

Stewards of the river valley corridor



State of the Valley

Path to Progress

Meewasin Valley Assessment Report

2014 - 2018

Meewasin 

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Author: Giselle Hooey, GIS Analyst

Meewasin Valley Authority

402 Third Avenue South Saskatoon, SK S7K3G5

Treaty 6 Territory and Homeland of the Métis

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Front Cover Photo: Fall Landscape at Beaver Creek Conservation Area

Back Cover Photo: Curious Deer at the Northeast Swale. Photo Credit: Peter Baran

Meewasin Valley Authority

Created in 1979, the Meewasin Valley Authority (“Meewasin”) is a non-profit organization dedicated to conserving the cultural and natural resources of the South Saskatchewan River Valley. Meewasin’s enabling statute, *The Meewasin Valley Authority Act*, established a partnership between the City of Saskatoon, the Government of Saskatchewan, and the University of Saskatchewan for the joint management of the South Saskatchewan River Basin. Meewasin’s structure reflects a commitment to the goal of having the participating parties accomplish more by working together through a single agency – Meewasin – than could be achieved individually.

Acknowledgements

Meewasin is the steward of the South Saskatchewan River Valley and humbly acknowledge the traditional care takers of our land in Treaty 6 Territory and the homeland of our Métis.

Meewasin acknowledges the technical advisory on the subject matter included therein provided by current and retired Meewasin Conservation Advisory Committee Members over the span of this project.

Project Team

Project Manager	Mike Velonas, Manager of Planning and Conservation
Project Leads	Giselle Hooey, GIS Analyst Renny W. Grilz, PAg, Resource Management Officer Noelle Bouvier, B.A. Resource Management Assistant
Project Support Team	Eve Keller, Resource Management Technician Jamie Harder, Resource Management Technician Jessica Flahr, Visual Communications Officer

Meewasin Conservation Advisory Committee

Peter Goode (Chair)
Dr. Yuguang Bai (Meewasin Board of Directors, University of Saskatchewan)
Fran Walley (Board Representative, University of Saskatchewan)
Luc Delanoy
Darcy Henderson (Environment and Climate Change Canada)
Nadia Mori (Ministry of Agriculture)
Dr. Michael Hill (City of Saskatoon)
Ron Jensen (Saskatoon Nature Society)
Amber Weckworth (City of Saskatoon)
Bert Weichel (University of Saskatchewan)

Executive Summary

As stewards of the river valley corridor, the Meewasin Valley Authority strives to ensure a healthy and vibrant river valley, balancing human use and conservation for the benefit of present and future generations (Meewasin Valley Authority, 2016). The concept of partners working within a single agency to conserve regional natural and cultural resources for future generations was introduced through Raymond Moriyama's original vision for the Meewasin Valley Authority (Raymond Moriyama Architects and Planners, 1979) and remains fundamental as Meewasin enters its 5th decade of operation.

The intent of the State of the Valley Report is to provide a point in time assessment of the advancement Meewasin has made in relation to the overarching themes of **Health, Balance, Fit** (Raymond Moriyama Architects and Planners, 1979) and **Vibrancy** (Meewasin Valley Authority, 2014). Comparisons to the previous assessment determine the progress achieved in respect to Meewasin's objectives and goals. Table I presents a summary of the progress assessment for each indicator.



Diefenbaker Park at Sunset

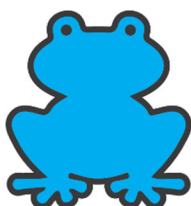
The assessment of **Health** includes a broad analysis of ecological factors including land use and land cover and changes, fragmentation, protections, biodiversity and conservation measures. Progress has been positive on the majority of ecological goals; progress lags in relation to stated goals two areas: conservation land management and lands under protection.

Land use and land cover analysis found that the Built Environment comprises 21% of the study area, with Green Space and Native and Naturalized Environments making up 5% and 75% of the study area, respectively. Cropland and tame forage crops account for the largest areas overall, making up nearly half of the Native and Naturalized Environment.

Within the study area, 84% of Natural Areas are in patches larger than 20 hectares, making up 28% of the total study area. Within the Meewasin Valley, that proportion is 91%; comprising 50% of the total valley area.

91%

of natural areas in the Meewasin Valley
are in patches 20 hectares or larger



70

rare or COSEWIC
ranked species
in the study area

Seventy rare or COSEWIC ranked species were found in the study area, out of 524 unique species reported.

Nearly 100 hectares of land was managed in the reporting period utilizing targeted conservation grazing and prescribed fire techniques.



35,000+
Horticulture plantings

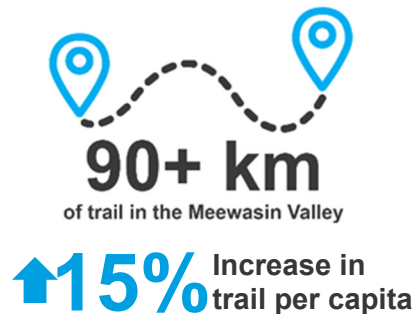
Horticulture restoration planting projects were established at multiple locations, resulting in 35,122 plantings within the Meewasin Valley. Where possible, these projects utilize native wildflowers and shrubs grown locally in Meewasin's greenhouse.

Over 900,000 invasive species plant stems were treated within the reporting period. Monitoring of aquatic invasive species continues at multiple locations. To date no invasive mussels have been detected.

The review of **Balance** in relation to conservation and means of providing safe access for community recreation and nature appreciation reveals that progress goals have been achieved or are bound for completion.

Seventy-three percent of the shoreline in the study area falls on publicly owned lands. Within the City of Saskatoon, 92% of the shoreline is publicly owned. There have been an increasing number of areas that allow for direct access to the river, resulting in the total proportion of publicly accessible shoreline within the Meewasin Valley to increase 10% over the last reporting period.

Over 13 kilometres of new trail was established in several areas and upgrades were also completed during the reporting period; the Meewasin Trail is currently over 90 kilometres in length. Formalizing trail assists in minimizing disturbances to environments, protecting green and natural areas from compaction and damage, while allowing the community access for wellness and recreation.



~2000 Ha
of green space in the study area

The amount of green space has increased marginally over time, although there has been a slight decrease in per capita amounts. The green space category now encompasses 1,998 hectares of the total study area. Meewasin continues to promote safe accessible recreation in the Meewasin Valley and the sites within it.

Meewasin's strategic goals related to **Fit and Vibrancy** are being achieved; these include goals connected to facilitating recreational access to the river valley, achieving diversity in activities, and increasing education and public participation.

Meewasin has worked hard to expand communications, outreach and engagement opportunities within the region. These new and enhanced strategies have resulted in broader and diversifying engagement, with a larger volume of community participation reported since the last assessment. Public engagement peaked at over 75,000 participants in 2017; this included participation in education and structured programs, tourism and events, and logged visitors to Meewasin facilities.

Table I. Summary of Progress Assessment

Category	Indicator	Progress Assessment	Summary
Health	Land Use & Land Cover Analysis	<i>On Pace</i>	Natural Areas comprise the greatest proportion of the Meewasin Valley; this is rated as Fair.
	Temporal Change Analysis	<i>Achieving Goal</i>	Negative trending change is less than .5%.
	Land in Habitat & Natural Areas Proportion	<i>Achieving Goal</i>	Natural area proportions have remained consistent.
	Patch Size and Fragmentation	<i>On Pace</i>	Overall, natural cover within larger parcels remains a significant proportion of total cover.
	Protected Lands	<i>Progress Lagging</i>	There has been no expansion of the Meewasin Valley this reporting period.
	Species Biodiversity	<i>On Pace</i>	Increased reporting of species occurrences; 70 rare or COSEWIC ranked species are found within the study area.
	Conservation Land Management	<i>Progress Lagging</i>	Total hectares managed this period has fallen short of goals.
	Restoration	<i>On Pace</i>	The amount and variety of restoration projects undertaken has progressed in the reporting period.
	Invasive Species Management	<i>On Pace</i>	Treatment numbers have steadily increased year over year; invasive species remain a high threat.
Balance	Public Shoreline	<i>Achieving Goal</i>	Public accessibility is keeping pace with population increases.
	Access Points	<i>Achieving Goal</i>	Access within the City of Saskatoon remains high; access is balanced between the north and south outside of the city.
	Trail Length	<i>Achieving Goal</i>	Trail extensions envisioned have been completed or planning is currently underway.
	Trail Use	<i>Achieving Goal</i>	Trail utilization has steadily increased within the reporting period.
	Green Space	<i>On Pace</i>	Amount has increased marginally over time; there has been a slight decrease in per capita amount.
	Active and Passive Uses	<i>On Pace</i>	Meewasin has advanced on long-ranging goals related to positive partnerships, accessibility and land use.
	Development and Review	<i>On Pace</i>	Meewasin continues to consistently execute its legislated role regarding development review in the valley.
Fit and Vibrancy	Community Engagement	<i>Achieving Goal</i>	New and enhanced strategies have resulted in broader and diversifying engagement, with a larger volume of community participation.
	Organization Participation & Partnerships	<i>Achieving Goal</i>	Collaborative partnerships with a varied cross-section of interests has actively grown.
	Public Perception	<i>Achieving Goal</i>	Support for Meewasin continues to be strong.

Table of Contents

1.0 INTRODUCTION	1
2.0 ANALYSIS LEVELS	2
2.1 Geographical Context.....	2
2.2 Temporal Context.....	2
3.0 GOALS AND PROGRESS INDICATORS	3
3.1 Progress Assessment	3
3.2 2018 Progress Assessment Indicators	3
4.0 HEALTH.....	4
4.1 Land Use and Land Cover	5
4.1.1 Classification Schema	5
4.1.2 Land Use and Land Cover Analysis	7
4.2 Temporal Change Analysis	8
4.3 Ecological Assessment	9
4.3.1 Land in Habitat and Natural Areas Proportion	10
4.3.1A Total Land in Habitat.....	10
4.3.2 Patch Size and Fragmentation	11
4.3.2A 2018 Patch Size Analysis	12
4.4 Protected Lands	13
4.4.1 Meewasin Valley	13
4.4.2 Protections External to Meewasin	14
4.4.3 Cultural Significance	14
4.5 Biodiversity and Conservation Measures	14
4.5.1 Species Biodiversity.....	14
4.5.1A Species Observations	15
4.5.1B Rare Species Occurrences and Species At Risk.....	15
4.5.2 Conservation Land Management.....	16
4.5.2A Targeted Conservation Grazing.....	16
4.5.2B Prescribed Fire	16
4.5.3 Restoration	17
4.5.4 Invasive Species Management.....	18
4.5.5 Other Monitoring Initiatives	19
5.0 BALANCE	20
5.1 Public Shoreline	20
5.1.1 Public Shoreline Ownership.....	20
5.1.2 Publicly Accessible Shoreline	21
5.1.2A Publicly Accessible Shoreline Per Capita	21

5.2 Access Points	22
5.3 Trail	22
5.3.1 Trail Length	22
5.3.1A Amount Per Capita	23
5.3.2 Trail Use	24
5.4 Green Space	24
5.4.1 Green Space Amount	24
5.4.1A Amount Per Capita	25
5.5 Active and Passive Uses	26
5.6 Development and Review	27
6.0 FIT AND VIBRANCY	28
6.1 Community Engagement	28
6.2 Organization Participation and Partnerships	30
6.3 Public Perception	31
7.0 FUTURE ASSESSMENT	33
8.0 REFERENCES	34
9.0 DATA SOURCES	35
APPENDIX A: MAPS	38
Map 1 State of the Valley Study Area	38
Map 2 Land Use and Land Cover Detail	39
Map 3 Anthropogenic Land Use in the Study Area	40
Map 4 Changes to Land Use and Land Cover in the Study Area	41
Map 5 Natural Area Patches in the Study Area	42
APPENDIX B: TABLES	43
Table 1 Land Use and Land Cover Definitions	43
Table 2 Land Use and Land Cover Analysis	46
Table 3 Land Use and Land Cover Change Analysis	48
Table 4 Land Use and Land Cover in Protection	50
Table 5 Species Observations	52

List of Figures

Figure 1. State of the Valley Study Area	2
Figure 2. 2018 Land Use and Land Cover Classification Schema	6
Figure 3. Land Use and Land Cover in the Study Area	7
Figure 4. Anthropogenic Intensity in the Study Area.....	7
Figure 5. Natural Area Patches.....	12
Figure 6. Land Use and Land Cover in the Meewasin Valley	13
Figure 7. Anthropogenic Intensity in the Meewasin Valley	13
Figure 8. Unique Species Observations	15
Figure 9. Rare Species and Species at Risk	15
Figure 10. Prescribed Fire & Targeted Conservation Grazing.....	17
Figure 11. Horticulture Plantings.....	18
Figure 12. Invasive Species Treated	18
Figure 13. European Buckthorn Program	18
Figure 14. Trail in Meewasin Valley	23
Figure 15. Trail Per Capita.....	23
Figure 16. Meewasin Trail Visits	24
Figure 17. Green Space in Hectares	24
Figure 18. Green Space in the Study Area	25
Figure 19. Reported Meewasin Valley Uses	26
Figure 20. 2018 Public Opinion Survey Summary	31

List of Tables

Table 1. 2013 State of the Valley Land Use Classifications	5
Table 2. Change Analysis Results	8
Table 3. Summary of Change Analysis by Percentage of Total 2013 Study Area.....	9
Table 4. Land in Habitat Categorical Comparison	11
Table 5. Patch Size Analysis of the Study Area.....	12
Table 6. Publicly Accessible Shoreline	21
Table 7. Meewasin Trail Length.....	23
Table 8. Levels of Community Engagement.....	29



Downtown Saskatoon Skyline

1.0 Introduction

The Meewasin Valley consists of lands described in the *Meewasin Valley Authority Act* (1979), covering 6,696 hectares of land contiguous to the South Saskatchewan River on Treaty 6 Territory and the homeland of the Métis people. The Meewasin Valley is situated within City of Saskatoon and the Rural Municipality of Corman Park; it also intersects with portions of the Saskatoon North Partnership for Growth (P4G) Regional Planning Area (Saskatoon North Partnership for Growth, 2017).

As stewards of the river valley corridor, the Meewasin Valley Authority strives to ensure a healthy and vibrant river valley, balancing human use and conservation for the benefit of present and future generations (Meewasin Valley Authority, 2016). The concept of partners working within a single agency to conserve regional natural and cultural resources for future generations was introduced in Raymond Moriyama's original vision for the Meewasin Valley Authority (Raymond Moriyama Architects and Planners, 1979) and remains fundamental as Meewasin enters its 5th decade of operation.

The purpose of the State of the Valley Report is to provide a point in time assessment of advancements Meewasin has made in relation to the overarching themes of *Health, Balance, Fit* (Raymond Moriyama Architects and Planners, 1979) and *Vibrancy* (Meewasin Valley Authority, 2014). Comparisons to the previous State of the Valley assessment determine the progress achieved in respect to Meewasin's objectives and goals as set in guiding documents.

2.0 Analysis Levels

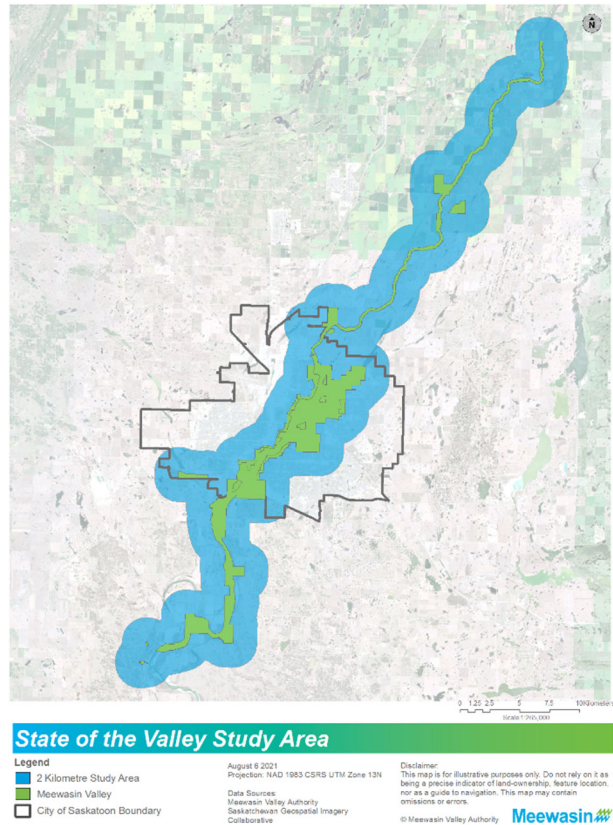
2.1 Geographical Context

As described in the introduction, the Meewasin Valley forms a regional corridor extending along the South Saskatchewan River through the City of Saskatoon and Rural Municipality of Corman Park.

The State of the Valley study area is based on the Meewasin Valley jurisdiction as defined in the *Meewasin Valley Authority Act* (1979). The study area consists of a 2 kilometre buffer applied to the outer boundaries of the Meewasin Valley. The extension of the study area allows for broader analysis of influencing external pressures and ecology both adjacent and connecting to the Meewasin Valley.

Note that for this report, the buffer is applied to the borders of jurisdictional lands not contiguous to the river, which resulted in an additional 1,732 hectares of lands assessed as part of the 2018 study area. Figure 1 shows the Meewasin Valley and study area within the context of the region; this shown in further detail in Appendix A Map 1.

Figure 1. State of the Valley Study Area



Several analytics contained in this report include dissection of information based on the Meewasin Valley area and what is referred to in this report as Meewasin sites. Meewasin sites include Meewasin-owned parcels, easements, and parks where Meewasin has a hand in conservation measures and/or trail management through various agreement mechanisms with public or private landowners.

2.2 Temporal Context

State of the Valley reporting is completed on a quinquennial cycle. The cycle for the current report is the fiscal year 2014 to the end of fiscal 2018. This is referred to herein as the reporting period. Statistics described which are reported based on calendar year as opposed to fiscal year are notated as such.

3.0 Goals and Progress Indicators

Since its inception, the Meewasin Valley Authority has operated under the guiding principles set out by Raymond Moriyama in his vision plan for the Meewasin Valley (Raymond Moriyama Architects and Planners, 1979). These guiding principles have influenced the progress goals set forth by Meewasin, described in the following planning documents:

- *The Meewasin Valley Project – 100 Year Conceptual Master Plan (1979)*
- *Previous State of the Valley Reports (1993, 1998, 2003, 2008, 2013)*
- *Meewasin Valley Authority Strategic Plan 2014 – 2024 (2014)*
- *Meewasin Valley Authority Development Plan*
- *Meewasin Valley-wide Resource Management Plan 2017 - 2027 (2017)*

3.1 Progress Assessment

Throughout this report, current progress goals set forth in the guiding documents are referenced and a progress indicator is used to qualify status in relation to progression on these goals and strategies. The addition of data in this report that was not considered in previous reporting will be referred to as baseline data, meant to be studied further in future analysis.

In past State of the Valley reports, indicators were assigned grades based on their value relative to the preceding reporting period. In the *State of the Valley 2013 Assessment Report* (Meewasin Valley Authority, 2016) indicators fell into the following categories:

- **Needs Improvement** – indicator is *less than* the results in the previous State of the Valley Report.
- **Meets Expectations** – indicator is *equal to* or *not improved* from the results from the previous State of the Valley Report.
- **Exceeds Expectations** – indicator is *greater than* the results from the previous State of the Valley Report.

3.2 2018 Progress Assessment Indicators

This report contains the following indicators, which encompass not only the previous comparative grading system, but also the present progress in respect to Meewasin's long-term goals and strategies within the current reporting period.

- **Achieving Goal** – Data indicates Meewasin has achieved or is achieving the currently stated goal; data shows upward trend since previous reporting period.
- **On Pace** – Data is showing positive progression toward currently stated goal; data indicates steady trend improvement over previous reporting period statistics.
- **Progress Lagging** – Data is showing lagging progression toward currently stated goal; indicators show trend decline since previous reporting period.



Targeted Conservation Grazing at the Northeast Swale

4.0 Health

Health is a grounding principal within the Meewasin Valley Project and understood in relation to a definition produced by the World Health Organization, describing health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (World Health Organization, 2001). This broad conceptualization of health is the basis of linkages between ecological landscape health, social health, cultural connectivity, and individual well-being. Exposure to nature is increasingly imperative to health and well-being outcomes as the urban environment expands (Shanahan et al., 2015). The measure of the natural and cultural ecology of the regional landscape is evaluated as an integral part of the wellness of the community as a whole.

4.1 Land Use and Land Cover

As in previous assessments, a thorough Geographic Information Systems (GIS) desktop review of land use and land cover type is completed for the purposes of analysis.

4.1.1 Classification Schema

The 2013 land use classification schema was re-categorized for the 2018 assessment. The rationale for the change was to refine land cover types, while also classifying the natural and anthropogenic uses of the cover in order to assess specific conservation targets and threats (Tomlinson et al., 2017). Previous assessments employed 13 land cover types as seen in Table 1 (Meewasin Valley Authority, 2016).

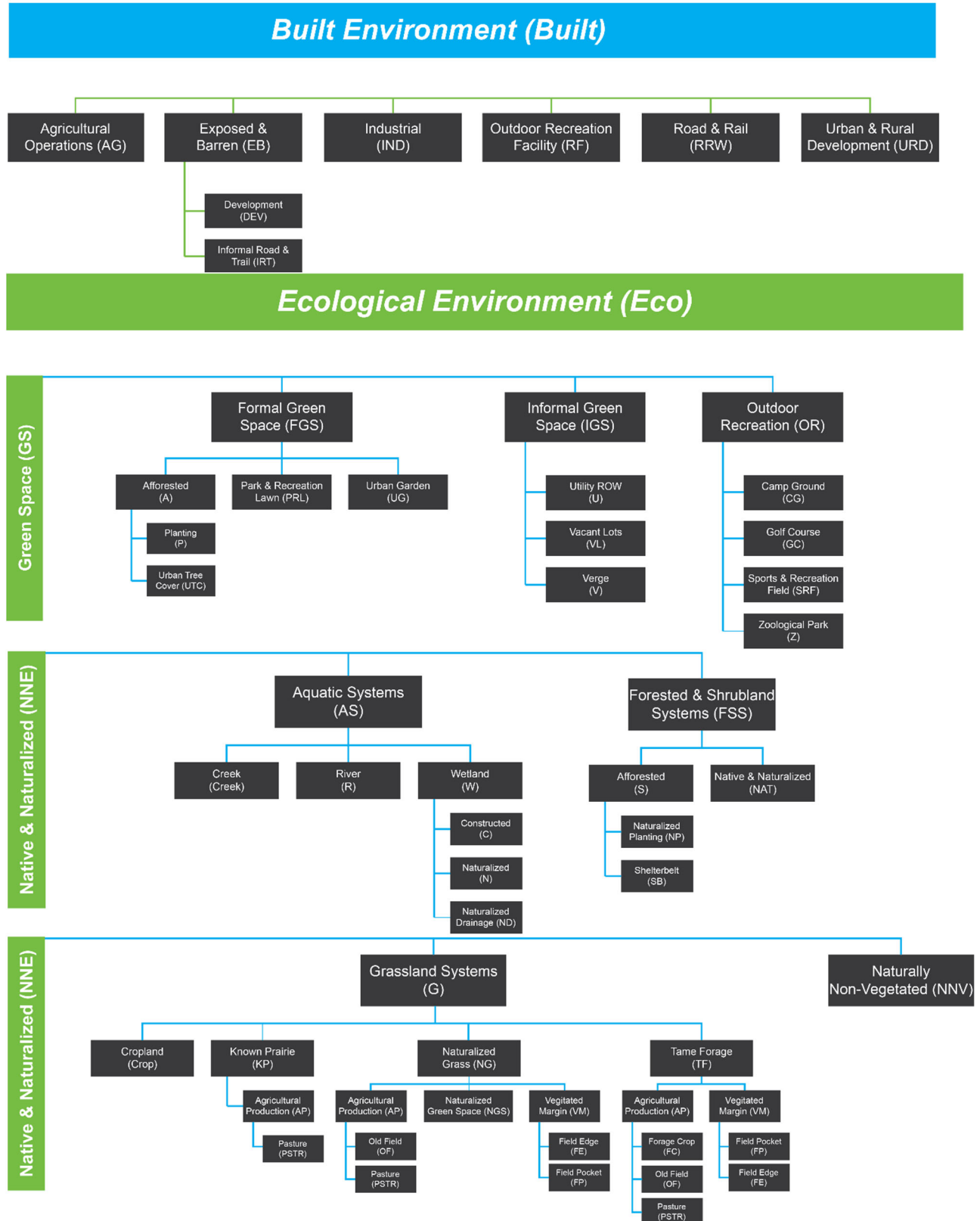
Table 1. 2013 State of the Valley Land Use Classifications

2013 State of the Valley Land Use Classifications		
<ul style="list-style-type: none">• Agricultural Production• Country Residential• Disturbed• Golf Course• Green Space	<ul style="list-style-type: none">• Habitat• Industrial• Institutional• Pasture	<ul style="list-style-type: none">• Recreation• River• Road and Rail• Urban

As seen in Figure 2, the 2018 analysis re-categorized the cover types into two main categories: *Built Environment* and *Ecological Environment*. The *Built Environment* was further defined into eight sub-types. The *Ecological Environment* was sub-divided into two sub-categories: *Green Space* and *Native & Naturalized Environments*, and further refined into fifteen and thirty-four sub-types respectively.

Within this new classification schema, some categories remain consistent while other categories have been refined (2013 'Pasture' is now defined by cover type: Known Prairie, Naturalized Grass or Tame Forage). The majority of the 2013 Land Use Classifications are now re-classified into sub-types, such as 'Habitat' now further defined by natural feature type (Wetland, Forested and Shrubland Systems, Known Prairie or Naturalized Grass).

Figure 2. 2018 Land Use and Land Cover Classification Schema



As part of the new schema, each sub-category is classified by Anthropogenic Intensity based on their degree of modification and potential ecological value:

- **Modified Area**
- **Modified Natural Area**
- **Natural Area**

This definition is used to aid in current and future change analysis, fragmentation and ecological topical assessments.

4.1.2 Land Use and Land Cover Analysis

The land use and land cover analysis employed previous cover type data, external land cover informational sources, evolved subject matter expert field knowledge, as well as multi-temporal aerial imagery sources to best determine the state of cover in 2018. Refer to Section 8.0 to review the data sources employed. Due to the fine scale of the 2018 classification schema, a scale of 1:500 was used to identify features; no minimum polygon size was set for feature delineation. The digitization process was largely manual in order to accurately identify and represent the newly refined sub-categories. This methodology update resulted in additional features being digitized and classified since the 2013 assessment; this will be further discussed in later sections.

As seen in Appendix B Table 2 the Built Environment comprises 9,050 hectares of the study area, with Green Space and Native and Naturalized Environments making up 1,998 and 32,477 hectares, respectively.

Within Ecological Environments, cropland and tame forage crops account for the largest area, totaling nearly 50% of the Native and Naturalized Environment.

When reviewing the data through the scope of anthropogenic intensity, Modified Natural Areas constitute the greatest proportion of the study area.

A comprehensive analysis of land use and land cover type within the Meewasin Valley can be viewed in Appendix B Table 4 Land Use and Land Cover in Protection.

Figure 3. Land Use and Land Cover in the Study Area

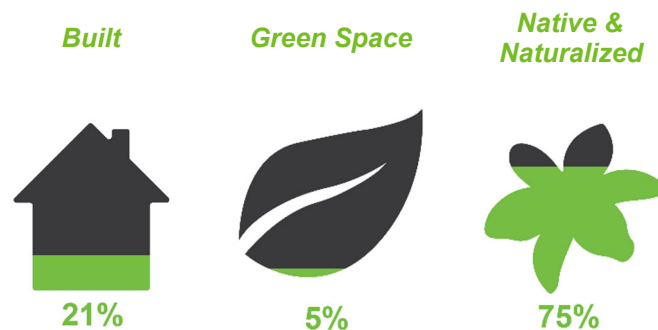
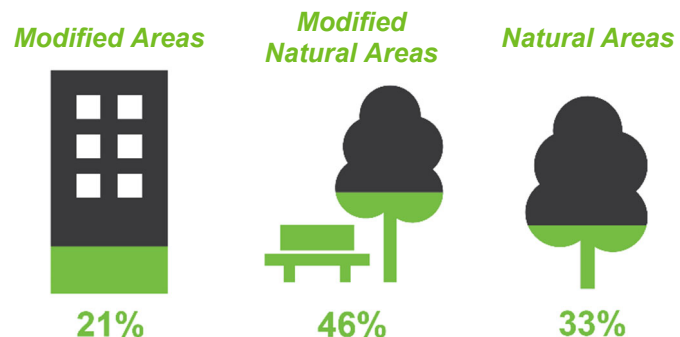


Figure 4. Anthropogenic Intensity in the Study Area



Progress Assessment

On Pace

The execution of detailed land use and land cover analysis of the study area advances the *Meewasin Valley-wide Resource Management Plan* (Meewasin RMP) goals of detailed classification mapping of various cover types within the region. The current proportion of Natural Areas within the Meewasin Valley is considered Fair according to the Meewasin RMP ranking of native habitat cover.

4.2 Temporal Change Analysis

In order to assess temporal changes since the last reporting period, further desktop analysis aimed at verifying changes in the land use and land cover data since the last reporting period. As described in 3.1.1 Classification Schema, due to schema modification between 2013 and 2018, a thorough analysis was undertaken to determine actual changes within the landscape versus false change through further division of sub-categories. The categories that remained identical in the 2013 and 2018 schemas were:

- Industrial
- Golf Course
- Road and Rail
- Pasture
- River

Due to the changes in classification noted above, the change assessment was completed comparing 2013 and 2018 aerial imagery sources. Each land cover polygon is assigned one of the following categorical definitions:

Table 2. Change Analysis Results

Analysis Outcome	Percentage of Total Study Area
Changed: There has been noted change between the imagery sources that resulted in categorization of the polygon.	3%
No Change: The classification category has not been changed between 2013 and 2018, and no changes were visually detected in the imagery that would necessitate a change in categorization.	17%
Reclassified: No change was visually detected in the imagery between 2013 and 2018, however due to the differences in classification schema between 2013 and 2018 the polygon classification has been modified to another category or sub-category.	76%
New: Due to the additional buffer included in the 2 kilometre study area as noted in section 2.1 Geographical Context, these polygons were not assessed in 2013, so have been marked as 'New' area.	4%

A summary of change is shown in Table 3; a comprehensive list of changes can be viewed in Appendix B Table 3. Conversion such as Road and Rail to Modified Natural Area is largely attributed to verge seeding and naturalizing along roadways. Changes of River to other Natural Areas is attributed to receding river levels exposing non-vegetated land forms and sandbars.

Table 3. Summary of Change Analysis by Percentage of Total 2013 Study Area

2013 Land Use	2018 Anthropogenic Intensity		
	Modified Area	Modified Natural Area	Natural Area
Agricultural Production	0.74%	0.08%	0.40%
Country Residential	0.02%	0.02%	0.01%
Disturbed	0.02%	0.04%	0.01%
Golf Course	0.01%	0.00%	0.02%
Green Space	0.01%	0.01%	0.00%
Habitat	0.16%	0.23%	0.03%
Industrial	0.02%	0.03%	0.00%
Institutional	0.01%	0.01%	0.00%
Pasture	0.19%	0.05%	0.02%
Recreation	0.01%	0.01%	0.00%
River	0.00%	0.00%	0.25%
Road & Rail	0.05%	0.17%	0.00%
Urban	0.08%	0.07%	0.00%
Totals	1.34%	0.72%	0.74%

Previous reports assessed the amount of encroaching development as well as increasing conservation values. Analysis of Table 3 percentages shows conversions of 2013 natural land categories (Habitat and River) to Built or Modified Natural Areas is slightly outpacing conversions of 2013 built lands (Country Residential, Disturbed, Industrial, Institutional, Road & Rail and Urban) to Natural or Modified Natural Areas by 0.03%.

Progress Assessment

Achieving Goal

The review of changes reveal minimal change occurrence over the study area since the last assessment. Although some conversions of land type have occurred, negative trending change is shown to be less than half of a percent.

4.3 Ecological Assessment

As described in Section 3.1.1 Classification Schema, there has been a methodology change regarding classifying Built and Ecological Environments compared to the 2013 State of the Valley report. Analysis will now consider anthropogenic intensity of features within the ecological environment.

4.3.1 Land in Habitat and Natural Areas Proportion

The Habitat classification was previously described as areas in relatively natural states and considered suitable for wildlife (Meewasin Valley Authority, 2016). While the preceding habitat classification included features now defined in the 2018 schema such as Wetlands, Forested and Shrublands Systems, and others, it shall be noted that the river was reported as a separate category and was factored into some but not all of the habitat assessments contained in the 2013 State of the Valley report. The inclusion of River in some comparative analysis is referenced in each section below. Additionally, some parcels of the 2013 Pasture category are now considered as Natural Area due to their Known Prairie and Naturalized Grass cover.

Ecological assessments contained within this report and in future are based upon the anthropogenic class of Natural Area defined in the 2018 schema. As described in Appendix B Table 1 Land Use and Land Cover Definitions, this encompasses all aquatic systems including the South Saskatchewan River.

In order to assess habitat gain or loss relative to the 2013 report and bridge the gap to the 2018 classification methodology, several specific comparisons are considered.

4.3.1A Total Land in Habitat

Previously Reported Habitat

The 2013 assessment detailed a total of 1,411 hectares of Meewasin Valley land within the Habitat designation (not including the river). Applying a change assessment to these parcels shows a combined net loss of nearly 8% when considering change and reclassification outside of the 2018 Natural Areas schema. Of this proportion, it is found that only 15% of this loss was due to actual change in cover as opposed to false change by reclassification to the new schema. Considering this, the habitat parcels within the Meewasin Valley as reported in 2013 show a loss of 1% within the reporting period.

The most significant habitat conversions were 8 hectares to Development and 2 hectares to Informal Road and Trail within the Modified Area spectrum and 5 hectares converted to Crop within the Modified Natural Area category. Reclassifications due to refined digitization resulted in 8 hectares of former Habitat now defined as Road and Rail or Informal Road and Trail within the Modified Area spectrum, and 46 hectares now considered Naturalized Planting within the Modified Natural Area category.

2013 Categorical Comparison

Taking into account the noted differences in Section 3.3.1, a comparison of ecological 2013 categorical content in relation to the 2018 classification schema is shown in Table 4. This comparison shows an addition of 1% Natural Areas coverage since the previous assessment, when excluding natural lands utilized as Pasture in 2018.

Table 4. Land in Habitat Categorical Comparison

Reporting Period	Category	Meewasin Valley		Study Area	
		Hectares	Percent of Area	Hectares	Percent of Area
2013	Habitat & River	3470	52%	9519	23%
2018	Natural Areas Total	3717	56%	14319	33%
	Natural Areas Excluding Pasture Lands ¹	3544	53%	10528	24%

¹ Pasture lands excluded to compare to 2013 State of the Valley categorization as stated in section 3.3.1 Land in Habitat and Natural Areas Proportion.

Progress Assessment

Achieving Goal

When reviewing comparisons, overall natural area proportions are determined to be consistent since last assessed. This meets the previously stated goals of no net losses of habitat occurring.

4.3.2 Patch Size and Fragmentation

Habitat parcels or patches are a contiguous area created when aggregating homogenous natural features (Forman, 1995). While large natural patch areas provide habitat landscapes for ecological function, smaller patches complement this in a myriad of ways, such as adding means for movement to larger areas within the ecological landscape (Forman, 1995). Conversely, fragmentation is the dissection of these contiguous areas into smaller patches through various means of human affectation (Kennedy et al., 2003).

Previous Reports

The 2013 State of the Valley report assessed habitat parcels over 50 acres (20.25 hectares) in size, noting that 50 acres was considered a sustainable parcel size. As discussed earlier in this section, anthropogenic intensity of features is considered when evaluating lands in the ecological context for this assessment.

2013 Categorical Comparison

To compare the previous reporting with the 2018 classification methodology, the 2013 reported Habitat parcels are parsed out of the 2018 change analysis files and aggregated based on the 2018 Natural Area category. As with the Habitat Categorical Comparison in Subsection 4.3.1, the river as well as lands re-categorized as pasture are omitted from analysis in order to allow for the most accurate comparison to the 2013 Habitat category. This change analysis is used to determine habitat fragmentation due to conversion (loss) or reclassification.

A categorical assessment of habitat parcels within the study area as reported in 2013 shows that 194 hectares were affected by fragmentation, although 91% (180 hectares) of this due to reclassification and digitization of refined subcategories. Examples of this include digitization of

¹ Pasture lands excluded to compare to 2013 State of the Valley categorization as stated in section 3.3.1 Land in Habitat and Natural Areas Proportion

existing trail within larger natural landscapes, such as at Chief Whitecap Park, Richard St. Barbe Baker Afforestation Area, Beaver Creek Conservation Area and Cranberry Flats Conservation Area.

Actual fragmentation loss due to change amounts to <1% of 2013 study area Habitat parcels. This consists of 9 hectares converted to Built Environments, 0.09 hectares converted to Green Space, and 5 hectares to Native and Naturalized categories (4 hectares of this were conversions to crop). Four of the 2013 significantly sized habitat parcels are found to be fragmented due to these changes as described. These fragmentations occurred in the Northeast Swale area (changes due to development and conversion to croplands) and along Central Avenue (conversion to trail and development).

When examining the 2013 habitat parcel sizes reported exclusively within the Meewasin Valley, although statistics indicate increasing fragmentation, this is again predominately due to reclassification and the fine grain of digitization completed for this assessment. 93% of the 2013 habitat parcels are now less than 20.25 hectares (50 acres) in size. This accounts for 294 hectares or 25% of the 2013 reported habitat.

4.3.2A 2018 Patch Size Analysis

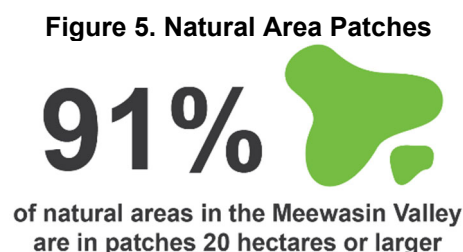
Analysis of aggregated patches at the scale of the 2018 Natural Areas classification schema that includes both River and Pasture areas with Known Prairie or Naturalized Grass cover is shown in Table 5. The inclusion of Modified Natural Areas as a secondary analysis considers these areas as an important sub-function of an entire green network of natural habitat and semi-natural connective spaces.

Table 5. Patch Size Analysis of the Study Area

Size Class (Hectares)	≥1000	≥100	≥50	≥20	≥10	<10
Natural Areas						
Count	1	14	12	38	42	3137
Percent of Total Area	15.63%	7.30%	2.20%	2.64%	1.42%	3.70%
Natural and Modified Natural Areas Combined						
Count	1	57	18	48	40	7741
Percent of Total Area	34.09%	33.07%	3.08%	3.42%	1.25%	4.28%

Analysis of Natural Areas found 84% are in patches larger than 20 hectares, making up 28% of the total study area.

Within the Meewasin Valley, 91% of the natural area cover are in patches 20 hectares or larger; this makes up 50% of the total valley area.



The contiguity provided by the river system as a central spine (Raymond Moriyama Architects and Planners, 1979) connects 48% of the Natural Areas in the study area, and 16% of the land cover as a whole. Within the Meewasin Valley, the river connects 83% of the Natural Areas, and 46% of the entire Meewasin Valley land cover. Although there is a large count of individual patches sized less than 10 hectares, the percentage of land cover contained within larger parcels is quite significant within not only the Meewasin Valley, but also within the study area.

Progress Assessment

On Pace

When considering the entirety of 2018 Natural Areas network including the river and native and natural pasture lands, along with the fine grain of classification completed for this report, analysis shows the overall percentage of natural land cover contained within larger parcels remains a significant proportion of total land cover within the Meewasin Valley and study area.

4.4 Protected Lands

Protected areas have fundamental importance not only for ecological purposes, but also for the cultural connection of people to these ecological assets and landforms.

4.4.1 Meewasin Valley

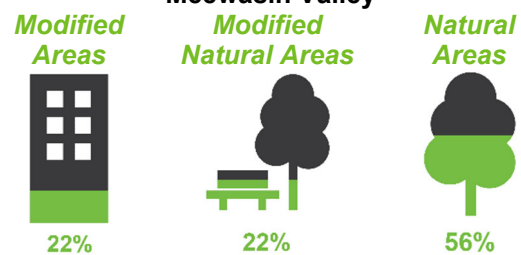
The protected lands considered within the Meewasin Valley consists of lands described as Conservation Zone and Buffer Zone as outlined in *The Meewasin Valley Authority Act's* Schedule A and B, as well as owned parcels or easements granted to Meewasin. Meewasin's *Development Review Exemption Bylaw #3* (Meewasin Valley Authority, 2013), has not been amended since the last reporting period, therefore there has been no increase to lands exempted from the Meewasin Valley Authority's jurisdiction.

The Meewasin Valley covers 6,696 hectares (67 square kilometres) of public and private land. Analysis of Land Use and Land Cover within this protection is summarized in Figures 6 and 7, and detailed in Appendix B Table 4.

Figure 6. Land Use and Land Cover in the Meewasin Valley



Figure 7. Anthropogenic Intensity in the Meewasin Valley



4.4.2 Protections External to Meewasin

A review of land protected through other mechanisms outside of Meewasin Valley Authority Sites assessed protections obtained by other organizations within the region as a complement and connection to those held by Meewasin. The Canadian Protected and Conserved Areas Database (CPCAD) was utilized for this review, as these areas have been formally evaluated by Provincial and Federal Government assessors according to International Union for Conservation of Nature (IUCN) standards and practices.

As of this reporting period, there are 871 hectares of land protected outside of Meewasin Valley Authority sites. 229 hectares of these lands fall within the Meewasin Valley Conservation Zone. These lands consist of public designations as Migratory Bird Sanctuary, Wildlife Habitat Protections and Crown Pastures, as well as private conservation lands. A review of the composition of these lands is found in Appendix B Table 4. This analysis will provide baseline data for measuring increasing protections in the study area in future years.

4.4.3 Cultural Significance

Past and present cultural connections are an important aspect in terms of protection and conservation of lands and landscapes for future generations. Analysis of culturally significant sites reveals 219 archaeological and palaeontological sites found within the Study Area. This number has increased by 8 sites added to the Saskatchewan Government Heritage Conservation Branch data sources since the last State of the Valley report. Seventy-seven of these sites are located within the Meewasin Valley with 39 of those being located within the boundaries of Meewasin sites. An additional 8 sites are located within the other protected areas (CPCAD) external to the Meewasin Valley, with the majority of these (6) located within Crown Pasture lands. A review of Indigenous lands within the study area as reported in the Government of Canada Aboriginal Lands database found 15 hectares of land within 5 Indigenous communities as of 2018.

Progress Assessment

Progress Lagging

Meewasin's work towards the long ranging resource management and strategic plan goals of jurisdictional amendments and additions continues to progress, however this has not resulted in expansion of the Meewasin Valley, sites or easements within this reporting period. Documentation of culturally significant features and lands continues within the study area.

4.5 Biodiversity and Conservation Measures

4.5.1 Species Biodiversity

Species analysis complements the assessment of the dynamic landscape within the study area and intends to provide contextual data relative to natural systems.

4.5.1A Species Observations

An analysis of species observations from multiple agency and reviewed citizen science data sources² (refer to Section 9.0 Data Sources) was completed in order to assess species observation densities and provide data on potential biodiversity being witnessed within the Study Area. Over 61,000 observations recorded more than 720,000 single species counts.

Analysis shows 524 unique species across 13 species groups found within the study area during the reporting period. This data will provide baseline information for future State of the Valley analysis. The full list of species observations can be viewed in Appendix B Table 5.

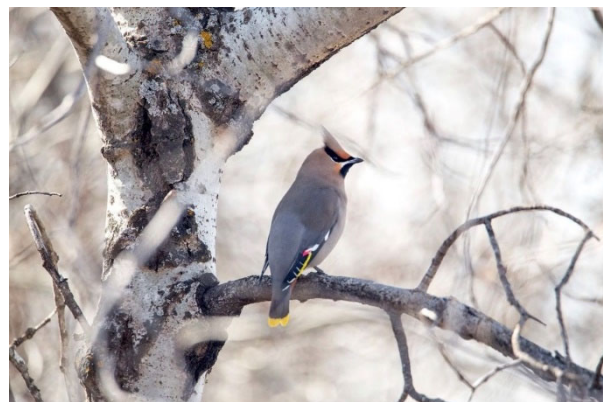
Figure 8. Unique Species Observations



4.5.1B Rare Species Occurrences and Species At Risk

Utilizing the species observation dataset compiled as detailed in Section 3.5.1, additional analysis focused on determining the presence of rare species and species at risk within the reporting period.

The Conservation Data Centre Saskatchewan Taxa Lists is used to assess the presence of S1 – S3 Subnational Ranks to determine rare species occurrences.



Bombycilla garrulus (Bohemian Waxwing) at Beaver Creek Conservation Area

Bird species with range ranks (multiple Subnational Rankings) are analyzed for Breeding, Non-Breeding and Migration risk windows. Anecdotal evidence and recorded observation dates are studied and assessed against published sources relevant to Saskatchewan species observations in order to identify the appropriate conservation Subnational Rank. Fifty-seven unique species ranked as S3 or higher, including Northern Leopard Frog, Red-throated Loon, Whooping Cranes and Lesser Duckweed.

Figure 9. Rare Species and Species at Risk



In addition to assessing species rarity, the taxa lists are also used to determine Committee on the Status on Endangered Wildlife in Canada (COSEWIC) classed species. Twenty-six unique species rank as Endangered, Threatened or of Special Concern within the study area, including Piping Plover, Monarch Butterfly and Little Brown Myotis. The list of species observations in Appendix B Table 5 includes the applicable Subnational Rankings and COSEWIC designations.

² (Calendar)

Another item of note is the documenting of 3 active Sharp-tailed Grouse Leks within the study area since the last assessment. Two of these Leks are in proximity to the Northeast and Small Swale areas, and another is found adjacent to the Beaver Creek Conservation Area. Although Sharp-tailed Grouse are ranked as S5 in the Subnational Rankings, Leks are listed on the Saskatchewan Activity Restriction Guidelines for Sensitive Species (Government of Saskatchewan Ministry of Environment, Fish, Wildlife and Lands Branch, 2017). As such they are an important inclusion to assessing biodiversity in the area as well being identified as a culturally significant species to Indigenous peoples.

Progress Assessment

On Pace

There has been an increasing amount of documented rare and species at risk reported, notably due to the increase in available spatial data sources since the last reporting period. With the advancements in digital platforms used to facilitate species observations reporting and the progression of Meewasin monitoring network initiatives, more data regarding biodiversity will be available for future comparisons. These initiatives will aid in future assessments to determine if goals relative to species population increase are being met.

4.5.2 Conservation Land Management

Conservation land management is employed as a mechanism for enhancing land and habitat quality relative to its natural state. Meewasin aims to generate a positive shift in grassland health using these processes.

4.5.2A Targeted Conservation Grazing

Targeted conservation grazing is a multi-use tool for land management. It assists in simulating disturbance patterns that are no longer naturally occurring on the post-contact grassland landscape. Beneficial aspects of targeted conservation grazing include improvement of native grasslands habitat for flora and fauna, management of non-native species and shrub reduction as a way of enhancing native grassland health.

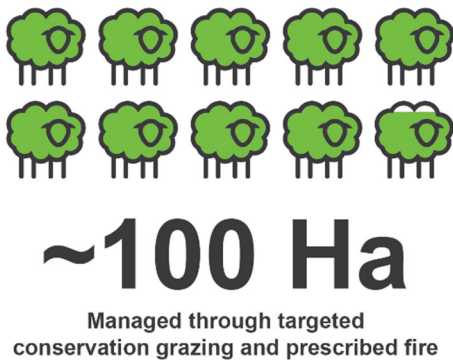
Meewasin's targeted conservation grazing program continued through 2018, resulting in a total of 47 hectares³ of grasslands managed through this process. This is a 135% increase over 2013 reported hectares. This is in part due to the increase in documentation of the targeted conservation grazing program.

4.5.2B Prescribed Fire

Similar to targeted conservation grazing, prescribed fire is used as a tool to mimic natural disturbance and assists in controlling non-native vegetation and shrubs, helping to invigorate and sustain native grassland species.

³ (Calendar)

Figure 10. Prescribed Fire & Targeted Conservation Grazing



Prescribed fires were conducted in collaboration with Meewasin's various partners throughout the Meewasin Valley, on Meewasin sites as well as other partner sites within the region. The prescribed fire program was used to manage nearly 50 hectares⁴ of grasslands within the Meewasin Valley. This is a 9% decrease over the hectares accomplished in the last reporting period.

Wildfires also occurred at Chief Whitecap Park and Cranberry Flats Conservation Area within the study area, totaling 0.75 hectares burned.

Progress Assessment

Progress Lagging

As shown through analysis, Meewasin's ability to utilize targeted conservation grazing and prescribed fire as a conservation tool continues to fluctuate by various degrees due to many influencing factors. These include weather conditions, resource availability, increasing liability obligations, and rising wildfire volatility across western Canada. For these reasons, Meewasin has fallen short on achieving stated goals in terms of number of sites and hectares managed during this reporting period. Meewasin has largely advanced on achieving objectives related to prescribed fire partnerships, inter-agency project and data sharing within the region and province.

4.5.3 Restoration

Meewasin continues to facilitate restoration of natural areas back to native species within the Meewasin Valley to enhance ecology and biodiversity within the area.

A variety of restoration projects were completed during the reporting period. Streambank restoration projects occurred at Beaver Creek Conservation Area, Fred Heal Canoe Launch and Shakespeare on the Saskatchewan site within the City of Saskatoon. Storm pond restoration began and continues to progress at the Northeast Swale.



Meewasin Restoration Planting Bed

⁴ (Calendar)

Figure 11. Horticulture Plantings



Additionally, horticulture restoration planting projects have been established at multiple locations throughout the valley. Where possible, these projects utilize native wildflowers and shrubs grown locally in Meewasin's greenhouse. A total of 0.12 hectares of streambank restoration occurred, along with 35,122 horticulture plantings during the reporting period.

Progress Assessment

On Pace

Work on restoration projects has continued to progress in regards to amount and variety of projects undertaken. Meewasin is on the path to achieving goals in relation to restoration plans and strategies set out in the Meewasin RMP. Availability of resources continues to be a challenge to the progression and amount of restoration projects undertaken. The documentation of these projects is improving as more resources and equipment become available; this will provide additional data to better assess progress over time.

4.5.4 Invasive Species Management

Invasive species management continues to be a focus within the Meewasin Valley. Analysis of Meewasin and citizen science data during the reporting period shows a count of over 3.23 million invasive species detected in the study area, consisting of 66 unique species of birds, insects and plants. Meewasin continues to employ integrated tactics to combat invasive species, including herbicide treatments, bio-control agents, targeted conservation grazing, mechanical and manual removals. Utilizing these methods, Meewasin facilitated the treatment or removal of over 900,000 invasive plant species stems within the reporting period. The European Buckthorn program has controlled 1.64 million stems to date since the inception of the program 20 years ago.

Figure 12. Invasive Species Treated



Figure 13. European Buckthorn Program



Aquatic invasive species are also being monitored by Meewasin and other partners within the Meewasin Valley and the South Saskatchewan River watershed. Meewasin partnered with the South Saskatchewan River Watersheds Stewards and other organizations in 2018 and 2019 to survey, map and remove flowering rush along 55 kilometres of the South Saskatchewan River.

Meewasin continues to sample for aquatic invasive mussels at areas throughout the Meewasin Valley. To date no invasive mussels have been detected.

Progress Assessment

On Pace

In 2017 the Meewasin RMP ranked invasive species as a 'Very High' threat for ecology in the region, and this continues to remain accurate when considering the volume of invasive species reported each year. Although the treatment of invasive species by Meewasin has steadily increased year over year, the success of the program varies from site to site in terms of detected species. Meewasin continues to collaborate with other agencies and use multiple resources in order to monitor, log and treat these species annually; this will help in determining future rates of spread and reduction over time in relation to invasive species objectives throughout the study area.

4.5.5 Other Monitoring Initiatives

Since the last assessment, Meewasin has initiated a network of active and passive monitoring techniques including spectral and audiometric methods to detect health, species presence and populations at various points within the Meewasin Valley. Detection methods include:

- Wildlife Monitoring Cameras
- Acoustic Monitoring
- Water Quality Monitoring
- Breeding Bird Surveys
- Insect Detection
- Range and Riparian Health Assessments

This network will provide baseline data for future assessments and continued program expansion will provide detection data throughout the Meewasin Valley in future years in order to assess and refine conservation objectives and measures.



Species Identification and Recording



Friendship Park

5.0 Balance

Maintaining the delicate balance between conservation and means of providing safe access for community recreation and nature appreciation is increasingly imperative within the context of growth and expansion occurring within the Meewasin Valley and study area as a region.

5.1 Public Shoreline

Public shoreline as reviewed for this reporting period encompasses the South Saskatchewan River shoreline that intersects with public ownership lands or falls within private ownership parcels. As in previous reports, public lands are defined as being either owned by, or easements granted to Meewasin or participating parties as defined in the *Meewasin Valley Authority Act*. Minor changes to the shoreline found in the Land Use and Land Cover analysis as well as the increase in study area resulted in the assessment of an additional 3.3 kilometres of shoreline along the southern extent.

5.1.1 Public Shoreline Ownership

When considering the intersection of shoreline and surface parcel ownership, of the 168 kilometres of shoreline assessed within the study area, 73% of the current shoreline falls on

publicly owned lands. Within the City of Saskatoon, 92% of the shoreline is publicly owned. It should be noted that this assessment is to be considered separately from the 2013 Public Shoreline assessment where public access was considered exclusive of ownership of the land wherein the shoreline boundary falls. The assessment of public access is described in Subsection 5.1.2.

5.1.2 Publicly Accessible Shoreline

For this assessment, publicly accessible shoreline is considered any shoreline that is accessible by the public through a form of land access as noted in 5.2 Access Points. This access may be due to public ownership status or by means of public access permitted by owners on privately owned lands. It should be noted that publicly owned shoreline can still be accessed from the South Saskatchewan River itself, regardless of land access.

Table 6. Publicly Accessible Shoreline

	Study Area	City of Saskatoon	RM of Corman Park
Publicly Accessible Shoreline	47%	89%	41%

Of the total shoreline length reviewed, data showed that 78 kilometres of the total shoreline in the study area is publicly accessible. Of this amount, less than 1% is due to public access being granted to privately owned shoreline. This is a 15% increase from the amount reported in 2013. The majority of this increase can be attributed to the revised access points discussed in Subsection 5.2. Within the City of Saskatoon, 89% of the shoreline is publicly accessible. Within the R.M. of Corman Park, the proportion is 41%. This is an increase of 9% and 8%, respectively, since the last assessment. The total proportion of publicly accessible shoreline within the Meewasin Valley is 74 kilometres, a 10% increase over the last reporting period.

5.1.2A Publicly Accessible Shoreline Per Capita

Assessment of ratios of publicly accessible shoreline per capita finds that within the Meewasin Valley, the proportion is 0.29 metres per person. This has not changed since the 2013 assessment.

Progress Assessment

Achieving Goal

Although the conversion of river-adjacent lands from private to public ownership continues to remain stagnant, this has not affected ratios of ownership or accessibility within the reporting period. Furthermore, per capita assessment shows that public accessibility is keeping pace with population increases within the Meewasin Valley. Meewasin continues to draw attention to the issue of public access to the South Saskatchewan River when collaborating with partnering organizations on regional growth planning.

5.2 Access Points

Meewasin completed an initial phase of the *River Access Study* (Meewasin Valley Authority, 2016) in order to meet goals identified in the *Meewasin Valley-wide Resource Management Plan*. The study identified access areas within the City of Saskatoon, utilizing public survey and comparison to other jurisdictions to determine future options to allow increased safe public access to the river within the city. Further study is required in order to finalize long-term formal river access points and potential infrastructure needs.

Public access points are public or private lands that allow for access to the river by the general public. A reassessment of public access points for this report is predicated on parcel ownership status, road and informal trail networks, as well as subject matter expert field knowledge gained within the reporting period. Taking these sources into account, it is found that the number of public access points has risen to 44 over the study area. Although there have been some new additions to this count such as the SaskPower parking lot public access at the Queen Elizabeth Power Station, the majority of the additions are derived from reassessment based on evolved field knowledge.

Access point dispersal remains heavily focused within the city, with 50% falling within the 2018 City of Saskatoon boundary. The reassessment has shown increased balance of access outside of the city, with 23% of access situated north of the City of Saskatoon, and 27% to the south.

Progress Assessment

Achieving Goal

Evaluation shows there are an increasing number of areas allowing for direct access to the river. These accesses are increasingly balanced between the north and south as envisioned in *The Meewasin Valley Project*. The completion of the *River Access Study* set forth long term goals that are considered in the current and future partnerships Meewasin has with the City of Saskatoon, regional and recreational groups.

5.3 Trail

The development of sustainable trail systems have versatile benefits within the context of health, fit and vibrancy. In addition to providing safe and accessible recreation opportunities, they provide community linkage, alternative transportation structure and access to interpretive and natural areas. Formalized trails assist in minimizing disturbances to environments, protecting green and natural areas from compaction and damage, while allowing the community access for wellness and recreation.

5.3.1 Trail Length

Since the work completed on *The Meewasin Trail Study* (Meewasin Valley Authority, 2014) the Meewasin Trail continues to undergo ongoing assessment and upgrades to adapt to community needs, site requirements and accessibility standards.

13.36 kilometres of new trail was established during the reporting period in the following areas:

- Diefenbaker Park
- Birchwood Heights Trail
- SaskPower Tertiary Trail
- Wanuskewin Road
- Northeast Swale Recreation & Ecological Zone
- Aspen Ridge Greenway

Figure 14. Trail in Meewasin Valley



Trail enhancements were completed within the reporting period at Cosmopolitan Park, the Meewasin Riverworks and areas adjacent to the new Traffic Bridge.

A total of 23.65 kilometres of the Meewasin trail is recognized within The Great Trail system, providing a linkage from Chief Whitecap Park in the south to Wanuskewin Heritage Park in the north.

Table 7. Meewasin Trail Length

Trail Type	Length (Kilometres)
Primary	45.97
Secondary	9.09
Tertiary	16.03
Backshore	11.56
Casual ²	14.01

² Includes length previously reported as Equestrian Trail.

In addition to the multi-use pathways noted in Table 7, there are an additional 19.91 kilometres of seasonal cross-country ski trails groomed in the Meewasin Valley each winter in locations such as Diefenbaker Park, Holiday Park, the Forestry Farm and Meewasin Park. This is an additional 1.6 kilometres length since the 2013 reporting period.

5.3.1A Amount Per Capita

When assessing per capita amounts, the ratio of Meewasin Trail per person is calculated at 0.38 metres. If considering the amount of seasonal cross-country ski trail within that assessment, the amount grows to 0.46 metres, which is a 15% increase over the previous period.

Figure 15. Trail Per Capita



Progress Assessment

Achieving Goal

Goals set out in the *Meewasin Valley Authority Strategic Plan 2014-2024* (Meewasin Valley Authority, 2014) are being met in regards to trail extensions to serve the growing community and increasing links to neighborhoods. The trail extensions envisioned for the corridor have either been completed or the planning process is currently underway. Meewasin is accomplishing the vision for recreation and development access for the growing population.

5.3.2 Trail Use

Figure 16. Meewasin Trail Visits



Trail counters are utilized within the Meewasin Trail system to capture usage rates⁵ throughout the Meewasin Valley. Although the trail counter system has grown within the last 5 years, the number of active counters has fluctuated due to maintenance and environmental factors. An average of 9.4 counters were active throughout the Reporting period, peaking at 14 active counters in 2016. Analysis of usage counts show there have consistently been over 1 million trail visits annually, with peak annual usage of 1.83 million in 2017.

Progress Assessment

Achieving Goal

Trail utilization rates have increased within the reporting period, progressing towards the 2 million users per year mark. Self-reported trail use has also risen by 22% as is later discussed in Subsection 6.3.

5.4 Green Space

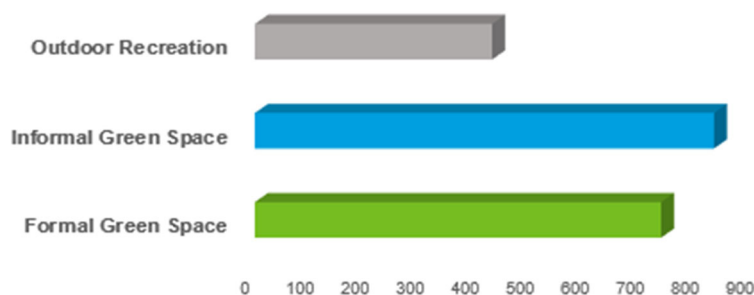
Many studies have shown that green spaces within urban environments are important complements to the overall health of individuals (World Health Organization, 2016).

5.4.1 Green Space Amount

As discussed in Section 3.2 Temporal Change Analysis, the reason for the increase in reported Green Space is due to the fine grain of digitization and classification schema applied to the assessment, rather than a significant increase to allotted green space throughout the study area. Examples of this include an additional green space and canopy being recognized and digitized within the previous 2013 parcels of Urban, Institutional, Industrial, Agricultural and Country Residential lands, as well as verge cover being classified independently of Road and Rail.

According to the 2018 classification schema, the 'Green Space' category now encompasses a total 1,998 hectares of the study area, compared to a total of 1,312 hectares in the 2013 study area for the Green Space, Golf Course and Recreation categories.

Figure 17. Green Space in Hectares



⁵ (Calendar)

Figure 18. Green Space in the Study Area



A comparative analysis of conversion to and from Green Space assessed rate of change from the 2013 totals. Taking into account change and reclassification, within the Meewasin Valley there was a net gain of 3.5% or 22 hectares over the last 5 years, with 53% of gross gains attributed to change.

The change assessment detailed in Section 3.2 found that 668 hectares of Green Space was added to the Study Area since 2013; although this is an increase of 38% overall, only 13% of gross gains in this area are attributed to change. An additional 18 hectares were added through the new lands included in the revised 2018 study area.

Within the hectares reported in Figure 17 over 20 hectares of land was converted to the 'Formal Green Space' category, with 82% of that being Urban parcels converted to Park & Recreation Lawns via the establishment of park areas in the Evergreen neighborhood, as well as green space additions adjacent to the Diefenbaker Park to Western Development Museum link trail upgrade. 91 hectares of land was converted to 'Informal Green Space', with the majority of that (76%) being Road & Rail adjacent lands seeded to verge at various locations throughout the City of Saskatoon area.

5.4.1A Amount Per Capita

The 2013 assessment reported on per capita ratios of Green Space located exclusively within the Meewasin Valley. When calculating the additional hectares of Green Space noted in the last section in relation to increasing population values, it is determined that there has been a 6% decrease in Green Space to 25 square metres per person. The addition of Green Space is not keeping pace with population growth within the Meewasin Valley.

When applying the same assessment to the Study Area, the ratio increases to 78 square metres per person, applying the same population metrics.

Progress Assessment

On Pace

The amount of green space has increased marginally over time, although there has been a slight decrease in per capita amounts. It is recognized that green space is generally added as a means of endowing municipal reserve through the development of lands and neighborhoods in the increasing urban landscape, and as such typically grows incrementally. The utilization of existing natural lands as established green space in growth areas would meet both objectives for sustaining land in its natural state and providing space for the community to connect with nature. Stating that, future metrics may require adjustment to reflect the use of natural areas in this manner, the Northeast Swale being an example of naturalized areas providing green space within the urban context.

5.5 Active and Passive Uses

The Meewasin Valley mandate to **Conserve, Develop and Educate** (Meewasin, 2014) is integrated throughout the valley with the goal to provide human connection to nature, while balancing the provisioning of access and facilities in order to do so in a responsible and sustainable manner.

Figure 19. Reported Meewasin Valley Uses



In addition to the recreational uses envisioned and planned for within the Meewasin Valley (Figure 19), there continues to be other recreational activities occurring that are not anticipated. Although the majority of these activities are correlative to Meewasin's goal of providing recreation as a connection to nature, some activities may have unintended consequences without the proper infrastructure and planning, or may need to be curtailed for safety or conservation reasons. Meewasin continues to work towards addressing these incidental uses through partnerships, education, infrastructure and enforcement means to ensure that safe, accessible recreation is available to the public and reduce any further impact to the environment.

Meewasin has begun to collaborate with recreational and conservation organizations and groups to formalize and develop these partnerships. Meewasin has also been furthering work with area groups and organizations to facilitate land connections through cultural and traditional land uses on sites within the Meewasin Valley.

Progress Assessment

On Pace

Work continues to be ongoing specific to promoting safe accessible recreation in the Meewasin Valley and the sites within it. Meewasin has advanced on long-ranging goals set since the last assessment related to positive partnerships, accessibility and land use.

5.6 Development and Review

Another important role Meewasin undertakes is the authority to review and approve any improvements within and outside of Conservation Zone, within the Meewasin Valley. The criterion for these improvements and areas where this applies are defined in the *Meewasin Authority Act* (1979).

Meewasin's Development Review process is intended to ensure that improvements conform to Meewasin's Development Plan. Projects are reviewed and assessed based on their impact to natural resources, riverbank restoration, slope stability and drainage, landscape construction and maintenance, the river channel, public access and heritage resources.

Within this reporting period, Meewasin has seen a decline in the number of Development and Review applications received over the number reported in 2013; there were a total of 53 applications, an average of 11 per year over the reporting period.

Projects subject to Development and Review vary in purpose, and include buildings such as utility apartments and condos, offices and hotels, neighbourhood concept plans, transportation and infrastructure projects, park and recreation facility upgrades, artistic and cultural installations, and habitat and restoration projects. This includes private and public projects, including those undertaken by Meewasin.

Examples of projects brought to the Development and Review Committee during the reporting period include the various project components of the North Commuter Parkway project, River Landing Developments, Traffic Bridge improvements, Diefenbaker Park Recreation Facility project, Wanuskewin Heritage Park expansion, and the Northeast Swale and Chief Whitecap Park Master Plans.

Progress Assessment

On Pace

Meewasin remains committed to its mandate of balancing additional development in the region with conservation goals. In executing its legislated role, the policies and processes developed by Meewasin has resulted in a consistent and equitable process.



Meewasin Learning from the Land Event

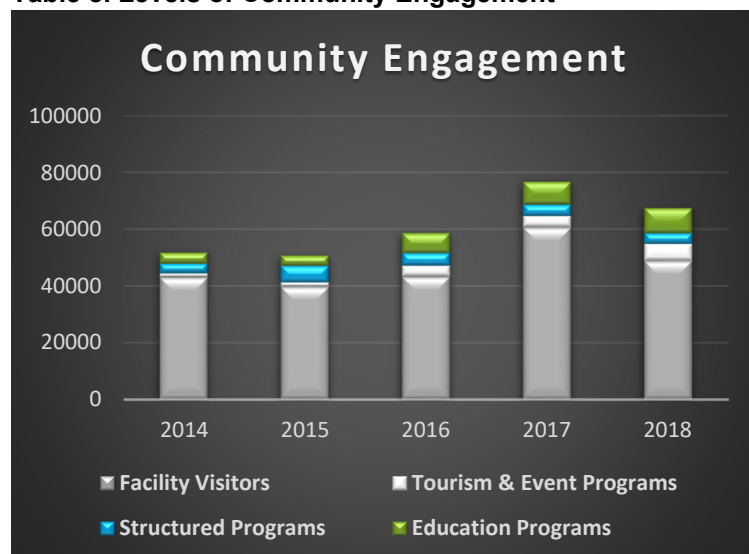
6.0 Fit and Vibrancy

Fit is a component of the linkage between individual and social health to natural systems (Raymond Moriyama Architects and Planners, 1979) while **vibrancy** is the effect on the river valley resultant from these positive interactions. Meewasin's strategic goals related to recreational access to the river valley, diversity in activities, education and public participation actively reinforce these fundamentals.

6.1 Community Engagement

Meewasin saw a reduction in programs and services in 2017 due to funding challenges; this resulted in the closure of the Meewasin Interpretive Centre and discontinuation of the Interpretive Canoe Program in 2017. Despite this Meewasin continues to persevere in the face of these challenges, finding new ways of engaging the community with the resources available and in partnership with other organizations in the regions. Examples include the creation of both the Dark Skies and Chalk Mural events, and hosting skating party events at the Meewasin Rink. Participation in the Nature City Festival and Saskatoon Boys and Girls Club Youth Programs has allowed Meewasin to continue to engage with increasingly broader audiences.

Table 8. Levels of Community Engagement



Pillar campaigns such as the Pelican Watch⁶ and the Meewasin Clean-up Campaign⁷ have continued throughout the reporting period; it is estimated that nearly 30,000 community members participate during the Clean-up Campaign each year. Education and awareness in respect to conservation topics and the resource management measures Meewasin employs within the region continues to be promoted through the addition of conservation-focused social media, public presentations and tours.

Partnerships with educational institutions to facilitate learning opportunities and research projects on Meewasin sites remains a priority. Ongoing partnerships with the Saskatoon Public School and Greater Saskatoon Catholic School Divisions as well as with post-secondary learning institutions such as the University of Saskatchewan and Saskatchewan Polytechnic have brought field learning and professional development opportunities to many students over the reporting period.

In 2014, Meewasin was honoured with the Saskatchewan Tourism Land of Living Skies Award, which recognizes tourism businesses that reflect sustainable tourism development.

Progress Assessment

Achieving Goal

Meewasin has worked hard to expand communications, outreach and engagement opportunities within the region despite of the challenges it has faced within the reporting period. These new and enhanced strategies have resulted in broader and diversifying engagement, with a larger volume of community participation reported since the last assessment.



Meewasin Cross-country Ski Program

⁶ (Calendar)

⁷ (Calendar)

6.2 Organization Participation and Partnerships

As referenced within this report, partnership is vital to Meewasin, not only through ongoing engagement with external organization and public groups, but also through engagement of the community that functions to connect citizens to Meewasin's work within the region. In addition to its Board of Directors, Meewasin maintains several advisory and specialty committees. These committees consist of regional and community organization representatives and public participants who assist with advisement and as such, provide Meewasin with variety of input and perspectives in respect to the work it undertakes.

The number of participants on Meewasin's Board of Directors and committees remains consist since the last assessment resultant of the formal structure of these groups. The number of appointees total 76 at the end of the reporting period.

Conversely, Meewasin and its staff hold 19 seats on the boards and committees of other community and non-profit groups and organizations. This has increased by 70% since 2013. These appointments relate to a variety of matters such as conservation, development, Indigenous consultation, tourism and economic development.

Meewasin has increased membership in other organizations by 75%, holding 21 memberships with other organizations similar to those already described. Additionally, Meewasin continues to maintain and grow relationships and partnerships with other organizations to facilitate joint efforts towards Meewasin's overarching goals.

Progress Assessment

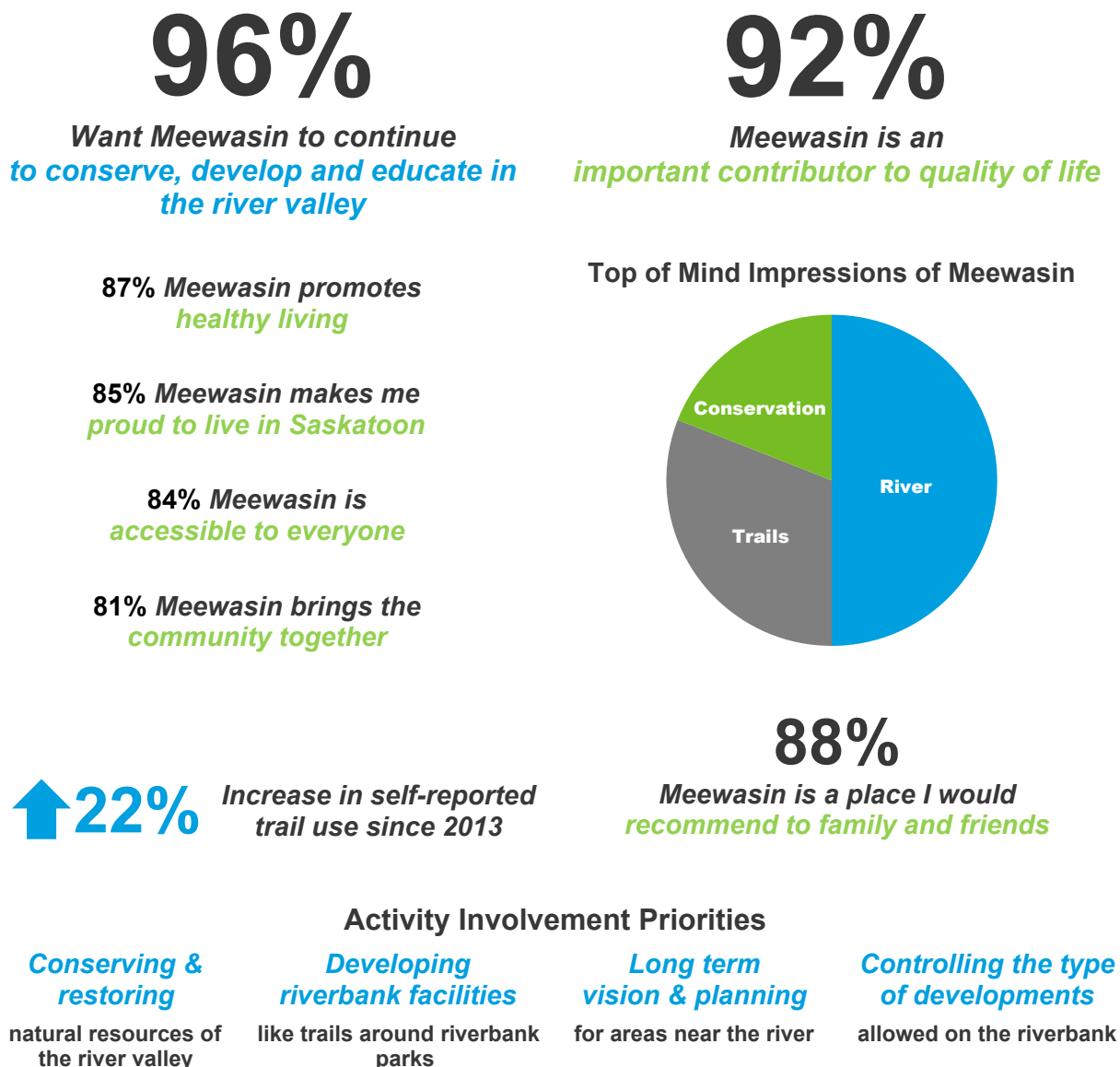
Achieving Goal

Community engagement through fostering partnerships and memberships with a varied cross-section of interests continues to progress, and in this reporting period has actively grown. These collaborations strengthen Meewasin as an organization and boost the work it is able to accomplish.

6.3 Public Perception

Meewasin regularly obtains survey data from external resources to evaluate how the public views Meewasin as an organization within the community, the work Meewasin accomplishes, general feelings toward the Meewasin Valley as a destination and the value of the region as a whole. Figure 20 shows a summarization of the results of the 2018 Public Opinion Survey (Insightrix Research, 2019).

Figure 20. 2018 Public Opinion Survey Summary



Progress Assessment

Achieving Goal

Overall support for Meewasin has continued to rise over the reporting period. Responses in respect to Meewasin continuing work in future years and being an important contributor to the quality of life in Saskatoon rose a further 6% each from the previous survey results. According to the respondents, Meewasin Trail use increased 22% from 2013 survey reported use.

7.0 Future Assessment

As Meewasin continues to evolve, the State of the Valley report is adapted in order to provide suitable metrics through which to assess Meewasin's success relative to the guiding principles and goals that have been implemented in the 39 years since its inception.

Although it is unfeasible in terms of finance and schedule, completion of a thorough ground-truthing of the Land Use and Land Cover outcomes of the remote sensing desktop analysis would be beneficial to ground assess a random sample size of each cover type for accuracy. It would provide empirical evidence to assist in better data quality, and aid in further refinement of the classification system. Improvement of data quality is not only beneficial for the purposes of the State of the Valley report, but also other projects undertaken by Meewasin and other partners in the study area as data is shared.

In addition to the assessment of patches, fragmentation and encroaching development discussed in this report, a thorough connectivity assessment would provide supplementary data relative to habitat quality and potential within the region.

The additional active and passive monitoring techniques added to the overall monitoring network referenced in Subsection 4.5.6 will provide future data and context in relation to ecological health and biodiversity in the study area. The effective collection and documentation of this material is imperative in ensuring a quality inventory of data resources for analysis.

Expansion of the public opinion survey to help inform data in relation to social, cultural and spiritual connections that community members associate with the river valley. In this way, the survey may be broadened to build a more complex understanding of the multiple integrated values that community well-being is comprised of.

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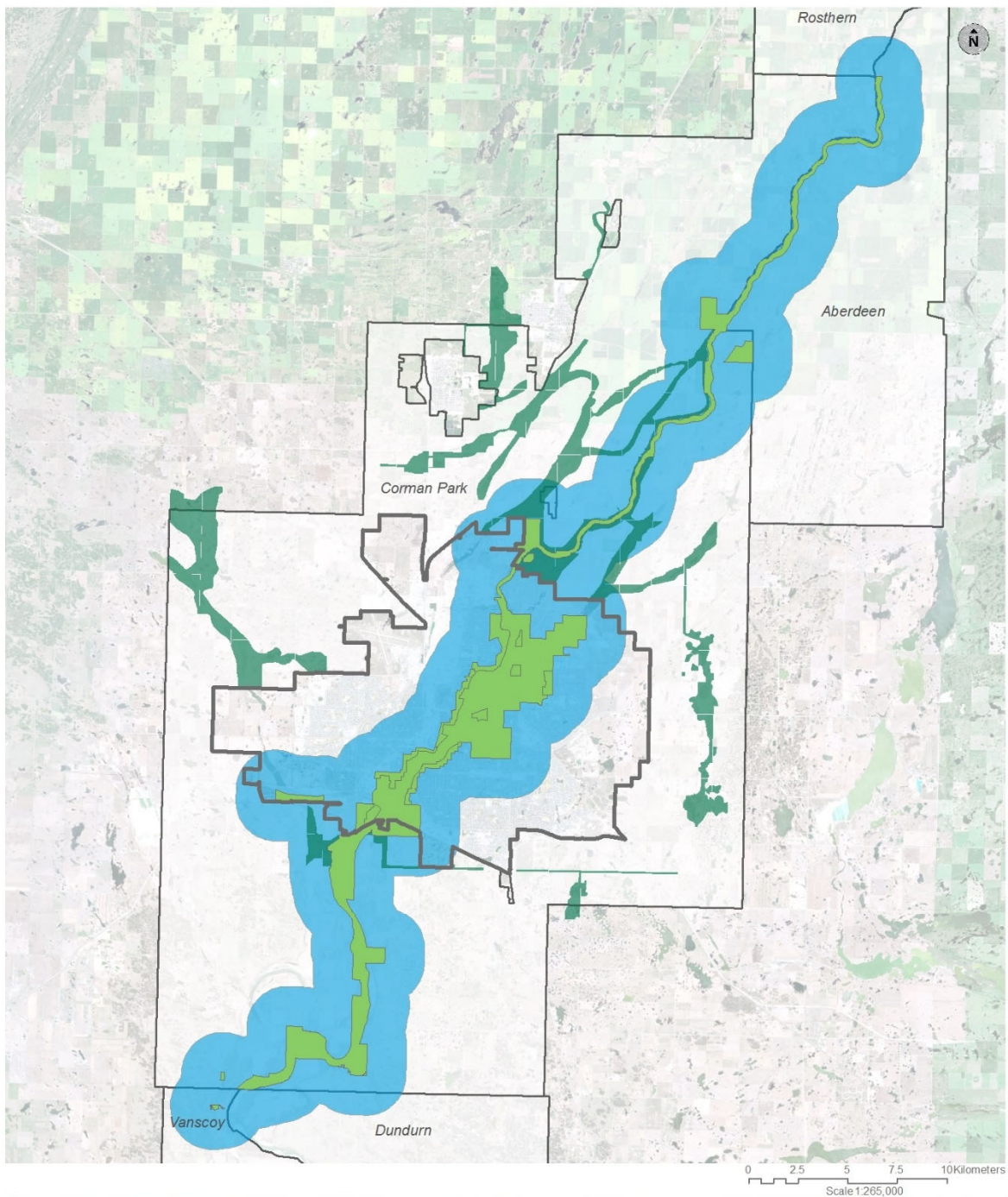
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Appendix A: Maps

Map 1 State of the Valley Study Area



State of the Valley Study Area

Legend

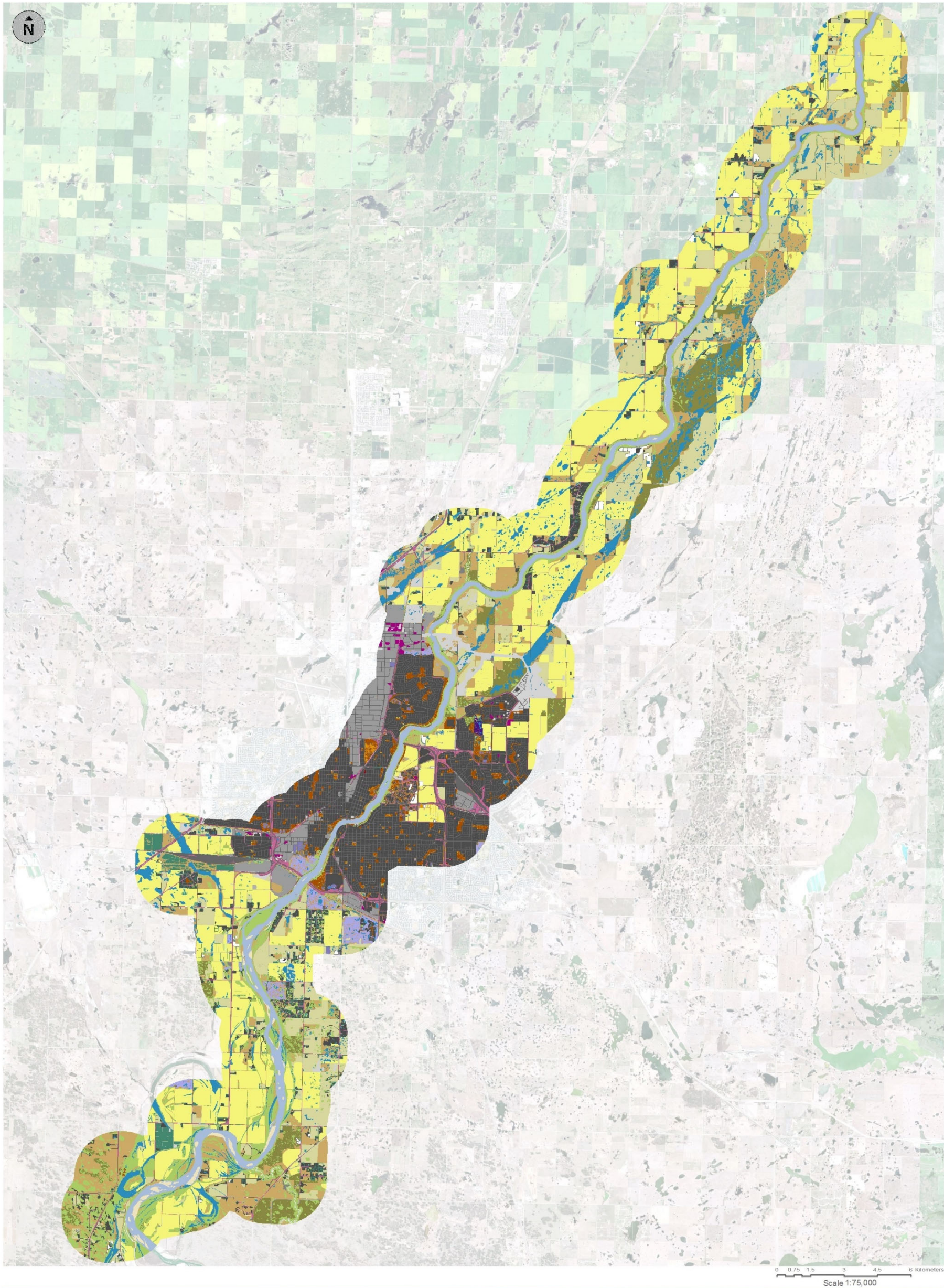
- | | |
|---|--|
| Study Area | Rural Municipalities |
| Meewasin Valley | P4G Green Network Study Area |
| City of Saskatoon | |

August 6 2021
 Projection: NAD 1983 CSRS UTM
 Zone 13N
 Data Sources:
 Meewasin Valley Authority
 Saskatchewan Geospatial Imagery
 Collaborative

Disclaimer:
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 as being a precise indicator of land-ownership, feature
 location, nor as a guide to navigation. This map may
 contain omissions or errors.

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Map 2 Land Use and Land Cover Detail



Land Use and Land Cover Detail

Legend

Built Environment

- Agricultural Operations
- Development
- Informal Road & Trail
- Industrial
- Outdoor Recreation Facility
- Road & Rail
- Urban & Rural Development

Green Space

Formal Green Space

- Afforested
- Park & Recreation Lawn
- Urban Garden

Informal Green Space

- Utility Right of Way
- Verge
- Vacant Lot

Outdoor Recreation

- Campground
- Golf Course
- Sport & Recreation Fields
- Zoological Park

Native & Naturalized Environment

Aquatic Systems

- Creek
- River
- Wetland

Forested & Shrubland Systems

- Native & Naturalized
- Afforested

Grassland Systems

- Crop
- Known Prairie
- Naturalized Grass
- Tame Forage

Naturally Non-Vegetated

- Naturally Non-Vegetated

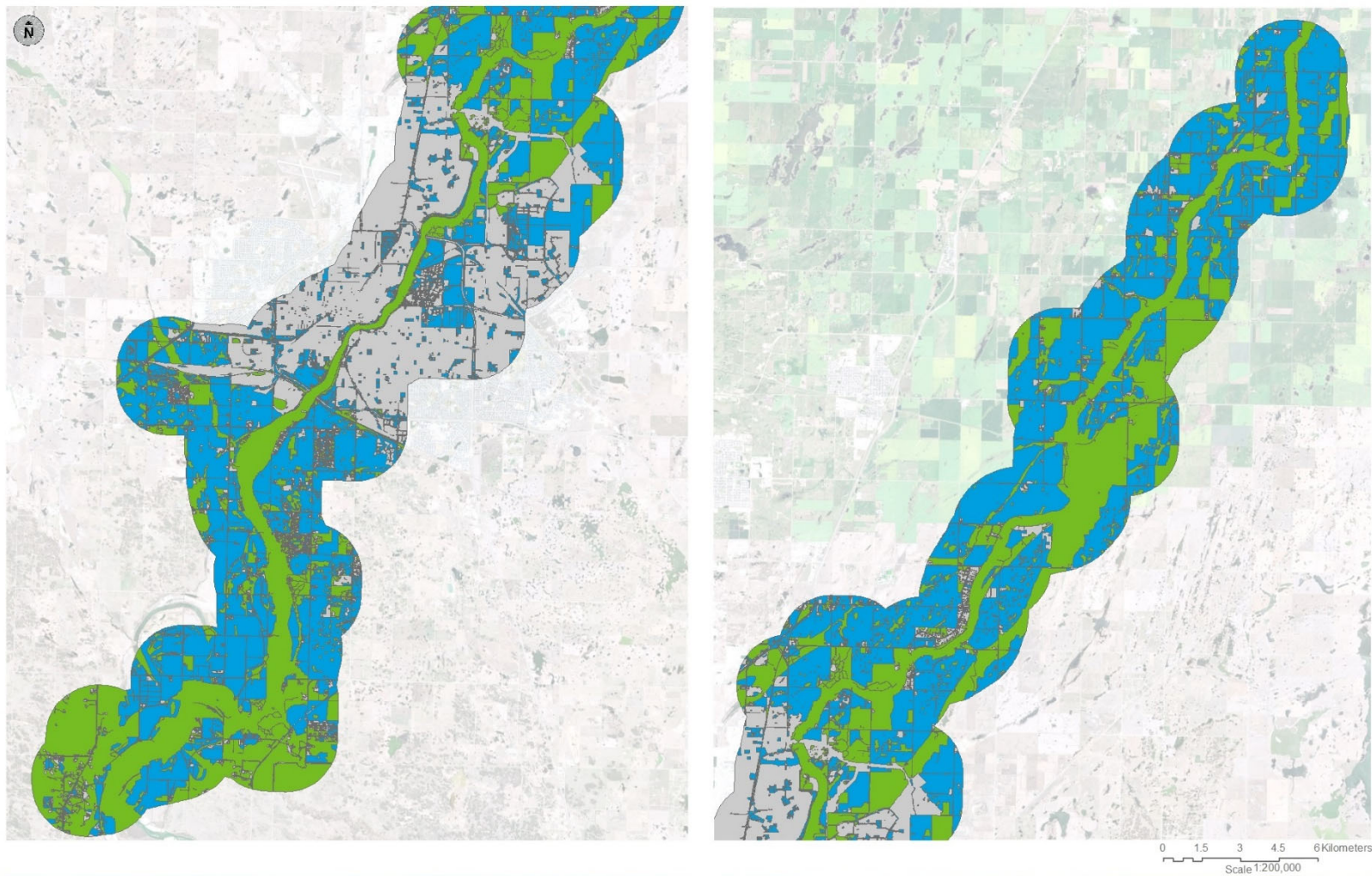
August 17 2021
Projection: NAD 1983 CSRS UTM Zone 13N

Data Sources:
Meewasin Valley Authority
Saskatchewan Geospatial Imagery Collaborative

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Map 3 Anthropogenic Land Use in the Study Area



Anthropogenic Land Use in the Study Area

Legend

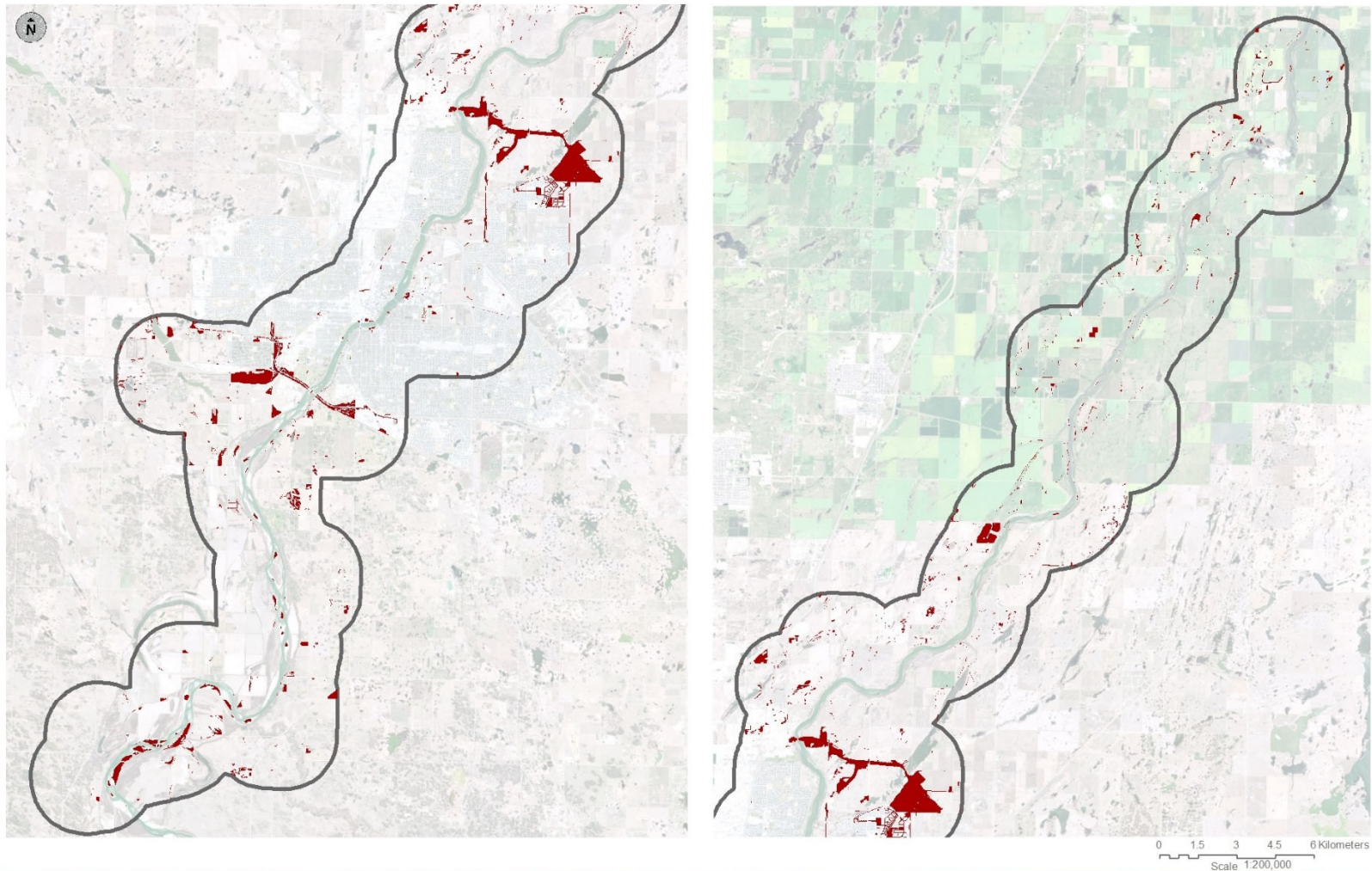
- Modified Area
- Modified Natural Area
- Natural Area

August 9 2021
 Projection: NAD 1983 CSRS UTM Zone 13N
 Data Sources:
 Meewasin Valley Authority
 Saskatchewan Geospatial Imagery Collaborative

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Map 4 Changes to Land Use and Land Cover in the Study Area



Changes to Land Use and Land Cover in the Study Area

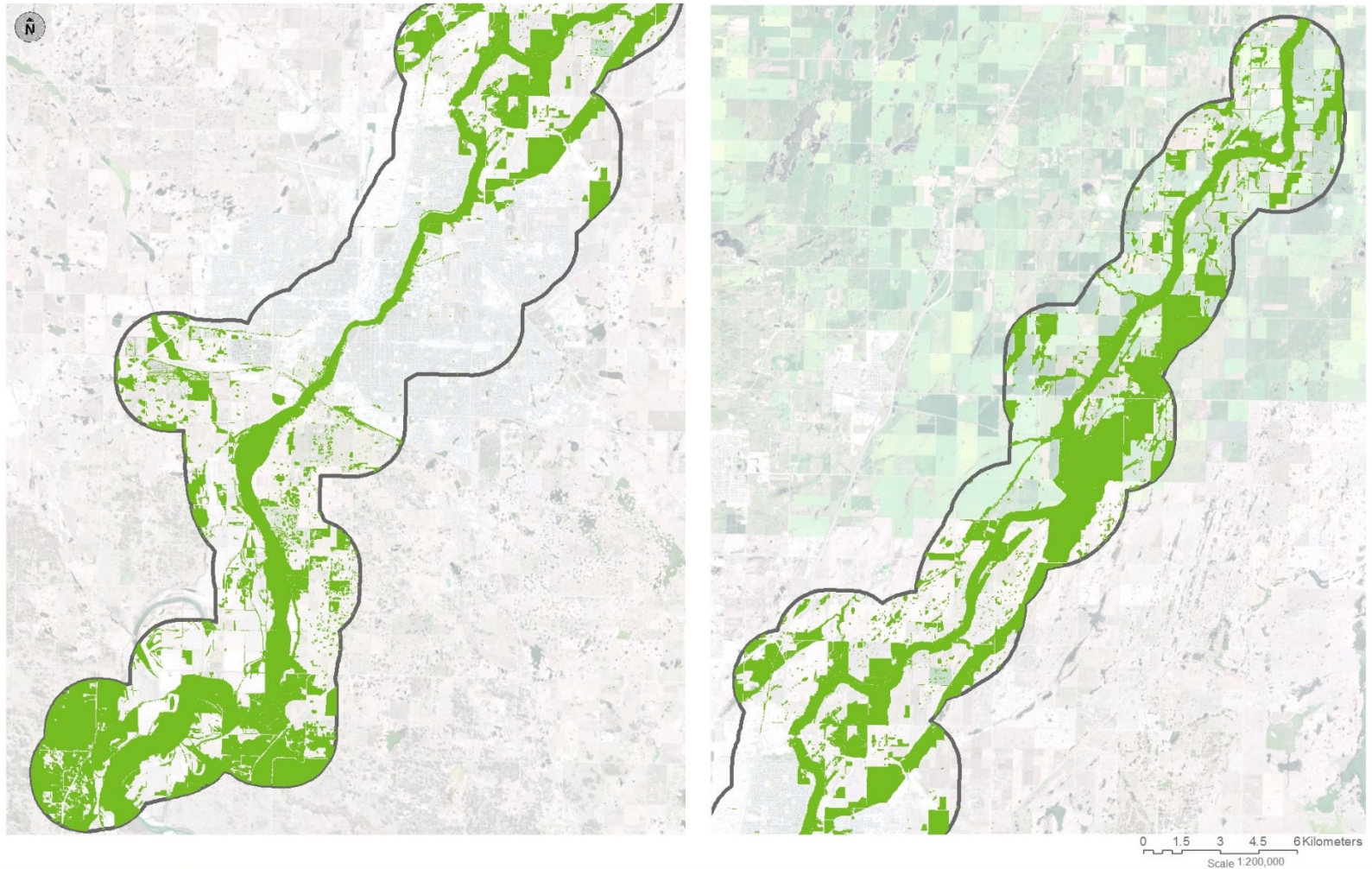
- Legend**
- Areas of Change
 - Study Area

August 9 2021
 Projection: NAD 1983 CSRS UTM Zone 13N
 Data Sources:
 Meewasin Valley Authority
 Saskatchewan Geospatial Imagery Collaborative

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Map 5 Natural Area Patches in the Study Area



Natural Area Patches in the Study Area

Legend

- Natural Area Patches
- Study Area

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 Data Sources:
 Meewasin Valley Authority
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Appendix B: Tables

Table 1 Land Use and Land Cover Definitions

Land Use and Land Cover Definitions								
Category	Sub-Categories					Definition: Form, Management, Use, Ecological Value	Anthropogenic Intensity	Attribute Code
	1	2	3	4	5			
Built Environment						Built Environment: An environment where artificial surfaces predominantly comprise the land cover. These surroundings are created for humans, by humans to be used for human activity. While anthropogenic in nature, such spaces can support synanthropic species and include nested natural areas (ex. backyards, private property trees).		Built
	Agricultural Operations					A classification of the built environment that captures agricultural production characterized by a high degree of modification to the natural areas and includes farmyards which are distinct from single parcel country residential site footprints, agriculture research centres, manufacturing facilities related to agriculture, and intensive agricultural operations. The extent of the site footprint is determined by the presence of facilities, equipment, landscaping and maintenance.	Modified Area	AG
	Exposed & Barren					Exposed & Barren: A classification of the built environment that captures recent or lasting human-made disturbances which have led to the exposure of soil and low levels of vegetation.		EB
		Development				An environment of exposed soil and relatively low levels of vegetation for the purposes of development and other anthropogenic uses.	Modified Area	DEV
		Informal Road & Trail				An environment of exposed soil and relatively low levels of vegetation generated for or by human or motor vehicle traffic. This category includes informal roads and trails that are not paved (i.e. access roads).	Modified Area	IRT
	Industrial					A classification of the built environment that captures developed lands zoned or visibly used for the purposes of industrial operations.	Modified Area	IND
	Outdoor Recreation Facility					A classification of the built environment that captures outdoor private and civic facilities nested within ecological environments. These spaces are characterized by their high degree of modification of the ecological environments they are constructed within and high levels of imperviousness or hard landscaping. The extent may be based upon the site footprint (ex. Shakespeare on the Saskatchewan) or the constructed facility footprint (ex. skate park).	Modified Area	RF
	Road & Rail					A classification of the built environment that captures transportation network infrastructure including paved roadways and walkways, as well as railways and rail yards.	Modified Area	RRW
	Urban & Rural Development					Built environments within their respective urban and rural contexts. This category includes residential, commercial, and other land uses characterized by high degrees of modification and artificial surfaces, which are not otherwise captured by other built environment categories.	Modified Area	URD

Category	Sub-Categories					Definition: Form, Management, Use, Ecological Value	Anthropogenic Intensity	Attribute Code
	1	2	3	4	5			
Ecological Environment						Ecological Environment: An environment where natural surfaces predominantly comprise the land cover. These surroundings are low in anthropogenic intensity/range.		Eco
	Green Space					Green Space: Planned and designed for human use in built environments. Generally has lower ecological significance than native and naturalized environments, as emphasis is placed on an aesthetic landscape versus ecological integrity.		GS
		Formal Green Space				Formal Green Space: Vegetated areas that provide ecological services but are actively managed and manicured for human use, often set apart for recreational or aesthetic purposes.		FGS
			Afforested			Afforested: Non-native or naturalized tree and shrub cover within formal or informal green spaces. Trees and shrubs would not be naturally occurring without anthropogenic intervention.		A
				Planting		Planting bed comprised of tree and shrub vegetation within planned green spaces. Vegetation density is varied and may be heavily comprised of woodchips and other similar materials.	Modified Natural Area	P
				Urban Tree		Planted trees and shrubs with understory of lawn or low value grass ecosystem within urban and rural yard sites.	Modified Natural Area	UTC
			Park & Recreation Lawn			Planted and maintained non-native grasses used for aesthetic landscaping and recreational purposes. Often publicly accessible and occurring within formal public spaces.	Modified Natural Area	PRL
			Urban Garden			Small-scale community gardens, allotment gardens, and urban agriculture. Excludes larger scale urban agriculture within University lands.	Modified Natural Area	UG
		Informal Green Space				Informal Green Space: Liminal vegetated spaces within urban areas that are not formally recognized or managed as public spaces for aesthetic or recreational purposes. Ecological value varies within subclasses.		IGS
			Utility Right of Way			Vegetated utility and infrastructure sites or ROWs, irregular maintenance.	Modified Natural Area	U
			Vacant Lots			Vegetated lot presently not used with irregular maintenance.	Modified Natural Area	VL
			Verge			Grassy small, liminal and linear spaces along roads, railway tracks, or other built or natural elements. Formality varies boulevard to right of way. Public accessibility varies. Varied maintenance, but often is for safety and requirements rather than formal planning and design as a green space.	Modified Natural Area	V
		Outdoor Recreation				Outdoor Recreation: Vegetated areas with surfaces maintained for sport and recreational purposes. Predominantly publicly accessible.		OR
			Campground			Public or private land campground.	Modified Natural Area	CG
			Golf Course			Public or private land golf course.	Modified Natural Area	GC
			Sport & Recreation Fields			Characterized by vegetated or porous surfaces, as opposed to paved surfaces.	Modified Natural Area	SRF
			Zoological Park			Outdoor zoological enclosures and open space within the site.	Modified Natural Area	Z

Category	Sub-Categories					Definition: Form, Management, Use, Ecological Value	Anthropogenic Intensity	Attribute Code
	1	2	3	4	5			
Ecological Environment, continued	Native & Naturalized	Aquatic Systems				Aquatic Systems: Water-based ecosystem.		AS
			Creek			Naturally occurring watercourse with intermittent flow and is smaller than a river; acts as a drainage or tributary as part of a watershed.	Natural Area	Creek
			River			South Saskatchewan River channel.	Natural Area	R
			Wetland	Constructed		Constructed wetlands for storm water management, green spaces, or agricultural purposes.	Modified Natural Area	C
				Naturalized		Naturally occurring.	Natural Area	N
				Naturalized Drainage		Drainage linear in form; may be constructed but managed as naturalized.	Modified Natural Area	ND
		Forested & Shrubland Systems				Forested and Shrubland Systems: Native and naturalized tree and shrub cover. Primarily situated outside of urban areas, although known sites with understories that are not lawn, or proximity to river channel are also characteristic of a native and naturalized state. No limitation to size and extent to be considered a forested system.		FSS
			Native & Naturalized			Not visibly afforested; may be near to a waterbody.	Natural Area	NAT
			Afforested	Naturalized Planting		Not a shelterbelt.	Modified Natural Area	NP
				Shelterbelt		Linear planting adjacent to agricultural and rural sites.	Modified Natural Area	SB
		Grassland Systems				Grassland Systems: Ecosystem characterized by dominant grass cover.		G
			Cropland			Land used for the commercial production of field crops (includes summer fallow), fruits, field vegetables, sod or nursery.	Modified Natural Area	Crop
			Known Prairie			Known Prairie: Identified sites of prairie.	Natural Area	KP
				Agricultural Production		Agricultural Production: Grassland system maintenance that supports agricultural operations.		AP
			Naturalized Grass	Pasture		Land used for grazing.	Natural Area	PSTR
						Naturalized Grass: Dominant grass vegetation with indications of naturalization. Higher presence of shrubs is reflective of a naturalized state given presumed	Natural Area	NG
						Agricultural Production: Grassland system maintenance that supports agricultural operations.		AP
				Agricultural Production	Old Field	Open areas recreated by agriculture and other anthropogenic development. In the past lands may have been designated as having been cultivated or grazed, but there are identifiable indicators of such into the present. Non-linear form and higher shrub presence.	Natural Area	OF
					Pasture	Land used for grazing.	Natural Area	PSTR

Table 2 Land Use and Land Cover Analysis

Land Use and Land Cover Analysis (2 Kilometer Study Area)										
Category	Sub-Categories					Anthropogenic Intensity	Area		Percent of Total	
	1	2	3	4	5		(Hectares)	(KM²)		
Built Environment	Agricultural Operations (AG)					Modified Area	180.05	1.80	0.41%	
	Exposed & Barren (EB)	Development (DEV)				Modified Area	694.09	6.94	1.59%	
		Informal Road & Trail (IRT)				Modified Area	112.56	1.13	0.26%	
	Industrial (IND)					Modified Area	1176.09	11.76	2.70%	
	Outdoor Recreation Facility (RF)					Modified Area	72.96	0.73	0.17%	
	Road & Rail (RRW)					Modified Area	2317.24	23.17	5.32%	
	Urban & Rural Development (URD)					Modified Area	4496.87	44.97	10.33%	
Ecological Environment	Green Space (GS)	Formal Green Space (FGS)	Afforested (A)	Planting (P)		Modified Natural Area	36.76	0.37	0.08%	
				Urban Tree Cover (UTC)		Modified Natural Area	177.09	1.77	0.41%	
			Park & Recreation Lawn (PRL)				Modified Natural Area	519.24	5.19	1.19%
			Urban Garden (UG)				Modified Natural Area	3.29	0.03	0.01%
		Informal Green Space (IGS)	Utility Right of Way (U)				Modified Natural Area	3.16	0.03	0.01%
			Vacant Lots (VL)				Modified Natural Area	83.26	0.83	0.19%
			Verge (V)				Modified Natural Area	745.76	7.46	1.71%
		Outdoor Recreation (OR)	Campground (CG)				Modified Natural Area	4.36	0.04	0.01%
			Golf Course (GC)				Modified Natural Area	351.96	3.52	0.81%
			Sport & Recreation Fields (SRF)				Modified Natural Area	54.34	0.54	0.12%
			Zoological Park				Modified Natural Area	18.96	0.19	0.04%

Category	Sub-Categories					Anthropogenic Intensity	Area		Percent of Total	
	1	2	3	4	5		(Hectares)	(KM²)		
Ecological Environment, continued	Native & Naturalized (NNE)	Aquatic Systems	Creek (Creek)			Natural Area	46.41	0.46	0.11%	
			River (R)			Natural Area	2080.39	20.80	4.78%	
			Wetland (W)	Constructed (C)		Modified Natural Area	106.56	1.07	0.24%	
				Naturalized (N)		Natural Area	2396.36	23.96	5.51%	
				Naturalized Drainage (ND)		Modified Natural Area	31.60	0.32	0.07%	
		Forested & Shrubland Systems (FSS)	Native & Naturalized (NAT)			Natural Area	3291.56	32.92	7.56%	
			Afforested (S)	Naturalized Planting (NP)		Modified Natural Area	195.87	1.96	0.45%	
				Shelterbelt (SB)		Modified Natural Area	450.15	4.50	1.03%	
		Grassland Systems (G)	Cropland (Crop)			Modified Natural Area	12451.00	124.51	28.61%	
			Known Prairie (KP)	Known Prairie (KP)		Natural Area	404.83	4.05	0.93%	
				Agricultural Production (AP)	Pasture (PSTR)	Natural Area	1286.43	12.86	2.96%	
			Naturalized Grass (NG)	Naturalized Grass (NG)		Natural Area	492.60	4.93	1.13%	
				Agricultural Production (AP)	Old Field (OF)	Natural Area	963.53	9.64	2.21%	
					Pasture (PSTR)	Natural Area	2504.07	25.04	5.75%	
				Naturalized Green Space (NGS)		Natural Area	268.98	2.69	0.62%	
				Vegetated Margin (VM)	Field Edge (FE)	Natural Area	401.86	4.02	0.92%	
					Field Pocket (FP)	Natural Area	9.45	0.09	0.02%	
			Tame Forage (TF)	Agricultural Production (AP)	Forage Crop (FC)	Modified Natural Area	3629.53	36.30	8.34%	
					Old Field (OF)	Modified Natural Area	376.46	3.76	0.86%	
					Pasture (PSTR)	Modified Natural Area	550.85	5.51	1.27%	
				Vegetated Margin (VM)	Field Edge (FE)	Modified Natural Area	335.78	3.36	0.77%	
					Field Pocket (FP)	Modified Natural Area	30.69	0.31	0.07%	
		Naturally Non-Vegetated (NNV)					Natural Area	172.36	1.72	0.40%
		Totals							43525.36	435.25

Table 3 Land Use and Land Cover Change Analysis

Land Use and Land Cover Change Analysis (2 Kilometer Study Area)																			
2018 Category	2018 Sub-Categories					2013 Land Use Categories (Hectares Changed)													
	1	2	3	4	5	Agricultural Production	Country Residential	Disturbed	Golf Course	Green Space	Habitat	Industrial	Institutional	Pasture	Recreation	River	Road & Rail	Urban	
Built Environment	Agricultural Operations					0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Exposed & Barren	Development				214.27	8.63	3.71	4.05	1.98	58.28	5.63	0.48	65.95	4.21	1.81	13.32	6.59	
		Informal Road & Trail				12.74	0	1.22	0	0.03	2.97	0.19	0	1.55	0	0	3.51	0.54	
	Industrial					64.42	0	1.77	0	0	1.36	0	0	0	0	0	2.67	2.59	
	Outdoor Recreation Facility					0.01	0	0	0	0.68	0.01	0	0.16	0	0	0	0	0.23	
	Road & Rail					7.91	0	0.27	0	0.75	0.4	4.27	2.59	0.35	0	0.01	0.61	21.55	
	Urban & Rural Development					11.8	0	3.09	0	0.25	3.98	0	2.25	13.24	0.01	0	0.13	0	
Ecological Environment	Green Space	Formal Green Space	Afforested	Planting		0	0	0	0	0.1	0	0	0.02	0	0	0	0.13	0.66	
				Urban Tree Cover		0	0	0	0	0	0	0	0	0	0	0		0.01	
			Park & Recreation Lawn				0.01	0	0.56	0	2.61	0.26	0	0.62	0.11	0	0	0.27	16.99
				Urban Garden				0	0	0.05	0	0.06	0	0.1	0.19	0.45	0.08	0	0.02
		Informal Green Space	Utility Right of Way				0	0	0	0	0	0.13	0	0	0	0	0	0	0
			Vacant Lots				0	0	0	0	0	0	0	0	0	0	0	0.18	0
			Verge				0.42	0	0.31	0	0.08	0.8	3.73	1.71	1.1	2.05	0	69.25	12.46
		Outdoor Recreation	Campground				0	0	0	0	0	0	0	0	0	0	0	0	0
			Golf Course				0	0	0	0	0	0	0	0	0	0	0	0	0
			Sport & Recreation Fields				0	0	0	0	0	0	0	1.07	0	0	0	0	0
			Zoological Park				0	0	0	0	0	0	0	0	0	0	0	0	0

2018 Category	2018 Sub-Categories					2013 Land Use Categories (Hectares Changed)													
	1	2	3	4	5	Agricultural Production	Country Residential	Disturbed	Golf Course	Green Space	Habitat	Industrial	Institutional	Pasture	Recreation	River	Road & Rail	Urban	
Ecological Environment, continued	Native & Naturalized (NNE)	Aquatic Systems	Creek			0	0	0	0	0	0	0	0	0	0	0	0	0	0
			River			0.05	0	0	0	0	0.36	0	0	0	0	0	0	0	0
			Wetland	Constructed		0.46	0.34	3.23	0.29	0	1.4	0.01	0	0.16	0	0	0.67	0.16	
				Naturalized		91.54	0.47	2.6	0	0	0.73	0.11	0	5.44	0	4.36	0.03	0	
				Naturalized Drainage		0.75	0.08	0.14	0	0	0.18	0	0	0.36	0	0	0	0	
		Forested & Shrubland Systems	Native & Naturalized			0.07	0.02	0.06	0	0	0	0	0.04	0.13	0	0.51	0	0	
			Afforested	Naturalized Planting		0	0.03	0	0	0	0	0	0	0	0	0	0	0	0
				Shelterbelt		2.86	0.19	0	0	0	0	0	0	0.02	0	0	0	0	0
		Grassland Systems	Cropland			0	4.49	4.62	0	0	70.04	9.32	0	9.27	0	0	0.51	0	
			Known Prairie	Known Prairie		0	0	0	0	0	0.4	0	0	0	0	0.01	0	0	
				Agricultural Production	Pasture	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Naturalized Grass	Naturalized Grass		0.39	0	0.23	0	0	1.37	0	0	0	0	0.09	0	0	
				Agricultural Production	Old Field	47.61	1.35	2.22	0	0	1.96	0	0	0.01	0	0	0	0	0
					Pasture	17.15	0.5	0.25	0	0	3.18	0	0	0	0	0	0	0	0
				Naturalized Green Space		0.64	0	0	9.78	0.03	0.45	0	0	0	0	0	0.03	0	
				Vegetated Margin	Field Edge	11.03	0	0.31	0	0	2.84	0	0	1.41	0	0.13	0	0	
					Field Pocket	0.07	0	0	0	0	0	0	0	0	0	0	0	0	
			Tame Forage	Agricultural Production	Forage Crop	4.18	0.77	0.16	0	0	19.82	0	0	5.69	0	0	0.21	0	
					Old Field	13.81	2.2	4.2	0	0	0.05	0	0	3.19	0	0	0	0	
					Pasture	2.16	0	1.06	0	0	1.53	0	0	0	0	0	0	0	
				Vegetated Margin	Field Edge	8.67	0.66	0.56	1.64	0	1.5	0	0	0	0	0	0	0	
					Field Pocket	0.3	0	0.23	0	0	0.41	0	0	0.04	0	0	0	0	
		Naturally Non- Vegetated			0	0	0	0	0.38	0.15	0	0	0	0	99.52	0	0		
		Totals						513.31	19.73	30.87	15.76	6.94	174.56	23.37	9.14	108.48	6.35	106.43	91.56

Table 4 Land Use and Land Cover in Protection

Land Use and Land Cover in Protection (Hectares)											
Category	Sub-Categories					Meewasin Valley Zones			Meewasin Sites	Other Protections	
	1	2	3	4	5	Conservation	Buffer	Exempt			
Built Environment	Agricultural Operations (AG)					29.53	0	3.94	0	3.94	
	Exposed & Barren (EB)	Development (DEV)				107.13	0.63	1.90	16.95	0.67	
		Informal Road & Trail (IRT)				29.08	< 0.01	4.24	12.41	11.74	
	Industrial (IND)					59.13	14.95	39.11	0.61	0	
	Outdoor Recreation Facility (RF)					24.64	2.64	0.06	10.67	0	
	Road & Rail (RRW)					312.44	111.91	14.42	37.24	4.38	
	Urban & Rural Development (URD)					381.50	316.72	18.88	6.85	19.96	
Ecological Environment	Green Space (GS)	Formal Green Space (FGS)	Afforested (A)	Planting (P)		17.12	1.08	2.07	4.30	0.05	
				Urban Tree Cover (UTC)		75.60	3.56	3.65	11.17	0.15	
			Park & Recreation Lawn (PRL)				158.38	28.30	15.44	71.84	5.25
			Urban Garden (UG)				0.42	0.33	0	0.04	0.04
		Informal Green Space (IGS)	Utility Right of Way (U)				0.05	0	0	0.13	0
			Vacant Lots (VL)				2.70	0.12	1.49	0	1.20
			Verge (V)				154.61	8.07	4.27	10.32	2.47
		Outdoor Recreation (OR)	Campground (CG)				4.33	0.03	0	0	0
			Golf Course (GC)				117.98	0	0	0.09	0
			Sport & Recreation Fields (SRF)				23.04	0.53	0	1.07	0
			Zoological Park				18.96	0	0	18.82	0.14

Category	Sub-Categories					Meewasin Valley Zones			Meewasin Sites	Other Protections	
	1	2	3	4	5	Conservation	Buffer	Exempt			
Ecological Environment, continued	Native & Naturalized (NNE)	Aquatic Systems	Creek (Creek)			7.80	0	0	7.80	13.11	
			River (R)			1888.72	0	0.41	17.43	143.19	
			Wetland (W)	Constructed (C)		23.24	0	0.48	5.57	0	
				Naturalized (N)		133.31	0	0.50	154.20	29.78	
				Naturalized Drainage (ND)		6.11	0	0	1.33	4.10	
		Forested & Shrubland Systems (FSS)	Native & Naturalized (NAT)			685.39	1.34	8.72	457.70	187.13	
			Afforested (S)	Naturalized Planting (NP)		63.32	0.71	0.34	91.54	0.45	
				Shelterbelt (SB)		5.43	0	2.96	1.19	3.17	
		Grassland Systems (G)	Cropland (Crop)			515.87	0	39.55	16.36	68.96	
			Known Prairie (KP)	Known Prairie (KP)		289.11	0	0.71	273.74	1.76	
				Agricultural Production (AP)	Pasture (PSTR)	84.32	0	0	72.53	185.72	
			Naturalized Grass (NG)	Naturalized Grass (NG)		154.15	0	0	112.28	22.59	
				Agricultural Production (AP)	Old Field (OF)	68.64	0.01	0.46	5.76	12.33	
					Pasture (PSTR)	89.06	0	0	3.04	58.53	
				Naturalized Green Space		149.25	0.08	0	163.79	0.04	
				Vegetated Margin (VM)	Field Edge (FE)	22.49	0	0.43	10.40	6.99	
					Field Pocket (FP)	0	0	0	0	0.01	
			Tame Forage (TF)	Agricultural Production (AP)	Forage Crop (FC)	121.67	0	0	86.89	46.85	
					Old Field (OF)	59.74	0	5.59	38.26	2.97	
					Pasture (PSTR)	0.51	0	0	0.14	3.24	
				Vegetated Margin (VM)	Field Edge (FE)	16.69	0	0.47	4.68	1.84	
					Field Pocket (FP)	0.84	0	0	0.05	0	
		Naturally Non-Vegetated (NNV)					132.71	0	0	3.15	28.26
		Totals						6035.05	491.00	170.09	1730.32

Table 5 Species Observations

Species Observations (2 Kilometer Study Area)				
Group	Scientific Name (Genus/Species)	Common Name	Subnational Ranking	COSEWIC
Actinopterygii	<i>Cyprinus rubrofuscus</i>	Amur carp	n/a	n/a
Amphibia	<i>Anaxyrus hemiophrys</i>	Canadian Toad	S4	Not at Risk
	<i>Lithobates pipiens</i>	Northern Leopard Frog	S3	Special Concern
Arachnida	<i>Araneus gemmoides</i>	An Orbweaver Spider	S4	n/a
	<i>Dermacentor variabilis</i>	American dog tick	n/a	n/a
	<i>Dolomedes triton</i>	Sixspotted Fishing Spider	S5	n/a
	<i>Eris militaris</i>	Bronze Jumper	S4	n/a
	<i>Misumena vatia</i>	Goldenrod Crab Spider	S5	n/a
	<i>Phalangium opilio</i>	European harvestman	n/a	n/a
	<i>Salticus scenicus</i>	Zebra Jumper	SNA	n/a
Aves	<i>Acanthis flammea</i>	Common Redpoll	S4B,S4N,S4M	n/a
	<i>Acanthis hornemanni</i>	Hoary Redpoll	S5N	n/a
	<i>Accipiter cooperii</i>	Cooper's Hawk	S4B,S2N,S2M	Not at Risk
	<i>Accipiter gentilis</i>	Northern Goshawk	S4B,S3N,S4M	Not at Risk
	<i>Accipiter striatus</i>	Sharp-shinned Hawk	S4B,S2N,S4M	Not at Risk
	<i>Actitis macularius</i>	Spotted Sandpiper	S4B,S4M	n/a
	<i>Aechmophorus clarkii</i>	Clark's Grebe	S1B,S1M	n/a
	<i>Aechmophorus occidentalis</i>	Western Grebe	S3B,S3M	Special Concern
	<i>Aegolius acadicus</i>	Northern Saw-whet Owl	S5B,S4N,S5M	n/a
	<i>Agelaius phoeniceus</i>	Red-winged Blackbird	S5B,SUN,S5M	n/a
	<i>Aix sponsa</i>	Wood Duck	S4B,S4M	n/a
	<i>Ammodramus savannarum</i>	Grasshopper Sparrow	S4B	n/a
	<i>Ammospiza leconteii</i>	LeConte's Sparrow	S5B,S5M	n/a
	<i>Ammospiza nelsoni</i>	Nelson's Sparrow	S5B,S5M	Not at Risk
	<i>Anas acuta</i>	Northern Pintail	S5B,S4N,S5M	n/a
	<i>Anas crecca</i>	Green-winged Teal	S5B,S2N,S5M	n/a
	<i>Anas platyrhynchos</i>	Mallard	S5B,S5M	n/a
	<i>Anser albifrons</i>	Greater White-fronted Goose	S5M	n/a
	<i>Anser caerulescens</i>	Snow Goose	S5M	n/a
	<i>Anser rossii</i>	Ross's Goose	S5M	n/a
	<i>Anthus rubescens</i>	American Pipit	S5M	n/a
	<i>Anthus spragueii</i>	Sprague's Pipit	S3B,S3M	Threatened
	<i>Antigone canadensis</i>	Sandhill Crane	S5B,S5M	n/a
	<i>Aquila chrysaetos</i>	Golden Eagle	S3B,S3N,S4M	Not at Risk
	<i>Archilochus colubris</i>	Ruby-throated Hummingbird	S5B,S4M	n/a
	<i>Ardea herodias</i>	Great Blue Heron	S5B	n/a

Group	Scientific Name (Genus/Species)	Common Name	Subnational Ranking	COSEWIC
Aves	<i>Asio flammeus</i>	Short-eared Owl	S3B,S2N,S3M	Special Concern
	<i>Asio otus</i>	Long-eared Owl	S5B,S2N	n/a
	<i>Aythya affinis</i>	Lesser Scaup	S5B,S3N,S5M	n/a
	<i>Aythya americana</i>	Redhead	S5B,S2N,S5M	n/a
	<i>Aythya collaris</i>	Ring-necked Duck	S5B,S5M	n/a
	<i>Aythya marila</i>	Greater Scaup	S5M	n/a
	<i>Aythya valisineria</i>	Canvasback	S5B,S2N,S5M	n/a
	<i>Bartramia longicauda</i>	Upland Sandpiper	S5B,S5M	n/a
	<i>Bombycilla cedrorum</i>	Cedar Waxwing	S5B,S5M	n/a
	<i>Bombycilla garrulus</i>	Bohemian Waxwing	S4B,S5M	n/a
	<i>Bonasa umbellus</i>	Ruffed Grouse	S5	n/a
	<i>Botaurus lentiginosus</i>	American Bittern	S5B	n/a
	<i>Branta canadensis</i>	Canada Goose	S5B,S2N,S5M	n/a
	<i>Branta hutchinsii</i>	Cackling Goose	S5B	n/a
	<i>Bubo scandiacus</i>	Snowy Owl	S5N,S5M	Not at Risk
	<i>Bubo virginianus</i>	Great Horned Owl	S4	n/a
	<i>Bucephala albeola</i>	Bufflehead	S5B,S1N,S3M	n/a
	<i>Bucephala clangula</i>	Common Goldeneye	S5B,S3N,S3M	n/a
	<i>Buteo jamaicensis</i>	Red-tailed Hawk	S5B,S1N,S5M	Not at Risk
	<i>Buteo lagopus</i>	Rough-legged Hawk	S4N,S4M	Not at Risk
	<i>Buteo platypterus</i>	Broad-winged Hawk	S4B,S3M	n/a
	<i>Buteo regalis</i>	Ferruginous Hawk	S3B	Threatened
	<i>Buteo swainsoni</i>	Swainson's Hawk	S4B,S4M	n/a
	<i>Calcarius lapponicus</i>	Lapland Longspur	S4N,S4M	n/a
	<i>Calidris bairdii</i>	Baird's Sandpiper	S5M	n/a
	<i>Calidris fuscicollis</i>	White-rumped Sandpiper	S5M	n/a
	<i>Calidris himantopus</i>	Stilt Sandpiper	S5M	n/a
	<i>Calidris melanotos</i>	Pectoral Sandpiper	S5M	n/a
	<i>Calidris minutilla</i>	Least Sandpiper	S4B,S4M	n/a
	<i>Calidris pusilla</i>	Semipalmated Sandpiper	S4M	n/a
	<i>Cardellina canadensis</i>	Canada Warbler	S4B,S3M	Special Concern
	<i>Cardellina pusilla</i>	Wilson's Warbler	S5B,SUM	n/a
	<i>Cathartes aura</i>	Turkey Vulture	S3B,S3M	n/a
	<i>Catharus fuscescens</i>	Veery	S4B,S4M	n/a
	<i>Catharus guttatus</i>	Hermit Thrush	S5B,S5M	n/a
	<i>Catharus minimus</i>	Gray-cheeked Thrush	S4B,S4M	n/a

Group	Scientific Name (Genus/Species)	Common Name	Subnational Ranking	COSEWIC
Aves	<i>Catharus ustulatus</i>	Swainson's Thrush	S5B,S5M	n/a
	<i>Centronyx bairdii</i>	Baird's Sparrow	S4B	Special Concern
	<i>Certhia americana</i>	Brown Creeper	S4B,S3N,S4M	n/a
	<i>Charadrius melodus</i>	Piping Plover	S3B	Endangered
	<i>Charadrius semipalmatus</i>	Semipalmated Plover	SUB,S5M	n/a
	<i>Charadrius vociferus</i>	Killdeer	S5B,S5M	n/a
	<i>Chlidonias niger</i>	Black Tern	S5B,S5M	Not at Risk
	<i>Chondestes grammacus</i>	Lark Sparrow	S5B,SNRM	n/a
	<i>Chordeiles minor</i>	Common Nighthawk	S4B,S4M	Special Concern
	<i>Chroicocephalus philadelphia</i>	Bonaparte's Gull	S4B,S4M	n/a
	<i>Circus hudsonius</i>	Northern Harrier	S4B,S4M	Not at Risk
	<i>Cistothorus palustris</i>	Marsh Wren	S4B,S4M	n/a
	<i>Cistothorus platensis</i>	Sedge Wren	S5B,S5M	Not at Risk
	<i>Clangula hyemalis</i>	Long-tailed Duck	S4M	n/a
	<i>Coccothraustes vespertinus</i>	Evening Grosbeak	S4	Special Concern
	<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo	S5B,S5M	n/a
	<i>Colaptes auratus</i>	Northern Flicker	S5B,SUN,S5M	n/a
	<i>Contopus cooperi</i>	Olive-sided Flycatcher	S4B,S4M	Special Concern
	<i>Contopus sordidulus</i>	Western Wood-pewee	S4B,S4M	n/a
	<i>Corvus brachyrhynchos</i>	American Crow	S5B,S4N,S5M	n/a
	<i>Corvus corax</i>	Common Raven	S5	n/a
	<i>Coturnicops noveboracensis</i>	Yellow Rail	S3B,S3M	Special Concern
	<i>Cyanocitta cristata</i>	Blue Jay	S5	n/a
	<i>Cygnus columbianus</i>	Tundra Swan	S5M	n/a
	<i>Dolichonyx oryzivorus</i>	Bobolink	S4B,S4M	Threatened
	<i>Dryobates pubescens</i>	Downy Woodpecker	S5	n/a
	<i>Dryobates villosus</i>	Hairy Woodpecker	S5	n/a
	<i>Dryocopus pileatus</i>	Pileated Woodpecker	S3	n/a
	<i>Dumetella carolinensis</i>	Gray Catbird	S5B,S5M	n/a
	<i>Empidonax alnorum</i>	Alder Flycatcher	S5B,S5M	n/a
	<i>Empidonax flaviventris</i>	Yellow-bellied Flycatcher	S5B,S5M	n/a
	<i>Empidonax minimus</i>	Least Flycatcher	S5B,S5M	n/a
	<i>Empidonax traillii</i>	Willow Flycatcher	S4B,S4M	n/a
	<i>Eremophila alpestris</i>	Horned Lark	S4B,S3N,SUM	n/a
	<i>Euphagus carolinus</i>	Rusty Blackbird	S3B,SUN,S3M	Special Concern
	<i>Euphagus cyanocephalus</i>	Brewer's Blackbird	S4B,SUN,S4M	n/a

Group	Scientific Name (Genus/Species)	Common Name	Subnational Ranking	COSEWIC
Aves	<i>Falco columbarius</i>	Merlin	S5B,S5N,S5M	Not at Risk
	<i>Falco mexicanus</i>	Prairie Falcon	S3B,S3N,S3M	Not at Risk
	<i>Falco peregrinus</i>	Peregrine Falcon	S1B,SNRM	Not at Risk
	<i>Falco sparverius</i>	American Kestrel	S5B,S1N,S5M	n/a
	<i>Fulica americana</i>	American Coot	S5B,S5M	Not at Risk
	<i>Gallinago delicata</i>	Wilson's Snipe	S5B,S5M	n/a
	<i>Gavia immer</i>	Common Loon	S5B,SUN,S5M	Not at Risk
	<i>Gavia stellata</i>	Red-throated Loon	S1B,S1M	n/a
	<i>Geothlypis philadelphia</i>	Mourning Warbler	S5B,S5M	n/a
	<i>Geothlypis tolmiei</i>	MacGillivray's Warbler	S4B,S4M	n/a
	<i>Geothlypis trichas</i>	Common Yellowthroat	S5B,S5M	n/a
	<i>Grus americana</i>	Whooping Crane	SXB,S1M	Endangered
	<i>Haemorhous mexicanus</i>	House Finch	S5N	n/a
	<i>Haemorhous mexicanus frontalis</i>	Northern house finch	n/a	n/a
	<i>Haemorhous purpureus</i>	Purple Finch	S5B,S4N,S5M	n/a
	<i>Haliaeetus leucocephalus</i>	Bald Eagle	S5B,S5N,S4M	Not at Risk
	<i>Hirundo rustica</i>	Barn Swallow	S5B,S5M	Threatened
	<i>Histrionicus histrionicus</i>	Harlequin Duck	SNA	n/a
	<i>Hydroprogne caspia</i>	Caspian Tern	S2B,S2M	Not at Risk
	<i>Icteria virens</i>	Yellow-Breasted Chat	S3B,S3M	Not at Risk
	<i>Icterus galbula</i>	Baltimore Oriole	S5B,S5M	n/a
	<i>Ixoreus naevius</i>	Varied Thrush	SNA	n/a
	<i>Junco hyemalis</i>	Dark-eyed Junco	S5B,S4N,S5M	n/a
	<i>Lanius borealis</i>	Northern Shrike	S1B,S4N,S4M	n/a
	<i>Lanius ludovicianus</i>	Loggerhead Shrike	S2B,S2M	Threatened
	<i>Larus argentatus</i>	Herring Gull	S5B,S5M	n/a
	<i>Larus californicus</i>	California Gull	S4B,S4M	n/a
	<i>Larus delawarensis</i>	Ring-billed Gull	S5B,S5M	n/a
	<i>Larus fuscus</i>	Lesser Black-backed Gull	SNA	n/a
	<i>Larus glaucoides</i>	Iceland Gull	SNA	n/a
	<i>Larus hyperboreus</i>	Glaucous Gull	S2N,S2M	n/a
	<i>Leiothlypis celata</i>	Orange-crowned Warbler	S5B,S5M	n/a
	<i>Leiothlypis peregrina</i>	Tennessee Warbler	S5B,S5M	n/a
	<i>Leiothlypis ruficapilla</i>	Nashville Warbler	S5B,S5M	n/a
	<i>Leucophaeus pipixcan</i>	Franklin's Gull	S4B,S4M	n/a
	<i>Limnodromus griseus</i>	Short-billed Dowitcher	SUB,S4M	n/a

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Aves	<i>Limnodromus scolopaceus</i>	Long-billed Dowitcher	S5M	n/a
	<i>Limosa fedoa</i>	Marbled Godwit	S4B,S4M	n/a
	<i>Limosa haemastica</i>	Hudsonian Godwit	S4M	Threatened
	<i>Lophodytes cucullatus</i>	Hooded Merganser	S4B,S3M	n/a
	<i>Loxia curvirostra</i>	Red Crossbill	S4B,S5N	n/a
	<i>Loxia leucoptera</i>	White-winged Crossbill	S4B,S3N	n/a
	<i>Mareca americana</i>	American Wigeon	S5B,S2N,S5M	n/a
	<i>Mareca strepera</i>	Gadwall	S5B,S2N,S5M	n/a
	<i>Megaceryle alcyon</i>	Belted Kingfisher	S4B,S4M	n/a
	<i>Melanerpes carolinus</i>	Red-bellied Woodpecker	SNA	n/a
	<i>Melanitta deglandi</i>	White-winged Scoter	S5B,S3M	n/a
	<i>Melanitta perspicillata</i>	Surf Scoter	S4B,S3M	n/a
	<i>Melospiza georgiana</i>	Swamp Sparrow	S5B,S5M	n/a
	<i>Melospiza lincolni</i>	Lincoln's Sparrow	S5B,S5M	n/a
	<i>Melospiza melodia</i>	Song Sparrow	S5B,S5M	n/a
	<i>Mergus merganser</i>	Common Merganser	S5B,S2N,S4M	n/a
	<i>Mergus serrator</i>	Red-breasted Merganser	S5B,S4M	n/a
	<i>Mniotilta varia</i>	Black-and-white Warbler	S5B,S5M	n/a
	<i>Molothrus ater</i>	Brown-headed Cowbird	S5B,SUN,S5M	n/a
	<i>Myadestes townsendi</i>	Townsend's Solitaire	S3N,S3M	n/a
	<i>Myiarchus crinitus</i>	Great Crested Flycatcher	S5B,S5M	n/a
	<i>Numenius americanus</i>	Long-billed Curlew	S3B,S4M	Special Concern
	<i>Nycticorax nycticorax</i>	Black-crowned Night-Heron	S4B	n/a
	<i>Oporornis agilis</i>	Connecticut Warbler	S2B,S2M	n/a
	<i>Oxyura jamaicensis</i>	Ruddy Duck	S5B	n/a
	<i>Pandion haliaetus</i>	Osprey	S2B,S2M	n/a
	<i>Parkesia noveboracensis</i>	Northern Waterthrush	S5B,S5M	n/a
	<i>Passerculus sandwichensis</i>	Savannah Sparrow	S5B,S5M	n/a
	<i>Passerella iliaca</i>	Fox Sparrow	S5B,SUM	n/a
	<i>Passerina amoena</i>	Lazuli Bunting	S4B,S4M	n/a
	<i>Pelecanus erythrorhynchos</i>	American White Pelican	S5B,S5M	Not at Risk
	<i>Perisoreus canadensis</i>	Canada Jay	S5	n/a
	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow	S5B,S5M	n/a
	<i>Phalacrocorax auritus</i>	Double-crested Cormorant	S5B,S5M	Not at Risk
	<i>Phalaropus tricolor</i>	Wilson's Phalarope	S5B,S5M	n/a
	<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak	S5B,S5M	n/a

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Aves	<i>Pheucticus melanocephalus</i>	Black-headed Grosbeak	S4B	n/a
	<i>Pica hudsonia</i>	Black-billed Magpie	S5	n/a
	<i>Picoides arcticus</i>	Black-backed Woodpecker	S4	n/a
	<i>Picoides dorsalis</i>	American Three-toed Woodpecker	S4	n/a
	<i>Pinicola enucleator</i>	Pine Grosbeak	S2B,S4N	n/a
	<i>Pipilo erythrophthalmus</i>	Eastern Towhee	S4B,S4M	n/a
	<i>Pipilo maculatus</i>	Spotted Towhee	S5B,S5M	n/a
	<i>Piranga rubra</i>	Summer Tanager	SNA	n/a
	<i>Plectrophenax nivalis</i>	Snow Bunting	S5N,S5M	n/a
	<i>Podiceps auritus</i>	Horned Grebe	S5B,S5M	Special Concern
	<i>Podiceps grisegena</i>	Red-necked Grebe	S5B,S5M	Not at Risk
	<i>Podiceps nigricollis</i>	Eared Grebe	S5B,S5M	n/a
	<i>Podilymbus podiceps</i>	Pied-billed Grebe	S5B,S5M	n/a
	<i>Poecile atricapillus</i>	Black-capped Chickadee	S5	n/a
	<i>Poecile hudsonicus</i>	Boreal Chickadee	S4	n/a
	<i>Poecetes gramineus</i>	Vesper Sparrow	S5B,S5M	n/a
	<i>Porzana carolina</i>	Sora	S5B,S5M	n/a
	<i>Progne subis</i>	Purple Martin	S5B,S5M	n/a
	<i>Quiscalus quiscula</i>	Common Grackle	S5B	n/a
	<i>Rallus limicola</i>	Virginia Rail	S4B,S4M	n/a
	<i>Recurvirostra americana</i>	American Avocet	S4B,S4M	n/a
	<i>Regulus calendula</i>	Ruby-crowned Kinglet	S5B,S5M	n/a
	<i>Regulus satrapa</i>	Golden-crowned Kinglet	S5B,S4N,S5M	n/a
	<i>Riparia riparia</i>	Bank Swallow	S4B,S5M	Threatened
	<i>Salpinctes obsoletus</i>	Rock Wren	S5B,S4M	n/a
	<i>Sayornis phoebe</i>	Eastern Phoebe	S4B,S4M	n/a
	<i>Sayornis saya</i>	Say's Phoebe	S4B,S4M	n/a
	<i>Seiurus aurocapilla</i>	Ovenbird	S5B,S5M	n/a
	<i>Setophaga caerulescens</i>	Black-throated Blue Warbler	S2B,S2M	n/a
	<i>Setophaga castanea</i>	Bay-breasted Warbler	S5B,S5M	n/a
	<i>Setophaga coronata</i>	Yellow-rumped Warbler	S5B,S5M	n/a
	<i>Setophaga coronata coronata</i>	Myrtle Warbler	S5B,S5M	n/a
	<i>Setophaga fusca</i>	Blackburnian Warbler	S4B,S4M	n/a
	<i>Setophaga magnolia</i>	Magnolia Warbler	S5B,S5M	n/a
	<i>Setophaga palmarum</i>	Palm Warbler	S5B,S5M	n/a
	<i>Setophaga pensylvanica</i>	Chestnut-sided Warbler	S5B,S5M	n/a

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Aves	<i>Setophaga petechia</i>	Yellow Warbler	S5B,S5M	n/a
	<i>Setophaga pinus</i>	Pine Warbler	SNA	n/a
	<i>Setophaga ruticilla</i>	American Redstart	S5B,S5M	n/a
	<i>Setophaga striata</i>	Blackpoll Warbler	S5B,S4M	n/a
	<i>Setophaga tigrina</i>	Cape May Warbler	S4B,S4M	n/a
	<i>Setophaga townsendi</i>	Townsend's Warbler	SNA	n/a
	<i>Setophaga virens</i>	Black-throated Green Warbler	S4B,S4M	n/a
	<i>Sialia currucoides</i>	Mountain Bluebird	S4B,S4M	n/a
	<i>Sialia sialis</i>	Eastern Bluebird	S3B,S3M	Not at Risk
	<i>Sitta canadensis</i>	Red-breasted Nuthatch	S5B,S5N,S5M	n/a
	<i>Sitta carolinensis</i>	White-breasted Nuthatch	S5	n/a
	<i>Spatula clypeata</i>	Northern Shoveler	S5B,S5M	n/a
	<i>Spatula cyanoptera</i>	Cinnamon Teal	S4B,S4M	n/a
	<i>Spatula discors</i>	Blue-winged Teal	S5B,S5M	n/a
	<i>Sphyrapicus varius</i>	Yellow-bellied Sapsucker	S5B,S5M	n/a
	<i>Spinus pinus</i>	Pine Siskin	S5	n/a
	<i>Spinus tristis</i>	American Goldfinch	S5B	n/a
	<i>Spizella pallida</i>	Clay-coloured Sparrow	S5B,S5M	n/a
	<i>Spizella passerina</i>	Chipping Sparrow	S5B,S5M	n/a
	<i>Spizelloides arborea</i>	American Tree Sparrow	S4B,S5M	n/a
	<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow	S4B,S5M	n/a
	<i>Sterna forsteri</i>	Forster's Tern	S4B,S4M	Data Deficient
	<i>Sterna hirundo</i>	Common Tern	S5B,S5M	Not at Risk
	<i>Sturnella neglecta</i>	Western Meadowlark	S4B,S4M	n/a
	<i>Sturnus vulgaris</i>	European Starling	SNA	n/a
	<i>Surnia ulula</i>	Northern Hawk Owl	S3B,S5N	Not at Risk
	<i>Tachycineta bicolor</i>	Tree Swallow	S5B,S5M	n/a
	<i>Tachycineta thalassina</i>	Violet-green Swallow	S4B,S4M	n/a
	<i>Toxostoma rufum</i>	Brown Thrasher	S5B,S5M	n/a
	<i>Tringa flavipes</i>	Lesser Yellowlegs	S4B,S4M	Threatened
	<i>Tringa melanoleuca</i>	Greater Yellowlegs	S5B,S5M	n/a
	<i>Tringa semipalmata</i>	Willet	S4B,S4M	n/a
	<i>Tringa solitaria</i>	Solitary Sandpiper	S5B,S4M	n/a
	<i>Troglodytes aedon</i>	House Wren	S5B,S5M	n/a
	<i>Troglodytes hiemalis</i>	Winter Wren	S5B,S5M	n/a
	<i>Turdus migratorius</i>	American Robin	S5B,SUN,S5M	n/a

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Aves	<i>Tympanuchus phasianellus</i>	Sharp-tailed Grouse	S5	n/a
	<i>Tyrannus tyrannus</i>	Eastern Kingbird	S5B,S5M	n/a
	<i>Tyrannus verticalis</i>	Western Kingbird	S5B,S5M	n/a
	<i>Vireo gilvus</i>	Warbling Vireo	S5B,S5M	n/a
	<i>Vireo olivaceus</i>	Red-eyed Vireo	S5B,S5M	n/a
	<i>Vireo philadelphicus</i>	Philadelphia Vireo	S5B,S5M	n/a
	<i>Vireo solitarius</i>	Blue-headed Vireo	S5B,S5M	n/a
	<i>Xanthocephalus xanthocephalus</i>	Yellow-headed Blackbird	S5B,S5M	n/a
	<i>Zenaida macroura</i>	Mourning Dove	S5B,S5M	n/a
	<i>Zonotrichia albicollis</i>	White-throated Sparrow	S5B,S5M	n/a
	<i>Zonotrichia atricapilla</i>	Golden-crowned Sparrow	SNA	n/a
	<i>Zonotrichia leucophrys</i>	White-crowned Sparrow	S4B,S4M	n/a
	<i>Zonotrichia querula</i>	Harris's Sparrow	SUB,S5M	Special Concern
Bivalvia	<i>Lampsilis siliquoidea</i>	Fatmucket	S5	n/a
	<i>Lasmigona complanata</i>	White Heelsplitter	S3	n/a
Crustacea	<i>Faxonius virilis</i>	Virile crayfish	n/a	n/a
	<i>Porcellio spinicornis</i>	Brickwork woodlouse	n/a	n/a
Eubacteria	<i>Nostoc commune</i>	Star Jelly	n/a	n/a
Fishes	<i>Catostomus commersonii</i>	White Sucker	S4	n/a
Fungi	<i>Apiosporina morbosa</i>	Black knot	n/a	n/a
	<i>Coprinus comatus</i>	Shaggy mane	n/a	n/a
	<i>Gymnosporangium juniperi-virginianae</i>	Juniper-apple rust	n/a	n/a
	<i>Hemiphiliota populnea</i>	n/a	n/a	n/a
	<i>Irpex lacteus</i>	Milk-white toothed polypore	n/a	n/a
	<i>Mutinus elegans</i>	Devil's dipstick	n/a	n/a
	<i>Schizophyllum commune</i>	Splitgill mushroom	n/a	n/a
Insecta	<i>Adalia bipunctata</i>	Two-spotted Lady Beetle	S4	n/a
	<i>Aeshna constricta</i>	Lance-Tipped Darner	S2	n/a
	<i>Aeshna interrupta</i>	Variable Darner	S5	n/a
	<i>Andrena milwaukeensis</i>	A Bee	S5	n/a
	<i>Antheraea polyphemus</i>	Polyphemus Moth	S4	n/a
	<i>Apis mellifera</i>	Honey Bee	SNA	n/a
	<i>Boisea rubrolineata</i>	Western boxelder bug	n/a	n/a
	<i>Boisea trivittata</i>	Eastern boxelder bug	n/a	n/a
	<i>Bombus borealis</i>	Northern Amber Bumble Bee	S5	n/a

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Insecta	<i>Bombus huntii</i>	Hunt's Bumble Bee	S5	n/a
	<i>Bombus nevadensis</i>	Nevada Bumble Bee	S5	n/a
	<i>Bombus perplexus</i>	Confusing Bumble Bee	S5	n/a
	<i>Bombus ternarius</i>	Tri-coloured Bumble Bee	S5	n/a
	<i>Brumoides septentrionis</i> var. <i>septentrionis</i>	Winter Lady Beetle	S4	n/a
	<i>Camnula pellucida</i>	Clear-winged Grasshopper	S4	n/a
	<i>Ceratomia amyntor</i>	elm sphinx moth	SU	n/a
	<i>Chilocorus stigma</i>	Twice-stabbed Lady Beetle	S3	n/a
	<i>Cicindela duodecimguttata</i>	Twelve-spotted Tiger Beetle	S4	n/a
	<i>Cicindela lengi</i>	Blowout Tiger Beetle	SU	n/a
	<i>Cicindela repanda</i>	Bronzed Tiger Beetle	SU	n/a
	<i>Coccinella septempunctata</i>	Seven Spotted Lady Beetle	SNA	n/a
	<i>Coenonympha tullia benjamini</i>	Common Ringlet	S5	n/a
	<i>Conocephalus fasciatus</i>	Slender Meadow Katydid	S4	n/a
	<i>Cosmopepla lintneriana</i>	Twice-stabbed stink bug	n/a	n/a
	<i>Danaus plexippus</i>	Monarch	S2B	Endangered
	<i>Dermestes lardarius</i>	Larder Beetle	SNA	n/a
	<i>Diachrysia balluca</i>	Green-Patched Looper Moth	SU	n/a
	<i>Dissosteira carolina</i>	Carolina Grasshopper	S4	n/a
	<i>Dolichovespula arenaria</i>	Aerial Yellow-jacket	S5	n/a
	<i>Erebia discoidalis</i>	Red-disked Alpine	S5	n/a
	<i>Erebia epipsodea</i>	Common Alpine	S5	n/a
	<i>Estigmene acrea</i>	Saltmarsh Moth	S4	n/a
	<i>Exoprosopa dorcadion</i>	Dorcadion Bee Fly	SU	n/a
	<i>Feltia jaculifera</i>	Dingy Cutworm Moth	S4	n/a
	<i>Formica argentea</i>	An Ant	S5	n/a
	<i>Formica podzolica</i>	An Ant	S5	n/a
	<i>Glaucopsyche lygdamus</i>	Silvery Blue	S5	n/a
	<i>Hemaris diffinis</i>	Snowberry Clearwing	SU	n/a
	<i>Hesperia assiniboia</i>	Plains Skipper	S5	n/a
	<i>Hyles gallii</i>	Galium Sphinx	SU	n/a
	<i>Hyphantria cunea</i>	Fall Webworm Moth	S4	n/a
	<i>Leptinotarsa juncta</i>	False potato beetle	n/a	n/a
	<i>Lethe anthedon</i>	Northern Pearly-eye	S4	n/a
	<i>Lethocerus americanus</i>	Giant Water Bug	SNR	n/a
	<i>Libellula quadrimaculata</i>	Four-Spotted Skimmer	S5	n/a

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Insecta	<i>Limenitis arthemis rubrofasciata</i>	White Admiral	S5	n/a
	<i>Lycaena helloides</i>	Purplish Copper	S4	n/a
	<i>Malacosoma californica</i>	Western Tent Caterpillar Moth	S4	n/a
	<i>Malacosoma disstria</i>	Forest Tent Caterpillar Moth	S5	n/a
	<i>Megachile relativa</i>	A Leaf-cutter Bee	S5	n/a
	<i>Melanchra assimilis</i>	Black Arches Moth	SU	n/a
	<i>Melanoplus bivittatus</i>	Two-striped Grasshopper	S4	n/a
	<i>Nabis subcoleoptratus</i>	Black damsel bug	n/a	n/a
	<i>Nymphalis l-album</i>	Compton Tortoiseshell	S5	n/a
	<i>Ophiogomphus severus</i>	Pale Snaketail	S4	n/a
	<i>Orgyia antiqua</i>	Rusty Tussock Moth	S4	n/a
	<i>Phymata americana</i>	Jagged ambush bug	n/a	n/a
	<i>Pieris rapae</i>	Cabbage White	SNR	n/a
	<i>Plebejus melissa</i>	Melissa Blue	S5	n/a
	<i>Poecilus lucublandus</i>	A Beetle	S4	n/a
	<i>Pontia occidentalis</i>	Western White	S5	n/a
	<i>Pseudochorthippus curtipennis</i>	Marsh Meadow Grasshopper	S4	n/a
	<i>Psyllobora vigintimaculata</i>	Twenty-spotted Lady Beetle	S2	n/a
	<i>Pyrrharctia isabella</i>	Woolly Bear Caterpillar	S4	n/a
	<i>Sceliphron caementarium</i>	Yellow-legged mud-dauber wasp	n/a	n/a
	<i>Sitona lineatus</i>	Pea Leaf Weevil	SNA	n/a
	<i>Spilosoma virginica</i>	Virginia Tiger Moth	S4	n/a
	<i>Sunira bicolorago</i>	Bicolored Sallow Moth	S3	n/a
	<i>Sympetrum danae</i>	Black Meadowhawk	S5	n/a
	<i>Sympetrum obtrusum</i>	White-Faced Meadowhawk	S5	n/a
	<i>Vanessa cardui</i>	Painted Lady	S5B	n/a
	<i>Xanthorhoe ferrugata</i>	Red Twin-Spot Moth	S3	n/a
	<i>Zygogramma exclamationis</i>	Sunflower Beetle	SU	n/a
Mammalia	<i>Canis latrans</i>	Coyote	S5	n/a
	<i>Erethizon dorsatum</i>	North American Porcupine	S4	n/a
	<i>Ictidomys tridecemlineatus</i>	Thirteen-lined Ground Squirrel	S5	n/a
	<i>Lepus americanus</i>	Snowshoe Hare	S5	n/a
	<i>Lepus townsendii</i>	White-tailed Jack Rabbit	S4	n/a
	<i>Mustela frenata</i>	Prairie Long-tailed Weasel	S5	Not at Risk
	<i>Myotis lucifugus</i>	Little Brown Myotis	S4B,S4N	Endangered
	<i>Neotamias minimus</i>	Least Chipmunk	S5	n/a

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Mammalia	<i>Neovison vison</i>	American Mink	S5	n/a
	<i>Odocoileus hemionus</i>	Mule Deer	S4	n/a
	<i>Odocoileus hemionus hemionus</i>	Rocky mountain mule deer	n/a	n/a
	<i>Odocoileus virginianus</i>	White-tailed Deer	S4	n/a
	<i>Ondatra zibethicus</i>	Muskrat	S5	n/a
	<i>Procyon lotor</i>	Raccoon	S5	n/a
	<i>Tamiasciurus hudsonicus</i>	Red Squirrel	S5	n/a
	<i>Urocitellus richardsonii</i>	Richardson's Ground Squirrel	S5	n/a
	<i>Vulpes vulpes</i>	Red Fox	S5	n/a
Plantae	<i>Acer negundo</i>	Manitoba Maple	S5	n/a
	<i>Acer saccharinum</i>	Silver Maple	SNA	n/a
	<i>Achillea millefolium</i>	Common Yarrow	S5	n/a
	<i>Achnatherum hymenoides</i>	Indian Rice Grass	S4	n/a
	<i>Aegopodium podagraria</i>	Bishop's Goutweed	SNA	n/a
	<i>Agaricus campestris</i>	Field Mushroom	SNR	n/a
	<i>Agastache foeniculum</i>	Giant Hyssop	S4	n/a
	<i>Allium textile</i>	Prairie Onion	S4	n/a
	<i>Amelanchier alnifolia</i>	Saskatoon	S5	n/a
	<i>Anemonastrum canadense</i>	Canada Anemone	S4	n/a
	<i>Anemone multifida</i>	Cut-leaved Anemone	S4	n/a
	<i>Antennaria neglecta</i>	Broad-leaved Pussytoes	S4	n/a
	<i>Anthoxanthum hirtum</i>	Sweet Grass	S4	n/a
	<i>Apocynum androsaemifolium</i>	Spreading Dogbane	S4	n/a
	<i>Aralia nudicaulis</i>	Wild Sarsaparilla	S4	n/a
	<i>Arctostaphylos uva-ursi</i>	Bearberry	S4	n/a
	<i>Argentina anserina</i>	Silverweed	S4	n/a
	<i>Artemisia frigida</i>	Pasture Sage	S5	n/a
	<i>Asclepias ovalifolia</i>	Oval-leaved Milkweed	S5	n/a
	<i>Astragalus agrestis</i>	Field Milk-vetch	S4	n/a
	<i>Astragalus crassicaupus</i>	Ground-plum	S4	n/a
	<i>Astragalus flexuosus</i>	Slender Milkvetch	S4	n/a
	<i>Betula papyrifera</i>	Paper Birch	S5	n/a
	<i>Boechera retrofracta</i>	Reflexed Rockcress	S4	n/a
	<i>Borago officinalis</i>	Borage	SNA	n/a
	<i>Bouteloua gracilis</i>	Blue Grama	S5	n/a
	<i>Campanula rotundifolia</i>	Harebell	S5	n/a

Group	Scientific Name (Genus/Species)	Common Name	Subnational Ranking	COSEWIC
Plantae	<i>Carex filifolia</i>	Thread-leaved Sedge	S5	n/a
	<i>Chamaenerion angustifolium</i>	Fireweed	n/a	n/a
	<i>Chamaerhodos erecta</i>	Little Ground Rose	S4	n/a
	<i>Chenopodium murale</i>	Nettle-leaf Goosefoot	SNA	n/a
	<i>Chenopodium album</i>	Lamb's-quarter's	SNA	n/a
	<i>Cirsium undulatum</i>	Wavy-leaved Thistle	S4	n/a
	<i>Cladonia cariosa</i>	Split-peg soldiers	S5	n/a
	<i>Comandra umbellata</i>	Bastard Toadflax	S5	n/a
	<i>Comandra umbellata ssp. pallida</i>	Bastard Toadflax	S5	n/a
	<i>Cornus canadensis</i>	Bunchberry	S4	n/a
	<i>Cornus sericea</i>	Red-osier Dogwood	S4	n/a
	<i>Cypripedium parviflorum</i>	Small Yellow Lady's Slipper	S3	n/a
	<i>Dalea candida</i>	White Prairie-clover	S5	n/a
	<i>Dalea purpurea</i>	Purple Prairie-clover	S4	n/a
	<i>Dasiphora fruticosa</i>	Shrubby Cinquefoil	S4	n/a
	<i>Datura stramonium</i>	Jimsonweed	SNA	n/a
	<i>Echinocystis lobata</i>	Wild Cucumber	S5	n/a
	<i>Elaeagnus commutata</i>	Silverberry	S4	n/a
	<i>Elymus canadensis var. canadensis</i>	Canada Wild Rye	S4	n/a
	<i>Equisetum hyemale</i>	Common Scouring-rush	S4	n/a
	<i>Erigeron canadensis</i>	Horseweed	S4	n/a
	<i>Erysimum inconspicuum</i>	Shy Wallflower	S4	n/a
	<i>Euphorbia glyptosperma</i>	Ridge-seeded Spurge	S4	n/a
	<i>Euthamia graminifolia var. graminifolia</i>	Flat-top Goldentop	S4	n/a
	<i>Festuca hallii</i>	Plains Rough Fescue	S3	n/a
	<i>Fragaria virginiana</i>	Smooth Wild Strawberry	S5	n/a
	<i>Gaillardia aristata</i>	Great-flowered Gaillardia	S4	n/a
	<i>Galium boreale</i>	Northern Bedstraw	S5	n/a
	<i>Galium triflorum</i>	Sweet-scented Bedstraw	S4	n/a
	<i>Gentianopsis virgata</i>	Lesser Fringed Gentian	S3	n/a
	<i>Geum triflorum</i>	Three-flowered Avens	S5	n/a
	<i>Glycyrrhiza lepidota</i>	Wild Licorice	S4	n/a
	<i>Gutierrezia sarothrae</i>	Broomweed	S4	n/a
	<i>Halerpestes cymbalaria</i>	Seaside Buttercup	S4	n/a
	<i>Helenium autumnale</i>	Common Sneezeweed	S4	n/a
	<i>Helianthus annuus</i>	Common Annual Sunflower	S4	n/a

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Plantae	<i>Helictotrichon hookeri</i>	Hooker's Oat Grass	S5	n/a
	<i>Hesperostipa comata</i>	Needle-and-thread Grass	S5	n/a
	<i>Heterotheca villosa</i>	Hairy False Golden-aster	S5	n/a
	<i>Heuchera richardsonii</i>	Alumroot	S4	n/a
	<i>Juncus balticus</i>	Baltic Rush	S4	n/a
	<i>Juniperus communis</i>	Common Juniper	S4	n/a
	<i>Juniperus horizontalis</i>	Creeping Juniper	S5	n/a
	<i>Krascheninnikovia lanata</i>	Winter-fat	S4	n/a
	<i>Lemna minor</i>	Lesser Duckweed	S1	n/a
	<i>Lepidium densiflorum pubecarpum</i>	Prairie peppergrass	n/a	n/a
	<i>Liatris punctata</i>	Dotted Blazing Star	S5	n/a
	<i>Linum rigidum</i>	Large-flower Yellow Flax	S5	n/a
	<i>Lithospermum incisum</i>	Narrow-leaved Puccoon	S4	n/a
	<i>Lygodesmia juncea</i>	Skeleton-weed	S5	n/a
	<i>Lysimachia maritima</i>	Sea-milkwort	S4	n/a
	<i>Maianthemum canadense</i>	Two-leaved Solomon's-seal	S4	n/a
	<i>Maianthemum stellatum</i>	Starflower False Solomon's-seal	S4	n/a
	<i>Matricaria discoidea</i>	Pineapple-weed	SNA	n/a
	<i>Medicago lupulina</i>	Black Medic	SNA	n/a
	<i>Medicago sativa</i>	Alfalfa	SNA	n/a
	<i>Monarda fistulosa</i>	Wild bergamot	n/a	n/a
	<i>Muhlenbergia cuspidata</i>	Prairie Muhly	S4	n/a
	<i>Oenothera biennis</i>	Yellow Evening Primrose	S4	n/a
	<i>Oenothera suffrutescens</i>	Scarlet Gaura	S4	n/a
	<i>Oxytropis campestris var. spicata</i>	Northern Yellow Point-vetch	S4	n/a
	<i>Packera cana</i>	Silvery Groundsel	S4	n/a
	<i>Parthenocissus quinquefolia</i>	Thicket Creeper	SNA	n/a
	<i>Pedimelum argophyllum</i>	Silvery Scurf Pea	S5	n/a
	<i>Pedimelum esculentum</i>	Indian Breadroot	S4	n/a
	<i>Penstemon gracilis</i>	Lilac Beardtongue	S4	n/a
	<i>Penstemon procerus</i>	Slender Beardtongue	S4	n/a
	<i>Persicaria lapathifolia</i>	Pale Persicaria	S4	n/a
	<i>Phlox hoodii</i>	Moss Phlox	S5	n/a
	<i>Picea abies</i>	Norway Spruce	n/a	n/a
	<i>Plantago major</i>	Common Plantain	SNA	n/a
	<i>Populus balsamifera</i>	Balsam Poplar	S5	n/a

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Plantae	<i>Populus deltoides</i>	Eastern Cottonwood	S4	n/a
	<i>Populus tremuloides</i>	Trembling Aspen	S5	n/a
	<i>Portulaca oleracea</i>	Purslane	SNA	n/a
	<i>Potentilla concinna</i>	Early Cinquefoil	S2	n/a
	<i>Potentilla pensylvanica</i>	Prairie Cinquefoil	S4	n/a
	<i>Primula incana</i>	Mealy Primrose	S4	n/a
	<i>Primula pauciflora</i>	Saline Shootingstar	S4	n/a
	<i>Prunus virginiana</i>	Chokecherry	S5	n/a
	<i>Pulsatilla nuttalliana</i>	Prairie Crocus	S5	n/a
	<i>Pyrola asarifolia</i>	Pink Wintergreen	S4	n/a
	<i>Quercus macrocarpa</i>	Bur Oak	S5	n/a
	<i>Ratibida columnifera</i>	Prairie Cone-flower	S4	n/a
	<i>Rhus aromatica</i>	Fragrant Sumac	S5	n/a
	<i>Rosa arkansana</i>	Low Prairie Rose	S5	n/a
	<i>Rumex occidentalis</i>	Western Dock	S4	n/a
	<i>Rusavskia elegans</i>	Elegant sunburst lichen	S5	n/a
	<i>Sagittaria cuneata</i>	Arum-leaved Arrowhead	S4	n/a
	<i>Salvia officinalis</i>	Sage	n/a	n/a
	<i>Sambucus racemosa</i>	Red Elderberry	S2	n/a
	<i>Sanicula marilandica</i>	Black Snakeroot	S4	n/a
	<i>Schizachyrium scoparium</i>	Little Bluestem	S4	n/a
	<i>Selaginella densa</i>	Dense Spike-moss	S4	n/a
	<i>Setaria viridis</i> var. <i>viridis</i>	Green Foxtail	SNA	n/a
	<i>Shepherdia argentea</i>	Buffalo-berry	S4	n/a
	<i>Sisyrinchium montanum</i>	Common Blue-eyed-grass	S4	n/a
	<i>Smilax lasioneura</i>	Herbaceous Greenbrier	S4	n/a
	<i>Solanum triflorum</i>	Wild Tomato	S4	n/a
	<i>Sphaeralcea coccinea</i>	Scarlet Mallow	S5	n/a
	<i>Symphoricarpos albus</i>	Snowberry	S4	n/a
	<i>Symphoricarpos occidentalis</i>	Western Snowberry	S5	n/a
	<i>Symphyotrichum</i>	Geyer's Aster	S5	n/a
	<i>Symphyotrichum ciliatum</i>	Rayless Aster	S4	n/a
	<i>Symphyotrichum ericoides</i>	Tufted White Prairie Aster	S5	n/a
	<i>Syntrichia ruralis</i>	Hairy Screw Moss	S5	n/a
	<i>Tephroseris palustris</i>	Marsh Ragwort	S4	n/a
	<i>Thalictrum venulosum</i>	Veiny Meadow-rue	S4	n/a

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Plantae	<i>Thermopsis rhombifolia</i>	Golden-bean	S5	n/a
	<i>Tilia americana</i>	American Linden	SNA	n/a
	<i>Toxicodendron rydbergii</i>	Poison Ivy	S4	n/a
	<i>Tragopogon dubius</i>	Yellow Goat's-beard	SNA	n/a
	<i>Trifolium repens</i>	White Clover	SNA	n/a
	<i>Triglochin maritima</i>	Seaside Arrow-grass	S4	n/a
	<i>Triglochin palustris</i>	Marsh Arrow-grass	S4	n/a
	<i>Typha latifolia</i>	Common Cattail	S4	n/a
	<i>Ulmus americana</i>	American Elm	S4	n/a
	<i>Viburnum opulus</i>	High Bush-cranberry	S4	n/a
	<i>Viburnum opulus var. americanum</i>	High Bush-cranberry	S4	n/a
	<i>Vicia americana</i>	American Purple Vetch	S5	n/a
	<i>Viola adunca</i>	Early Blue Violet	S5	n/a
	<i>Viola canadensis</i>	Western Canada Violet	S4	n/a
	<i>Viola canadensis var. rugulosa</i>	Western Canada Violet	S4	n/a
	<i>Viola nuttallii</i>	Nuttall's Yellow Violet	S4	n/a
	<i>Viola pedatifida</i>	Crowfoot Violet	S3	n/a
	<i>Xanthium strumarium</i>	Cocklebur	S4	n/a
	<i>Zizia aptera</i>	Heart-leaved Alexanders	S4	n/a
Reptilia	<i>Chelydra serpentina</i>	Snapping Turtle	S3	Special Concern
	<i>Thamnophis radix</i>	Western Plains Gartersnake	S5	n/a



Photo Courtesy Peter Baran

Meewasin Valley Authority

402 Third Avenue South Saskatoon, SK S7K3G5

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e: meewasin@meewasin.com | t: 1(306)665-6887

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