

**TOWN OF STRATHMORE**  
**WETLAND CONSERVATION PLAN**

August 7, 2005

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## INTRODUCTION

The Town of Strathmore, one of the fastest growing urban municipalities in Canada, is located within one of the highest density waterfowl production areas in North America as evidenced by the Ducks Unlimited Canada Decision Support System. Unlike within the nearby City of Calgary, which has pioneered in urban wetland conservation planning with their “Wetland Conservation Plan” of 2004, the Town of Strathmore still retains nearly all of the significant wetland areas located within its present and proposed town boundaries. Those wetlands have however been significantly impacted by the adjacent urban development.

In addition to significant waterfowl production values, wetlands also play an important role in improving water quality and quantity, reducing flooding and soil erosion, providing biodiversity, moderating climate conditions, contributing to an aesthetic urban design, and providing educational and recreational opportunities. To ensure that these benefits remain viable and sustainable for future generations, the Town of Strathmore has developed a Wetland Conservation Plan, which sets priorities and explores alternatives for wetland conservation in order to guide future urban development.

Wetland issues within the Town of Strathmore parallel those identified by the Calgary Plan:

- adherence to related provincial and federal laws and policies;
- ensuring “No Net Loss” of wetlands by promoting their conservation and/or mitigation within areas of future urban development and within transportation and utility corridors;
- maintaining or improving local water quality and quantity;
- ensuring orderly and cost-efficient development of lands within the town while addressing engineering constraints;
- the use of naturally occurring wetlands for stormwater treatment while ensuring their long-term viability;
- identifying and mitigating the effects of telecommunication lines on avian life; and
- providing consistency, efficiency and effectiveness in dealing with wetlands through the development application process.

## GOALS

Balancing the conservation of Strathmore’s wetlands within the context of urban development is a priority for the Town.

1. The primary goal of this present wetland study is to identify, map, and classify all of the wetlands located within the current boundaries of the Town of Strathmore and within the proposed expansion area. This represents the first step towards establishing a wetland policy for the Town of Strathmore and to the incorporation of wetland conservation planning into the Town of Strathmore business plan and into future integrated town planning.
2. Environmentally significant wetlands will be identified.

3. Potential elements of a wetland conservation policy for the Town of Strathmore will be set forth.

## INVENTORY

In order to ensure the conservation and protection of Strathmore wetlands during the development approval process, a detailed inventory of the wetlands is required. Semi-permanent and permanent wetlands were identified through a combination of the use of aerial photography and a Geographical Information System (G.I.S.), and through field inspection.

There are two widely accepted systems of wetland classification in North America, the broad-reaching system for all types of wetlands used in the United States wetland inventory designed by Cowardin, and the system designed for the classification of prairie wetlands by Stewart and Kantrud. The Stewart and Kantrud system (Appendix 1) provides greater detail for identification of wetlands in the prairie pothole region of North America, and was used by the City of Calgary in their inventory. In this inventory, the Stewart and Kantrud system is used for all comparisons, but the equivalent Cowardin classes (Appendix 2) are also provided. Unlike the City of Calgary inventory where wetland classes were assigned using aerial photography, in Strathmore all Stewart and Kantrud wetland classifications were assigned based on the field inspection of each wetland by a “Qualified Wetland Specialist” and are deemed accurate. Stewart and Kantrud Class I (ephemeral) wetlands were not inspected. All wetlands in Stewart and Kantrud wetland Classes II through V (temporary, seasonal, semi-permanent and permanent wetland classes) were field inspected. Class I and II wetlands, which may play a role in water purification, groundwater recharge, and soil moisture retention, are generally too low in biological species diversity to qualify for environmental significance on that basis. Wetlands in these classes are also likely to come into direct conflict with human health issues as the major sources of mosquitoes that increase the potential for the spread of West Nile Virus. There are no Class VI or VII wetlands within the study area. Wetland area and shoreline were measured through G.I.S. application. A field information collection key is included as Appendix 3.

**(Note:** The numbering of the Stewart and Kantrud wetland Classes I through VII does not imply wetland priority or significance. The wetland Classes are numbered for identification purposes only.)

The area inventoried included all land within the existing Town boundary and those lands currently under consideration for annexation into the Town of Strathmore, i.e. the NE¼ of Section 12, All of Section 13, the East½ of Section 16, the East½ of Section 21, the NW¼ of Section of Section 22, and All of Section 24, all in Township 24, Range 25, West of the 4<sup>th</sup> Meridian.

A total of 29 complexes containing 69 wetlands were classified as seasonal, semi-permanent, or permanent within the Strathmore area wetland inventory (Appendix 6), 21 of which complexes are located within the existing town boundary. Under the *Municipal Government Act*, all of these wetlands would qualify for protection as either Environmental Reserve or Municipal Reserve. Many of these wetlands are situated within four established Ducks Unlimited Canada wetlands conservation projects located all or in part within the proposed town boundary.

In addition, 58 Class II temporary wetlands occur within 3 complexes, 23 of them within the existing town boundary. The majority of these wetlands exist as a result of a combination of natural run-off and irrigation spill, without which most of these wetlands would be categorised as ephemeral. Twenty-six of these wetlands are currently under cultivation. Ponds within these classifications can play a role in reducing flooding and soil erosion and contribute to groundwater discharge/recharge and water purification, and may be protected through the *Provincial Water Act*.

Two additional seasonal wetlands fall within the “other” category: irrigation canal, stream. The presence of the Western Irrigation District canals and the abundant supply of irrigation water has given many of the wetlands a degree of permanence much greater than would normally occur on dryland prairie. In fact, many of the wetlands most likely did not exist, other than as ephemeral, temporary or seasonal run-off ponds, prior to the introduction of irrigation water into the area. The succession of these wetlands to a more semi-permanent or permanent state has resulted in the establishment of a wetland fauna more akin to that found within the aspen parkland than that that would historically have occurred here. Nearly all of the wetlands are highly productive in a biological sense.

## ENVIRONMENTALLY SIGNIFICANT WETLANDS

Obviously all wetlands possess some environmental significance, but wetlands transgress political and economic boundaries and not all wetlands can be preserved in our growing vibrant society. A form of assessment is required to determine which wetlands warrant retention and which have the potential to remain viable within an urban environment, and which, if there is absolutely no alternative to development, warrant mitigation to negate that wetland loss. The generally accepted policy standard for wetlands both internationally and within Canada has become that of “No Net Loss”.

The City of Calgary suggested model for determining the significance of individual wetlands is included as Appendix 4, attached. Other models exist, but nearly all are qualitative rather than quantitative. One quantitative model developed by the United States Fish and Wildlife Service is the *Habitat Evaluation Procedures* or “HEP”. The HEP process calls for the development of individual models for index species, which will measure the “habitat suitability index” and “habitat units” for that species within any particular site. “Mallard Units” will be replaced with a like number of “Mallard Units”, and cannot be substituted for by species units of a different type.

Habitat unit measurements are then applied to any mitigation procedures. Although models for many common species now exist, new species models can and often do require extensive hours of research, sometimes years, and are very expensive to develop. Usually the simplest and least expensive solution, if at all possible, is to protect and retain the significant values of wetland habitats where they already exist.

Due to the expense involved with quantitative models and to their limitations as to who is to determine just what the minimum threshold is for environmental significance, qualitative models are commonly used to determine the environmental significance of any wetland.

Wetland functions can be sorted into four general categories:

- life support – bio-diversity, fish and wildlife habitats (It should be noted that these values are greatest in warm shallow wetlands where light penetrates to the substrate and with a variety of submergent and emergent vegetation, not in deeper wetlands with clean shorelines.)
- hydrology – flood attenuation and storage, erosion control, groundwater recharge and discharge, climatic regime (drought buffering, carbon sequestration, climate stabilization, temperature moderation)
- water quality – purification through sediment removal, removal of nutrients, microbial action
- socio-economic – urban design, cultural heritage sites, educational opportunities, recreational opportunities

Some of these values are very difficult to quantify, and the state of the science for others is still quite rudimentary. None of the flora and fauna that were noted in the Strathmore wetlands qualifies as a threatened or endangered species under either the provincial or federal status listings. The horned grebe, which was found nesting in wetlands ST-3a and ST-24, is on the watch list as a possible species of concern in the *Status of Alberta Wildlife* listings. Forster's tern, which was observed at 3 adjacent sites on or near the Strathmore Golf Course, is also on the provincial watch list. These birds most likely breed in wetland ST-10a on the Strathmore Golf Course, which provides suitable nesting habitat, and only feed at the other two sites, wetlands ST-15 and ST-17. Both the great blue heron and the black-crowned night heron, which were recorded, are on the provincial watch list as well, but neither of these birds breeds within the study area.

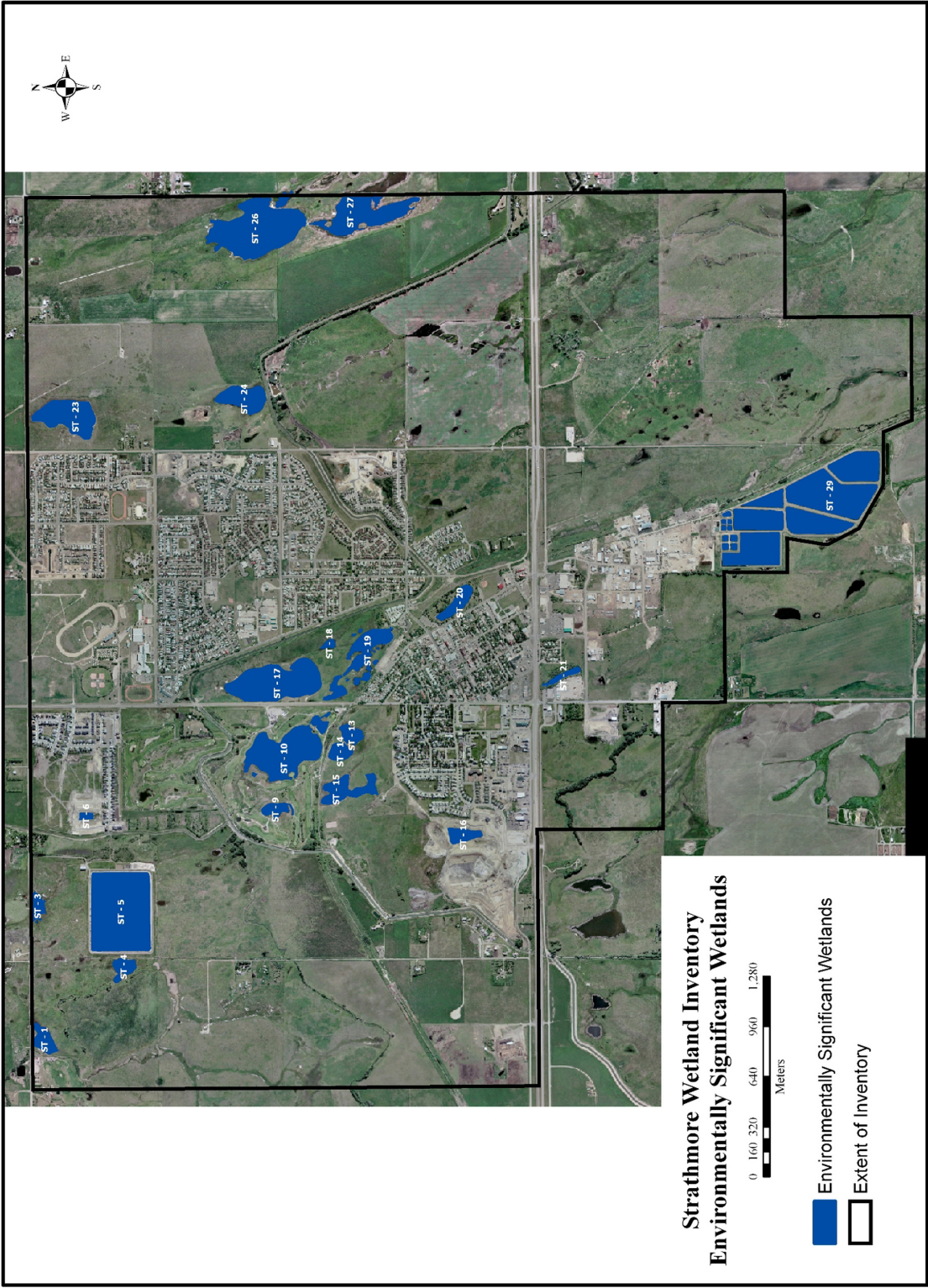
Of the temporary (Class II) wetlands, the only ones examined, which could be considered to be relatively undisturbed and fully natural, are those located in site ST-2 located in the proposed annexation area. These are quite low in species diversity and would not qualify for environmental significance on the basis of flora or fauna, although they may possess other significant values not investigated.

For the purpose of the environmental significance assessment, the Calgary model considers the factors of the degree of disturbance, flora, fauna, flood & erosion control, water quality and quantity, the cultural, recreational and educational potential, and urban design potential. These qualities are found to greatest abundance in Stewart and Kantrud category III, IV and V wetlands, those wetlands that qualify for preservation under the *Municipal Government Act* as either environmental reserve or municipal reserve. The wetlands, which would qualify for significance under the Calgary model, are summarised in the following chart:

### Chart of Environmentally Significant Wetlands

WETLAND NUMBER	AREA		SHORELINE		STEWART & KANTRUD CLASS	SIGNIFICANCE
	Ha	Acres	Km	Miles		
CLASS III - BIOLOGICALLY SIGNIFICANT WETLANDS						
Wetlands located inside present town boundary:						
ST-18	0.412	1.02	0.272	0.17	III-B	High Species Diversity (H.S.D.)
CLASS III – HYDROLOGICALLY SIGNIFICANT WETLANDS						
Wetlands located in proposed annexation area:						
ST-23	6.637	16.40	1.172	0.73	III-C	Stormwater Attenuation
CLASS IV – BIOLOGICALLY SIGNIFICANT WETLANDS						
Wetlands located inside present town boundary:						
ST-13	1.382	3.41	0.478	0.30	IV-B	High Species Diversity
ST-14	1.383	3.42	0.444	0.28	IV-C	High Species Diversity
ST-15	3.697	9.14	1.274	0.79	IV-B	High Species Diversity
ST-19	5.976	14.77	2.956	1.83	IV-B	High Species Diversity
Wetlands located in proposed annexation area:						
ST-1	1.885	4.66	0.613	0.38	IV-B	High Species Diversity
ST-3	1.347	3.33	0.658	0.40	IV-B	H. S. D., Sensitive Species
ST-4	1.500	3.71	0.602	0.37	IV-B	High Species Diversity
ST-24	4.002	9.89	0.863	0.53	IV-B	H. S. D., Sensitive Species
ST-27	8.970	22.17	2.354	1.46	IV-B	High Species Diversity
CLASS V – BIOLOGICALLY SIGNIFICANT WETLANDS						
Wetlands located inside present town boundary:						
ST-9	1.339	3.31	0.695	0.43	V-B	H. S. D., also Recreational Significance
ST-10	11.915	29.44	2.467	1.53	V-B	H. S. D., Sensitive Species, also a Recreational Wetland
Wetlands located in proposed annexation area:						
ST-26	16.176	39.97	2.414	1.50	V-C	High Species Diversity
CLASS V – HYDROLOGICALLY SIGNIFICANT WETLANDS						
Wetlands located inside present town boundary:						
ST-6	0.404	1.00	0.265	0.16	V-B	Stormwater Attenuation
ST-17	11.686	28.88	1.581	0.98	V-D	Stormwater Attenuation
ST-21	0.832	2.06	0.609	0.38	V-A	Stormwater Attenuation
ST-29	34.488	85.24	7.362	4.55	V-B	Wastewater Treatment Lagoons
Wetlands located in proposed annexation area:						
ST-5	19.052	47.08	1.733	1.07	V-B	Town Water Supply Reservoir
CLASS V – SOCIO-ECONOMICALLY SIGNIFICANT (RECREATIONAL) WETLANDS						
Wetlands located inside present town boundary:						
ST-16	1.602	3.96	0.580	0.36	V-C	Strathmore Lakes Estates
ST-20	2.062	5.10	0.705	0.44	V-B	Kinsmen Park
ST-9	1.339	3.31	0.695	0.43	V-B	Golf Course, also H. S. D.
ST-10	11.915	29.44	2.467	1.53	V-B	Golf Course, also a Biologically Significant Wetland for Sensitive Species, High Species Diversity

**Note:** Appendices 5, 6 and 7 contain detailed wetland inventory forms, a summary table of traits for all wetlands inspected and classified, and a map showing the location of wetlands.





## Discussion:

Only three wetlands in the inventory area were categorized as class III, seasonal. Wetland ST-11 is of low species diversity and is low in other environmentally significant values. Wetland 23 has a shoreline highly impacted by intensive grazing and is of very low species diversity, but it may make a significant contribution to flood and erosion control. Wetland ST-18 has moderate to high species diversity.

The greatest numbers of study area wetland complexes, 16, qualify as class IV, semi-permanent, wetlands. Of these complexes, seven, ST numbers 7, 8, 12, 22, 28, 33 and 34 are of low to moderate species diversity and are not of high environmental significance for flora and fauna. Wetland ST-22 was recently breached and is now almost dry.

As is indicated by the number and variety of species recorded during what was normally only a single visit to each site, class IV complexes ST-1, 3, 4, 13, 14, 15, 19, 24, and 27 all rate as of moderate to high species diversity. In depth observation would undoubtedly result in the identification of many more species at each of these sites.

The shorelines and adjacent uplands of #'s 1, 3, 4, 13, 14, 24, and 27 have only been moderately impacted up to this point. Wetlands ST-13, 14, and 15 are all threatened and are currently impacted by constructed drainage ditches. Water levels in wetland 15 have already dropped and the shoreline is exposed mudflat. Complex ST-19 has an urban area immediately adjacent in part with the remainder of the adjacent uplands being largely introduced quackgrass. It does however contain extensive emergent vegetation and is of high species diversity.

Of the ten Class V, permanent, complexes included in this inventory, six would seem to possess such a high degree of disturbance that this would negate their inclusion as areas of environmental significance: wetlands number ST-5 (town reservoir), ST-6 (Hillview stormwater pond), ST-9 & 10 (Strathmore Golf Course), ST-16 (Strathmore Lake Estates) and ST-29 (the wastewater treatment lagoons). However, as well as significant recreational value, wetland ST-10a still provides habitat suitable for a bird species, the Forster's tern, which is listed as provincially sensitive and this wetland is generally high in species diversity. The other large golf course wetland, ST-9, also has fairly high species diversity, and it and the Strathmore Lake Estates wetland (low in species diversity) possess significant recreational values. Although it has only moderate species diversity, complex ST-29, the wastewater treatment lagoons, is, in addition to the obvious contribution to water quality, one of the most productive waterfowl habitats in the inventory area. Wetland ST-20, the Kinsmen Park, although highly disturbed, possesses significance for recreational and cultural values. The remaining three Class V wetlands, ST-17, 21 & 26, are relatively undisturbed and all meet one or more of the criteria for environmentally significant wetlands. Wetland ST-17 qualifies for high species diversity (fauna – staging waterfowl), flood & erosion control, and visual aesthetics. Wetland ST-21 qualifies for flood and erosion control as well as a unique aesthetic being the only wetland in the inventory area in a wooded setting. Wetland ST-26 scores highly for species diversity. Thus, all ten Class V wetland complexes possess qualifications in one or more of the criteria for significance.

Based on the City of Calgary suggested matrix, twenty-one of the twenty-nine Stewart and Kantrud Class III, IV and V wetland complexes totalling 136.747 hectares (337.96 acres) qualify for environmental significance based on one or more criteria. All of these wetlands undoubtedly possess other significant values, but the role that any or all wetlands might play in such areas as groundwater recharge or carbon sequestration or climate regime is clearly beyond the scope of this study. Nor were other potential socio-economic values investigated at this time. Eight of these complexes totalling 59.569 hectares (147.21 acres) are located outside of the present town boundary within the area proposed for annexation into the Town of Strathmore.

## POLICY ELEMENTS

Alberta legislation states that all water within the province belongs to the Province of Alberta. The Crown owns all water including water in wetlands, as well as the right to divert and, generally, to disturb water, regardless of whether that water is on private or public land. The Crown also owns the bed and shores of nearly all naturally occurring permanent wetlands in the province. Where those permanent wetlands were recognized at the time of the original topographical surveys as shown on the township plans, the bed of the wetlands was withdrawn from the titles of privately held lands. That was not the case with nearly all of the Strathmore wetlands. However, the permanence of a wetland can change over the years depending on climate change and drainage basin land use changes as well as the impoundment and diversion of waters both into and out of wetland basins. With the introduction of irrigation water diverted from the Bow River into the hydrological factors in this area, many wetlands have subsequently increased in permanence. Regardless of who holds the land title, the Crown gives itself and others the right to use, divert or disturb water through different types of *Water Act* statutory authorizations. Disturbance includes any activity that modifies the bed or shoreline or modifies the watershed drainage of a wetland including activities such as partial or complete infilling, erosion protection such as the rocking of shorelines, vegetation removal, draining, or re-alignment of the water body.

The process of conserving wetlands is to be through the application of a hierarchical progression of alternatives, which include:

- **Avoidance** of impacts.
- **Minimization** of and mitigation for unavoidable impacts; and
- **Mitigation** for development impacts that cannot be minimized.

Higher priority may be given to certain wetland functions over others based upon the likelihood of these functions remaining post-development. Hydrological function such as flood attenuation and water quality/quantity or socio-economic function such as recreational may be given priority over fish and wildlife habitat, if the habitat will be severely impaired following development. The principle of No Net Loss of function still applies and mitigation of any loss on site or elsewhere including compensation banking may become the only option available. No Net Loss and the application of mitigation principles may no longer remain optional under Alberta Provincial wetland policy but become a requirement for all municipalities.

The basic elements of a wetland policy could include any or all of the following:

## Priority Functions and Policy Options:

- I. Hydrological
- II. Socio-Economic
- III. Biological

### Options:

- A. Protect existing wetlands on site
- B. Minimize the impact on existing wetlands plus mitigation (see C.)
- C. Loss of Existing Wetlands – Mitigation Required

(Note: The state of ecological science is such that not all ecologically significant values of any given wetland can be recreated through the construction of artificial wetlands, which, because of the difficulty involved in recreating ecological processes, are nearly always of less than equal value. In recognition of that fact, mitigation standards often require that more equivalent wetland units be constructed to replace any lost wetland(s), the actual quantity of replacement habitat depending on the environmental significance of the wetland(s) lost or degraded, and the quality of the constructed wetland(s).

### Mitigation options:

- 1. Wetland restoration
- 2. Enhancement of wetland function of existing wetlands
- 3. Creation of new wetlands that will replace all of the key functions of a wetland lost or degraded as a result of development disturbance. This will require a “Wetland Functional Assessment”. For example, waterfowl habitat cannot be mitigated for by fish habitat, or habitat of any type other than habitat for the same waterfowl species lost or degraded. A replacement ratio for replacement habitat will be determined on a case-by-case basis as a part of the mitigation process.
- 4. Compensation Banking for the enhancement or creation of wetlands. An advantage of compensation banking is that it allows for the consolidation of funds for the enhancement, creation, or preservation of more substantial wetland projects, thus increasing the chances of success as compared to smaller, isolated replacement sites.

Efforts must be made to avoid the impact from development on wetlands that are environmentally significant and/or contribute to water quality and quantity, and that can be integrated into urban development while maintaining their ecosystem survivability and sustainability.

The minimization of impacts on existing wetlands would include:

- Minimization of disturbance to vegetation and the restoration of disturbed areas with native vegetation. This could include the utilization of salvaged soils and plant material from other construction sites.
- The prevention of run-off from construction sites into local wetlands.
- Depending on the wetland function, the establishment of shoreline setbacks from the minimum of 6 m to as much as 100 m where waterfowl production is recognized as the major function of a wetland. The majority of waterfowl species do not nest within the wetland but nest in adjacent upland areas. A setback of less than 100 m results in the establishment of a narrow cover corridor easily hunted out by predators searching for nesting waterfowl and other birds. Aside from wildlife values, the protection of the shoreline and provision of an upland buffer is essential to the prevention of shoreline erosion and the purification of run-off waters entering wetlands through sedimentation and through nutrient and contaminant removal by absorption and natural filtration processes.
- Diversion of roadways and utility corridors away from wetlands wherever possible. If not possible, roadways and utilities should utilize the same corridor taking the shortest possible route through the wetland. The shoulders of corridors should include protective berms to provide dryland travel routes and loafing sites for wildlife without the wildlife being forced to utilize roadway surfaces. Oversized culverts or bridges should be installed through roadways in order to permit wildlife to travel from one sector of a wetland to the other without having to cross over roadways.
- Where an ecological reserve or natural area wetland can remain viable and sustainable over the long-term, it shall be retained in a natural state. This may require the designation of an environmental reserve area as a “Natural Environment Park” restricting development and access within the park area to permitted uses such as educational or scientific facilities, restricting pets at large, leaving natural vegetation unmown, and restricting the application of fertilizers, pesticides and herbicides except as required under noxious weed regulation.
- Engineered stormwater wetlands are not to be located in Natural Environment Park

The foregoing options listed are based in part on the City of Calgary *Wetland Conservation Plan*, and some, such as mitigation and compensation banking, would be considerably more difficult to achieve in the setting of a community the size of Strathmore than in a large city such as Calgary is. In most instances, the avoidance of impacts and the conservation of wetlands on site, in addition to being of the greatest benefit, are probably the least costly of alternatives in dealing with the local wetland base.

Strathmore is the beneficiary of a considerable and highly valuable wetland base coupled with an abundant supply of water. Wherever possible, these wetlands should be recognised for the asset that they are, and incorporated directly into community planning for the future.

## APPENDIX 1: STEWARD & KANTRUD WETLAND CLASSIFICATION SYSTEM<sup>1</sup>

(Abbreviated to reflect only those kinds of wetlands found in the Inventory Area)

Seven major classes of wetlands in natural basins are recognized on the basis of ecological differentiation. Each class is distinguished by the vegetational zone occurring in the central or deeper part and occupying 5 percent or more of the total wetland area being classified. The classes are designated as follows:

### 1. Class I - Ephemeral Ponds.



**Picture 1:** The wetland-low-prairie zone dominates the deepest part of the pond basin.

#### **Wetland-low-prairie zone.**

In certain types of basin wetlands, low-prairie vegetation may occupy the central area of a pond. Occasionally, in deeper ponds and lakes with other zones, a narrow border of surrounding low prairie is inundated during unusually high water. Because of the porous condition of the soil in this vegetational zone, the rate of bottom seepage is very rapid. As a result, surface water ordinarily is maintained for only a brief period in the early spring before the bottom ice seal disappears. Measurements of specific conductance (micromhos/cm<sup>3</sup>) of surface water in low-prairie plant associations in central areas of pond basins indicate that these species are characteristic of fresh water.

In natural untilled low-prairie zones, a normal emergent phase, with low-prairie plants, occurs regularly. Occasionally in the early spring, when water levels rise above the tops of low-prairie plants, an open-water phase without submerged aquatic plants develops. Under agricultural use, the cropland tillage phase nearly always persists as dry tilled soil, with or without weedy plant growth or crops. Tilled low-prairie zones may also appear briefly in the open-water phase during extremely high water conditions.

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<sup>1</sup> Stewart, Robert E. and Harold A. Kantrud. *Classification of natural ponds and lakes in the glaciated prairie region*. Resource Publication 92, Bureau of Sport Fisheries and Wildlife. U.S. Fish and Wildlife Service, Washington, D.C. (Northern Prairie Wildlife Research Center Home Page). 1971.

## 2. Class II - Temporary Ponds.



**Pictures 2 & 3:** The wet-meadow zone dominates the deepest part of the wetland area. A peripheral low-prairie zone is usually present.

### **Wet-meadow zone.**

Wet-meadow vegetation occupies the central areas of many of the shallower pond basins and commonly occurs as a peripheral band in most of the deeper ponds and lakes. Water loss from bottom seepage is fairly rapid in this zone, so that surface water usually is maintained for only a few weeks after the spring snowmelt and occasionally for several days after heavy rainstorms in late spring, summer and fall. Wetland phases in untilled wet-meadow zones include a normal emergent phase with typical wet-meadow plants occurring as emergents, and an open-water phase that develops only when water levels rise above the tops of wet-meadow plants. Most of the more numerous plant species in the normal emergent phase are fine-textured grasses, rushes, and sedges of relatively low stature. Under cultivation a wet-meadow zone in early spring normally has an open-water phase without submerged aquatic plants; this is soon replaced by a drawdown bare-soil phase unless old-growth plants from previous years are present. Shortly afterwards, typical species of the cropland drawdown phase appear. A similar sequence of phases may take place later in the season, particularly when surface water is temporarily replenished or when there is repeated cultivation. Cultivation of dry bottom soils results in the appearance of the cropland tillage phase.

Wet-meadow zones in the central areas of shallow pond basins are restricted to fresh or slightly brackish wetlands, while peripheral bands of wet-meadow zone frequently occur in deeper, more permanent ponds or lakes with salinity ranging from fresh to subsaline. Characteristic species of plant associations in the normal emergent phase and cropland drawdown phase differ markedly, and major differences in species composition within the normal emergent phase may be correlated with variations in salinity.

### 3. Class III - Seasonal Ponds and Lakes.



**Pictures 4 & 5:** The shallow-marsh zone dominates the deepest part of the wetland area. Peripheral wet-meadow and low-prairie zones are usually present.

#### Shallow-marsh zone.

Shallow-marsh vegetation dominates the central areas of pond basins that normally maintain surface water for an extended period in spring and early summer but frequently are dry during late summer and fall. In the deeper, more permanent ponds and lakes, this zone often occurs as a concentric band between wet-meadow and deep-marsh zones; in shallow alkali ponds and lakes it may occur as a band between wet-meadow and intermittent-alkali zones.

Under natural untilled conditions, this zone is represented by four wetland phases: a normal emergent phase of regular occurrence; an open-water phase, often with submerged aquatic plants, occurring during high water; and a natural drawdown emergent phase, occasionally preceded by a drawdown bare-soil phase that develops during periods of low precipitation. Typical dominant species in the normal emergent phase are grasses or grass-like plants that are intermediate in height in comparison with emergent plants in the normal emergent phase of wet-meadow and deep-marsh zones.

Wetland phases occurring when this zone is tilled include the following: an open-water phase, with or without submerged aquatic plants, which is generally present during the spring and occasionally present after heavy rainstorms in summer and fall; a drawdown bare-soil phase, developing as open surface water disappears; a cropland drawdown phase that becomes established on exposed mud flats, particularly during late summer and fall; and a cropland tillage phase immediately following cultivation. Whenever surface water is maintained for a considerable period in late spring and summer, a distinctive normal emergent phase characteristic of the tilled shallow-marsh zone occurs. This phase is composed of pioneering shallow-marsh species that also appear, although less commonly, in the normal emergent phase of natural untilled shallow-marsh zones.

Shallow-marsh zones occurring in central areas of pond basins are largely restricted to fresh, slightly brackish, or moderately brackish ponds or lakes. In the deeper, more permanent ponds and lakes, the concentric bands of shallow marsh adjoining the more centrally located deep-marsh zones are of regular occurrence throughout the

range of salinity, from fresh to subsaline. Tillage of shallow-marsh zones ordinarily occurs only in fresh, slightly brackish, and moderately brackish ponds. Outer bands of shallow marsh in strongly saline alkali lakes are subsaline, in contrast to the greater salinity of the central open areas. Surface water in brackish and subsaline shallow marsh tends to be shallower and less permanent than surface water in shallow-marsh zones of the fresher ponds and lakes. Nevertheless, the spatial relation of shallow-marsh to wet-meadow and deep-marsh remains the same, regardless of salinity.

Differences in species composition are quite pronounced between shallow-marsh plant associations characteristic of untilled and tilled conditions, and among emergent, open-water, natural drawdown, and cropland drawdown phases of this zone. More subtle differences within each phase may be represented as a continuum of overlapping species that is correlated with differences in salinity.

#### 4. Class IV - Semi-permanent Ponds and Lakes.



**Pictures 6 & 7:** The deep-marsh zone dominates the deepest part of the wetland area. Shallow-marsh, wet-meadow, and low-prairie zones are usually present, and isolated marginal pockets of fen zones occasionally occur.

##### Deep-marsh zone.

Deep-marsh vegetation dominates the central areas of pond basins that ordinarily maintain surface water throughout the spring and summer and frequently maintain surface water into fall and winter. Deep-marsh zones usually occur also as marginal bands that adjoin the deep permanent-open-water zones of permanent ponds and lakes.

Four wetland phases are represented in this zone: a normal emergent and an open-water phase, both of regular occurrence, and a drawdown bare-soil (nonvegetated) phase and a natural drawdown emergent phase, both of which develop only during drought. In the deeper ponds, an alternation of the normal emergent phase and the open-water phase is common because of annual and seasonal changes in water depth. The normal emergent phase is generally present in the shallower areas of this zone, while the open-water phase occupies the deeper areas. In permanent lakes, marginal bands of deep marsh are usually represented by the normal emergent phase in the outer, shallower portions, while the open-water phase is typical of the deeper portions that adjoin the permanent-open-water zone. Submerged or floating plants are often found throughout this zone; certain species of these plants occur as subdominants in the normal emergent phase, while many other species are characteristic of the open-water phase. Dominant plant species in the normal emergent phase are in general coarser and taller than corresponding species in shallow-marsh zones.



Deep-marsh zones are nearly always present in the deeper ponds and lakes in which salinity ranges from slightly brackish to subsaline. During high water this zone may also be found locally in some of the deep fresh-water ponds. Species composition of plant associations differs noticeably in the three vegetational phases of deep marsh and under different ranges of salinity within each phase.

## 5. Class V - Permanent Ponds and Lakes.



**Picture 8:** The permanent-open-water zone dominates the deepest part of the wetland area. Peripheral deep-marsh, shallow-marsh, wet-meadow, and low-prairie zones are often present, and isolated marginal pockets of fen zone occasionally occur.

### Permanent-open-water zone.

This deep-water zone, of local occurrence in a few ponds and lakes that maintain fairly stable water levels, is represented only by the open-water phase. Measurements of specific conductance (micromhos/cm<sup>3</sup>) indicated that water in this zone may be classified as slightly brackish, moderately brackish, brackish, or subsaline. Only two species of vascular plants were found in this zone (see under Class V). Western widgeongrass (*Ruppia occidentalis*) is quite regular in occurrence, and occasionally it is associated with big-sheath pondweed (*Potamogeton vaginatus*). In some lakes the deeper portions of this zone are completely devoid of submerged vegetation. Because of stability of water levels and greater water depth, emergent plants do not develop in this zone. Toward shore this zone is frequently bordered by a band of open water representing the open-water phase of the deep-marsh zone. Although superficially similar in appearance, this shallow open-water band differs in species composition of submerged plants.

## APPENDIX 2: COWARDIN CLASSIFICATION OF WETLAND AND DEEPWATER HABITATS OF THE US

Abbreviated. Systems are described in detail in Cowardin et al. 1979, *Classification of wetlands and deepwater habitats of the United States*. US Dept. of the Interior, Fish and Wildlife Service, Office of Biological Services, Washington, D.C.

### Cowardin Systems: (Choose one)

**Riverine (R):** Includes all wetlands and deepwater habitats contained within a channel, excluding any wetland dominated by trees, shrubs, persistent emergent plants, emergent mosses, or lichens. Channels that contain oceanic-derived salts greater than 0.5‰ are also excluded.

**Lacustrine (L):** Includes wetlands and deepwater habitats with all of the following characteristics: 1) situated in a topographic depression or a dammed river channel; 2) lacking trees or shrubs, persistent emergents, emergent mosses or lichens with greater than 30% aerial coverage; and total area exceeds 8 ha (20 acres). Similar areas less than 8 ha are included in the lacustrine system if an active wave-formed or bedrock shoreline feature makes up all or part of the low tide boundary, or if the water in the deepest part of the basin exceeds 2 m (6.6 feet) at low tide. Oceanic derived salinity is always less than 0.5‰.

**Palustrine (P):** Includes all non-tidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity derived from oceanic salts is less than 0.5‰. Also included are areas lacking vegetation, but with all of the following four characteristics: 1) areas less than 8 ha (20 acres); active wave-formed or bedrock shoreline features lacking; 3) water depth in the deepest part of the basin less than 2 m (6.6 feet) at low water; and 4) salinity due to ocean-derived salts less than 0.5‰.

### Cowardin Classes: (Choose one)

Unconsolidated Shore (US)

Vegetative (5)

Emergent Wetland (EM)

Persistent (1)

Non-Persistent (2)

Forested Wetland (FO)

Broad-Leaved Deciduous (1)

## **APPENDIX 3: FIELD INFORMATION COLLECTION KEY**

### **Wetland Impacts:**

1. Drainage
2. Filling
3. Road Construction
4. Urban Development
5. Farming
6. Other

### **Riparian (Shoreline) Zone:**

1. Willow
2. Aspen
3. Poplar
4. Other

### **Upland Type:**

1. Native Grass
2. Hay
3. Forested
4. Cropland
5. Other

## APPENDIX 4: WETLAND ENVIRONMENTAL SIGNIFICANCE ASSESSMENT (ESA)

Meets One or All of the Criteria Below									
Significance	Disturbance	Flora	Fauna	Flood & Erosion Control	Hydrological (water quality & quantity) Function	Cultural, Recreational & Educational Potential	Urban Design Potential		
Environmentally Significant Wetland	Very little to no disturbance is evident.	<ul style="list-style-type: none"><li>Dominated by native species that may:<ul style="list-style-type: none"><li>Exhibit high flora diversity relative to other area wetlands; and/or</li></ul></li><li>Be unique species including those that are locally, provincially or nationally rare.</li></ul>	<ul style="list-style-type: none"><li>High species diversity;<ul style="list-style-type: none"><li>Act as an important staging area for wildlife movement; or</li></ul></li><li>Contains unique species.</li></ul>	High contribution to flood and erosion control.	High contribution to the long-term maintenance of the hydrological regime beyond its boundaries.	High potential for developing passive recreational, interpretative, and/or educational facilities.	High potential to enhance the quality, form and function of the built environment through visual aesthetics, character, variety, sun allowances, noise/sight buffering, and/or the creation of public spaces.		
Major Wetland	Moderate to very little disturbance is evident.	<p>Predominately native in character with some non-native species and may have:</p> <ul style="list-style-type: none"><li>moderate to high flora diversity.</li></ul>	<ul style="list-style-type: none"><li>Moderate to high species diversity; or</li><li>Act as a moderately important staging area for wildlife movement.</li></ul>	Moderate to high contribution to flood and erosion control.	Moderate to high contribution to the long-term maintenance of the hydrological regime beyond its boundaries.	Moderate to high potential for developing passive recreational, interpretative, and/or educational facilities.	Moderate to high potential to enhance the quality, form and function of the built environment through visual aesthetics, character, variety, sun allowances, noise/sight buffering, and/or the creation of public spaces.		
Supporting Wetland	High to moderate disturbance is evident.	<p>High to moderate invasion by non-native species and may have:</p> <ul style="list-style-type: none"><li>low to moderate flora diversity.</li></ul>	<ul style="list-style-type: none"><li>Low to moderate species diversity; or</li><li>Low importance to moderately important staging area for wildlife movement.</li></ul>	Low to moderate contribution to flood and erosion control.	Low to moderate contribution to the long-term maintenance of the hydrological regime beyond its boundaries.	Low to moderate potential for developing passive recreational, interpretative, and/or educational facilities.	Low to moderate potential to enhance the quality, form and function of the built environment through visual aesthetics, character, variety, sun allowances, noise/sight buffering, and/or the creation of public spaces.		

**APPENDIX 5: DETAILED STRATHMORE WETLAND  
INVENTORY FORMS**

**Detailed Strathmore Wetland Inventory Form**

**Wetland Number:** ST-1

**Stewart & Kantrud Notes:** IV-B

**Cowardin Notes:** PEM2

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 5 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 1 (refer to key for upland area options)

**Comments:** A segment of Ducks Unlimited Canada Sadler Project fed by irrigation water. Grazed uplands.

---

**Species Observations:**

**Birds**

Mallard  
Ruddy Duck  
American Coot (adults and young)  
Black Tern (5)  
Red-winged Blackbird  
Yellow-headed Blackbird (numerous)

**Plants**

*Carex* sp. (Sedge)  
*Scirpus acutus* (Hardstem Bulrush)  
*Juncus balticus* (Baltic Rush)  
*Eleocharis palustris* (Common Spikerush)  
*Typha latifolia* (Common Cattail)

**Detailed Strathmore Wetland Inventory Form**

**Wetland Number:** ST-2

**Stewart & Kantrud Notes:** II-B

**Cowardin Notes:** PUS5

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 5 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 1 (refer to key for upland area options)

**Comments:** Up to 9 temporary very small ponds are located along and to either side of this undeveloped road allowance in grazed native grassland.

---

**Species Observations:**

**Birds**

Blue-winged Teal (1)

**Plants**

*Juncus balticus* (Baltic Rush)

*Hordeum jubatum* (Foxtail Barley)

**Detailed Strathmore Wetland Inventory Form**

**Wetland Number:** ST-3

**Stewart & Kantrud Notes:** IV-B

**Cowardin Notes:** PEM2

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 5 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 1 (refer to key for upland area options)

**Comments:** A native seasonally grazed pasture area belonging to the town. The wetland is fed by canal seepage.

---

**Species Observations:**

**Birds**

Horned Grebe  
Mallard (3)  
Ruddy Duck (1)  
Sora  
Black Tern  
Red-winged Blackbird  
Yellow-headed Blackbird

**Plants**

*Carex* sp. (Sedge)  
*Juncus balticus* (Baltic Rush)  
*Agrostis stolonifera* (Redtop Grass)  
*Typha latifolia* (Common Cattail)



### Detailed Strathmore Wetland Inventory Form

**Wetland Number:** ST-4

**Stewart & Kantrud Notes:** IV-B

**Cowardin Notes:** PEM2

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 5 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 1 (refer to key for upland area options)

**Comments:** Wetland is fed by seepage/irrigation. Grazed area.

#### Species Observations:

##### Birds

Mallard (1 Brood)  
 Blue-winged Teal  
 Lesser Scaup  
 Ruddy Duck  
 Sora  
 Black Tern  
 Marsh Wren  
 Common Yellowthroat  
 Yellow-headed Blackbird

##### Plants

*Triglochin maritima* (Seaside Arrowgrass)  
*Carex* sp. (Sedge)  
*Scirpus acutus* (Hardstem Bulrush)  
*Juncus balticus* (Baltic Rush)  
*Agrostis stolonifera* (Redtop Grass)  
*Hordeum jubatum* (Foxtail Barley)  
*Typha latifolia* (Common Cattail)

**Detailed Strathmore Wetland Inventory Form**

**Wetland Number:** ST-5

**Stewart & Kantrud Notes:** V-B

**Cowardin Notes:** L

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 6 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 5 (refer to key for upland area options)

**Comments:** An artificially constructed water supply reservoir for the town supplied from irrigation canal. Rocked. Fenced all around. Adjacent uplands are largely native pastureland.

---

**Species Observations:**

**Birds**

The town water supply reservoir, this wetland was not inspected. It does however receive some use by waterfowl and by Canada geese in particular which often stage here, especially when other wetlands are frozen over.

**Detailed Strathmore Wetland Inventory Form**

**Wetland Number:** ST-6

**Stewart & Kantrud Notes:** V-B

**Cowardin Notes:** L

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 4 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 5 (refer to key for upland area options)

**Comments:** This is an artificially constructed stormwater lagoon with a rocked shoreline and inlet channels. The uplands are seeded to grass, mowed, and fenced.

---

**Species Observations:**

**Birds**

None noted.

**Plants**

No wetland vegetation.

**Detailed Strathmore Wetland Inventory Form**

**Wetland Number:** ST-7

**Stewart & Kantrud Notes:** IV-A

**Cowardin Notes:** PEM1

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 4 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 5 (refer to key for upland area options)

**Comments:** This is an artificially constructed wetland in a golf course fed by irrigation.

---

**Species Observations:**

**Birds**

Mallard (1)

**Plants**

*Typha latifolia* (Common Cattail)

**Detailed Strathmore Wetland Inventory Form**

**Wetland Number:** ST-8

**Stewart & Kantrud Notes:** IV-B

**Cowardin Notes:** PEM2

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 6 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 5 (refer to key for upland area options)

**Comments:** A small natural wetland with a borrow pit located within it. Located on the edge of an old farmstead adjacent to the golf course alongside a busy roadway (Highway 817/Wheatland Trail).

---

**Species Observations:**

**Birds**

Mallard (1)

Shoveler (12 including a brood of 9 young)

Red-winged Blackbird

**Plants**

*Carex* sp. (Sedge)

*Triglochin maritima* (Seaside Arrowgrass)

*Juncus balticus* (Baltic Rush)

*Glyceria grandis* (Mannagrass)

*Hordeum jubatum* (Foxtail Barley)

*Typha latifolia* (Common Cattail)

**Detailed Strathmore Wetland Inventory Form**

**Wetland Number:** ST-9

**Stewart & Kantrud Notes:** V-B

**Cowardin Notes:** PEM1

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 4 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 5 (refer to key for upland area options)

**Comments:** Part of the old Ducks Unlimited Canada Strathmore Project fed by irrigation water, this is now part of the golf course.

---

**Species Observations:**

**Birds**

29 ducks including:

Mallard (1 brood)

Blue-winged Teal (1 brood)

Redhead

Other Birds:

Canada Goose (ca. 180 including many young)

American Coot

Yellow-headed Blackbird

**Plants**

*Scirpus acutus* (Hardstem Bulrush)

*Eleocharis palustris* (Common Spikerush)

*Typha latifolia* (Common Cattail)

### Detailed Strathmore Wetland Inventory Form

**Wetland Number:** ST-10

**Stewart & Kantrud Notes:** V-B

**Cowardin Notes:** PEM1

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 4 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 5 (refer to key for upland area options)

**Comments:** Part of the old Ducks Unlimited Canada Strathmore Project this is now a part of the golf course. Fed by irrigation water.

#### Species Observations:

##### Birds

23 indicated breeding pairs of ducks including:

Mallard  
Blue-winged Teal  
Gadwall  
Lesser Scaup  
Ruddy Duck

Other Birds:

Common Snipe  
Forster's Tern  
Marsh Wren  
Common Yellowthroat

##### Plants

*Scirpus americana* (American Bulrush)  
*Triglochin maritima* (Seaside Arrowgrass)  
*Distichlis stricta* (Salt Grass)  
*Typha latifolia* (Common Cattail)  
*Potamogeton pectinatus* (Sago Pondweed)  
*Myriophyllum exalbescens* (Northern Watermilfoil)  
*Salix* sp. (Willow)

**Detailed Strathmore Wetland Inventory Form**

**Wetland Number:** ST-11

**Stewart & Kantrud Notes:** III-B

**Cowardin Notes:** PEM2

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 5 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 1 (refer to key for upland area options)

**Comments:** Pastureland.

---

**Species Observations:**

**Birds**

Wilson's Phalarope (2)  
Red-winged Blackbird  
Yellow-headed Blackbird

**Other**

Boreal Chorus Frog

**Plants**

*Carex* sp. (Sedge)  
*Rumex crispus* (Curly Dock)



**Detailed Strathmore Wetland Inventory Form****Wetland Number:** ST-12**Stewart & Kantrud Notes:** IV-A**Cowardin Notes:** PEM2

Presence of Wetland Complex: Y (Y/N)

**Wetland Impact(s):** 5 (refer to key for impact list)**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)**Upland Area:** 1 (refer to key for upland area options)**Comments:** Pastureland.

---

**Species Observations:****Birds**

None observed.

**Plants***Carex* sp. (Sedge)*Scirpus acutus* (Hardstem Bulrush)*Typha latifolia* (Common Cattail)

**Detailed Strathmore Wetland Inventory Form**

**Wetland Number:** ST-13

**Stewart & Kantrud Notes:** IV-B

**Cowardin Notes:** PEM2

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 5 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 1 (refer to key for upland area options)

**Comments:** Pastureland.

---

**Species Observations:**

**Birds**

Gadwall (2)  
Sora  
Killdeer  
Marsh Wren  
Red-winged Blackbird  
Yellow-headed Blackbird

**Plants**

*Scirpus acutus* (Hardstem Bulrush)  
*Eleocharis palustris* (Common Spikerush)  
*Juncus balticus* (Baltic Rush)  
*Typha latifolia* (Common Cattail)  
*Rumex crispus* (Curly Dock)

**Detailed Strathmore Wetland Inventory Form**

**Wetland Number:** ST-14

**Stewart & Kantrud Notes:** IV-C

**Cowardin Notes:** PEM2

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 5 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 1 (refer to key for upland area options)

**Comments:** Bare shoreline with no emergents. Pastureland.

---

**Species Observations:**

**Birds**

Eared Grebe (1 pair with nest)  
Mallard (20 including 2 broods)  
Blue-winged Teal (5)  
Gadwall (2)  
Redhead (4 including brood of 3)  
Lesser Scaup (6)  
Killdeer  
American Avocet  
Red-winged Blackbird  
Yellow-headed Blackbird  
Savannah Sparrow

**Plants**

*Salix exigua* (Coyote Willow)  
*Potamogeton pectinatus* (Sago Pondweed)

### Detailed Strathmore Wetland Inventory Form

**Wetland Number:** ST-15

**Stewart & Kantrud Notes:** IV-B

**Cowardin Notes:** PEM2

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 1 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 5 (refer to key for upland area options)

**Comments:** Bare shoreline. This wetland has been ditched and drawn down about 2+ feet from its former full supply level.

#### Species Observations:

##### Birds

25 ducks present including:

Mallard (1 brood)  
Blue-winged Teal  
Cinnamon Teal  
Gadwall (1 brood)  
Lesser Scaup

Other birds observed:

Northern Harrier  
Killdeer  
American Avocet  
Willet  
Greater Yellowlegs  
Ring-billed Gull (7)  
Franklin's Gull (1)  
Forster's Tern (2)  
Savannah Sparrow

##### Plants

*Carex* sp. (Sedge)  
*Juncus balticus* (Baltic Rush)  
*Typha latifolia* (Common Cattail)  
*Glyceria striata* (Fowl Mannagrass)

**Detailed Strathmore Wetland Inventory Form****Wetland Number:** ST-16**Stewart & Kantrud Notes:** V-C**Cowardin Notes:** L**Presence of Wetland Complex:** Y (Y/N)**Wetland Impact(s):** 4 (refer to key for impact list)**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)**Upland Area:** 5 (refer to key for upland area options)

**Comments:** The former shallow natural wetland at this site has been excavated and recontoured with a rocked shoreline. There are no emergent or submergent zones. 2 artificial islands have been constructed. The wetland is now approximately 35 feet deep and at present has no vegetation either within or around it.

---

**Species Observations:****Birds**

Lesser Scaup (4)

Ring-billed Gull (5)

**Plants**

No vascular plants present. Area has just been recontoured.

### Detailed Strathmore Wetland Inventory Form

**Wetland Number:** ST-17

**Stewart & Kantrud Notes:** V-D

**Cowardin Notes:** PEM1

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 5 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 5 (refer to key for upland area options)

**Comments:** Grazed seasonally at the south end, idled around the north end. The uplands are mostly quackgrass. Part of the old Ducks Unlimited Canada Strathmore Project, this wetland is irrigation fed and now receives urban stormwater run-off from the Town of Strathmore. Green algae were prevalent at the time of observation (July 5, 2005). The wetland is somewhat saline and has a sandy substrate. The shallows and shoreline are largely devoid of emergent vegetation. 5 constructed goose nesting islands. This wetland is utilized by staging waterfowl, often with several hundreds of ducks and Canada geese and 50-100 tundra swans.

#### Species Observations:

##### Birds

48 ducks including:

Mallard (including 1 brood)

Gadwall (including 1 brood)

Lesser Scaup (24)

Other birds observed:

Black-crowned Night Heron (1)

Canada Goose (10 including 3 young of the year)

American Avocet (3)

Wilson's Phalarope

Forster's Tern (2)

Red-winged Blackbird

##### Plants

*Scirpus acutus* (Hardstem Bulrush)

*Scirpus americanus* (American Bulrush)

*Juncus balticus* (Baltic Rush)

*Hordeum jubatum* (Foxtail Barley)

*Triglochin maritima* (Seaside Arrowgrass)

*Potamogeton pectinatus* (Sago Pondweed)

**Detailed Strathmore Wetland Inventory Form**

**Wetland Number:** ST-18

**Stewart & Kantrud Notes:** III-B

**Cowardin Notes:** PEM2

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 5 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 1 (refer to key for upland area options)

**Comments:** Vegetation around the wetland is mostly native and seasonally grazed.

---

**Species Observations:**

**Birds**

Mallard (1)  
Gadwall (2)  
Lesser Scaup (6 plus 1 nest)  
Killdeer  
American Avocet  
Marbled Godwit  
Spotted Sandpiper  
Wilson's Phalarope (3)

**Plants**

*Eleocharis palustris* (Common Spikerush)  
*Juncus balticus* (Baltic Rush)  
*Beckmannia syzigachne* (Sloughgrass)  
*Typha latifolia* (Common Cattail)

### Detailed Strathmore Wetland Inventory Form

**Wetland Number:** ST-19

**Stewart & Kantrud Notes:** IV-B

**Cowardin Notes:** PEM1

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 5 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 5 (refer to key for upland area options)

**Comments:** Uplands are mostly seasonally grazed. There is some urban development in the fringe. Part of the old Ducks Unlimited Canada Strathmore Project fed by irrigation water.

#### Species Observations:

##### Birds

Approximate 80 ducks including:

Mallard (1 brood)  
Blue-winged Teal (1 brood)  
Gadwall (3 broods)  
American Wigeon (1 brood)  
Lesser Scaup

Other birds observed:

Red-necked Grebe (pair)  
Great Blue Heron  
Canada Goose (nested)  
American Coot (including young of the year)  
Killdeer  
Common Snipe  
Black Tern  
Marsh Wren  
Red-winged Blackbird  
Yellow-headed Blackbird

##### Plants

*Scirpus acutus* (Hardstem Bulrush)  
*Juncus balticus* (Baltic Rush)  
*Typha latifolia* (Common Cattail)



### Detailed Strathmore Wetland Inventory Form

**Wetland Number:** ST-20

**Stewart & Kantrud Notes:** V-B

**Cowardin Notes:** PEM1

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 4 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 5 (refer to key for upland area options)

**Comments:** Kinsmen Park lake, this is part of a developed urban park. Around 12 feet deep, it has been excavated deeper than it was originally and is periodically cleaned. It is stocked annually for fishing with rainbow trout. Originally part of the Ducks Unlimited Canada Strathmore Project, the wetland is fed with irrigation water and with urban stormwater run-off.

#### Species Observations:

##### Birds

Canada Goose (a brood of young hatched here earlier in the year)

Mallard (6 young of the year)

Red-winged Blackbird

##### Plants

*Carex* sp. (Sedge)

*Scirpus paludosus* (Alkali Bulrush)

*Scirpus americanus* (American Bulrush)

*Typha latifolia* (Common Cattail)

*Potamogeton pectinatus* (Sago Pondweed)

*Sagittaria cuneata* (Arrowhead)

*Ranunculus circinatus* (White Watercrowfoot)

**Detailed Strathmore Wetland Inventory Form**

**Wetland Number:** ST-21

**Stewart & Kantrud Notes:** V-A

**Cowardin Notes:** PFO1

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 4 (refer to key for impact list)

**Riparian Zone Boundary:** 1, 3 (refer to key for riparian zone options)

**Upland Area:** 3 (refer to key for upland area options)

**Comments:** This wetland has a broad fringe of cattail and a totally wooded shoreline. It receives urban stormwater run-off. It normally supports breeding Canada geese each spring, but these had left the area by the time of observation.

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**Species Observations:**

**Birds**

Redhead (1)  
American Coot (6 including 3 young of the year)  
Red-winged Blackbird  
Yellow-headed Blackbird

**Plants**

*Typha latifolia* (Common Cattail)  
*Salix* sp. (Willow)  
*Populus balsamifera* (Balsam Poplar)

**Detailed Strathmore Wetland Inventory Form**

**Wetland Number:** ST-22

**Stewart & Kantrud Notes:** IV-B

**Cowardin Notes:** PEM2

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 1, 5 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 1 (refer to key for upland area options)

**Comments:** This was a small artificial impoundment along a seasonal drainage and semi-permanent in nature. The dam was deliberately breached by backhoe in June 2005, and little water remains. The wetland normally supported 2+ pairs of ducks and a pair of breeding Canada geese each spring.

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**Species Observations:**

**Birds**

None were noted at time of observation.

**Plants**

*Carex* sp. (Sedge)

**Detailed Strathmore Wetland Inventory Form**

**Wetland Number:** ST-23

**Stewart & Kantrud Notes:** III-C

**Cowardin Notes:** PEM2

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 5 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 1 (refer to key for upland area options)

**Comments:** Naturally semi-permanent, the permanence has been recently increased by the influx of urban stormwater run-off. The wetland has a bare shoreline and is located in heavily grazed pastureland.

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**Species Observations:**

**Birds**

Ring-billed Gull (ca. 90)

**Plants**

*Carex* sp. (Sedge)

*Scirpus americanus* (American Bulrush)

*Juncus balticus* (Baltic Rush)

### Detailed Strathmore Wetland Inventory Form

**Wetland Number:** ST-24

**Stewart & Kantrud Notes:** IV-B

**Cowardin Notes:** PEM1

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 5 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 1 (refer to key for upland area options)

**Comments:** The Ducks Unlimited Canada Dewitt Project. This wetland is fed by irrigation water from the Western Irrigation District A Canal. The surrounding uplands are grazed.

#### Species Observations:

##### Birds

40 ducks were noted including:

Mallard (21 including 2 broods)  
 Blue-winged Teal (1)  
 Cinnamon Teal (1)  
 Northern Shoveler (1)  
 Redhead (2)  
 Lesser Scaup (10)  
 Ruddy Duck (4)

Other birds observed:

Horned Grebe (2)  
 Eared Grebe (6)  
 American Coot (Numerous including 1 brood)  
 Black Tern  
 Red-winged Blackbird  
 Yellow-headed Blackbird

##### Plants

*Carex* sp. (Sedge)  
*Scirpus acutus* (Hardstem Bulrush)  
*Scirpus validus* (Softstem Bulrush)  
*Typha latifolia* (Common Cattail)  
*Glyceria grandis* (Mannagrass)  
*Myriophyllum exalbescens* (Northern Watermilfoil)

**Detailed Strathmore Wetland Inventory Form**

**Wetland Number:** ST-25

**Stewart & Kantrud Notes:** II-A

**Cowardin Notes:** PUS5

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 5 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 4 (refer to key for upland area options)

**Comments:** This is a cultivated area under centre pivot irrigation, planted to canola in 2005. It can at times contain up to 26 small wetlands, which are temporary by nature but recharged periodically by irrigation and rainfall run-off. There is some residual cattail in the deeper depressions.

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**Species Observations:**

**Birds**

5 ducks were noted including:

Blue-winged Teal  
Northern Shoveler  
Gadwall

Other Birds:

Killdeer

**Plants**

*Typha latifolia* (Common Cattail)

### Detailed Strathmore Wetland Inventory Form

**Wetland Number:** ST-26

**Stewart & Kantrud Notes:** V-C

**Cowardin Notes:** PEM2

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 5, 6 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 1 (refer to key for upland area options)

**Comments:** Part of the irrigation fed Ducks Unlimited Canada George Freeman Marsh (Thirwell) Project. The surrounding uplands are mostly grazed with some idle at the south end. The substrate in this, the deepest segment, is sandy and the water somewhat alkaline and the shallows and shoreline are mostly devoid of emergent vegetation. This wetland complex has been receiving treated wastewater from the Town of Strathmore for 2 years, and green algae were prevalent at the time of observation (July 6, 2005). This wetland is utilized by several hundreds of staging ducks, geese and tundra swans.

#### Species Observations:

##### Birds

250+ ducks were noted including:

Mallard  
Northern Pintail  
Blue-winged Teal  
Gadwall  
Lesser Scaup  
Bufflehead  
Ruddy Duck

Other birds noted:

Great Blue Heron  
Canada Goose (25+ adults and young)  
American Coot  
Killdeer  
American Avocet  
Yellow-headed Blackbird

##### Plants

*Scirpus acutus* (Hardstem Bulrush)  
*Juncus balticus* (Baltic Rush)  
*Typha latifolia* (Common Cattail)  
*Potamogeton pectinatus* (Sago Pondweed)

### Detailed Strathmore Wetland Inventory Form

**Wetland Number:** ST-27

**Stewart & Kantrud Notes:** IV-B

**Cowardin Notes:** PEM1

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 6 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 1 (refer to key for upland area options)

**Comments:** Part of the irrigation fed Ducks Unlimited Canada George Freeman Marsh (Thirwell) Project. This wetland complex has been receiving treated wastewater from the Town of Strathmore for 2 years. At the time of observation (July 6, 2005) green algae were prevalent. The uplands around this wetland segment consist of a mix of native grasses and quackgrass and have been idled from grazing in recent years through an agreement between Ducks Unlimited Canada and the Western Irrigation District, which owns the property. This wetland is utilized by several hundreds of staging ducks, geese and tundra swans.

#### Species Observations:

##### Birds

109 ducks were noted including:

Green-winged Teal  
Mallard  
Blue-winged Teal  
Gadwall  
Lesser Scaup  
Ruddy Duck

Other Birds:

American Coot  
Black Tern  
Marsh Wren  
Common Yellowthroat  
Red-winged Blackbird  
Yellow-headed Blackbird

##### Plants

*Scirpus acutus* (Hardstem Bulrush)  
*Typha latifolia* (Common Cattail)  
*Glyceria grandis* (Mannagrass)  
*Hordeum jubatum* (Foxtail Barley)  
*Sium suave* (Waterparsnip)  
*Potamogeton pectinatus* (Sago Pondweed)  
*Epilobium palustre* (Willowherb)



**Detailed Strathmore Wetland Inventory Form**

**Wetland Number:** ST-28

**Stewart & Kantrud Notes:** IV-B

**Cowardin Notes:** PEM2

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 4 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 5 (refer to key for upland area options)

**Comments:** Uplands are idled, largely non-native grasses. The 2 small wetlands present will be destroyed by urban development currently underway. One brood of unidentified ducks reported earlier in 2005 appear to have moved from this site.

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**Species Observations:**

**Birds**

One brood of ducks was produced here in the spring of 2005.

**Plants**

*Juncus balticus* (Baltic Rush)

**Detailed Strathmore Wetland Inventory Form**

**Wetland Number:** ST-29

**Stewart & Kantrud Notes:** V-B

**Cowardin Notes:** L

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 4, 6 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 5 (refer to key for upland area options)

**Comments:** This site consists of the artificially constructed town wastewater treatment lagoons. The adjacent uplands are a mix of industrial park, native pastureland and cultivation.

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Species Observations:

**Birds**

200+ waterfowl were noted including at least 10 broods. Species and numbers where noted (in brackets) included:

Mallard  
Blue-winged Teal  
Northern Shoveler  
Gadwall (1 brood)  
American Wigeon (2 broods)  
Lesser Scaup (3 broods)

Other Birds:

Eared Grebe (10+)  
Dowitcher (ca. 30)  
Franklin's Gull (ca. 40)

**Plants**

*Beckmannia syzigachne* (Sloughgrass)

**Detailed Strathmore Wetland Inventory Form**

**Wetland Number:** ST-30

**Stewart & Kantrud Notes:** II-B

**Cowardin Notes:** PUS5

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 5 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 1 (refer to key for upland area options)

**Comments:** A necklace of up to 23 very small temporary ponds periodically replenished by irrigation run-off from centre pivots fed by treated wastewater are located in the NW ¼ of Section 1 and SW ¼ of Section 12 in Township 24, Range 25, West of the 4<sup>th</sup> Meridian. The uplands are heavily grazed pastureland.

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**Species Observations:** None made.

**Detailed Strathmore Wetland Inventory Form****Wetland Number:** ST-31**Stewart & Kantrud Notes:** Stream**Cowardin Notes:** R**Presence of Wetland Complex:** Y (Y/N)**Wetland Impact(s):** 4, 5 (refer to key for impact list)**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)**Upland Area:** 1, 5 (refer to key for upland area options)

**Comments:** This is a naturally grassed waterway fed by the outlet from the Kinsmen Park lake. Largely undisturbed until 2005, north of Highway 1 the uplands are now under urban development. The drain remains largely native pasture south of the highway.

---

**Species Observations:****Birds**

Red-winged Blackbird

**Plants***Typha latifolia* (Common Cattail)*Glyceria grandis* (Mannagrass)*Salix* sp. (Willow)

**Detailed Strathmore Wetland Inventory Form**

**Wetland Number:** ST-32

**Stewart & Kantrud Notes:** IC

**Cowardin Notes:** R

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 6 (refer to key for impact list)

**Riparian Zone Boundary:** Various, 4 (refer to key for riparian zone options)

**Upland Area:** 5 (refer to key for upland area options)

**Comments:** Both the Western Irrigation District A and North A canals flow through the Town of Strathmore. Seasonally charged, the canals are normally operated from May 1<sup>st</sup> until September 30<sup>th</sup> each year.

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**Species Observations:**

**Birds**

Lesser scaup ducks are common along these canals with both nests and broods normally occurring. Though less common, some mallard and American wigeon also occur. Canada goose adults and broods frequently graze along the A canal.

**Detailed Strathmore Wetland Inventory Form**

**Wetland Number:** ST-33

**Stewart & Kantrud Notes:** IV-B

**Cowardin Notes:** PEM2

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 5 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 1 (refer to key for upland area options)

**Comments:** This small wetland is nearly completely overgrown with cattail.

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**Species Observations:**

**Birds**

Red-winged Blackbird

Yellow-headed Blackbird

**Plants**

*Typha latifolia* (Common Cattail)

**Detailed Strathmore Wetland Inventory Form**

**Wetland Number:** ST-34

**Stewart & Kantrud Notes:** IV-B

**Cowardin Notes:** PEM2

**Presence of Wetland Complex:** Y (Y/N)

**Wetland Impact(s):** 5 (refer to key for impact list)

**Riparian Zone Boundary:** 4 (refer to key for riparian zone options)

**Upland Area:** 1 (refer to key for upland area options)

**Comments:** Several small wetlands along the old railway grade, mostly overgrown with cattail. Some hardstem bulrush in southernmost pond.

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**Species Observations:**

**Birds**

Red-winged Blackbird

Yellow-headed Blackbird

**Plants**

*Scirpus acutus* (Hardstem Bulrush)

*Typha latifolia* (Common Cattail)

*Beckmannia syzigachne* (Sloughgrass)

## APPENDIX 6: STRATHMORE WETLANDS TABLE

Wetland Number	Area		Shoreline		Wetland Classification		Wetland Complex Present	Wetland Impacts	Riparian Area	Upland Type	Notes
	Ha	Acres	Km	Miles	S & K	Cowardin					
ST-1	1.885	4.66	0.613	0.38	IV-B	PEM2	Yes	5	4	1	Sadler Project
ST-2	0.864	2.14	1.013	0.62	II-B	PUS5	Yes	5	4	1	
ST-3	1.347	3.33	0.658	0.40	IV-B	PEM2	Yes	5	4	1	
ST-4	1.500	3.71	0.602	0.37	IV-B	PEM2	Yes	5	4	1	
ST-5	19.052	47.08	1.733	1.07	V-B	L	Yes	6	4	5	Town Reservoir
ST-6	0.404	1.00	0.265	0.16	V-B	L	Yes	4	4	5	Stormwater
ST-7	0.595	1.47	0.328	0.20	IV-A	PEM1	Yes	4	4	5	
ST-8	0.288	0.71	0.282	0.17	IV-B	PEM2	Yes	6	4	5	
ST-9	1.339	3.31	0.695	0.43	V-B	PEM1	Yes	4	4	5	
ST-10	11.915	29.44	2.467	1.53	V-B	PEM1	Yes	4	4	5	
ST-11	1.580	3.90	0.533	0.33	III-B	PEM2	Yes	5	4	1	
ST-12	0.201	0.50	0.181	0.11	IV-A	PEM2	Yes	5	4	1	
ST-13	1.382	3.41	0.478	0.30	IV-B	PEM2	Yes	5	4	1	
ST-14	1.383	3.42	0.444	0.28	IV-C	PEM2	Yes	5	4	1	
ST-15	3.697	9.14	1.274	0.79	IV-B	PEM2	Yes	1	4	5	
ST-16	1.602	3.96	0.580	0.36	V-C	L	Yes	4	4	5	
ST-17	11.686	28.88	1.581	0.98	V-D	PEM1	Yes	5	4	5	
ST-18	0.412	1.02	0.272	0.17	III-B	PEM2	Yes	5	4	1	
ST-19	5.976	14.77	2.956	1.83	IV-B	PEM1	Yes	5	4	5	
ST-20	2.062	5.10	0.705	0.44	V-B	PEM1	Yes	4	4	5	Kinsmen Park
ST-21	0.832	2.06	0.609	0.38	V-A	PFO1	Yes	4	1, 3	3	
ST-22	0.367	0.91	0.236	0.15	IV-B	PEM2	Yes	1, 5	4	1	
ST-23	6.637	16.40	1.172	0.73	III-C	PEM2	Yes	5	4	1	
ST-24	4.002	9.89	0.863	0.53	IV-B	PEM1	Yes	5	4	1	Dewitt Project
ST-25	4.432	10.97	4.155	2.57	II-A	PUS5	Yes	5	4	4	
ST-26	16.176	39.97	2.414	1.50	V-C	PEM2	Yes	5, 6	4	1	Freeman Marsh
ST-27	8.970	22.17	2.354	1.46	IV-B	PEM1	Yes	6	4	1	Freeman Marsh
ST-28	0.738	1.83	0.577	0.36	IV-B	PEM2	Yes	4	4	5	
ST-29	34.488	85.24	7.362	4.55	V-B	L	Yes	4, 6	4	5	Town Lagoons
ST-30	3.042	7.51	3.168	1.96	II-B	PUS5	Yes	5	4	1	



Wetland Number	Area		Shoreline		Wetland Classification		Wetland Complex Present	Wetland Impacts	Riparian Area	Upland Type	Notes
	Ha	Acres	Km	Miles	S & K	Cowardin					
ST-31	6.704	16.56	3.962	2.45	Stream	R	Yes	4, 5	4	1, 5	
ST-32	13.193	32.60	20.935	12.98	IC	R	Yes	6	Various, 4	5	Irrigation Canal
ST-33	0.748	1.85	0.378	0.23	IV-B	PEM2	Yes	5	4	1	
ST-34	0.884	2.19	1.096	0.67	IV-B	PEM2	Yes	5	4	1	

