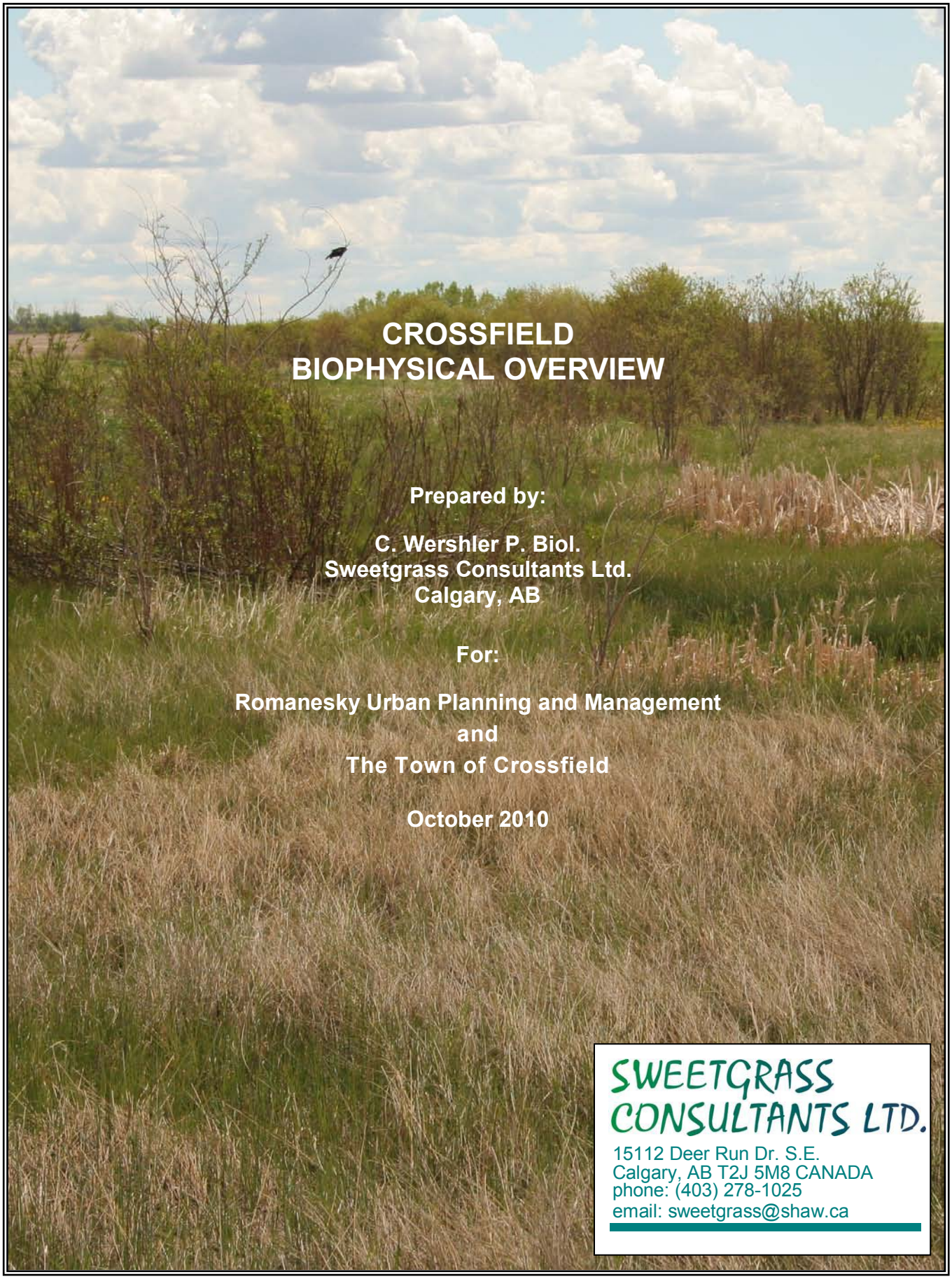

CROSSFIELD
BIOPHYSICAL OVERVIEW

Prepared by:

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For:

Romanesky Urban Planning and Management
and
The Town of Crossfield

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EXECUTIVE SUMMARY

A total of 9 habitat groupings have been identified:

- Semi-native Grassland
- Woodland
- Tall Shrub
- Stream Complex
- Wetland
- Cultivated Wetland
- Artificial Wetland
- Urban Anthropogenic
- Rural Anthropogenic

More than 90% of the Plan Area is non-native. Most of the remaining habitat has been fragmented and disturbed.

Totals of 58 bird, 7 mammal, 1 amphibian, and 108 vascular plant species were observed.

No federally listed bird species at risk were recorded and habitat potential for those species is generally low.

Wildlife species of provincial concern include 10 *Sensitive* bird species that either breed or potentially breed in the Plan Area. These species are of lower ranking than *At Risk* (endangered, threatened, and special concern) species and includes species that are vulnerable to natural events and human activities.

One provincially rare plant species, pale blue-eyed grass, was recorded at two sites—in seepage wetland habitat at Site 21 and springs wetland habitat at Site 1.

The most significant habitats in the Plan Area are several wetlands and stream complex habitats that collectively encompass the most diverse habitats; greatest biodiversity; wildlife corridor potential; sensitive, uncommon and rare species; and relatively low levels of disturbance and non-native plant invasion.

Recommendations include the following:

1. Although most native habitat has been lost in the Plan Area, an opportunity exists to retain numerous areas of significant habitat and representative biodiversity, including rare, sensitive and uncommon species.
2. This report provides a biophysical overview of the Plan Area that can guide future planning initiatives. However, biophysical impact assessments should be conducted for proposed developments on individual lands that contain native habitats. These should include more detailed field assessments and additional information on species of concern (including rare plants) and environmentally significant habitats.
3. Any clearing of native habitat and wetland work should be conducted outside of the nesting season to comply with the Migratory Birds Convention Act.
4. As provincial policy requires no net loss of wetlands, any wetland disturbance and loss through proposed development and wetland setbacks should be addressed with Alberta Environment.
5. A setback distance for development from wetlands and drainages should be adopted by Town Council as part of a conservation strategy for these habitats.

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APPENDICES

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1. INTRODUCTION

Sweetgrass Consultants was contracted in the spring of 2010 to conduct a biological impact assessment of the Town of Crossfield, including annex areas, in support of a Municipal Development Plan (Figure 1).

2. OBJECTIVES

Objectives of the study included the following:

- mapping of habitats and general description of wildlife and vegetation;
- identification of wetlands and ranking of relative significance;
- analysis of significant habitats and species at risk potential;
- discussion of regional ecosystem concepts, including assessment of habitat connectivity and wildlife corridor potential;
- recommendations for management and mitigation.

3. METHODOLOGY

1. An information survey was conducted that included provincial data bases for species at risk (ACIMS – Alberta Conservation Information Management System and FWMIS – Fish and Wildlife Management Information System.
2. Interpretation of aerial photography to map basic habitat units and select sites for field-checking.
3. A field program was conducted on June 2, June 6 and July 27, 2010 that included the following surveys:

- Habitat Ground Truthing – the majority of sites were field-checked and habitat units and boundaries were confirmed and mapped.
- Vegetation – representative habitats were walked extensively and vegetation was described, noting dominants and additional characteristic plant species.

  Wetlands – the majority of wetlands were mapped using GPS (Global Positioning System) and GIS (Geographic Information System) technology. Wetlands were described and classified using guidelines in Stewart and Kantrud (1971 and 1972).
- Wildlife – informal wildlife surveys for terrestrial vertebrates were undertaken in representative habitats.
- Species of Concern – based on the types of habitats occurring in the Plan Area and provincially rare plants documented for similar habitats in the general Crossfield area (ANHIC 2009a & b; Kershaw et al. 2001), habitats with the highest potential for rare plants were identified. These higher potential areas were surveyed most intensively using recommended provincial protocols: a combination of pattern and meander searches (Lancaster 2000).

  Similarly, based on records of wildlife species of concern in the region, habitat potential for wildlife species of concern was evaluated and field surveys were conducted using Alberta Fish and Wildlife sensitive species protocols (ASRD 2005) where applicable.

4. GENERAL BIOPHYSICAL DESCRIPTION

4.1 Regional Setting

The study area is located in the northern portion of the Foothills Fescue Natural Subregion. This area of the sub-region is characterized by cultivated plains, with native habitats mainly restricted to small areas, including wetlands and valleys. These remnant native habitats have been largely disturbed through heavy grazing by domestic livestock and by invasion of non-native vegetation. Linear disturbances, including road systems and have further fragmented native habitats into smaller, isolated units (Downing and Pettapiece 2006).

4.2 Topography, Surficial Geology and Soils

The following information is summarized from Turcheneck and Fawcett (1994).

Topography is undulating to hummocky. The study area is located at the headwaters of Nose Creek and Crossfield Creek. The valley of Nose Creek is a minor glacial meltwater channel (Shetsen 1987).

Upland soils are well drained Black Chernozemics formed over medium textured eolian and /or glaciolacustrine veneer overlying medium textured, generally silty, till. Minor amounts of poorly drained Solonetzic and Humic Gleysols occur in localized depressions.

Drainages contain a mixture of well to imperfectly drained Chernozemic and Regosolic soils; poorly drained saline Gleysols; and Solonetzic soils.

4.3 Land Use

The vast majority of the study area has been significantly disturbed by urban and rural development. Much of the remaining habitat contains semi-native and non-native areas of vegetation due to heavy grazing, invasion by non-native plants, and past surface disturbance including cultivation.

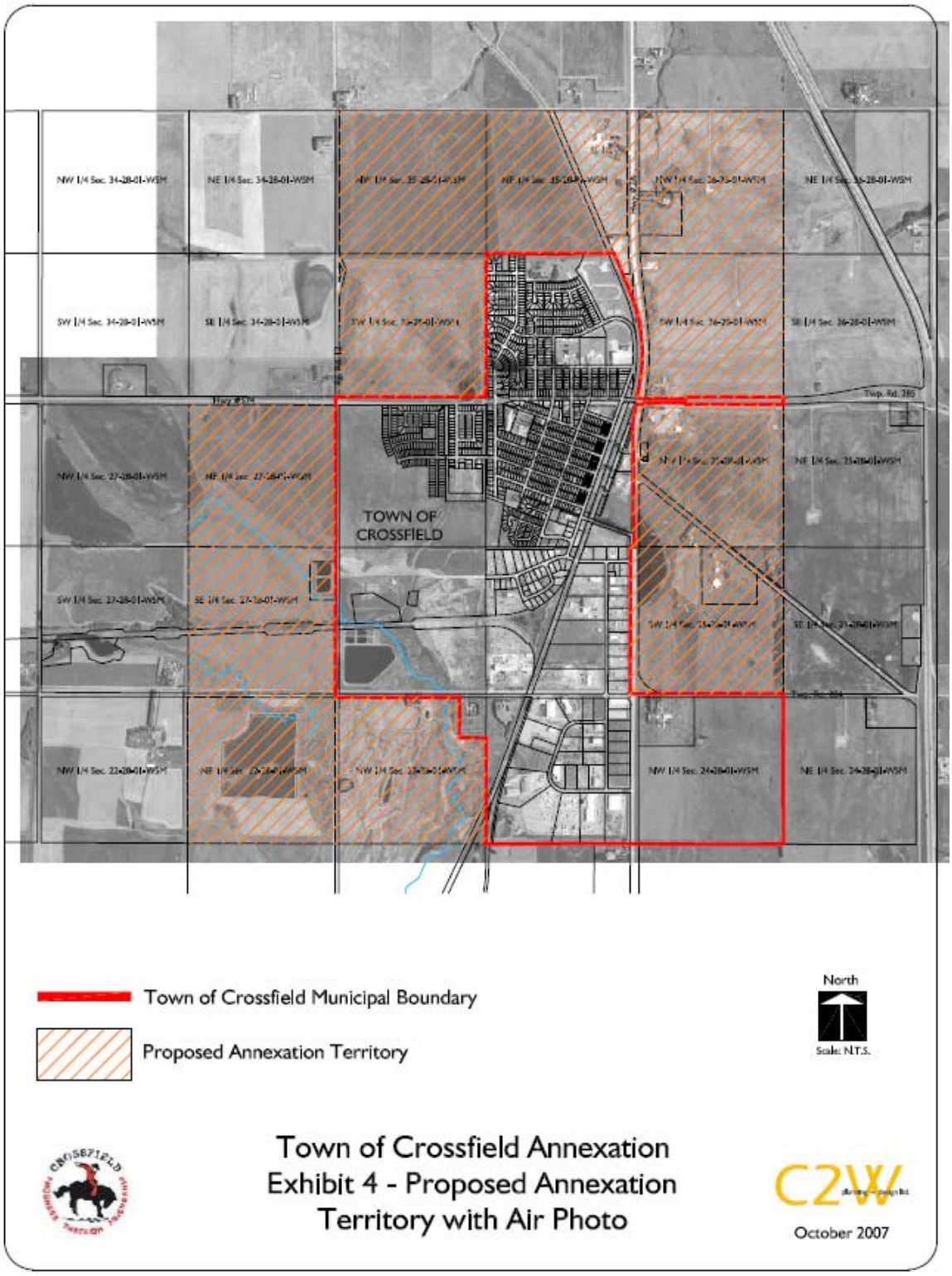
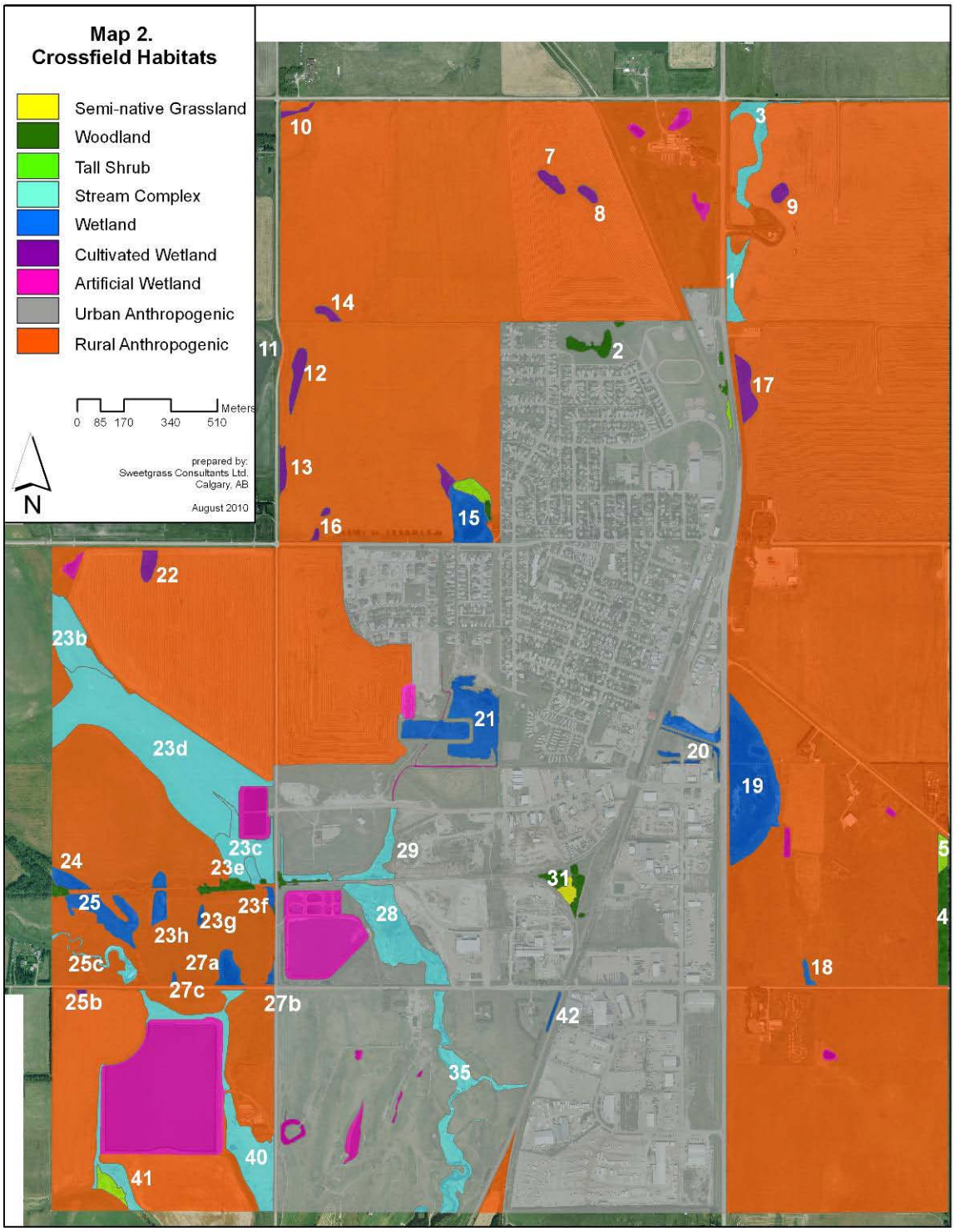


Figure 1. Municipal Development Plan Area


Map 2.
Crossfield Habitats
Semi-native Grassland
Woodland
Tall Shrub
Stream Complex
Wetland
Cultivated Wetland
Artificial Wetland
Urban Anthropogenic
Rural Anthropogenic
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Meters
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prepared by:
Sweetgrass Consultants Ltd.
Calgary, AB
August 2010
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23h
25c
27a
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27c
25b
27b
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5. HABITATS, VEGETATION AND WILDLIFE

A total of 9 habitat groupings have been identified (Figure 2)—these are defined in Appendix 1:

Semi-native Grassland
Woodland
Tall Shrub
Stream Complex
Wetland
Cultivated Wetland
Artificial Wetland
Urban Anthropogenic
Rural Anthropogenic

Table 1. Habitat Areas

Habitat	Area (hectares)
Semi-native Grassland	0.38
Woodland	4.90
Tall Shrub	1.82
Stream Complex	47.13
Wetland	23.16
Cultivated Wetland	5.27
Artificial Wetland	33.83
Urban Anthropogenic	409.83
Rural Anthropogenic	659.94

The various habitats are described in the following sections, which include representative photographs. Site numbers refer to those in Figure 2. Lists of all wildlife and plant species observed appear in Appendices 3-6.

5.1. Stream Complex

Stream complex habitats occupy shallow valleys, or drainages, and incorporate a diversity of habitats including stream courses, wetlands, springs, woodlands, tall shrubbery, and areas dominated by non-native grass. Portions of the stream courses have been channelized and, in some cases, re-routed. However, a few stream complexes constitute important connected habitats that have high potential as wildlife corridors.

More information on wetland, woodland/tall shrub components of Stream Complex habitats can be found in Sections 5.2 and 5.4, respectively. Areas of several Stream Complex wetlands are listed in Appendix 2.

5.1.1 Springs Wetland (Site 1)

Description

- spring-fed seasonal pond (Class III wetland)
- shallow marsh (dominated by awned sedge), wet meadow and tall shrub (willow spp.) backshore

Significance

- unique site in Crossfield containing springs habitat and plant species not found elsewhere in the Plan Area
- provincially rare plant species: *Sisyrinchium septentrionale* (pale blue-eyed grass)
- uncommon plant species: *Cypripedium parviflorum* var. *pubescens* (large yellow lady's-slipper)
- spring-fed wetlands are localized important habitats for rare and uncommon plants

Site 1. Springs wetland

5.1.2 Stream Complex (Site 3)

Description

- stream complex including the following: a minor Class II/III wetland; artificial ponds; non-native grass with scattered native plants on the valley slopes; tall shrubbery (willows); and aspen woodland with buckbrush and non-native grass (awnless brome) understory
- unit becomes non-native to the south and is not connected to Site 1

Significance

- important as green space but relatively low biodiversity because of non-native vegetation and disturbance (e.g. artificial ponds)
- wildlife included White-tailed Deer, Red Fox, and nesting Swainson's Hawk)

Site 3. Wetland in foreground; woodland and tall shrubbery in background

5.1.3 Stream Complex Wetland (Site 23b)

Description

- seasonal pond (Class III wetland) in bottom of a shallow valley that is a minor meltwater channel
- shallow marsh, in wetter parts, is native vegetation dominated by sedge spp.; wet meadow, in drier portions, is a mixture of native and non-native species; this unit includes a narrow strip of non-native grass along the outer edge
- non-native vegetation has invaded from a combination of previous surface disturbance and invasion of non-native plants from the adjacent cultivated upland.
- the current stream is an artificial, channelized ditch
- heavy grazing by cattle—wetland is hummocky from trampling
- moderate diversity of shallow marsh/wet meadow birds including nesting Wilson's Phalarope, an uncommon species in the Project Area
- part of a connected system of native and non-native habitats extending to the SSE, and includes Sites 23d, 23c and 23e

Significance

- an extensive shallow wetland and a component of a larger connected system to the south
- wildlife corridor potential
- removal of cattle would improve wetland function and wildlife habitat

Site 23b. Valley bottom wetland; view to southeast

5.1.4 Stream Complex (Site 23d)

Description

- non-native, heavily grazed dry meadow with minor areas of temporary pond (Class II wetland) in former nature stream course
- includes a channelized ditch that continues from 23b in the northwest and runs toward an artificial trout pond to the southeast; localized shallow marsh occupies portions of the ditch
- part of a connected system of habitats including Sites 23b to the northwest and 23c and 23e to the southeast
- also connected to a side arm of the valley system outside, to the west, of the Plan Area, that contains a natural stream course.

Significance

- constitutes an important open space link between native wetland habitats; part of a connected system of habitats
- heavy cattle grazing is limiting the habitat quality; however, the overall potential is relatively low for habitat and species diversity

Site 23d. View southeast from northwest end of unit, showing central artificial channel

5.1.5 Stream Complex Wetlands (Sites 23c and 23e)

Description

- 23c is a temporary pond (Class II wetland) with wet meadow vegetation
- 23e is a seasonal pond (Class III wetland) with shallow marsh and open water
- these wetlands may constitute a single wetland that would probably be ranked a Class III

Significance

- extensive shallow wetland area and a component of a larger connected system of wetland and non-native pasture to the northwest
- wildlife diversity appears to be relatively low for marsh birds and waterfowl
- removal of cattle would improve wildlife habitat.

Sites 23c and 23e. View to northwest from east side of unit; wetland in foreground

5.1.6 Stream Complex (Site 28)

Description

- complex includes the following: stream course; Class II, III and IV wetlands; and idle non-native grasses
- low-moderate diversity of wetland birds

Significance

- semi-connected to Site 35, to the south; and to the Site 23 by semi-native habitat along railway ditch (the west unit of Site 29)
- wildlife corridor potential

Site 28. View to northwest from southeast end

5.1.7 Railway Ditch Stream Complex (Site 29)

Description

- two semi-connected units: (1) north unit—a narrow strip of non-native habitat along an intermittent stream channel to the north of Site 28, and (2) west unit—a narrow strip of semi-native wetland and drainage channel along railway ditch: trees and shrubs/non-native grasses
- west unit idle; north unit disturbed by off-road motor vehicles

Significance

- semi-connected to Site 28 to the south and the Site 23b-c-d-e complex to the west
- north unit could recover somewhat with proper management but biodiversity potential is low— its main value is open space; west unit provides limited wildlife habitat and a potential travel route between larger habitats

Site 29. View west along west unit from its east end

5.1.8 Golf Course Stream Complex (Site 35)

Description

- enhanced stream channel through golf course, bordered by narrow, idle strip of non-native grasses
- wider strip of idle habitat, to the east of the stream channel, in the south portion contains small wetlands and semi-native backshore

Significance

- semi-connected to Site 28
- low biodiversity but has potential as a wildlife travel route

Site 35. View to south from north end

5.1.9 Stream Complex (Site 40)

Description

- includes the following: non-native grass with scattered tall willow shrub and individual trees (balsam poplar); stream channel remnants, and minor wetlands
- connected to agricultural open space with scattered wetlands and stream channel habitat, in the quarter-section to the north
- includes a strip of habitat around sewage lagoon
- continues southward outside of the property

Significance

- limited biodiversity potential, serving mainly as open space and a wildlife travel route

Site 40. Habitat complex

5.1.10 Stream Complex (Site 41)

Description

- includes a semi-permanent pond (Class IV wetland) in natural drainage that continues south of the Plan Area
- dominant pond vegetation: common cattail, in deep marsh; creeping spike-rush, water sedge and small bottle sedge, in shallow marsh; woolly sedge, fowl blue grass and northern reed grass in wet meadow; and non-native grasses on outer edge
- at the north end, the pond connects to constructed drainage on west side of sewage lagoon
- the pond contains a diversity of habitats including deep marsh, shallow marsh, wet meadow, and willow shrubbery, apparently fed by groundwater seepage or springs
- low water level during survey period and low diversity of breeding birds but potential for greater wildlife diversity during wetter periods

Significance

- contains one of the more diverse wetlands in the Plan Area
- uncommon wildlife in the Plan Area, including moose (abundant browse and pellets in willows) and nesting Wilson's Phalarope

Site 41. Semi-permanent pond

5.1.11 Stream Wetland (Site 25c)

Description

- seasonal pond (Class III wetland) in remnant stream course
- shallow marsh plants include fowl manna grass and creeping spike-rush
- heavily grazed
- semi-connected to artificial channel at the north end of the sewage lagoon, on south side of secondary road

Significance

- part of an important area of connected stream channel wetland and potential springs habitat to the west, outside of the Plan Area
- limited biodiversity, including Muskrat

Site 25c. Stream wetland

5.2. Wetlands (Upland Ponds)

Uncultivated upland ponds include some of the least disturbed and most productive habitats for species diversity within the Plan Area. Several types occur including Class II, III, IV and V—these are defined in Appendix 1. Wetland areas are listed in Appendix 2.

5.2.1 Wetland (Site 15)

Description

- permanent pond (Class V wetland)
- extensive open water, shallow marsh (mainly awned sedge), and wet meadow (including woolly sedge and fowl blue grass); patchy deep marsh (common cattail)
- connected to tall shrub and woodland on the backshore
- northwestern extremity of wetland is cultivated

Significant

- diversity of habitats and breeding birds, including diving ducks (3 species), dabbling ducks (3 species), and a variety of water and marsh birds, including sensitive species and species uncommon in the Plan Area
- breeding Boreal Chorus Frog
- one of the most significant wetlands in the Plan Area in terms of reliable water, biodiversity and degree of disturbance
- together with connected woodland and tall shrubbery on the northeast backshore, constitutes diverse, productive wildlife habitat
- discontinuing cultivation in the northwest would improve wetland function

Site 15. Productive permanent pond

5.2.2 Wetland (Site 19)

Description

- permanent pond (Class V wetland)
- mostly open water, with narrow band of deep marsh (common cattail) on outer edge

Significance

- largest natural wetland in the Plan Area
- diversity of breeding birds, including diving ducks (4 species), dabbling ducks (7 species), and a diversity of water and marsh birds, including species uncommon in the Plan Area
- one of the most significant wetlands in the Plan Area in terms of reliable water and biodiversity

Site 19. Productive permanent pond

5.2.3 Sunset Ridge Wetland (Site 21)

Description

- semi-permanent pond (Class IV wetland)
- diversity of habitats including open water, extensive deep marsh (common cattail), shallow marsh (dominated by awned sedge), wet meadow (dominated by sedges and grasses), seepage wet meadow (dominated by rushes) and non-native wet meadow
- disturbed at various times in the past through ditching, excavation and drainage. In 2010, portions in the southwest were dominated by non-native grass and contained a lower biodiversity. A rectangular portion of the wetland in the southwest is separated from the rest of the wetland by a narrow berm/road; however, there is a hydrological connection and, based on historical aerial photography, there had been a connected wetland in the area of the present complex.
- all-terrain vehicle tracks in seepage habitat

Significance

- largest deep marsh in the Plan Area
- diversity of breeding birds including diving ducks (1 species), dabbling ducks (5 species), and a diversity of water birds and marsh birds, including sensitive species
- breeding Boreal Chorus Frogs
- seepage habitat on north edge of wetland contains a provincially rare plant species, *Sisyrinchium septentrionale* (pale blue-eyed grass) and plant species uncommon in the Plan Area
- one of the most significant wetlands in the Plan Area in terms of habitat, plant, and breeding bird diversity

Site 21. Semi-permanent pond - productive northern portion

Site 21. Seepage meadow at north edge of wetland – rare plant habitat

5.2.4 Wetlands in S portion of SE1/4, Sec. 27-27-28-10-W5M

5.2.4.1 Site 23f

Description

- very small shallow marsh (Class III wetland) dominated by awned sedge
- heavily grazed
- low potential for biodiversity

Significance

- relatively low significance

Site 23f. Seasonal pond

5.2.4.2 Site 23g

Description

- very small, degraded Class III wetland
- heavily grazed
- mainly non-native vegetation and only one wetland plant species (golden dock)

Significance

- relatively low significance

5.2.4.3 Site 23h

Description

- medium size seasonal pond (Class III wetland), including two units—one on either side of railway berm
- shallow marsh with open water and a mixture of non-native and native vegetation; wetland vegetation and zones not well developed
- heavily grazed
- low diversity of vegetation and wildlife, but three species of dabbling ducks

Significance

- moderate significance—somewhat degraded through periodic cultivation around it but presence of ducks shows some productivity
- historically connected with Site 25 wetland

Site 23h. Seasonal pond – south portion

5.2.4.4 Site 25

Description

- large seasonal pond (Class III wetland)
- extensive shallow marsh (dominated by water sedge and creeping spike-rush) and wet meadow (including a saline Nuttall's salt-meadow grass – foxtail barley community, uncommon in the Plan Area)
- heavily grazed
- low diversity of wildlife; no waterfowl—limited open water

Significance

- moderate significance—more saline than most other wetlands in the Plan Area
- historically connected with Site 25 and 23h wetlands

Site 25. Seasonal pond

5.2.4.5 Site 24

Description

- moderate size seasonal pond (Class III wetland)
- extensive shallow marsh (awned sedge) and open water
- diversity of birds including waterfowl (one duck species) and marsh birds

Significance

- moderate significance
- connected with relatively large patch of woodland to the west, just outside of the Plan Area
- historically connected with Site 25 wetland

Site 24. Seasonal pond

5.2.4.6 Site 27a

Description

- medium size seasonal pond (Class III wetland)
- extensive shallow marsh (slough grass and needle spike-rush) and open water; semi-native wet meadow (foxtail barley and common dandelion); wetland zones not well defined
- heavily grazed
- low diversity of wildlife: one duck species and one shorebird

Significance

- low/moderate significance

Site 27a. Seasonal pond

5.2.4.7 Site 27b

Description

- very small, shallow seasonal pond (Class III wetland)
- shallow marsh (creeping spike-rush, awned sedge and slough grass) and limited open water
- low wildlife diversity

Significance

- low significance
-- historically connected with Site 25 wetland

Site 27b. Seasonal pond

5.2.4.8 Site 27c

Description

- very small, degraded wetland; cultivated recently (2007)
- wetland class undetermined as wetland was dry and vegetation was sparse and grazed down
- low potential for biodiversity

Significance

- relatively low significance

5.2.5 Wetland (Site 18)

Description

- small seasonal pond (Class III wetland) in very narrow, drainage with non-native vegetation
- low habitat and species diversity

Significance

- relatively low significance

5.2.6 Wetland (Site 20)

Description

- semi-connected group of small semi-permanent ponds (Class IV wetland) in an industrial area
- open water and deep marsh (common cattail); small areas of shallow marsh (fowl manna grass, water sedge), and non-native wet meadow with a few scattered willows; largest, most important unit is in a road allowance ditch; one unit being filled in at edge

Significance

- good diversity of breeding bird species including 3 diving ducks and 6 dabbling ducks, and a variety of marsh and water birds
- historically connected with Site 19 wetland
- conservation of grassy backshore important for maintaining waterfowl nesting habitat at this site

Site 20. Seasonal ponds – largest unit

5.2.7 Wetland (Site 42)

Description

- narrow semi-permanent pond (Class IV wetland) in railway ditch
- primarily open water and deep marsh (common cattail); also willows and non-native grass, and non-native caragana hedge
- small areas of shallow marsh and non-native wet meadow; largest, most important unit is in a road allowance ditch; one unit being filled in at edge

Significance

- low/moderate significance—although not extensive habitat, four duck species and one marsh bird were recorded

Site 42. Semi-permanent pond

5.2.8 Site 11

Description

- narrow strip of wetland—part of a large Class V wetland that stretches to the west out of the Plan Area
- vegetation within Plan Area is shallow marsh (awned sedge) with wet meadow (northern reed grass and scattered willows) on outer edge; no open water
- the greater part of the wetland, outside of Plan Area, is very productive for breeding birds, including waterfowl (80 ducks of 6 species, and 20 Canada Geese) and three shorebird species

Significance

- high significance—a component of a large, productive wetland

Site 11. Productive permanent pond; portion in Plan Area is right of fence

5.3. Cultivated Ponds

These wetlands are situated on the upland in recently cultivated crop. The ponds themselves have been cultivated, often on numerous occasions, including 2010 or late 2009. Land use and the barren, disturbed, non-native environment have degraded wetland function.

Cultivated ponds are former Class II and III ponds but often function as Class I types, with ephemeral standing water. A distinctive community of plants often exists that includes pioneering species of native and non-native plants. There is potential for rare plants in mud flats at some sites when they are dry.

Cultivated wetland areas are listed in Appendix 2. There may have been a few very small cultivated ponds in inaccessible parts of fields that were not mapped.

5.3.1 Site 22

Description

- recently cultivated wetland with shallow water
- no vegetation or wildlife observed

Significance

- relatively low significance

5.3.2 Site 16

Description

- two recently cultivated small ponds
- breeding Boreal Chorus Frogs
- three shorebird and one duck species
- sparse vegetation; species indicative of Class III wetland: creeping spike-rush, slough grass, awned sedge, and minor common cattail

Significance

- greater biodiversity than other cultivated wetlands in the Plan Area
- higher potential if rested from cultivation

Site 16. Cultivated pond

5.3.3 Site 13

Description

- degraded seasonal pond (Class III wetland) in road ditch and recently cultivated field
- shallow marsh indicator plants present
- breeding Boreal Chorus Frogs
- one duck species (2 pairs)

Significance

- relatively low significance but with higher potential if rested from cultivation

Site 13. Cultivated pond

5.3.4 Site 12

Description

- medium size recently cultivated pond
- no vegetation or wildlife observed

Significance

- relatively low significance at time of survey

5.3.5 Site 10

Description

- small narrow recently cultivated wetland in minor, disconnected, disturbed drainage
- no vegetation or wildlife observed

Significance

- relatively low significance at time of survey

Site 10. Cultivated pond

5.3.6 Site 14

Description

- recently cultivated wetland
- not field-checked

Significance

- appeared to have relatively low significance at time of survey

5.3.7 Sites 7 and 8

Description

- two medium size cultivated ponds
- not field-checked

Significance

- appeared to have relatively low significance at time of survey

5.3.8 Site 9

Description

- recently ploughed dry pond
- mixture of non-native and native plants indicative of Class III pond degraded by cultivation
- no wildlife observed

Significance

- relatively low significance at time of survey, but with potential for rare plants

Site 9. Cultivated pond

5.3.9 Site 25b

Description

- very small cultivated wetland
- no vegetation or wildlife observed

Significance

- relatively low significance at time of survey

5.3.10 Site 17

Description

- larger cultivated wetland
- no vegetation or wildlife observed

Significance

- relatively low significance at time of survey

Site 17. Cultivated pond

5.4. Woodland, Tall Shrub and Semi-native Grassland

These upland habitats have been reduced to small remnants in the Plan Area. Consequently, there has been invasion of non-native plants, and wildlife and plant biodiversity are relatively low compared with more extensive habitats within the general region. The following are the least disturbed, larger stands that have been numbered in Map 2. Other units of tall shrub and woodland have been mapped but these are either smaller, more disturbed habitats or have been described with a wetland or stream complex habitat.

5.4.1 Town Park (Site 2)

Description

- primarily groves of aspen with chokecherry understory with minor willow component within a Town park; includes a few areas of non-native grass understory and scattered non-native shrubs
- diversity of 8 species of potentially breeding birds, some occurring nowhere else in the Plan Area

Significance

- medium significance

Site 2. Park woodland

5.4.2 Woodland-Tall Shrub (Sites 4 and 5)

Description

- narrow strip of woodland; tall willow shrubbery at the north end
- woodland is primarily balsam poplar and minor aspen with understory varying from semi-native and open, where cattle use has been heavy, to dense low and tall shrub (dominated by buckbrush and red-osier dogwood) in areas protected from cattle
- patches of non-native shrubs
- medium diversity of breeding birds and native plants

Significance

- medium significance

Site 4. Woodland – less disturbed habitat in right background

5.4.3 Semi-native Grassland and Woodland (Site 31)

Description

- semi-native grassland and aspen and balsam poplar woodland
- primarily non-native grass cover in both grassland and woodland, but there is a diversity of native grassland forbs in the grassland
- trash dumping on site
- medium-heavy old and recent deer browse
- relatively low diversity of breeding birds

Significance

- largest area of semi-native grassland in the Plan Area; other sites have a sparser cover of fewer native plant species

Site 31. Semi-native grassland in foreground, woodland in background

5.5. Artificial Wetland

This category includes dugouts, dammed wetlands, sewage lagoons, and golf course ponds. Ponds are usually relatively deep and the shorelines steep and straight, features that do not support the establishment of wetland vegetation communities. Biodiversity is relatively low.

5.5.1 Sewage Lagoon

Description

- large rectangular pond north of Site 41; not numbered
- good numbers of ducks and grebes and other water birds staging during early June. The majority of these were probably non-breeding since there is little habitat on or adjacent to the pond that is suitable for nesting.

Significance

- low

5.6. Rural and Urban Anthropogenic

These developed areas are primarily town and farm developments and associated roads. Vegetation is relatively sparse and non-native, lacking species and structural diversity. Potential for wildlife habitat and biodiversity is therefore very low. Wildlife is composed principally of non-native species and common, wide-ranging native species.

7. SPECIES OF CONCERN

7.1 Species At Risk

No federally or provincially listed species of animals or plants were recorded during the field survey and there appears to be low habitat suitability for these species. One wildlife species that could possibly occur in extensive shallow marsh/wet meadow habitat (e.g., Site 25), given a chance to recover from heavy grazing, is Yellow Rail, a federally listed *Species of Concern.*

7.2 Provincially Sensitive Species

A total of 10 bird species listed as *Sensitive* in Alberta (ASRD 2006) have been recorded. A *Sensitive* species is defined as “any that is not at risk of extinction or extirpation but may require special attention or protection to prevent it from becoming at risk.” *Sensitive* species have a lower ranking than *Species At Risk* and their status indicates that they should be monitored or watched more carefully than those species considered to be secure. The following is the rationale, as per ASRD (2006), for listing these species in Alberta, as well as local status:

Birds

Baltimore Oriole

- Largely declined within Alberta and surrounding jurisdictions since 1994. Parkland habitat threatened by cultivation.

- Observed in aspen woodland south of Site 23e.

Barn Swallow

- A common species that is declining in Alberta and all surrounding jurisdictions.
- Nests locally in old buildings (barns and sheds) in the Plan Area.

Black Tern

- Wetland habitat vulnerable to alteration; species declining across its North American range, likely a result of habitat loss on both breeding and wintering grounds.
- Nesting colony at Site 15.

Green-winged Teal

- A common, widespread species with no known threats but is rapidly decreasing in Alberta, Canada, and North America.
- Observed and possibly nesting at Site 19, 20.

Horned Grebe

- Threatened by degradation and loss of wetland habitat. Breeding Bird Survey data from Alberta suggest a population decline over the last four decades
- Nests at Site 19. Observed on the sewage lagoon.

Least Flycatcher

- Has been declining in Alberta and surrounding jurisdictions. May be threatened by habitat changes on wintering range.
- Observed and probably nesting at Site 3 and aspen woodland south of Site 23e.

Lesser Scaup

- Surveys show a long-term decline in populations within Alberta and surrounding jurisdictions. Alteration and loss of suitable habitat may pose threats.
- Nests at Site 19 and 21, and possibly Site 20. Observed on the sewage lagoon.

Pied-billed Grebe

- Has declined across most of its range since 1966. Drought-related disappearance of small ponds and other forms of wetland degradation affect this species.
- Nesting at Site 19.

Sora

- Large (>50%) declines have occurred in Alberta and all surrounding jurisdictions since 1994. Species threatened by loss of wetland habitat.
- Nests at Site 21, 15, 20, 24

Swainson's Hawk

- Adult population recently subjected to mass poisoning on winter range. Dependent on healthy ground squirrel populations.
- Nesting at Site 3

7.3 Provincially Rare Plants

One species, *Sisyrinchium septentrionale* (pale blue-eyed grass), was found in the Plan Area. Small populations were recorded in the seepage habitat on the north side of Site 21 and at the western edge of the springs wetland (Site 1) (Appendix 7). Pale blue-eyed grass is ranked as an S3/G3G4 species (Kemper 2009). This species inhabits alkali springs/seepages and calcareous soils.

The scope of the project did not allow for a detailed survey or rare plants. Other habitats identified with potential for rare plants include dry mudflats in cultivated wetlands (best surveyed in late summer/early fall).

Ranking definitions for rare plants include the following (Alberta Conservation Information Management System):

S1/G1	5 or fewer occurrences or only a few remaining individuals	May be especially vulnerable to extirpation because of some factor of its biology
S2/G2	6-20 or fewer occurrences or with many individuals in fewer locations	May be especially vulnerable to extirpation because of some factor of its biology
S3/G3	21-100 occurrences, may be rare and local throughout it's range, or in a restricted range (may be abundant in some locations)	May be susceptible to extirpation because of large scale disturbances
S4/G4	Typically >100 occurrences	Apparently secure
S5/G5	Typically >100 occurrences	Demonstrably secure

7.4 Provincially Rare Plant Communities

No rare plant communities occur in the Plan Area.

8. SIGNIFICANT HABITATS

The most significant native habitats in the Plan Area are wetlands and the extensive, connected areas of stream complex habitat.

8.1 Wetlands

Wetlands in general are recognized as environmentally significant habitats for biological, hydrological and socioeconomic values. However, because of differences in wetland class and individual site character, combined with the effects of land use, they are quite variable in their overall importance.

The most significant wetlands in the Plan Area are Sites 1, 11, 15, 19, 21 and 41. Various combinations of the following features make these wetlands more important than others: larger wetland size; sensitive and locally uncommon species; relatively high biodiversity including nesting waterfowl and marsh birds; relatively low levels of disturbance and invasion by non-native vegetation.

9. RELEVANT ENVIRONMENTAL POLICY

9.1 Wetlands

Existing provincial guidelines on wetlands (Alberta Environment 2007) and the proposed provincial wetlands policy (Wetland Policy Project Team 2008) stipulate no net loss of wetlands through development and land use. Wetland loss and disturbance associated with proposed development must be addressed with Alberta Environment who reviews applications under the Water Act, issues approvals, and handles any required compensation.

9.2 Provincially Rare Plants and Sensitive Wildlife

In Alberta, there are no regulations for the protection of provincially rare plants or sensitive wildlife species. Conservation of these species is encouraged through volunteer effort and responsible stewardship.

9.3 Migratory Birds Convention Act

Under the federal *Migratory Birds Convention Act*, it is illegal to disturb or cause mortality to nesting birds. Clearing and drainage of habitat should be avoided during the major nesting season, from at least April 1 to July 15, and usually later (late August-early September) for waterfowl.

10. DISCUSSION OF REGIONAL ECOSYSTEM CONCEPTS

10.1 Habitat Fragmentation

Native habitats in the Crossfield area have generally been broken into relatively small remnants that are often isolated by critical distances from other native habitats. This *habitat fragmentation* is symptomatic of urban and rural agricultural environments, resulting in a gradual loss of biodiversity.

As development proceeds in the Plan Area, there will be additional fragmentation of native habitats. Retention of the most significant habitats will be important in order to mitigate the effects of habitat fragmentation.

10.2 Wildlife Corridors

Connected native habitats in the stream complex habitats have high potential for wildlife corridors. Within the Town, where other habitats are small and isolated, these are very important for wildlife and native plant conservation.

10.3 Biodiversity

The greatest biodiversity of animals and plants is in native habitat. Because so little native habitat remains in the Plan Area, general retention of native habitat is required for species conservation. Especially important is the conservation of the most significant habitats.

11. RECOMMENDATIONS

1. Although most native habitat has been lost in the Plan Area, an opportunity exists to retain numerous areas of significant habitat and representative biodiversity, including rare, sensitive and uncommon species.
2. This report provides a biophysical overview of the Plan Area that can guide future planning initiatives. However, biophysical impact assessments should be conducted for proposed developments on individual lands that contain native habitats. These should include more detailed field assessments and additional information on species of concern (including rare plants) and environmentally significant habitats.
3. Any clearing of native habitat and wetland work should be conducted outside of the nesting season to comply with the Migratory Birds Convention Act.
4. As provincial policy requires no net loss of wetlands, any wetland disturbance and loss through proposed development and wetland setbacks should be addressed with Alberta Environment.
5. A setback distance for development from wetlands and drainages should be adopted by Town Council as part of a conservation strategy for these habitats.

13. REFERENCES

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APPENDIX 1. HABITAT DEFINITIONS

Semi-native Grassland – degraded remnant grassland containing native plant species within a matrix of non-native grasses. A number of plant species indicative of native grassland are not present.

Woodland – native aspen/balsam poplar woodland with variable native to non-native understory vegetation.

Tall Shrub – native tall willow shrubbery occurring at woodland or wetland edge.

Stream Complex – shallow stream valley (drainage) habitat complexes comprised of wetlands, woodland and shrubbery, stream channels, and non-native grass open space connections.

Wetland – wetlands on the upland with relatively diverse, native vegetation and wildlife. Portions or all of some smaller sites may have been cultivated in the past.

Cultivated Wetland – wetlands on the upland that had been recently cultivated at the time of the field survey. Standing water is ephemeral-temporary; vegetation has a significant component of non-native species; and biodiversity is relatively low.

Artificial Wetland – artificially created ponds with relatively low habitat diversity and biodiversity potential.

Urban Anthropogenic – habitats in an urban setting that have been significantly altered through human activities. Habitat components include areas of non-native vegetation, residential areas, buildings and roads.

Rural Anthropogenic – habitats in a rural setting that have been significantly altered by human activities, Habitat components include windbreaks, cultivated fields, buildings and farmyards.

Class I Wetland – an ephemeral pond with surface water usually maintained for only a brief period in the spring. In Alberta, ephemeral ponds are often degraded, cultivated Class II or III ponds.

Class II Wetland – a temporary pond characterized by a wet meadow vegetation zone in the central or deepest part of the wetland and occupying 5% or more of the total wetland area. Standing water can be present for a short period in the spring or following heavy rains later in the year. The dominant vegetation is typically a dense growth of graminoids (grasses and grass-like plants). A low prairie zone is often present on the outer perimeter.

Class III Wetland – a seasonal pond characterized by a shallow marsh vegetation zone in the central or deepest part of the wetland and occupying 5% or more of the total wetland area. A wet meadow vegetation zone occurs in the shallower, outer portion, often forming a complete or broken band on the outer edge. A low prairie zone is often present on the outer perimeter. Standing water is normally present for extended periods in spring and early summer but may become dry in late summer-fall.

Class IV Wetland – a semi-permanent pond characterized by deep marsh vegetation and open water dominating the central or deepest portion of the wetland and occupying 5% or more of the total wetland area. Typically there are also zones of shallow marsh, in the shallower water, and wet meadow and sometimes low prairie, in the drier outer edge. Surface water in semi-permanent ponds is usually maintained throughout the spring and summer and often into the fall and winter.

Class V Wetland – a permanent pond characterized by open water dominating the central areas of pond basins and ordinarily maintained throughout the year. Deep marsh, shallow marsh, wet meadow and low prairie zones often occur as marginal bands that adjoin the deep, permanent, open-water zones.

APPENDIX 2. TABLE OF WETLAND AREAS

Cultivated Habitat Type		
		Area (hectares)
Site 7	*	0.46
Site 8	*	0.29
Site 9	*	0.37
Site 10	*	0.21
Site 12	*	0.79
Site 13	*	0.42
Site 14	*	0.30
Site 16 (total of 2 units)	*	0.19
Site 17	*	1.21
Site 22	*	0.58
Site 25b	*	0.08
In Stream Complex Habitat Type**		
Site 1	CLASS III	1.31
Site 23b	CLASS III	2.95
Site 23c	CLASS II	3.01
Site 23e	CLASS III	0.38
Site 25c	CLASS III	0.93
Wetland Habitat Type		
Site 11	CLASS V	0.04
Site 15	CLASS V	2.70
Site 18	CLASS III	0.20
Site 19	CLASS V	8.01
Site 20 (total of 5 units)	CLASS IV	1.47
Site 21 (total of 2 units)	CLASS IV	5.58
Site 23f	CLASS III	0.20
Site 23g	CLASS III	0.14
Site 23h (total of 2 units)	CLASS III	0.87
Site 24	CLASS III	0.65
Site 25	CLASS III	2.36
Site 27a	CLASS III	0.91
Site 27b	CLASS III	0.14
Site 27c	undetermined	0.09
Site 42	CLASS III	0.18

* - degraded wetlands; originally Class II or III; some may still qualify as these types, but at least some function today as Class I wetlands
** - in Stream Complex habitat there area additional wetlands whose areas have not been defined

APPENDIX 3. LIST OF VASCULAR PLANTS

The following 108 species, including 15 non-native (identified with an asterisk), were identified during field surveys. Nomenclature is according to ANHIC (2006).

Agrimonia striata (agrimony)
Amelanchier alnifolia (saskatoon)
Anemone canadensis (Canada anemone)
Antennaria parvifolia (small-leaved everlasting)
Artemisia biennis (biennial sagewort)
Artemisia ludoviciana (prairie sage)
Aster ciliolatus (Lindley's aster)
Aster laevis (smooth aster)
Beckmannia syzigachne (slough grass)
**Bromus inermis* (awnless brome)
Calamagrostis inexpansa (northern reed grass)
**Capsella bursa-pastoris* (shepherd's-purse)
**Caragana arborescens* (common caragana)
Carex aquatilis (water sedge)
Carex atherodes (awned sedge)
Carex aurea (golden sedge)
Carex pellita (woolly sedge)
Carex sartwellii (Sartwell's sedge)
Carex scirpoidea (rush-like sedge)
Carex utriculata (small bottle sedge)
Cerastium arvense (field mouse-ear chickweed)
Cicuta maculata (water-hemlock)
**Cirsium arvense* (creeping thistle)
Coeloglossum viride (bracted bog orchid)
Comandra umbellata (bastard toadflax)
Cornus canadensis (bunchberry)
Cornus stolonifera (red-osier dogwood)
**Cotoneaster acutifolius* (Peking cotoneaster)
Corallorhiza trifida (pale coralroot)
Deschampsia cespitosa (tufted hair grass)
Disporum trachycarpum (fairybells)
Dodecatheon pulchellum (saline shooting star)
Elaeagnus commutata (silverberry)
Eleocharis acicularis (needle spike-rush)
Eleocharis palustris (creeping spike-rush)
Eleocharis quinqueflora (few-flowered spike-rush)
**Elytrigia repens* (quack grass)
Epilobium angustifolium (common fireweed)
Epilobium ciliatum (northern willowherb)
Epilobium leptophyllum (narrow-leaved willowherb)
Equisetum arvense (common horsetail)
Festuca saximontana (Rocky Mountain fescue)
Fragaria virginiana (wild strawberry)
Galium boreale (northern bedstraw)
Gentianella amarella (felwort)

Geum aleppicum (yellow avens)
Glyceria striata (fowl manna grass)
Heracleum lanatum (cow parsnip)
Hierochloe hirta (sweet grass)
Hordeum jubatum (foxtail barley)
Juncus alpinoarticulatus (alpine rush)
Juncus balticus (wire rush)
Juncus longistylis (long-styled rush)
Juncus nodosus (knotted rush)
Lemna minor (common duckweed)
Lithospermum ruderale (woolly gromwell)
Mentha arvensis (wild mint)
Osmorhiza depauperata (spreading sweet cicely)
**Phleum pratense* (timothy)
**Plantago major* (common plantain)
Platanthera hyperborea (northern green bog orchid)
**Poa pratensis* (Kentucky bluegrass)
Poa palustris (fowl bluegrass)
Polygonum amphibium (water smartweed)
Populus balsamifera (balsam poplar)
Populus tremuloides (aspen)
Potamogeton alpinus (alpine pondweed)
Potentilla anserina (silverweed)
Potentilla fruticosa (shrubby cinquefoil)
Potentilla rivalis (brook cinquefoil)
Primula incana (mealy primrose)
Prunus virginiana (choke cherry)
Puccinellia nuttalliana (Nuttall's salt-meadow grass)
Pyrola asarifolia (common pink wintergreen)
Ranunculus cymbalaria (seaside buttercup)
Ranunculus sceleratus (celery-leaved buttercup)
Ribes oxyacanthoides (northern gooseberry)
**Ribes* sp. (currant)
Rosa acicularis (prickly rose)
Rosa woodsii (common wild rose)
Rubus idaeus (wild raspberry)
Rumex maritimus (golden dock)
Rumex occidentalis (western dock)
Salix bebbiana (beaked willow)
Salix exigua (sandbar willow)
Salix lutea (yellow willow)
Salix planifolia (flat-leaved willow)
**Sambucus* sp. (elderberry)
Schoenoplectus sp. (great bulrush)
Shepherdia canadensis (Canada buffaloberry)
Smilacina stellata (star-flowered Solomon's-seal)
Solidago canadensis (Canada goldenrod)
**Sonchus uliginosus* (perennial sow-thistle)
**Sorbus* sp. (mountain-ash)

Stellaria longipes (long-stalked chickweed)
Symphoricarpos occidentalis (buckbrush)
**Taraxacum officinale* (common dandelion)
Thalictrum venulosum (veiny meadow rue)
Thermopsis rhombifolia (golden bean)
Triglochin maritima (seaside arrow-grass)
Triglochin palustris (narrow arrow-grass)
Typha latifolia (common cattail)
Urtica dioica (common nettle)
Utricularia vulgaris (common bladderwort)
Vicia americana (wild vetch)
**Vicia cracca* (tufted vetch)
Viola adunca (early blue violet)
Viola canadensis (western Canada violet)

APPENDIX 4. LIST OF BIRDS

The following is a list of 58 birds observed during the field surveys (an asterisk designates nesting or probable nesting):

***American Avocet:**
Site 16

***American Coot:**
Site 21, 15, 20, 19

***American Crow:**
Site 15, 2, 4

***American Goldfinch:**
Site 2, woodland S of 23e

***American Robin:**
Site 15, 31, woodland S of 23e

***American Wigeon:**
Site 20, 19, sewage lagoon, 42

***Barn Swallow:**
Rural anthropogenic

***Black Tern:**
Site 15

***Black-billed Magpie:**
Site 15, 3, woodland S of 23e

***Blue-winged Teal:**
Site 21, 20, 19, 42

***Brown-headed Cowbird:**
Site 3, 2, 41, woodland S of 23e

Bufflehead:
Site 19

***Canada Goose:**
Site 20

***Canvasback:**
Site 15, 19, sewage lagoon

***Cedar Waxwing:**
Site 15, 2, 31, 4, woodland S of 23e

***Cinnamon Teal:**
Site 21, 20, 19, 23e

***Clay-colored Sparrow:**
Site 3, 2, 31, 4, 28, 41, woodland S of 23e

***Common Grackle:**
Site 21, 15

***Common Raven:**
Site 3

***Downy Woodpecker:**
Woodland S of 23e

***Eared Grebe:**
Site 19, sewage lagoon

***Eastern Kingbird:**
Site 15, woodland S of 23e

***European Starling:**
Site 2, woodland S of 23e

***Gadwall**:
Site 21, 15, 20, 19, 23h, 24, sewage lagoon, 23e, 16

***Gray Partridge**:
Site 21, 17, 31

Great Blue Heron:
Site 29, 19

***Great-horned Owl:**
Site 3

***Green-winged Teal:**
Site 20, 19

***Horned Grebe:**
Site 19, sewage lagoon

***Horned Lark:**
Rural anthropogenic

***House Sparrow:**
Site 2, 4

***House Wren:**
Site 15, 2, 31

***Killdeer:**
Site 27a, 16

***Le Conte's Sparrow:**
Site 23b

***Least Flycatcher:**
Site 2, 4, woodland S of 23e

***Lesser Scaup:**
Site 21, 20, 19, sewage lagoon

***Mallard:**
Site 21, 15, 2, 19, 23h, 25c, 27a, 35, 42

***Merlin:**
Rural anthropogenic

***Nelson's Sparrow:**
Site 21, 15, 23b

***Northern Shoveler:**
Site 21, 15, 20, 19, 23h, sewage lagoon, 42

***Pied-billed Grebe:**
Site 15

***Redhead:**
Site 15, 20, sewage lagoon

***Red-tailed Hawk:**
Woodland S of 23e

***Red-winged Blackbird:**
Site 21, 15, 3, 20, 19, 23b, 24, 41, 42, 23e, 16

***Ruddy Duck:**
Site 21, 20, 19

***Savannah Sparrow:**
Site 21, 11, 3, 28, 23b, 25, 41

***Song Sparrow:**
Site 4

***Sora:**
Site 21, 15, 20, 24

***Spotted Sandpiper:**
Site 20, 19

***Swainson's Hawk:**
Site 3

***Tree Swallow:**
Variety of habitats

***Warbling Vireo:**
Woodland S of 23e

***Western Wood-Pewee:**
Site 2

Willet:
Site 16

***Wilson's Phalarope:**
Site 21, 41

***Wilson's Snipe:**
Site 21, 23b, 25, 41, 27b

***Yellow Warbler:**
Site 15,

***Yellow-headed Blackbird:**
Site 15, 20, 19

APPENDIX 5. LIST OF MAMMALS

The following 7 species were observed during field surveys:

Red Fox:
Site 3

White-tailed Deer:
Site 3; and Site (unidentified deer sign)

Northern Pocket Gopher:
Site 1, 4, 41, 40

Richardson's Ground Squirrel:
Site 2

White-tailed Jackrabbit:
Site 31

Muskrat:
Site 25c

Moose:
Site 41

APPENDIX 6. LIST OF AMPHIBIANS AND REPTILES

A single amphibian species, and no reptiles (garter snakes) were observed:

Boreal Chorus Frog:
Site 21, 15, 2, 20, 23e, 16, 13

APPENDIX 7. RARE PLANT LOCATIONS

Sisyrinchium septentrionale (pale-blue-eyed grass); Site 21 – seepage at north end of wetland

Population	UTM Easting (NAD83)	UTM Northing (NAD83)
estimated 50-100 plants	705844E to 705878	5701434N to 5701440
	above UTMs are outermost points of the habitat	

Sisyrinchium septentrionale (pale-blue-eyed grass); Site 1 – wet meadow on west side of wetland

Population	UTM Easting (NAD83)	UTM Northing (NAD83)
2 plants	706770	5702792
1 plant	706770	5702783
9 plants	706782	5702776
estimated total <50 plants		