The Colgate Prairie IBA and other community pastures are reasonably large and thus may have a chance to function as 'whole' grasslands ecosystems into the future. Their block-shape minimizes edge and thus retards the persistent invasion of weedy plants from adjacent agricultural fields. With proper grazing rotation, plants can periodically re-seed themselves and snowfall can be captured on site by the natural carry-over vegetation. Even so, maintaining the integrity of those grasslands may be a challenge.

Global climate and the forces that affect it are incredibly complex. Predictions about the future outcome of the green house effects and its impact on climate, ecosystems and biodiversity are fraught with uncertainty (Charlson 1992).

Climate change is relevant to birds<sup>25</sup> and grasslands on the community pastures, because precipitation is a primary factor driving the sage grassland ecosystem and its grazing land use. Long-term planning should give serious consideration to monitoring the changes that might occur, and to devising strategies for response. The habitat connectivity of the area may facilitate species movement in the event of climate change.

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<sup>25</sup> Studies on Great Tits in Europe, a relative of the North American Chickadee, have shown how a change in climate could compromise the birds by increasing energy demand during egg laying and place the time of hatching of young and caterpillar emergence out of synchrony (Stevenson and Bryant 2000).

range monitoring including soil type, plant residue and mulch (e.g. Abouguendia 1982).

## 8 Conservation Goals and Objectives

'A conservation plan does not conservation make.' A conservation plan can be a stepping stone in the continuum from conservation goals to conservation action (Fig. 3). The purpose of this plan is to serve as a tool, by providing a description of ecosystem elements that are presumably critical for conserving the IBA birds, the IBA sites, the landscape and the people's quality of life. The plan also outlines some specific goals and actions.

### 8.1 Management goals

**Goal 1.** Maintain the pasture's grassland ecosystem integrity.

**Action 1.** Use traditional range management strategies (e.g. rotations, complimentary grazing, fire; Sect. 5.4.2.1) to maintain the health of the grasslands resorting to chemical or tilling solutions only as a last resort.

**Action 2.** Expand where necessary the standardized range monitoring currently used by relying on ecologically based principles of

**Goal 2.** In view of potentially increasing pressures on the range arising from gradual nutrient depletion and forage demand possibly accentuated by climate change, monitoring of the range should be given high priority to allow adaptive responses as needed.

**Action 1.** Implement recommendations for grazing strategies (Sect. 5.4.1) and carry out future monitoring of range condition as outlined.

### 8.2 Infrastructure goals

**Goal 3.** Encourage where possible the local cattle-farming economy and find ways to ensure its environmental and economic sustainability.

**Goal 4.** Highlight the importance of the conservation of the IBA and other pastures as habitat 'islands' in the region. Ensure their protection in perpetuity.

### 8.3 Educational goals

**Goal 5.** Provide schools with appropriate resource materials so that teachers can easily

incorporate bird and pasture ecology in their program.

**Action 1:** Invite teachers to workshops and other appropriate functions, and schedule these functions to allow teachers to participate.

**Action 2:** Produce lesson plans and/or provide teachers with other 'props' to facilitate teaching that is consistent with the conservation planning message entailed in this report and other similar initiatives.

**Goal 6.** Encourage where possible the sharing of information with local people to highlight the opportunities and threats to conservation.

**Action 1.** Offer to be present at a local social function to provide information on all facets of IBA conservation where desired.

#### **8.4 Research and information needs**

**Goal 6.** Continue to monitor bird numbers at Colgate and surrounding pastures. Design studies, as needed, as a result of the monitoring.

## **9 Evaluating Success**

This IBA program is a new conservation program in Canada. In its current form, it was designed with a ten-year vision, to 2008.

The participants of the Important Bird Area program in Saskatchewan and nationally are supporting this conservation process. These participants and local stakeholders should be ever vigilant for opportunities to support the local initiatives where possible. Most importantly, however, a local 'champion' should be identified for each area and perhaps for special goals. It is hoped that these champions will accept some ownership for this initiative and keep the program moving, and continue to be vigilant for threats and for opportunities for conservation support.

Carol Bjorklund (Appendix 1) has agreed to be the local champion for the Colgate Prairie IBA.

## 10 Acknowledgments

This conservation plan owes its existence to BirdLife International, and to the joint initiative by the Canadian Nature Federation and Bird Studies Canada for launching this program in Canada. The Important Bird Areas program is part of Natural Legacy 2000 program, a nationwide initiative to conserve wildlife and habitats on private and public lands. We gratefully acknowledge the financial support of the government of Canada's Millennium Partnership Program for this initiative.

For making IBA possible in Saskatchewan, we acknowledge the participation of our funding partners. Financial support for development of this plan has been provided by the Canadian Adaptation and Rural Development - Saskatchewan (CARDS). Funding for the CARDS program is provided by Agriculture and Agri-Food Canada. Funding support has also been provided by Ducks Unlimited Canada and the U.S. National Fish and Wildlife Foundation. Saskatchewan Environment and Resource Management has provided financial and in-kind support. The Centre for Studies in Agriculture, Law and the Environment (CSALE) has provided office space and other services.

The IBA Advisory Committee members helped select IBA sites for conservation planning: Gregg Brewster, Stephen Davis, Frank Roy, Margaret Skeel, Alan R. Smith and Earl Wiltse.

Carol Bjorklund has kindly provided data which she had carefully collected over many years.

These data were transcribed by her from her field notes and in their entirety are published here for the first time. Carol also provided a historic perspective and insight into how the biodiversity and ecosystems in the region have changed over time. George Chu provided unpublished reports on range condition assessment including his own data for Lomond #3.

This specific plan also owes its existence to other local people who have cared and employed good judgment in their professional and private capacity for which the birds are able to reside on the IBA today. We are also grateful to the people listed here who have agreed to participate in this conservation planning in their professional or private capacity (see Appendix 1).

This plan has been greatly improved by various people through providing input including: Carol Bjorklund, Bill Bristol, Rob Foster and Margaret Skeel.

Darrel Cerkowniak, Sask. Land Resource Centre, Univ. of Sask., and Bill Sawchyn, Sask. Environment and Resource Management produced the maps used in this report. Jeff Keith, Saskatchewan Conservation Data Centre, provided data and the map of threatened species.

Information from the Canadian IBA Database was provided by the Canadian BirdLife International co-partners, Bird Studies Canada and the Canadian Nature Federation. This database is compiled using many different data sets, including government and non-government programs. Updated information can be obtained

by contacting Bird Studies Canada (see Appendix 2).

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**Appendix 1.** Names, affiliation and general interests of individuals in connection with the Colgate Prairie IBA. By letting their name appear here, these individuals have made no commitment beyond agreeing to be contacted when their participation is requested.

**Fred Beek**, Sask. Environment and Resource Manage., 3211 Albert Street, Regina, SK, S4S 5W6; 306-787-3019, fbeek@serm.gov.sk.ca  
Interests: Fred is the Team Leader for SERM's Representative Areas Network program.

**Carol Bjorklund**, 102--1833 Coteau Avenue, Weyburn, SK, S4H 2X3; Phone/Fax 306-842-8936 cmbb@sk.sympatico.ca  
Interests: Carol is an avid birder very familiar with the birds of the region.

**Gregg Brewster**, Ducks Unlimited Canada, Box 4465, 1030 Winnipeg Street, Regina, SK, S4P 3W7; 306-569-0424 g\_brewster@ducks.ca  
Interests: Gregg is a wetland and waterfowl biologist familiar with for the region.

**Bill Bristol**, Prairie Farm Rehabilitation Administration, 1800 Hamilton St., Regina, SK, S4P 4L2; 306-780-8155 bristolb@em.agr.ca  
Interests: Bill is the wildlife specialist for PFRA.

**Wayne C. Harris**, Sask. Environment and Resource Manage., 350 Cheadle Street W., Swift Current, SK, S9H 4G3; 778-8218 wayne.harris.erm@govmail.gov.sk.ca  
Interests: Wayne is the Provincial Biologist for the grassland ecoregion and a naturalist with broad knowledge of species and ecosystems.

**Jim Kroshus**, Saskatchewan Wildlife Federation, 444 River St. W, Moose Jaw, Sask. S6H 6J6; Tel. 306-692-8812, Fax 306-692-4370, e-mail sask.wildlife@sk.sympatico.ca  
Interests: Jim is the Projects Coordinator for the Saskatchewan Wildlife Federation.

**Llewellyn Matthews**, Box 2296, Fort Qu'Appelle, SK, S0G 1S0; work 306-566-2876, home 306-332-4810  
 lmatthews@saskpower.com  
Interests: Matthew is the chair of the habitat committee for Saskatchewan Pheasants Forever.

**Mark Niemegeers**, Prairie Farm Rehabilitation Administration, 615 Railway Ave., Weyburn, SK, S4H 0A9; 306-848-4488  
Interests: Mark is the Land Manager for the PFRA community pastures in the region.

**Adam Schmidt**, Sask. Environment and Resource Manage., 117-3rd Ave. West, Melville, SK S0A 2P0; Tel. 306-728-7487, Fax 306-728-7447, E-mail Adam.Schmidt.erm@govmail.gov.sk.ca  
Interests: Adam is the Wildlife Biologist for the parkland ecoregion.

**Margaret Skeel**, Nature Saskatchewan, 1860 Lorne Street, Regina, SK, S4P 2L7; 306-780-9273 Fax 306-780-9263 mskeel@unibase.com  
Interests: Margaret is the Program Coordinator for Nature Saskatchewan. In this role and with her strong interest in conservation, she helps deliver IBA-Saskatchewan.

**Alan R. Smith**, Canadian Wildlife Service, 115 Perimeter Road, Saskatoon, SK, S7N 0X4; 306-975-4091 alan.smith@ec.gc.ca  
Interests: Alan has carried out extensive bird surveys in the region.

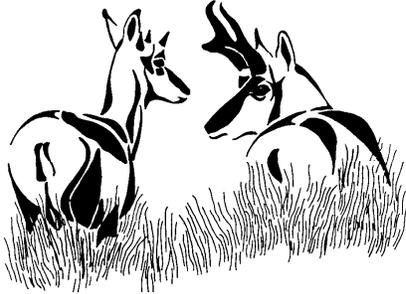
**Dale Weisbrot**, Sask. Pastures Program, 201 3085 Albert St., Regina, SK, S4S 0B1; 306-787-5013 dweisbrot@agr.gov.sk.ca  
Interests: Dale is the Regional Manager for the Sask. Pastures Program. He is a member of the International Wildlife Habitat Committee of the Society for Range Management.

**Earl Wiltse**, Sask. Environment & Resource Manage., 3211 Albert Street, Regina, SK, S4S

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5W6; 306-787-2889 or 2464  
earl.wiltse.erm@govmail.gov.sk.ca

Interests: Earl is SERM's Species at Risk Specialist. He also serves on the IBA Advisory Board.



**Appendix 2:** Information on the lead organizations of the IBA Program.

**BirdLife International** (Wellbrook Court, Girton Road, Cambridge, CB3 0NA, UK; [birdlife@ECNET.ec](mailto:birdlife@ECNET.ec))

A pioneer in its field, BirdLife International is the first non-government organization dedicated to promoting world-wide interest in and concern for the conservation of all birds and the special contribution they make to global biodiversity. BirdLife operates as a partnership of non-governmental conservation organizations, grouped together within geographic regions (e.g. Europe, Africa, Americas) for the purpose of planning and implementing regional programs. These organizations provide a link to on-the-ground conservation projects that involve local people with local expertise and knowledge. There are currently 20 countries involved in the Americas program throughout North, Central and South America. For further information about the Americas BirdLife Program, check the following web site: <http://www.birdlife1.org.ec/ingles.html>.

The **Canadian Important Bird Areas Program** has been undertaken by a partnership of two lead agencies. The Canadian Nature Federation (CNF) and Bird Studies Canada (BSC) are the Canadian BirdLife International partners.

**The Canadian Nature Federation** (1 Nicholas Street, Ottawa, ON, K1N 7B7; <http://www.cnf.ca>)

The CNF is a national conservation organization with a mission to be Canada's voice for the protection of nature, its diversity, and the processes that sustain it. The CNF represents the naturalist community and works closely with our provincial, territorial and local affiliated naturalists' organizations to directly reach 100,000 Canadians. The strength of our grassroots naturalists' network allows us to work effectively and knowledgeably on national conservation issues that affect a diversity of ecosystems and human populations in Canada. The CNF also works in partnership with other environmental

organizations, government and industry, wherever possible.

Our approach is open and cooperative while remaining firm in our goal of developing ecologically-sound solutions to conservation problems. CNF's web site is <http://www.cnf.ca>.

**Bird Studies Canada** (P.O. Box 160, Port Rowan, ON, N0E 1M0; <http://www.bsc-eoc.org>)

The mission of BSC is to advance the understanding, appreciation and conservation of wild birds and their habitats, in Canada and elsewhere, through studies that engage the skills, enthusiasm and support of its members, volunteers, staff and the interested public. BSC believes that thousands of volunteers working together, with the guidance of a small group of professionals, can accomplish much more than could the two groups working independently. Current programs collectively involve over 10,000 volunteer participants from across Canada.

BSC is recognized nation-wide as a leading and respected not-for-profit conservation organization dedicated to the study and understanding of wild birds and their habitats. BSC's web site is <http://www.bsc-eoc.org/>

**Nature Saskatchewan** (1860 Lorne Street, Regina, SK, S4P 2L7; [www.unibase.com](http://www.unibase.com))

Nature Saskatchewan is one of the largest conservation organizations in Saskatchewan whose vision is "Humanity in harmony with nature." Nature Saskatchewan was founded in 1949 and has been a reasoned and respected voice in conservation. Nature Saskatchewan's major accomplishments are in the areas of education, conservation, research and publication.

Nature Saskatchewan's educational programs include delivery of the *Living by Water Project* in Saskatchewan and Manitoba, BirdQuest and PlantQuest workshops for youth and adults, a scholarship for graduate studies at universities, and support of nature camps for youth. In the conservation area, Nature Saskatchewan owns and maintains six nature sanctuaries, negotiates and refers conservation easements, and fosters conservation through working with governments and industry.

Research conducted or facilitated by Nature Saskatchewan is through support for monitoring at high priority sites and for threatened species. Nature Saskatchewan is conducting inventories of flora and fauna at its nature sanctuaries. The organization co-manages the Saskatchewan Conservation Data Centre and operates a landowner stewardship program *Operation Burrowing Owl*.

Nature Saskatchewan quarterly publishes an internationally known journal *Blue Jay*, releases special publications on an irregular basis (22 to date), and publishes a quarterly newsletter *Nature Views*.

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**Appendix 3.** At the inaugural **IBA-Saskatchewan** workshop (Saskatoon, 22 October 1997), 123 candidate areas were nominated by several dozen naturalists. On 10 January 2001, the data compilation and assessment by outside reviewers was completed, yielding 53 IBAs approved by Bird Studies Canada.

The number of approved IBAs may yet grow as more information becomes available, particularly in the north. However, current IBA priorities involve conservation planning and implementation of suggested actions. The 13 sites shown below have conservation plans completed or in various stages of completion. Two sites focus on grasslands (Govenlock, Nashlyn and Battle Creek IBA, and Colgate IBA), one on a marsh-lake-upland complex (Cumberland Marshes IBA), and the remainder on water bodies. For lake IBAs the adjacent upland is usually equally if not more important in the ecology of IBA birds. In some cases the IBA has been expanded to include the entire watershed (Redberry Lake, and Chaplin, Old Wives and Reed lakes) or portions of watersheds.