City of Saskatoon

NATURAL CAPITAL ASSET VALUATION
PILOT PROJECT
CITY OF SASKATOON

Presentation Overview

1. Natural Capital Asset Valuation - pilot project
2. Definitions
3. Valuation Framework
4. Natural Areas Inventory
5. Vulnerability Assessment
6. Natural Assets - pilot project
7. Valuation Results
8. Conclusion
9. Next steps

City of Saskatoon

Pilot Project Goals

- Develop a proposed framework for valuation of natural assets for the City of Saskatoon;
- Create an inventory of municipal natural assets for the City;
- Conduct a basic vulnerability assessment for natural assets within city limits; and
- Complete a pilot valuation for these natural assets.

City of Saskatoon

Definitions

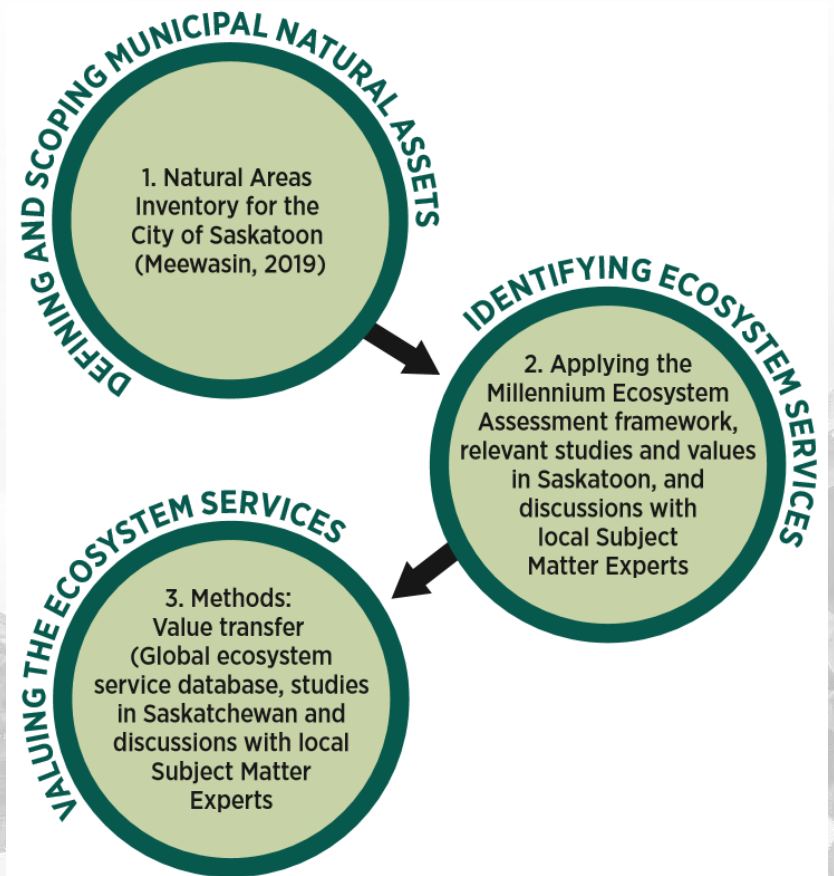
Municipal natural assets refer to the stocks of natural resources or ecosystems that contribute to the provision of one or more services required for the health, well-being and long-term sustainability of a community and its residents. (Municipal Natural Assets Initiative, 2017).

City of Saskatoon

Definitions

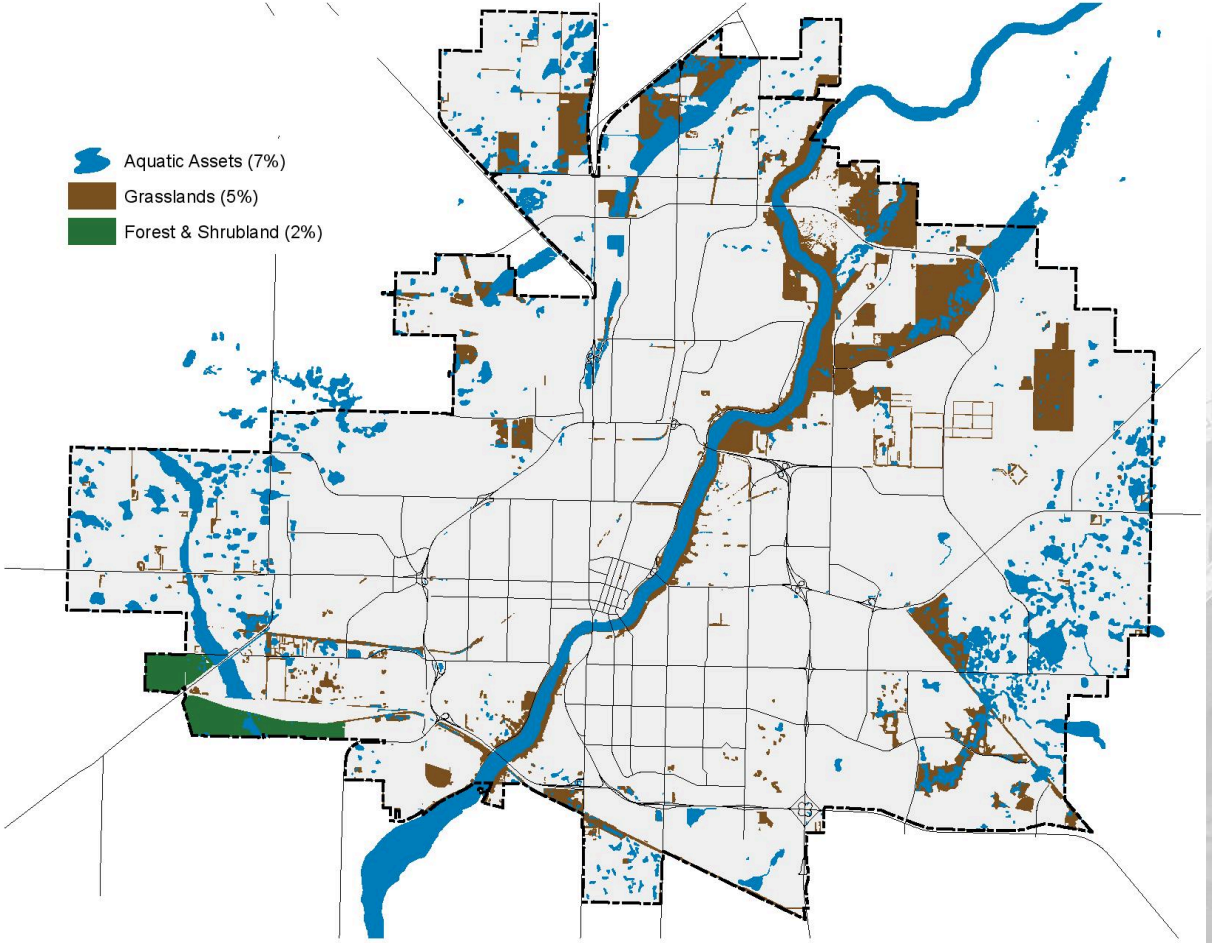
Ecosystem services are the benefits people derive from functioning ecosystems, the ecological characteristics, functions, or processes that directly or indirectly contribute to human well-being. (United Nations Millennium Ecosystem Assessment, 2005)

Valuation Framework



City of Saskatoon

Natural Areas Inventory



City of Saskatoon

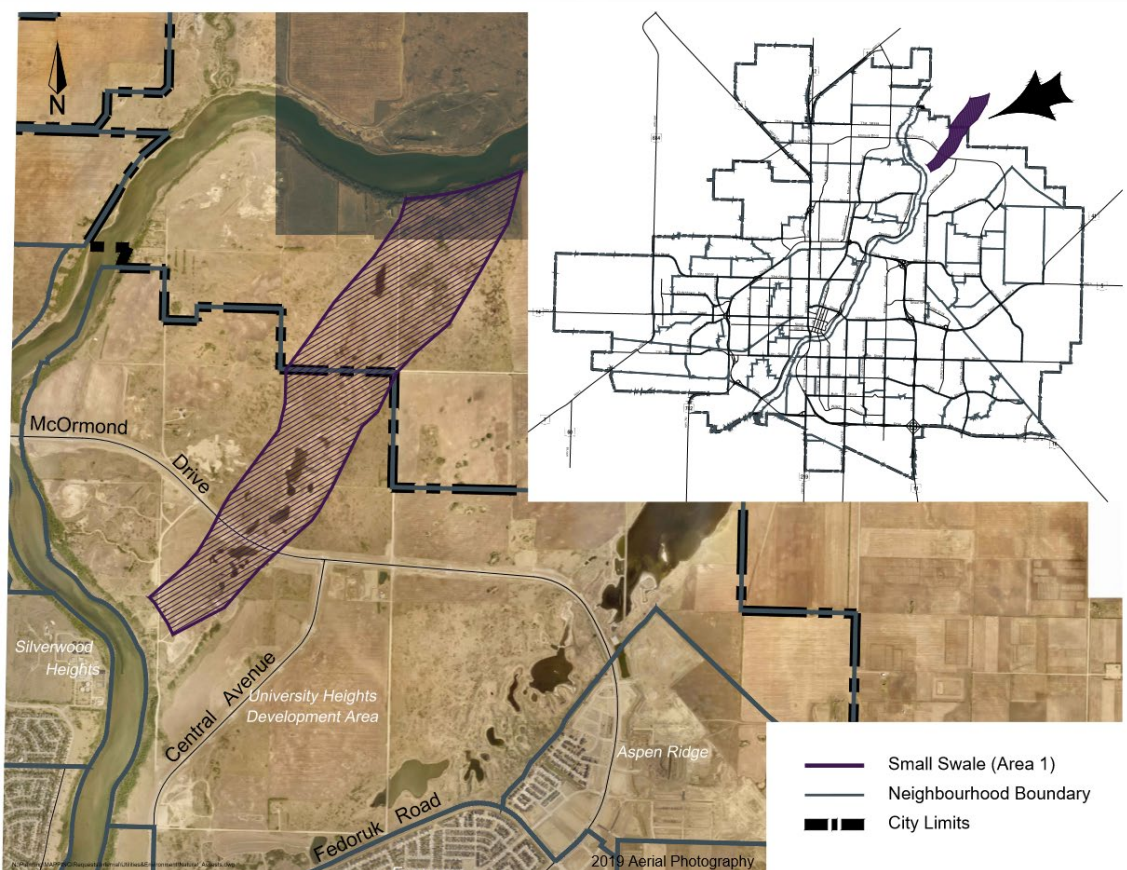
Vulnerability Assessment

Natural Asset	Service	Hazards	Risk
Aquatic (Wetlands)	Habitat	Heat stress, increasingly frequent freeze-thaw cycles	High
	Storm water management	Severe heavy precipitation events	High
	Recreation	Higher demand because of longer warm season	Medium
Grassland	Habitat	Heat stress, increasingly frequent freeze-thaw cycles	High
	Habitat	Uncontrolled wildfire	Low
	Habitat	Larger and more diverse pest populations	Medium
	Recreation	Higher demand because of longer warm season	Medium
	Forage Production	Reduced soil health	Low
Forest & Shrub-land	Habitat	Heat stress, increasingly frequent freeze-thaw cycles	High
	Habitat	Uncontrolled wildfire	Low
	Recreation	Higher demand because of longer warm season	Medium

City of Saskatoon

Pilot Valuation

Area 1. Small Swale

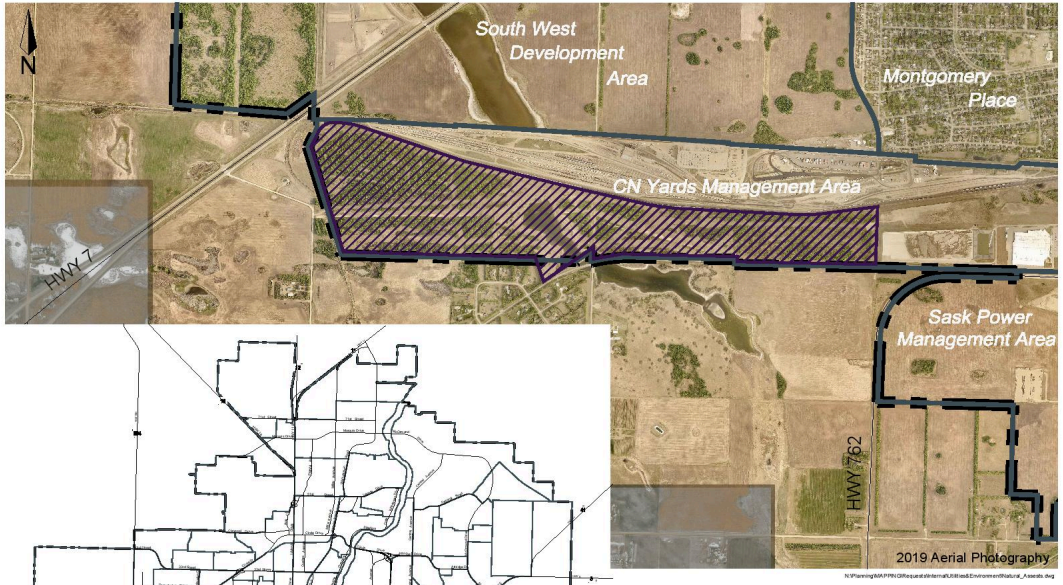


Land cover	Area (ha)	%
Wetland	18	11
Grassland	144	89
Forest/Shrubland	0	0
Total	162	100

City of Saskatoon

Pilot Valuation

Area 2. Richard St. Barbe Baker Afforestation area, including the Northwest Section of Chappell Marsh



Land cover	Area (ha)	%
Wetland	7	5
Grassland	67	51
Forest/Shrubland	58	44
Total	132	100

City of Saskatoon

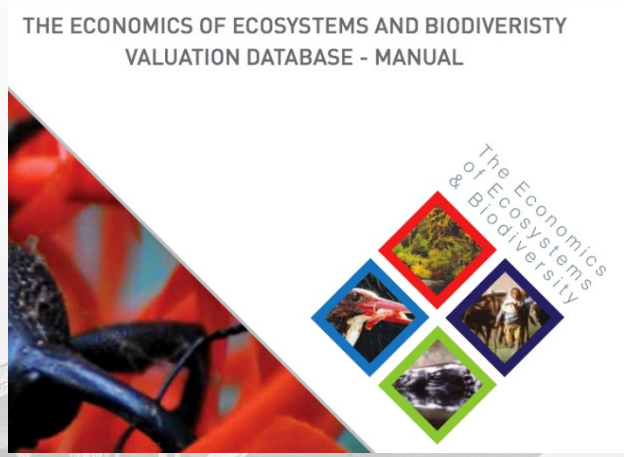
Ecosystem Services

Type	Service	Description
SUPPORTING	Habitat	Provides everything that an individual plant or animal needs to survive.
REGULATING	Carbon sequestration and storage	Ecosystems regulate the global climate by storing and sequestering greenhouse gases.
	Moderation of extreme events	Extreme weather events or natural hazards include floods, storms, tsunamis, avalanches and landslides. Ecosystems and living organisms create buffers against natural disasters, thereby preventing possible damage. For example, wetlands can soak up flood water whilst trees can stabilize slopes. Coral reefs and mangroves help protect coastlines from storm damage. Note: this study focused on storm water management.
	Waste water treatment	Ecosystems such as wetlands filter both human and animal waste and act as a natural buffer to the surrounding environment. Through the biological activity of microorganisms in the soil, most waste is broken down. Thereby pathogens (disease causing microbes) are eliminated, and the level of nutrients and pollution is reduced.
	Pollination	Insects and wind pollinate plants and trees which is essential for the development of fruits, vegetables and seeds. Animal pollination is a service mainly provided by insects but also birds and bats.
	Biological control	Ecosystems are important for regulating pests and vector borne diseases that attack plants, animals and people. Ecosystems regulate pests and diseases through the activities of predators and parasites. Birds, bats, flies, wasps, frogs and fungi all act as natural controls.
	Local climate and air quality regulation	Trees or other plants also play an important role in regulating air quality by removing pollutants from the atmosphere..
CULTURAL	Recreation and mental and physical health	Walking and playing sports in green space is not only a good form of physical exercise but also lets people relax. The role that green space plays in maintaining mental and physical health is increasingly being recognized, despite difficulties of measurement.
	Aesthetic appreciation and inspiration for culture, art and design	Language, knowledge and the natural environment have been intimately related throughout human history. Biodiversity, ecosystems and natural landscapes have been the source of inspiration for much of our art, culture and increasingly for science.
	Added value to property	Natural assets provide amenity value to neighbouring properties and increase property value.
	Historical/heritage	Many natural assets have historical and heritage importance.
PROVISIONING	Forage production	It describes the material or energy outputs from ecosystems such as food, raw material, fresh water, medicinal resources. For example, grasslands provide food for livestock.

Valuation Method

The **value (benefit) transfer method** was used to assign values to ecosystem services for the pilot. This method involves borrowing an existing value estimated for a similar ecosystem.

- from other studies in Saskatchewan
- from the global ecosystem service valuation database.



City of Saskatoon

Valuation Results

NCAV SUMMARY TABLE							
		Supporting	Regulating	Cultural	Provisioning	All Services	
Land Cover	Area (ha)	Value ($/year)	Value ($/year)	Value ($/year)	Value ($/year)	Value ($/ha/year)	Value ($/year)
Area 1							
Wetlands	18	529,100	46,500	500	0	32,002	576,100
Grasslands	144	700	89,400	3,700	61,300	1,078	155,100
Forest/Shrubland	0	0	0	0	0	887	0
Total	**162**	**529,800**	**135,900**	**4,200**	**61,300**		**731,200**
Area 2							
Wetlands	7	205,800	18,100	200	0	32,002	224,100
Grasslands	67	300	41,600	1,700	28,500	1,078	72,100
Forest/Shrubland	58	0	49,900	1,500	0	887	51,400
Total	**132**	**206,100**	**109,600**	**3,400**	**28,500**		**347,600**

City of Saskatoon

Valuation Results: Cultural Services

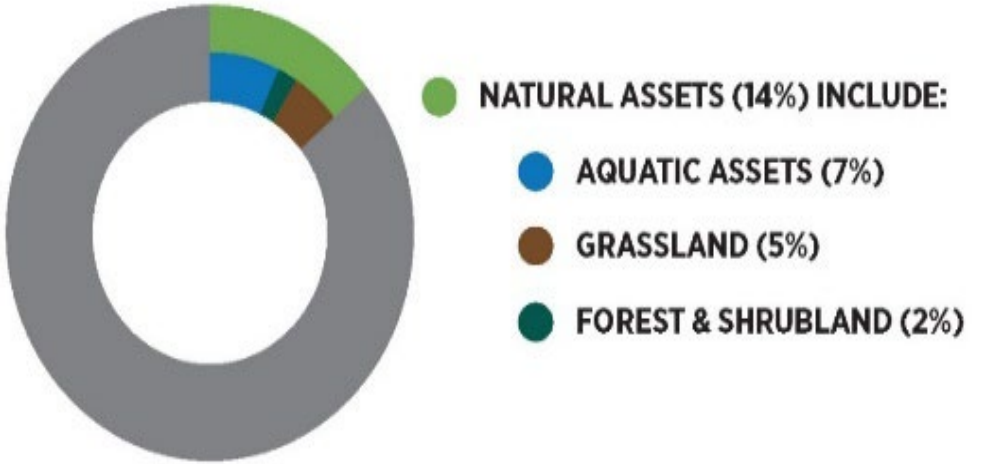
The cultural value has been underestimated.

CULTURAL SERVICES			
Land cover	**Area (ha)**	**Value ($ /ha/year)**	**Value ($ /year)**
Area 1			
Wetlands	18	26	500
Grasslands	144	26	3,700
Forest/Shrubland	0	26	0
Total			**$4,200**
Area 2			
Wetlands	7	26.07	200
Grasslands	67	26.07	1,700
Forest/Shrubland	58	26.07	1,500
Total			**$3,400**

City of Saskatoon

Valuation Results: City-wide

The total value of Saskatoon's natural assets identified by the Natural Areas Inventory is estimated as **$48.2 million per year**.



City of Saskatoon

Valuation Results: City-wide

Natural assets	Area (ha)	Estimated Carbon Storage (Carbon tonnes/ha)	Total Carbon Storage (tonnes of carbon)	Total CO_2e Storage (tonnes of CO_2e)
River	388	-	-	-
Wetland	1,207	175	211,225	775,196
Grassland	1,285	135	173,475	636,653
Forest & Shrublands	577	77	44,429	163,054
			Total Carbon Stored	**1,574,903**

City of Saskatoon

Conclusion

Valuation can help to:

- Identify and quantify the value (with greater accuracy) of ecosystem services provided by natural assets;
- Develop a framework for natural asset accounting;
- Develop indicators to track ecosystem health by measuring the status of natural assets;
- Identify risks to ecosystem services, such as the loss of soil or water quality;
- Prioritize actions to strengthen natural assets; and
- Manage and fund natural assets consistently.

City of Saskatoon

Conclusion

Challenges:

- Lack of policy to direct valuation of natural assets;
- Lack of experience in applying this new approach to asset management;
- Lack of information about the use and health of natural assets in general; and
- Inability to reflect natural assets in the financial statements of the corporation as these values cannot currently be audited.

City of Saskatoon

Next Steps

- Asset Management
  - Opportunity to consider management of natural assets while improving asset management of engineered and enhanced assets;
- Alignment with actions and initiatives proposed by:
  - *Green Infrastructure Strategy* and
  - *Corporate Climate Adaptation Plan*

City of Saskatoon

City of Saskatoon

Thank-you!