

Saskatoon's Green Infrastructure Strategy:

Towards an Interconnected Green Network

EXECUTIVE SUMMARY



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The Saskatoon community is passionate about our Green Network. The Green Network is used for many meaningful activities including active and passive recreation in over 200 parks, food production in over fifty community gardens, active transportation throughout our extensive trail system, agricultural and environmental research at the University of Saskatchewan, access to wild spaces in our natural areas and naturalized parks, and cultural connections at Wanuskewin Heritage Park.

As Saskatoon grows, our Green Network is under increasing pressure to provide high quality green space to all city residents while supporting storm water management and other ecosystem services. External risks such as climate change compromise the Network's capacity to support public needs and municipal services.

To address these concerns, the City of Saskatoon has created the *Green Infrastructure Strategy* (Strategy). The purpose of the Strategy is to establish the vision, actions, and implementation framework to enhance Saskatoon's Green Network by integrating green infrastructure into land use planning and asset management. The Strategy identifies existing green infrastructure, and the municipal and ecosystem services it provides while considering site-specific factors, community needs, and financial implications. The Strategy also identifies community partners to strengthen green infrastructure in priority areas.

Vision and Guiding Principles

The Vision is *Saskatoon's Green Network provides sustainable habitat for people and nature.*

The following Guiding Principles provide a framework through which the vision will be achieved. These principles were used to analyze the existing Green Network, create themes, and develop actions and key performance indicators to address network risks.

Climate Change Adaptation and Mitigation

Ecological Integrity

Education and Awareness

Equitable and Accountable

High Quality

Integrated and Multifunctional

Public Safety

Recognizable and Unique Places

Sustainable

Wellness: Physical and Mental

What is green infrastructure and where do we find it?

Green Infrastructure is a system of natural, enhanced, and engineered assets that provide municipal and ecosystem services by protection, restoring, or emulating nature. When green infrastructure is designed holistically, it becomes an interconnected **Green Network** that enhances the urban environment and improves quality of life.

Natural assets are native to the Saskatoon region. They include the South Saskatchewan River, grasslands, woodlands, wetlands, and soil systems. These sites often contain important cultural and archaeological features. Natural assets are core ecosystems that provide important habitat for urban wildlife, mitigate risks from changing climate conditions, support municipal services (e.g. storm water management), and connect the community to nature. They can be carefully integrated into development to conserve as much ecosystem and cultural function as possible.

Enhanced assets are designed places and features that modify natural assets for improved human use in an urban context. These include our formal green spaces such as district and neighbourhood parks, informal green spaces such as roadway greens and medians, the urban forest, and arable land. Enhanced assets provide space for recreation, relaxation, commuting, and food production. They can also provide linkages and habitat between natural assets, and help absorb storm water.

Engineered assets incorporate nature-inspired design into the built environment to support ecosystem function or greater connectivity to natural and enhanced assets. They include much of our storm water infrastructure, trail systems, Low Impact Development (e.g. green roofs), and grey infrastructure with nature friendly or cultural considerations. Some grey infrastructure interfaces with green infrastructure. For example, storm water infrastructure can sometimes be naturalized; trails and roadways can be modified to support wildlife movement.

Benefits of green infrastructure

Ecosystem services are the array of benefits provided by green infrastructure. Trees purify the air and absorb carbon as they grow.

Flowering plants support bees and other insects, which in turn pollinate our crops. Wetlands incorporated into the storm water network help purify our water and store carbon. Well-designed green spaces provide areas for both recreation and relaxation.

The Millennium Ecosystem Assessment is a United Nations framework that categorizes ecosystem services into four broad areas: Provisioning, Regulating, Cultural, and Supporting services. Understanding these services is essential to improving our management of the Green Network.

Development of the Green Infrastructure Strategy

The *Green Infrastructure Strategy* was developed using the following process:

- **Vision and Guiding Principles:** From 2017 to 2019 feedback from over 600 community members, technical experts, and the Indigenous Technical Advisory Group¹ informed the development of the Guiding Principles and vision for the Green Network (see Table 2). The Guiding Principles were endorsed by Council in May of 2018.
- **Inventory and Findings:** The current state of green infrastructure assets in Saskatoon’s Green Network was compiled in the *Green Infrastructure Strategy Baseline Inventory Report* that was presented to City Council in May of 2018². As the project progressed and information became available³, the inventory was refined and updated.

Findings related to each asset were developed through further analysis of risks and opportunities in the Green Network. Analysis included research into Saskatoon plans and policies, practices in other municipalities, and feedback from internal stakeholders and technical experts.

- **Themes:** The inventory, findings, and resulting actions were organized into five themes: Community, Governance, Open Space, Ecology, and Storm Water.
- **Actions & Initiatives:** Actions and initiatives are designed to address risks and take advantage of opportunities.
- **Implementation:** As the *Strategy* is implemented, initiatives that address the actions will be prioritized through further stakeholder and community input. Initiatives will be brought forward to Council for deliberation throughout implementation to direct priorities and funding.

Figure 1: Development of the Green Infrastructure Strategy



1 City of Saskatoon. (2020). Green Infrastructure Strategy Engagement Report.
 2 City of Saskatoon. (2018). Green Infrastructure Strategy Baseline Inventory Report.
 3 E.g. Diamond Head Consulting. (2019). Urban Forest Canopy Assessment. E.g. Meewasin. (2019). Natural Areas Inventory for the City of Saskatoon.

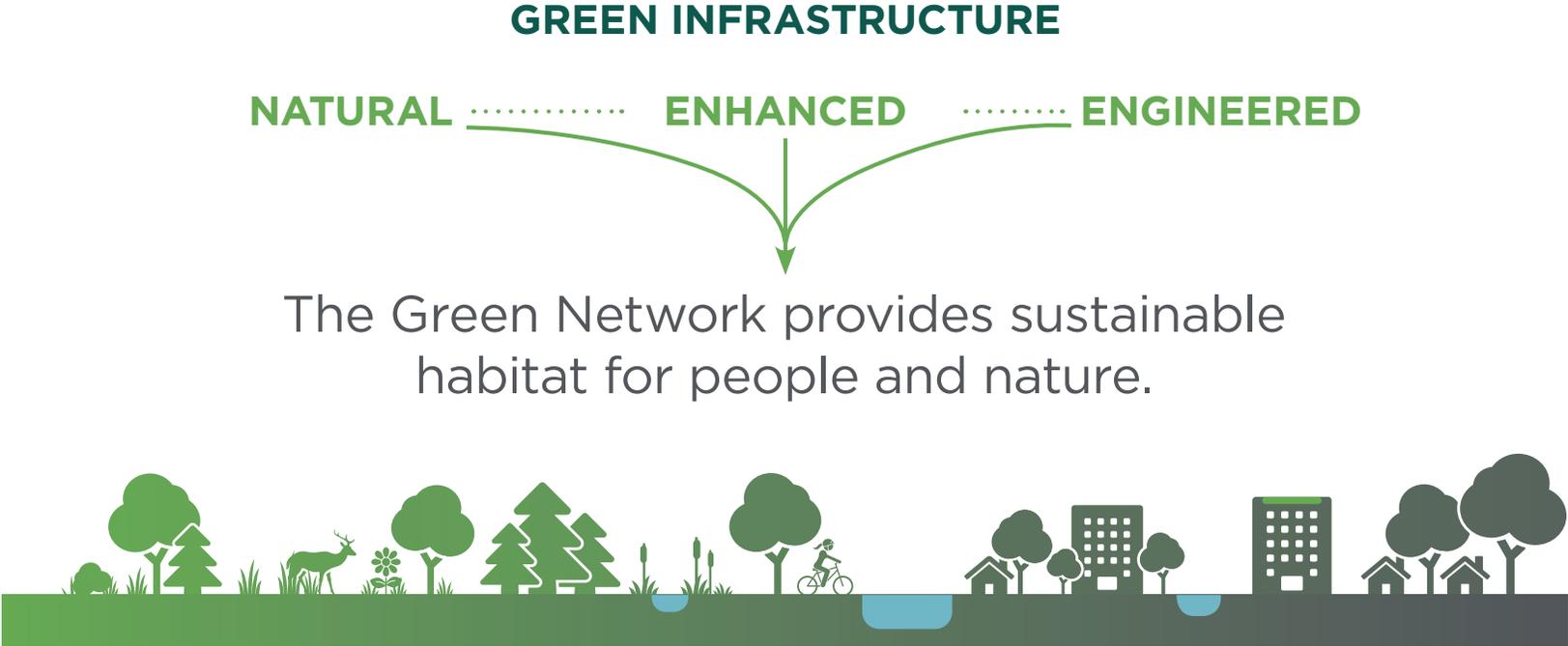
SASKATOON'S GREEN NETWORK

When green infrastructure is designed holistically, it becomes an interconnected **Green Network** that enhances the urban environment and improves quality of life (see Figure 2).

Taking a network approach to green infrastructure ensures that the multiple interactions of people, nature, and assets in the Green Network

are considered holistically. Systems thinking in both planning and land use frames green infrastructure assets through a web of interrelationships that provide far more ecosystem services when designed together than apart.

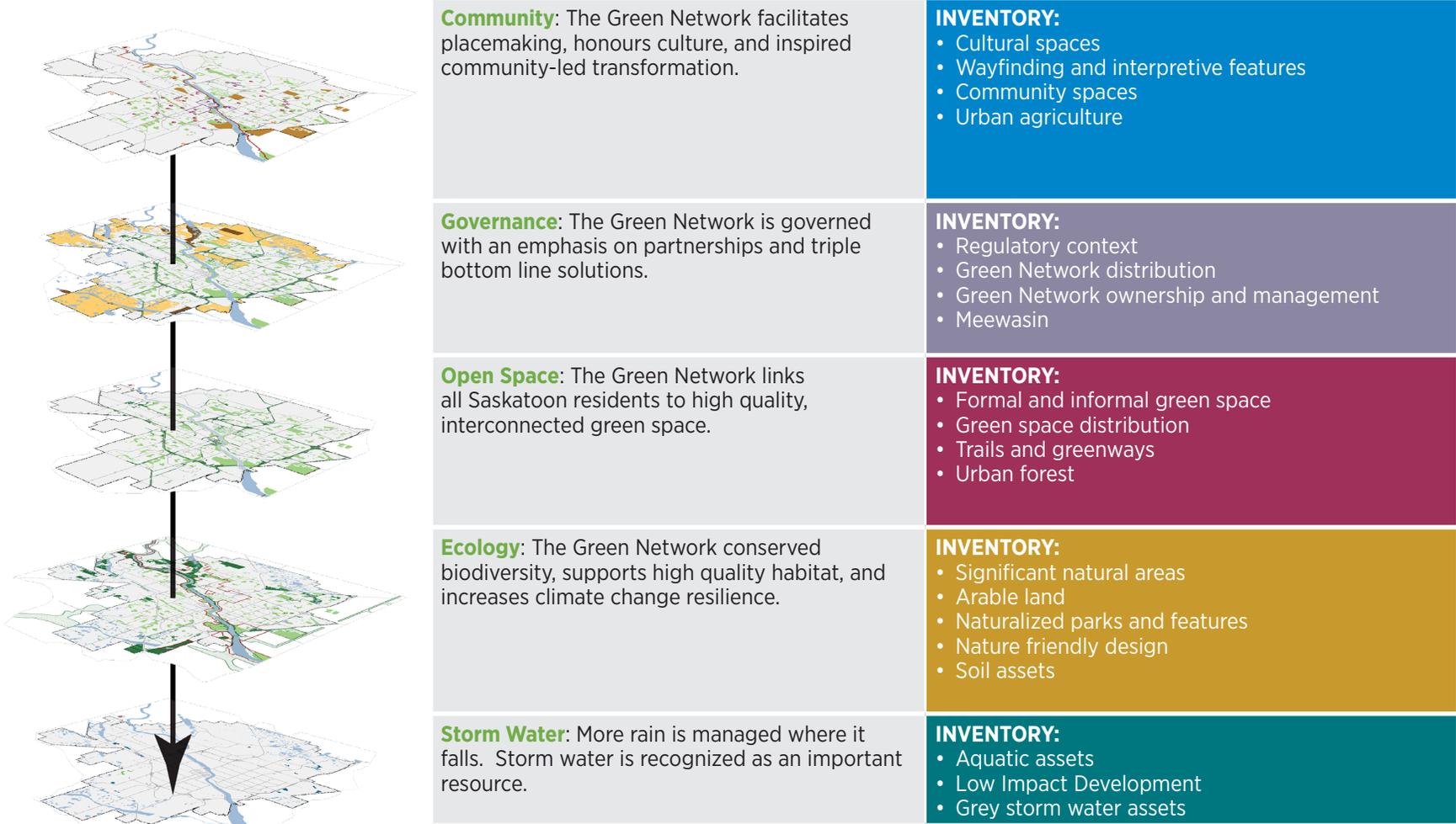
Figure 2: Green infrastructure assets interconnecting to form the Green Network and achieve the vision.



Green Network Themes

Addressing risks will allow Saskatoon to achieve an interconnected Green Network. Risks to green infrastructure are identified, and opportunities to address risks are proposed as actions in each theme. Through these actions, network risks will be addressed, and the vision for the Green Network will be achieved.

Figure 3: Green Network themes, inventory, and maps.



Summary of Community Actions

Community Actions	Phase*	Responsibility		
		Primary	Secondary	Partners
Action 1: Design the Green Network to reflect our collective history, honour cultural diversity, and create a sense of belonging for all.				
Action 1 should take place throughout the Green Network. Community partnerships and cultural assessments are required to identify specific priority areas.				
1.1: Complete an Intangible Cultural Heritage Assessment to better understand community uses of the Green Network.	2	Sustainability		Local First Nations, Heritage Society, Meewasin, and many others
1.2: In partnership with the community, complete a Traditional Land Use and Traditional Knowledge assessment to identify cultural elements in the Green Network, and establish ways to conserve, honour, and revitalize these elements.	2	Sustainability, Indigenous Initiatives	P&D	
1.3: Continue meaningful engagement with affected groups to design the Green Network through an equity and inclusion lens.	1	Sustainability	All	
1.4: Work with the community to tell the story of Saskatoon's Green Network from many voices through public art, interpretive features, and other mediums.	2	Community Development	Indigenous Initiatives	
Action 2: Inspire citizen-driven transformation of the Green Network.				
Community partnerships and an intangible cultural heritage assessment is required to identify priority areas.				
2.1: Develop and provide education materials about the Green Network to citizens to increase community awareness and ownership.	1	Sustainability	Parks, P&D, Saskatoon Land, Saskatoon Water	Meewasin, SES Local Businesses, and many others
2.2: Seek opportunities to incentivize green infrastructure in private and commercial areas.	1			
2.3: Develop a program and funding model to support community-led green infrastructure projects, citizen science, and bio-cultural management.	1			
Action 3: Increase food production in the Green Network.				
There is considerable public interest in increasing urban agriculture city-wide. The <i>Junction Improvement Strategy</i> recommends improving food security and urban growing practices in redevelopment projects. Food deserts are also a priority area.				
3.1: Update policies to improve urban agriculture outcomes and community or regional partnerships.	3	Sustainability	P&D, Parks, Community Development, Indigenous Initiatives	Saskatoon Food Council, CHEP Good Food, SFBLC, Meewasin
3.2: Work with partners to develop a comprehensive food strategy, including implementation of the <i>Saskatoon Regional Food System Assessment and Action Plan</i> .	2			
3.3: Work with and support partners to incorporate food and fruit production or traditional food systems into high priority urban areas.	2			
3.4 Identify potential sites and partners to develop a food forest pilot project.	1			
*Phases: proposed initiation of actions. 1: near term (within 2 years); 2: medium term (within 3 to 9 years); 3: long term (over 10 year).				

Summary of Governance Actions

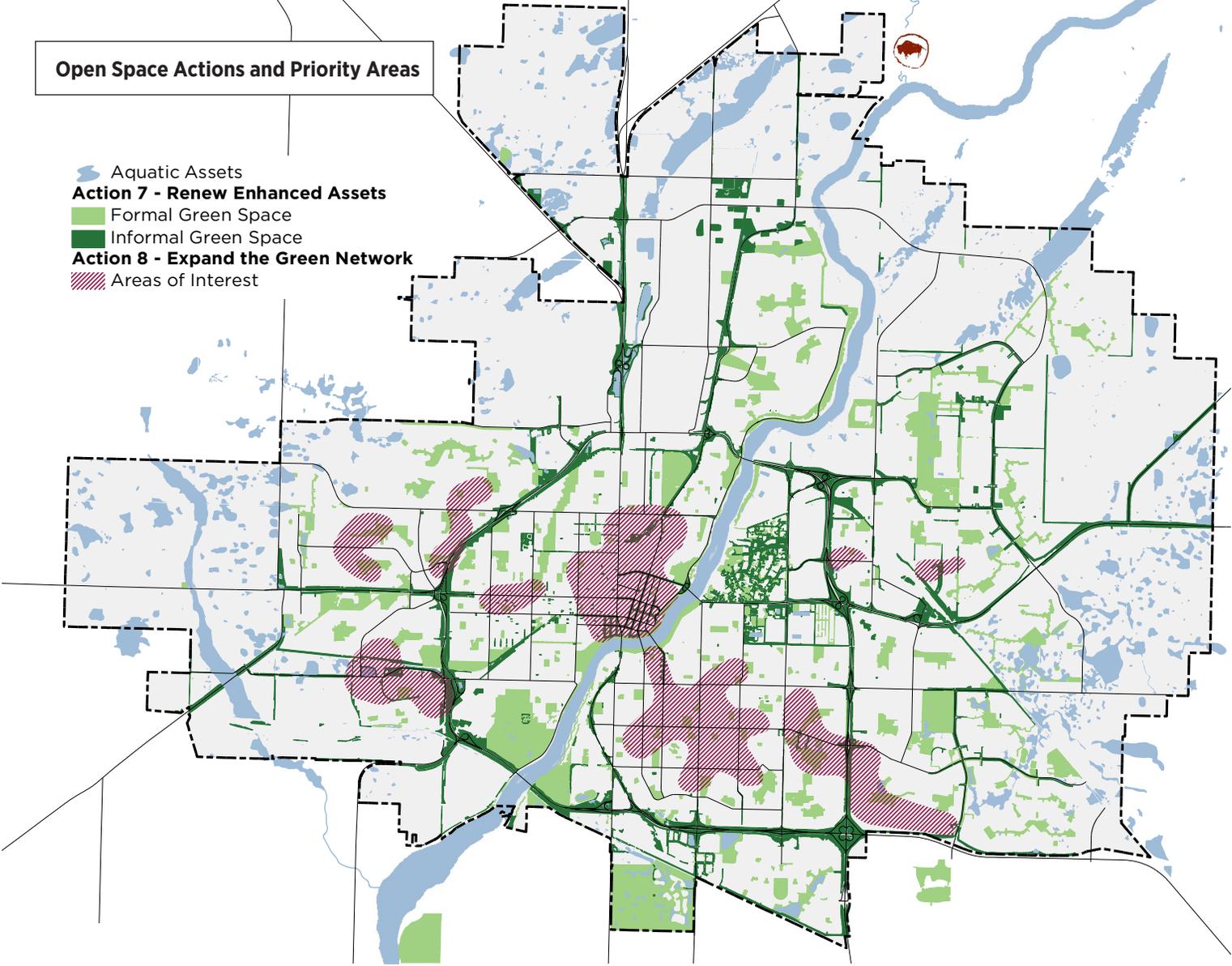
Governance Actions	Phase*	Responsibility		
		Primary	Secondary	Partners
Action 4: Invest in the Green Network within the City of Saskatoon. Action 4 should take place throughout the Green Network.				
4.1: Improve Green Network planning by updating City work plans, policies, and initiatives to increase green infrastructure across Saskatoon.	3	Sustainability	P&D	
4.2: Compile City-wide data sets for more effective data management and create data sharing agreements with other agencies.	1		All	Meewasin, many others
4.3: Adopt an ethical space and triple bottom line approach to Green Network governance, planning the Green Network through sustainability, inclusion, and equity frameworks.	1		All	Local First Nations
4.4: Define an appropriate service level and associated funding for the Green Network to prioritize future investments.	3		Parks	
4.5: Evaluate the ecosystem services of the Green Network through the Natural Capital Asset Valuation process.	3			Meewasin
Action 5: Develop a cooperative governance approach to Green Network provision and management. Action 5 should take place throughout the Green Network.				
5.1: Work with research and education institutions such as the University of Saskatchewan and school divisions, conservation agencies, landowners, and other stakeholders on green space management and education.	1	Sustainability	Saskatoon Water, P&D	U of S
5.2: Work with regional partners to coordinate Green Network development and management in urban areas that intersect with the region.	3			P4G, Meewasin
5.3: Work with Wanuskewin to conserve their viewshed and support management of Opimihaw Creek.	1		Indigenous Initiatives	WHP, P4G, Meewasin
5.4: Partner with Indigenous communities and organizations to explore traditional land management and governance models for the Green Network.	3			Many
Action 6: Redefine the partnership with Meewasin to achieve collective goals related to conservation, education, and development in the Green Network. Action 6 should take place in significant natural areas and partnership areas of interest.				
6.1: Establish regular meetings to review plans and priorities to strategically align mutual work.	1	Sustainability and Community Services	P&D, Parks, Saskatoon Water	Meewasin
6.2: Collaborate on conservation, naturalization, and the development of trails, interpretive infrastructure, and amenities in areas of interest.	2			
6.3: Leverage and support Meewasin's educational and public outreach programming and volunteer base to increase conservation, ecology, and natural and cultural resource awareness.	1			
6.4: Seek opportunities to collaborate on external funding.	1			
6.5: Update the Meewasin-City service agreement and other documents as needed to reflect the above initiatives.	1			
*Phases: proposed initiation of actions. 1: near term (within 2 years); 2: medium term (within 3 to 9 years); 3: long term (over 10 year).				

Summary of Open Space Actions

Open Space Actions	Phase*	Responsibility		
		Primary	Secondary	Partners
Action 7: Renew formal and informal green space in the Green Network to meet citizen needs. Action 7 should take place in areas determined through the Parks prioritization process. The Pierre Radisson Park complex has been identified as one opportunity.				
7.1: Identify high priority formal and informal green spaces to upgrade or redevelop.	2	Parks	Sustainability	Meewasin
7.2: Increase coordination within the City, and with the community, to encourage informal green space renewal.	2	Sustainability	Parks	Community groups
7.3: Implement park upgrade plans starting in high priority areas.	3	Parks, Facilities	RCD, Sustainability	
Action 8: Expand the Green Network by creating new publicly available green space or increasing green infrastructure. Action 8 should take place in areas with low green infrastructure distribution.				
8.1: Identify green infrastructure opportunities outside the existing Green Network.	3	Sustainability	Community Services, Parks, Saskatoon Land, Saskatoon Water	Meewasin, other green space owners and managers
8.2: Secure key sites through purchase, donation, or partnership with other land owners, stakeholders, or citizen groups.	3			
8.3: Design and implement green infrastructure expansion in areas of interest.	3			
Action 9: Increase walkability and active transportation throughout the Green Network. Action 9 should take place throughout the Green Network.				
9.1: Identify and address accessibility and connectivity barriers to and within the Green Network.	2	Transportation	Sustainability, Parks	Meewasin
9.2: Increase access to and within the Green Network, with an emphasis on walkability and multi-modal transportation.	2			
Action 10: Protect and grow the urban forest. Action 10 should take place in priority areas as determined by the Urban Forest Management Plan.				
10.1: Ensure existing trees are protected, including through policy and bylaw updates.	1	Parks	Sustainability, P&D	Meewasin
10.2: Review and improve existing programs related to tree watering, maintenance, inventory, and planting techniques.	1			
10.3: Continue to trial new tree species and increase biodiversity.	3			
10.4: Design sustainable tree planting sites to ensure adequate soil volume, quality, and space for trees.	2			
10.5: Develop community education and outreach programs to increase public awareness, stewardship, and partnerships.	1		Sustainability	SOS Elms, Friends of the Afforestation Areas
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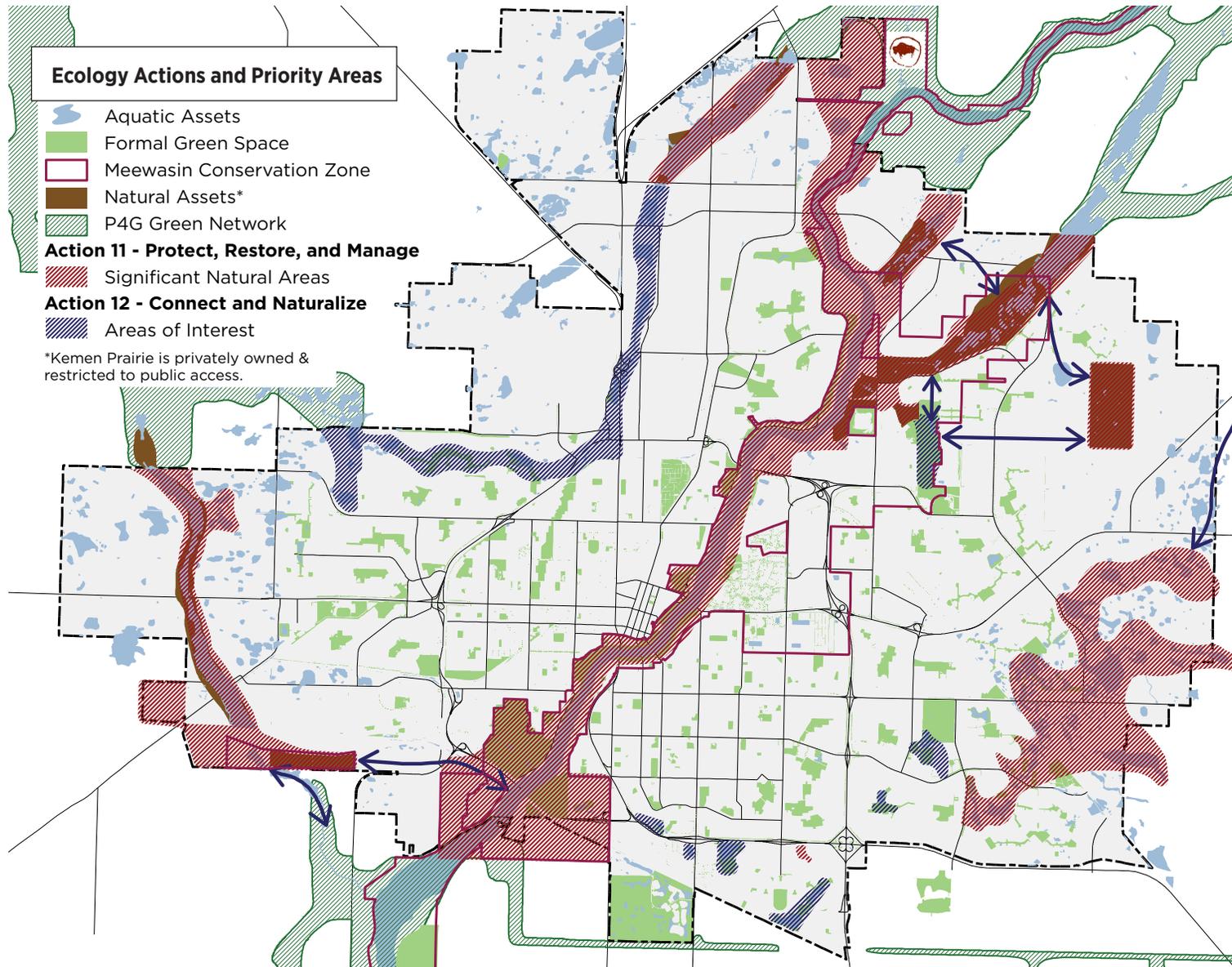
Open Space Actions and Priority Areas

-  Aquatic Assets
- Action 7 - Renew Enhanced Assets**
-  Formal Green Space
-  Informal Green Space
- Action 8 - Expand the Green Network**
-  Areas of Interest



Summary of Ecology Actions

Ecology Actions	Phase*	Responsibility		
		Primary	Secondary	Partners
Action 11: Protect, restore, and manage significant natural areas. Action 11 should take place in significant natural areas identified in the <i>Natural Areas Inventory</i> .				
11.1: Identify natural areas and make management decisions for these sites regarding avoidance, minimization, or compensation.	2	Sustainability, P&D		U of S, Meewasin
11.2: Protect significant natural areas using a variety of available protection tools.	1			Meewasin
11.3: Integrate natural assets into the urban fabric while conserving ecosystem function.	3	Sustainability	P&D, Saskatoon Water	
11.4: Develop and implement site-specific management plans, including restoration of natural areas when required.	1		Parks	
11.5: In partnership with landowners, direct development in a way that helps retain and protect high quality arable land connecting to the regional agricultural network.	3		P&D, Saskatoon Land	U of S, P4G, Meewasin
Action 12: Connect and naturalize the Green Network in built-up areas. Action 12 should take place where Network connectivity gaps are identified in the <i>Natural Areas Inventory</i> and in green spaces identified by the Parks Naturalization program.				
12.1: Naturalize parks, storm water infrastructure, and other open space where appropriate.	2	Sustainability, Parks	Saskatoon Water	Meewasin
12.2: Purchase or acquire land in strategic areas to enhance biodiversity outcomes and increase connectivity.	3	Sustainability, P&D	Saskatoon Land	
12.3: Increase the City's use of native species in restoration and naturalization work.	3	Parks, Sustainability		
12.4: Coordinate with regional partners to connect the City's Green Network to the Regional Green Network whenever possible.	3	Sustainability, P&D	Saskatoon Water	P4G
Action 13: Improve biodiversity and ecosystem health throughout the Green Network. Action 13 should take place throughout the Green Network. Wildlife friendly retrofits should be prioritized adjacent to natural areas.				
13.1: Develop dark sky and low noise zones, prioritizing sites to reduce ecological stress.	2	Sustainability	P&D, SL&P	Meewasin
13.2: Develop and integrate wildlife friendly standards into development, including bird friendly standards in highly built-up areas.	1		P&D, C&D, Transportation, Parks, Facilities	BIRDS, Meewasin
13.3: Reduce point and non-point source pollution to natural assets.	2		Saskatoon Water	Meewasin, PFSRB
13.4: Establish ongoing biodiversity monitoring and reporting with partners.	1		Parks	Meewasin, U of S, UWIN
13.5: Improve management of the City's soil assets.	2	Parks, Sustainability		
*Phases: proposed initiation of actions. 1: near term (within 2 years); 2: medium term (within 3 to 9 years); 3: long term (over 10 year).				



Summary of Storm Water Actions

Storm Water Actions	Phase*	Responsibility		
		Primary	Secondary	Partners
Action 14: Integrate natural waterbodies and drainage courses into development using green infrastructure. Action 14 should take place in wetlands and drainage courses that will serve future growth areas. More areas will be identified and added to the inventory as new information comes available. Storm ponds with non-vegetated shoreline should also be considered.				
14.1: As the city expands, incorporate wetlands and natural drainage paths into the storm water network in greenfield development areas.	3	P&D, Saskatoon Water	Sustainability	Meewasin
14.2: Identify how green infrastructure can increase the storm system's capacity to respond to intense rain events.	3	Saskatoon Water, Sustainability		U of S
14.3: Evaluate opportunities to increase naturalization of existing storm ponds to improve water quality and habitat, while balancing community recreation and other considerations.	3	Saskatoon Water	Sustainability, Parks	Meewasin
14.4: Consult with affected organizations when designing storm water infrastructure to mitigate impacts to natural areas and cultural elements within the watershed.	3		Sustainability	Meewasin, many
Action 15: Increase the use of Low Impact Development. Action 15 should take place in areas with high percentage of hard surface; areas along key corridors, downtown, and strategic infill areas; and flood prone areas.				
15.1: Incorporate Low Impact Development pilots into City projects to show leadership, prioritizing high-pedestrian areas such as BRT corridors and Downtown.	2	Sustainability, Saskatoon Water	P&D	U of S
15.2: Continue partnering with research institutions and conservation agencies to determine best practices for Low Impact Development.	2		Parks	U of S, PFSRB, Meewasin, MOST
15.3: Update bylaws and regulations to allow more permeable surfaces.	2	Sustainability, P&D	Saskatoon Water	
15.4: Encourage commercial, institutional, and residential installation of Low Impact Development and onsite storm water management through education and incentives.	2	Saskatoon Water, Sustainability		Businesses
15.5: Pilot raw water use projects.	2	Sustainability	Saskatoon Water, Parks	
*Phases: proposed initiation of actions. 1: near term (within 2 years); 2: medium term (within 3 to 9 years); 3: long term (over 10 year).				

